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**Bronze Age communities and
bronze metallurgy in
Xinjiang**
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INTRODUCTION

The theme of the origin of metallurgy and its transmission has been the object of debate since the early twentieth century among western scholars, who have generally assumed that “civilization” began in Western Asia and then spread in all directions, including China¹. The first diffusionist hypothesis was that of the *ex oriente lux* formulated by Oscar Montelius (1843-1921) after the Napoleonic expedition to Egypt (1798-1801)². The theory, according to which civilisation spread to Europe from Western Asia, was accepted by most scholars and, as time went by, it took a more ethnic connotation, especially evident with the establishment of the “Siedlungsarchäologie” (Settlement Archaeology or Cultural-historical Paradigm)³. The “Siedlungsarchäologie” recognized both theories of migration and diffusion, on the basis that migration had to be restricted to the movement of certain ethnic groups, who spread their cultural innovations by colonizing the receiving population⁴. The transmission of metal technologies to and from China has been a crucial focus in the debate on the origin of civilization from the 1920s, when John Andersson, after extensive surveys in Gansu and Qinghai, suggested that the painted pottery excavated in Yangshao (ca. 5000-3000 BC) may have reached China from Western Asia⁵. This theory gained larger consensus after the discovery of archaeological remains in Anyang, the last capital of the Shang dynasty (1600-1046 BC), which demonstrated that a state-level society, possessing metal technology, chariots and written language, existed in China in the twelfth century BC⁶. The lack of earlier examples to prove an internal technological development let western scholars to assume that all these inventions must have reached China from Mesopotamia. In the 1960’s the intellectual movement called “Processual Archaeology”⁷ emerged in Europe and the USA: by focusing on the observation of internal dynamics in ancient civilizations, “Processual Archaeology” rejected migration as an explanation for social change and proposed instead that internal factors, such as social

¹ CHILDE 1936, 1954; for a review see PUETT, 1998, pp. 699-700.

² SAID, 1995, p. 87; TRIGGER, p. 11.

³ The name “Siedlungsarchäologie” was used by Kossinna (1858-1931) during the Meeting of Anthropologists in Cassel in August 1895 to describe the diffusion of prehistoric Germanic populations in Germany. KOSSINNA, 1896, pp. 1-14.

⁴ The “Siedlungsarchäologie” developed from the combination of the first definition of “culture” given by Childe and the “colonial migration theory” by Kossinna. While the former equated archaeological cultures with specific ethnic groups, Kossinna studied the origin of social changes in early societies, which he identified in a series of migration waves by certain human groups. For instance, he proposed that the spread of innovations in prehistoric Europe was favoured by the movement of the Aryans. For further information see TRIGGER, 1980; CHILDE, 1925; KOSSINNA, 1896.

⁵ ANDERSSON, 1925; CHANG Kwang-chih, 1981.

⁶ THORP, 2013, pp. 117-153.

⁷ “Processual Archaeology” (also known as “New Archaeology” or “Scientific Archaeology”) is a theoretical movement developed in the 1960s-1970s. The central concepts included the following: 1) archaeology as a science, and not just as a branch of history; 2) focus on culture process, generating a more lifelike, fluid understanding of the past, based on understanding the complex interrelated cultural and environmental factors that contribute to cultural (and archaeological) change over time; 3) an expressly theoretical approach.

differentiation and population growth, had provided impulse for change⁸. The origin of Chinese civilization was one of the central topic and Chinese scholars in Europe and the USA were largely involved in the debate. They formulated a number of evolutionary theories on the independent development of Chinese civilization, such as the “Cradle of Asia Theory” by He Banji (“Cradle of Asia” is a distortion of the expressions “Cradle of the West” and “Cradle of Civilizations”, which have been used to define Mesopotamia and Egypt⁹) and the “Nuclear Theory”, advertised by Chang Kwang-chih¹⁰. Very soon these theories gained large consensus among western scholars, remaining unchallenged until the 1990s. In spite of the success of the evolutionary theories on the independence of Chinese civilization, in the 1970s “Processual Archaeology” was already losing favour among western archaeologists, while new diffusionist hypotheses emerged. An increasing number of studies on the spread of agriculture in prehistory set the basis for the “Demic Diffusionism”, which postulated that the surplus of population in regions where agriculture was practised caused the spread of farming in the Neolithic period¹¹. “Demic Diffusionism” was soon combined with “Cultural Diffusionism” (defined as the spread of agro-pastoralism by information and material transmission in the absence of migrations¹²), creating a mixed model, according to which innovations could have spread by migration of people or by transmission of information and material, or both¹³. The mixed model was deeply studied and applied to different regions, with encouraging results: for example, it was employed to demonstrate the spread of Indo-European languages throughout Eurasia by Renfrew¹⁴. In the following years research has improved with the growing deploy of new technologies and the development of specialized branches of archaeology: especially from the end of the 1980s genetics, historical linguistics, demographic modelling and archaeological evidence have been combined, in order to trace movement of ancient populations and possible interactions among different cultural groups. This new multidisciplinary approach is called “archaeogenetics”¹⁵.

As a consequence of these debates two theories on the emergence of metallurgy have been put forward so far: the first, proposed by Theodore Wertime, argues that the expertise required for an efficient

⁸ CHAPMAN, 1997, p. 12.

⁹ HE Banji, 1975.

¹⁰ CHANG Kwang-chih, 1963, pp. 53-55.

¹¹ AMMERMAN, CAVALLI-SFORZA, 1971.

¹² FORT, 2012, p. 18669.

¹³ LEMMEN, GRONENBORG, WIRTZ, 2011; FORT, 2012; FORT, 2015.

¹⁴ RENFREW, 1989.

¹⁵ RENFREW, 2000.

metalworking could only have been discovered once¹⁶, while the second theory, advanced by Colin Renfrew, proposes multiple independent origins of metallurgy¹⁷. In spite of the varying views on the topic, both theories include the concept of technological transmission from one (or more) centres to peripheral territories. According to the results of my research, Xinjiang was indeed a “periphery”, and it was reached by communities who used metal¹⁸.

Geography

Xinjiang is the north-westernmost province of China, and it is located in the heart of the Asian continent (Fig. 1). It is ecologically divided by the Tianshan Range into two main regions, the north and the south (Fig. 2). The northern part is called Dzungaria and includes the Dzungarian Basin and the surrounding areas: the Altay Mountains, the Ili River valley, the Tacheng region and the area around Urumqi. The Dzungarian Basin has a roughly triangular shape with “open corners”: in the west it is connected to Kazakhstan through a system of low mountains and wide passes, such as the famous Dzungarian Gate; in the north the Irtysh Valley also leads to Kazakhstan, while in the east it opens to the present region of Gansu. Western and northern ranges are relatively low, allowing moist from Central Asia to reach the Dzungarian Basin. Therefore, Northern Xinjiang is cooler and enjoys more rainfalls than its southern counterpart. In addition to rainfalls, water is supplied by rivers and streams: in the northern part of the Dzungarian Basin, the Irtysh River originates on the Altay Mountains (close to the Mongolian border) and flows in a north-western direction towards the Zayzan Lake in Kazakhstan, and then to Western Siberia, where it meets the Ob River, forming one of the world’s longest river systems. Dzungaria is characterized by a number of endorheic lakes, such as the Wulungu, Aibi, Manas and Ailike. Given the relatively humid condition of Northern Xinjiang, ecological habitat includes meadows and marshlands, which provide wide grazing and pasture lands, in particular in the valleys on the northern slope of the Tianshan Range and in the Altay highlands. A separate region is that of Ili-Tacheng in North-western Xinjiang: the Ili Valley and the territory around Tacheng are both green and fertile lands, surrounded by high mountains on all sides except the west, where they open to the semi-arid steppe of Kazakhstan.

¹⁶ WERTIME, 1964; he supported his theory in WERTIME, 1973.

¹⁷ RENFREW, 1969; RENFREW, 1973.

¹⁸ The only exception is the Qiemu’erqieke community, in the Altay region, where evidence of an early and perhaps local metallurgy has been found. This will be discussed in the first chapter.

The southern part of Xinjiang is a close region bounded by mountain ranges on all its sides and with the Taklamakan Desert at its centre. The particular feature of the Taklamakan Desert is its gravel belt, which surrounds the sandy desert and isolates it from the foothills. At present, only the Keriya and Hotan (Hetian) rivers are able to flow rather far into the desert, while smaller streams and brooks from the Kunlun and the A'erjin Mountains usually vanish under the gravel and reappear in the sandy desert, forming deltaic fans. In the northern part of the Taklamakan Desert, small rivers from the Tianshan Mountains flow to the valleys and reach the gravel desert. In the past, oases were created in the large valleys where agriculture and pastoralism were both practiced. The eastern side of the desert consists of gravels. From the Bogedashan and Kuluke Mountains small rivers flow down creating intricate and isolated deltaic fans, where oases have formed and prospered. In particular, the oases of Turfan and Hami are fertile lands, widely covered by loess, and their soil has been suitable for agriculture since prehistory. The eastern part of the Tarim Basin opens to Gansu through several passes, the most famous being the Jade Gate (Yumen). The western side of the Taklamakan Desert consists of fertile highlands contained in the three main ranges, the Tianshan, Pamirs, and Karakorum (Kala Kunlun), which surround the area on three sides: north, west and south respectively. Rivers from these mountains flow down to the Taklamakan Desert, forming oases, such as that of Kashgar. The southern rim of the Tarim Basin includes the green highlands contained in the Kunlun Range, from which rivers and brooks flow down to the desert and form oases on their deltas.

Xinjiang has long been effected by the phenomenon called the “desiccation of Asia”, which has essentially resulted in a decrease of the glaciers mass, a predominance of wind erosion, a degradation of plant life and a reduction of lakes and rivers’ areas¹⁹. Recent paleoenvironmental and archaeological studies have revealed that in the past green lands in Xinjiang were wider, while the area of the Taklamakan Desert was significantly smaller²⁰. In addition, the Tarim River system was larger: the Tarim River flew along the northern slope of the Tianshan Range reaching Lop Nur and the Kongque River, which was its tributary. Now the Tarim River reaches the endorheic lake of Taitema²¹. Moreover, at present the Keriya River disappears in the Taklamakan Desert, while once it crossed this arid area from south to north and flew into the Tarim River. The Niya River was its tributary. The Hotan River flows north from the Kunlun Mountains: while in the past it was larger and richer, the

¹⁹ HUNTINGTON, 1906; KURKOV, 1968.

²⁰ YANG Xiaoping, WHITE [et. al.], 2006, see in particular p. 389, fig. 7. During the several conversations I had in 2016 with professors Yuan Qirong and Liu Wensuo, in Urumqi and Guangzhou respectively, both expressed the same idea that the Taklamakan Desert may have been significantly smaller in the past.

²¹ HORNER, CHEN, 1935.

river is now fed only by melting snow and carries water during the summer, when it can still reach the Tarim River²².

Archaeological history: from the first explorations to modern excavations

Because of its geographical features - a desert surrounded by formidable mountains - its remoteness and inaccessibility, Xinjiang was one of the last places on Earth to be inhabited in the Mesolithic period and explored from the end of the nineteenth century²³. Russian explorers were the first to investigate Xinjiang and its neighbouring regions at the end of the nineteenth century. The growing interest in Inner Eurasia²⁴ was largely motivated by political reasons: in the British-Russian struggle for power in Central Asia, the so called “Great Game” (1856-1907), the two Empires funded new expeditions in the region, aiming at the creation of “spheres of influence” for archaeological research, but mainly for political power²⁵. While the British Empire mainly focused on Afghanistan, the Russian RGS (Russian Geographical Society) and RAS (Russian Academy of Science) initiated a series of expeditions in Xinjiang in order to map the region, facilitate trades and gain strategic information. In doing so, scholars in the fields of archaeology, anthropology, botany and ethnography were also added to the teams. Among others, anthropologist, archaeologist and keeper at the Museum of Anthropology and Ethnography in Saint Petersburg, Dmitri Klementz (1848-1914) explored for the first time the northern slope of the Tianshan Range in 1898, collecting numerous artefacts in Karakhoja (Gaocheng), Asitana, Yarkhoto (Jiaohe), and then investigated a few sites in the Turfan Basin. These discoveries, including manuscripts, painting and numerous handmade objects, were reported to the 12th International Congress of Orientalists in Rome in 1899. On the basis of his experience and together with other two experts of Asian Studies, namely Valisilii Radlov (1837-1918) and Sergei Oldenburg (1863-1934), Klementz wrote *Note on the organization of an expedition to the Tarim Basin for Archaeological Purposes* (1901)²⁶, which became the *vade mecum* for the following Russian expeditions in Central and Eastern Asia. In fact, in line with Klementz suggestions, the Russian Committee for Middle and East Asian Studies launched a number of expeditions with the pioneering purpose of “studying those

²² YANG Xiaoping, WHITE [et. al.], 2006, p. 385.

²³ MAIR, 2010, p. 24.

²⁴ I have adopted the term and concept of “Inner Eurasia” explained by David Christian. As Inner Eurasia is intended the area of the ex URSS, Mongolia and Xinjiang. The reason behind this choice is more clearly explained later in the introductory chapter.

²⁵ For further information on the Grate Game period see MEYER, BRYSAC, 1999.

²⁶ KLEMENTZ КЛЕМЕНТИЦ, OLDENBURG ОЛЬДЕНБУРГ, 1901, p. 10.

cultural monuments, which could shed the light on ancient cultural links between different great civilizations and provide help to all international expeditions”²⁷. Vice chairman of the Committee was Oldenburg, who took credit for succeeding in the first attempt of collaboration with western scholars and explorers: after consulting with Paul Pelliot (1879-1945) and Marc Aurel Stein (1862-1943), he successfully conducted the two Russian-Turkestan expeditions (1909-1910 and 1914-1915), briefly published in his *Exploratory Archaeological Expedition to Chinese Turkestan*²⁸. These and other reports by Russian travellers and scholars stimulated interest among European explorers in the ancient populations in the heart of Asia. The first European to explore Xinjiang was Sven Anders Hedin (1865-1952) in 1890-1891. He was then followed by Stein, who organized three expeditions (1900-1902, 1906-1908, 1913-1916)²⁹, Albert Grünwedel (1856-1935)³⁰, who in total led four explorations together with Albert von Le Coq (1860-1930) between 1902-1914³¹, and Pelliot, who only went once in 1906-1909. For the purpose of this research, Hedin’s expeditions are the most useful, in particular the fourth one, which took place between 1927 and 1935. This is known as the “Sino-Swedish Expedition” as the nationalist government in Beijing imposed the presence of Chinese researchers as full partners. The results of the “Sino-Swedish Expedition” were described in several publications by Hedin himself³², or by Folke Bergman (1902-1946)³³, the main archaeologist in Hedin’s team. Another important book is that by Erik Norin (1895-1982)³⁴, geologist in Stein’s group. These reports still constitute reference literature for topographical, geographical, geological and archaeological information³⁵.

The well-reported exploration campaigns by these European pioneers drew further scholarly attention to the early Xinjiang civilizations. However, the social and political changes that involved the world in the following years caused western interest in investigating Xinjiang and Inner Asia to decline. After the Second World War (1939-1945) and the proclamation of the People’s Republic of China (1949), western scholars were no longer permitted to carry out field work in China, and even access to the PRC was extremely difficult. On the contrary, the Soviet Union maintained a close alliance with China, but only until 1957, when ideological and political conflicts emerged, leading to a definite split in 1960.

²⁷ “Russian Collections, Russian Explorations in Chinese Central Asia”, in *International Dunhuang Project*, http://idp.bl.uk/pages/collections_ru.a4d, 16/02/2016.

²⁸ OLDENBURG ОЛЬДЕНБУРГ, 1914. For a review of Oldenburg’s first expedition see: POPOVA, 2008.

²⁹ STEIN, 1981.

³⁰ GRUNWEDEL, 1912; GRUNWEDEL, 1906.

³¹ LE COQ, 1926.

³² HEDIN, 1944; HEDIN, 1966.

³³ BERGMANN, 1939.

³⁴ NORIN, 1941.

³⁵ STEIN, 1981; HEDIN, 1966; NORIN, 1941. HEDIN, BERGMANN, 1945; BERGMANN, 1939.

The result of this situation is that from the 1960s until the 1990s, western, Chinese and Russian scholars conducted their research independently from each other. While the Chinese and the Russians suffered from intellectual isolation imposed by the political climate, western scholars were not granted access to materials nor to the country. Despite the numerous excavations and reports, news of Chinese and Russian discoveries in Xinjiang and Inner Asia rarely reached the west³⁶. As a consequence, interest on prehistoric Xinjiang among western scholars faded away, and the region was excluded from their research³⁷.

China began to autonomously investigate in Xinjiang after the end of the Second World War (1939-1945)³⁸. From 1956 to 1981 the Chinese government launched two general archaeological surveys, which resulted in the discovery of prehistoric sites, such as those of Yanbulake (1958), Qiemu'erqieke (1963), Xiangbaobao (1976), Aga'ersen (1976), Aketala (1977) and Wupu (1978). Unfortunately, not all the excavations were fully published. Significant finds were recorded from the 1980s to the 1990s, when national and local institutions launched a series of archaeological campaigns: in that period Bronze Age sites, such as Zagunluke no. 1 (1985), Tianshan Beilu (1988) and Sazi (1989) were investigated. In the past twenty-five years more sites were found. Archaeological activities have been recently encouraged by the Chinese Regulation on Archaeological Research: as a consequence of the "Xibu da kaifa" 西部大开发 (the great development of the western regions), since the 2000s the government has allowed a high number of salvage surveys and rescue campaigns, during which new findings have been uncovered every year.

Previous studies on Xinjiang

Systematic studies on Xinjiang prehistory began in the 1980s and major attempts to classify the remains into chronological frameworks have been made since then. In 1983 the general collection of Xinjiang archaeological research paper, *Xinjiang Kaogu sanshi nian* 新疆考古三十年 (Thirty years of archaeological research) was published: in this work prehistoric remains were all attributed to the

³⁶ For a concise summary on the discoveries in Xinjiang see ZHANG Yuzhong 张玉忠, 2002.

³⁷ Very few publications were produced by western scholars before the 1980s, the best known being Samolin's and Keith's: SAMOLIN, 1958; KEITH, 1929.

³⁸ The Sino-Soviet alliance broke up in the 1960s, however, even before that, archaeological cooperation with Russian scholars was more on a theoretical basis: Russian archaeologists offered academic aid to China in order to modernise its science. For a review on the relationship between Soviet and Chinese archaeologists see ZHANG Liangren, 2011.

Neolithic period³⁹. In 1985 Wang Binghua established the existence of two periods, Bronze Age and Iron Age, and placed them to 2000-1000 BC and 1000-200 BC respectively⁴⁰. After that, an increasing number of chronological frameworks have been proposed and, as a consequence, diverging opinions among scholars have emerged. While a group of experts has shown agreement with Wang Binghua on the existence of a Bronze Age and an Iron Age⁴¹, some have advanced a more general division into an “early” and a “later” period⁴², and others have rejected both the ideas and insisted that most of the remains belong to one period, that is the Bronze Age⁴³. Relevant progress has been made by Corinne Debain⁴⁴, Kwang-tzuu Chen and Fredrik Hiebert⁴⁵, Chen Ge⁴⁶, Han Jianye⁴⁷, Mei Jianjun⁴⁸, who proposed five major temporal-cultural frameworks, thus showing agreement on the attribution of some remains, such as those at Gumugou and Aketala, although uncertainties on the chronological position of sites in the Altay, Ili-Tacheng region and Eastern Xinjiang still linger. In spite of this, Wang Binghua’s periodization has been accepted by most scholars⁴⁹, as the division of prehistoric remains into Bronze Age and Iron Age has generally been confirmed by the typological analysis of the remains combined with available carbon dating results. Therefore in this research Wang Binghua’s division is used as reference, though comparisons with other dated remains (such as those in Siberia, Central Asia and China)⁵⁰ have been made, in order to place the findings correctly.

Research on Xinjiang prehistory has tended to consider Xinjiang as a single territory, both geographically and environmentally neglecting significant aspects connected to specific regional, geographical and climatic features. In 1993 Shui Tao proposed to organize all the Bronze Age remains into “eight regional groups”⁵¹, allowing the emergence of a geography-based approach to Xinjiang

³⁹ Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1983.

⁴⁰ WANG Binghua 王炳华, 1985a.

⁴¹ WANG Binghua 王炳华, 1985a; CHEN Ge 陈戈, 1985; CHEN Ge 陈戈, 1987; CHEN Ge 陈戈, 1990; CHEN Ge 陈戈, 1994; CHEN Ge 陈戈, 2002; MEI Jianjun, 2000.

⁴² CHEN Kwang-tzuu, HIEBERT, 1995; Gong Guocheng actually divides Xinjiang prehistory into four periods. GONG Guoqiang 龚国强, 1997.

⁴³ SHUI Tao 水涛, 1993, p. 489.

⁴⁴ DEBAINE, 1988; DEBAINE, 1989.

⁴⁵ CHEN Kwang-tzuu, HIEBERT, 1995.

⁴⁶ Chen Ge wrote several papers on the topic. Among them the most recent one is taken in higher consideration, though the others have been also used in this dissertation. CHEN Ge 陈戈, 2002.

⁴⁷ HAN Jianye 韩建业, 2005.

⁴⁸ MEI Jianjun, 2000.

⁴⁹ CHEN Ge 陈戈, 1990; MEI Jianjun, 2000; HAN Jianye 韩建业, 2005. This has also been confirmed by all the scholars I met in Xinjiang in 2016.

⁵⁰ For example the Andronovo cultural group, which has been pretty safely placed (by typological analysis and carbon dating) around 1900-1200 BC, and the Siba, assigned to the period ca. 1900-1500.

⁵¹ SHUI Tao 水涛, 1993.

prehistory. Soon after that, debates on the importance of the environment for the development of early communities in Xinjiang began: while some scholars have stressed the relevance of geographical features for the distribution of cultural groups⁵², others more or less explicitly have rejected the idea, stating that the cultural distribution was not controlled by geographical factors⁵³. In both cases, most studies have actually shown little interest in paying attention to the environment in which the remains were found, thus missing the opportunity to identify specific features of prehistoric communities, determined by their very environment. Unfortunately, more often archaeological findings have continued to be grouped on a regional basis for convenience sake, while the surrounding environmental conditions have not been taken into account in the interpretation process⁵⁴. An exception was the environment-oriented approach taken by Chen and Hiebert in 1995⁵⁵: by considering two distinct environments, the highlands and the desert oasis, they attempted to interpret the remains in the light of the regional environmental conditions in which early communities developed. These studies show the emergence of two distinct approaches to the regional distribution of prehistoric communities in Xinjiang: the geographical and the ecological ones. The geographical approach divides the territory into sub-regions on the basis of geographical barriers, while the ecological method pays more attention to ecology. The ecological approach seems to be particularly useful to analyse Xinjiang, given that, due to its harsh deserts surrounded by massive mountain chains, the region was not entirely suitable for human life. Large areas must have been uninhabited, while others were exploited for their environmental traits, namely the highlands and the desert basins oases. The highlands, mostly located in the northern part of the region (including the valleys on the northern and southern slopes of the Tianshan and the Pamir Ranges, the Altay and part of the Ili-Tacheng region), enjoyed relatively abundant rainfalls and were supplied with water by rivers, streams and lakes. As a result, the ecological habitat included meadows and marshlands, providing swathes of land for pasturage and allowing the development of semi-nomadic pastoralist communities⁵⁶. Desert oases were typical of the southern part of the Taklamakan Desert⁵⁷ and developed on the deltaic fans of rivers after their reappearance in the sandy desert. According to Chen and Hiebert, these oases were scattered and separated by high dunes,

⁵² SHUI Tao 水涛, 1993; CHEN Kwang-tzuu, HIEBERT, 1995.

⁵³ AN Zhimin, 1998, p. 47; MEI Jianjun, 2000, p. 8.

⁵⁴ See for example GUO Wu 郭物, 2012; CHEN Ge 陈戈, 1994; SHUI Tao 水涛, 1993; MEI, 2000, pp. 9-24.

⁵⁵ CHEN Kwang-tzuu, HIEBERT, 1995.

⁵⁶ SUSLVOV, 1961; HIEBERT, 1992.

⁵⁷ There are desert oases along the northern rim of the Taklamakan Desert and in the Dzungarian Basin, however, as Chen and Hiebert have stated, the greater supply of water has created an environment, which is closer to the highlands. CHEN Kwang-tzuu, HIEBERT, 1995, p. 247.

suggesting that local people must have been mainly sedentary, practicing some form of agriculture⁵⁸. However, recent paleoenvironmental and archaeological research has indicated that in the past the Taklamakan Desert may have been smaller than today⁵⁹, thus putting questions on Chen and Hiebert interpretation of some of the remains in Southern Xinjiang. The oases of Turfan and Hami, which lie on depressions surrounded by mountains with a continental desert climate, can be categorised as desert oases (Fig. 3).

The ecological approach to prehistoric sites in Xinjiang offers a different but equally useful perspective on the regional distribution of early communities. It provides a common background for remains in the same ecological environment (such as similar available materials, similar economy etc...), and, by contrast, underlines the emergence of local variants as well as the impact of external influences. In addition, this kind of analysis offers support in the difficult task of connecting communities characterized by similar objects, but made of different materials. For example, archaeological remains of the group at Gumugou, on the Kongque River, and those found in the early phase of the Qiemu'erqieke site in Altay City present many similarities concerning the burial structures, shape and the decoration of grave goods⁶⁰. However, the material used by the two communities was different: wood and stone respectively. This has made the establishment of connections between the two groups questionable, even though it is possible that the same cultural background was adapted to two different environments: the desert oasis (wood) and the highlands (stone) respectively⁶¹. Furthermore, promoting the emergence of patterns of regional occupation on an ecological basis provides helpful suggestions for further excavations. The drawback of the ecological approach is its difficult application, due to the lack of information on the ecological features of ancient Xinjiang: the intensity and actual effects of the phenomenon of the “desiccation of Asia” are currently not completely known, while paleoenvironmental research focused mainly on the area of Lup Nur⁶², and only recently some studies on the rest of

⁵⁸ CHEN Kwang-tzuu, HIEBERT, 1995, pp. 246-47.

⁵⁹ YANG Xiaoping, WHITE [et. al.], 2006, see in particular p. 389, fig. 7. The idea that in the past the Taklamakan Desert may have been significantly smaller than it is now was expressed by professors Yuan Qirong and Liu Wensuo when I met them in Urumqi and Guangzhou respectively in 2016.

⁶⁰ In both cemeteries, graves were marked with either poles or stele, one or more bodies were placed in coffins made of wooden or stone slabs and grave goods included a high number of simple tools, round-bottomed vessels or baskets and anthropomorphic figures. In both sites pottery was either absent (Gumugou) or rare (Qiemuerqieke). For a comparison see XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981; MAIR, 2006.

⁶¹ Some connections have been proposed by Han Kangxin, who, by analysing some of the skulls from Gumugou cemetery I, found similarities with those from Afanasievo's assemblages, thus speculated that Gumugou people were migrants from the highlands. However, when I was in Xinjiang in 2016, professor Yuan Qirong told me that in his opinion no connections existed between the two regions. HAN Kangxin 韩康信, 1986; HAN Kangxin, 1994, p. 2.

⁶² WANG Yue, DONG Guangrun, 1994; YANG Xiaoping, WHITE [et. al.], 2006.

Xinjiang have been conducted⁶³. That said, it seems that environment played a key role in the development of early cultural groups, since these communities were formed and had certain features also in response to environmental constraints. In addition, as pointed out by Boyd and Chang, land use, the choice of changing and exchanging and the patterns thereof, the emergence of specific technologies, as well as that of special burial rituals, reflect, at least partially, the process of integration between humans and the environment and the existence of “mutual relationships and feedbacks between people and environment”⁶⁴. In my opinion (formed on the basis of my research results), the role of the environment in the formation and distribution of prehistoric societies in Xinjiang was especially relevant, given the peculiar geographical and climatic characteristics of the single zones of Xinjiang. These particular environmental features also constitute an important factor to be considered during the process of interpretation of the remains⁶⁵.

Ecology plays a pivotal role also when prehistoric Xinjiang is considered from a wider perspective that exceeds today’s national borders. Despite the fact that by definition a national state may include single ethnicities, languages and cultures, prehistoric communities in Xinjiang cannot be studied within the confines of the PRC and indeed must be included in a wider context, comprising the neighbouring regions and beyond. How can this wide unit of analysis be defined? A number of definitions for the large geographic area occupied by nomadic and semi-nomadic people, located between Europe and China, have been proposed, such as Central Asia⁶⁶, Inner Asia⁶⁷, Northern Zone⁶⁸, and Central Eurasia⁶⁹. However, as pointed out by Nicola di Cosmo, these labels have usually been created *ad hoc*, thus causing confusion if used out of the precise context in which they were created⁷⁰. The regional unit of “Inner Eurasia”, proposed by David Christian, includes the territory once occupied by the Soviet Union, that of present-day Mongolia and Xinjiang⁷¹. One can claim that this unit has also been defined *ad hoc*, however it is particularly convincing, since this huge area shares the same geography,

⁶³ JIANG Qingfeng, JI Junfeng, SHEN Ji, MATSUMOTO Ryo, TONG Guobang, QIAN Peng, REN Xuemei, YAN Dezhi, 2013; LIU Xingqi, HERZSHUH, SHEN Ji, JIANG Qingfen, XIAO Xiayun, 2008; YANG Xiaoping, 2001.

⁶⁴ BOYD, CHANG, 2010, p. 293.

⁶⁵ Number and types of material recovered from modern excavations partially depend on what the environment “has allowed to be preserved”. In some regions of Xinjiang, the arid climate has maintained human remains and textiles in excellent conditions, while in other areas higher humidity levels have facilitated the decomposition of organic materials.

⁶⁶ AKINER, 1998; DANI, MASSON, 1992.

⁶⁷ SINOR, 1987.

⁶⁸ SHELACH, 2009, chapter 2.

⁶⁹ SINOR, 1990, p. 6.

⁷⁰ DI COSMO, 2004, pp. 13-17.

⁷¹ CHRISTIAN, 1994.

ecology⁷² and history⁷³, that means the low productivity of the territory, the arid, continental climate, the low demography, the late inhabitation, and the pastoralist nomadic tradition. The idea that Xinjiang was part of a “wider context” was expressed by Kohl as early as 1981 when, speaking of possible connections occurred between Uzbekistan and China in the second millennium BC, he stated that no relation between the two regions could be determined without a serious research of the “undisturbed archaeological context in Xinjiang”⁷⁴. By the end of the decade the pioneering work (and also one of the few western research on Xinjiang prehistory at the time) by Debain proposed a wider perspective for studying Xinjiang prehistoric remains, suggesting a number of links with western, northern and eastern communities⁷⁵. A real interest in the existence of early east-west connections in the Inner Eurasian territory developed among western scholars in the 1990s, mostly because of a wider circulation of Soviet studies, which followed the meltdown of the Soviet Union. Books, monographs, collections of papers and translations from Russian into English of works concerning early communities of Inner Eurasia went to print, allowing western scholars to discover the hitherto unknown world of the steppe⁷⁶. The central role of Xinjiang began to be recognized by scholars and the general public after the publication of the Tarim mummies on *Discover Magazine*⁷⁷ in 1994. These extraordinarily well-preserved Caucasoid bodies with their colourful textiles and burial artefacts have shown that Europoid people were present in Xinjiang as early as the beginning of the second millennium BC. This discovery placed Xinjiang among the crossroads along the so-called “Prehistoric

⁷² Christian admittedly shows an initial hesitation in considering Xinjiang as part of Inner Eurasia, because of the mountains surrounding part of the region. However, as these ranges have not acted as barriers, he eventually included the Chinese Province into the “Inner Eurasia Unit of World History”. CHRISTIAN, 1994, pp. 175, 178.

⁷³ Christian draw a comparison between Inner Eurasia and Outer Eurasia, and stated that the Paleolithic of Inner Eurasia was dominated by hunting rather than gathering, and Neolithic was characterized by pastoralism rather than farming. CHRISTIAN, 1994, p. 176.

⁷⁴ KOHL, 1981, pp. xxi-xxii.

⁷⁵ DEBAINE, 1988.

⁷⁶ Notably, the first volume of the UNESCO collection of papers *History of Civilization in Central Asia*, edited by Dani and Masson in 1992, is a comprehensive historical review of the earliest human cultural groups in Central Asia from the dawn of civilization to 700 BC, (DANI, MASSON, 1992); *The Deer Goddess of Ancient Siberia* analyses artistic traditions from the Neolithic to the Iron Age in Southern Siberia and North-central Asia, including the communities of Afanasevo, Okunev, Andronovo and Karasuk (JACOBSON-TEPFER, 1993); Heibert, in his volume *Origin of the Bronze Age Oasis Civilization in Central Asia*, describes the results of the Bactro-Margiana Archaeological Complex excavated in collaboration with the Ministry of Culture of Turkmenistan and the Institute of Archaeology of Moscow, and attempts to make connections with diverse regions of Central Asia (HIEBERT, 1994); *Nomads of Eurasian Steppes in the Early Iron Age* is a collection of papers translated into English by ten of the foremost archaeologists from the Institute of Archaeology of the Russian Academy of Sciences, on material excavated from 1960 to 1990 (DAVIS-KIMBALL, BASHILOV, YABLONSKY [eds.], 1995); in the book *Traders and Riders on China's Northern Frontier*, So and Bunker discuss the existence and patterns of interaction between northern pastoral tribes and China (SO, BUNKER, 1995); in the milestone *Ancient Metallurgy in the USSR: The Early Metal Age* Chernykh examines metal evidence in Eurasia (CHERNYKH, 1992); Kohl reconstructs economic activities from subsistence practices to the production and exchange of metals in Western Eurasia (KOHL, 2007); Kuzmina, in her books tries to reconstruct Bronze Age civilizations in the wide Eurasian steppe and to trace the origin of the Indo-Iranians through archaeological evidence (KUZ'MINA, MALLORY, 2007; KUZ'MINA, MAIR, 2008); *Social Complexity in Prehistoric Eurasia Monuments, Metals and Mobility*, is a collection of papers by western and Russian scholars on archaeological research in the Eurasian steppe (HANKS, LINDUFF [eds.], 2009); Anthony, in *The Horse, the Wheel, and Language: How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World*, focuses on ancient languages (ANTHONY, 2010).

⁷⁷ HADINGHAM, 1994.

Silk Road”⁷⁸, stretching from the west to China⁷⁹. Thereafter archaeologists, linguists, experts in textiles, anthropology, genetics and bio-archaeology have begun to intensively research Xinjiang remains, with the main purposes of discovering evidence of west-east interactions⁸⁰. In most of these studies Xinjiang has been considered a key-point for cultural and technological transmission from the west to China, neglecting the peculiarities of Xinjiang communities and interactions occurred in the other directions. This has hampered an authentic understanding of Xinjiang Bronze Age communities and, by overseeing other possibilities of interactions, the actual role of these communities in the early system of cultural and technological exchange.

One of this dissertation’s original research questions was to understand the metallurgical transmission process from Xinjiang to the Central Plain during the Bronze Age, however, as the research progressed, I realized the complexity of Xinjiang contexts and that the role of local communities in the early system of interactions had not necessarily involved contacts with the Central Plain. The doubt was instilled by the possible existence of early routes, connecting populations of Central Asia, South-western Siberia and China, which could have bypassed Xinjiang, raising questions about the role of Xinjiang Bronze Age communities in the prehistoric system of interactions. The first hypothesis, proposed by Bunker, is the so-called “Fur Route”, which “ran in an eastward direction north of the fiftieth parallel from the Caspian Sea to Southern Siberia, and then southward to ancient China and its border areas via the Amur Valley”⁸¹ (Fig. 4). The “Fur Route” was opened long before the Silk Road and allowed contacts between tribes in Northern China and populations of Inner Eurasia. The second hypothesis, advanced by Mei Jianjun, is the so-called “Steppe Road”, which ran from Northern China

⁷⁸ This term was used by Mei Jianjun: MEI Jianjun, 2000, p. 2; MEI Jianjun, 2003a, p. 28.

⁷⁹ As research on the topic is at the beginning, it is premature to specifically define “west”.

⁸⁰ Notably Victor Mair edited the milestone *The Tarim Mummies: Ancient China and the Mystery of the Earliest Peoples from the West* (MAIR, 2000), which extensively examines clues left by physical remains in burials excavated in the Tarim Basin and discusses their “racial” affiliations. Mair, who has been especially instrumental in bringing the Tarim mummies to the notice of western scholars, also published numerous papers on the topic, notably, *Prehistoric Caucasoid Corpses of the Tarim Basin* (MAIR, 1995), *Genes, geography, and glottochronology: the Tarim Basin during late prehistory and history* (MAIR, 2005), and *The mummies of East Central Asia* (MAIR, 2010), all concerning origin and anthropological features of the bodies preserved in the dry conditions of the Tarim Basin. Barber examined textiles from burials in diverse areas of Xinjiang and found that they were technologically connected to both western and eastern cultural groups. (BARBER, 1998; BARBER, 1995; BARBER). Irene Good analysed garments’ structure and shape, in order to understand the social role of textiles in prehistoric contexts (GOOD, 1995; GOOD, ZHANG Xian, LAURSEN, 2007).

Mummies attracted also the attention of experts in the fields of anthropology, genetics and bio-archaeology, notably Paolo Francalacci (University of Sassari), Brian E. Hemphill (University of Alaska Fairbanks Fairbanks), James Mallory (Queen’s University of Belfast) and Luigi Luca Cavalli-Sforza (Stanford University), whose studies have demonstrated that Xinjiang people were an admixed group from different parts of Eurasia. While Francalacci demonstrated the European lineage of the Tarim mummies (FRANCALACCI, 1995; FRANCALACCI, 1998), Hemphill and Mallory noted cranial similarities with population of Southern Asia (HEMPHILL, MALLORY, 2004). Especially noteworthy is the controversial paper by Cavalli-Sforza, *Genes and Peoples, and Languages* (CAVALLI-SFORZA, 2000, pp. 7719-7724), in which genetic examination on Tarim mummies, archaeology and linguistic studies were combined in order to trace the origin of the ancient population in the region.

⁸¹ BUNKER, 1993, p. 31.

through Mongolia to Southern Siberia and was used from the second millennium BC⁸² (Fig. 5). These theories are of great interest, however at present insufficient archaeological evidence does not allow to trace the actual routes. This dissertation does not intend to discuss these hypotheses, but rather give a contribution to the understanding of the role of early Xinjiang communities in the system of interactions during the Bronze Age and, more specifically, in the process of technological transmission, through a scientific study of archaeological evidence.

Metallurgy

In Bronze Age Eurasia two alloys prevailed: arsenic copper and tin copper⁸³. The former had been in use since the late fifth millennium BC in Western Asia⁸⁴. Until ca. 2000 BC, arsenic bronze had spread in Eurasia and remained the more common of the two bronze alloys throughout this territory. The intensive use of arsenic bronze was facilitated by the greater availability of raw materials, while tin ores were more rare, being located in a narrow belt stretching from Europe to South-east Asia. From the early second millennium BC tin bronze replaced the arsenic variety throughout most of Western and Central Asia⁸⁵. Diverse theories have been formulated to explain the abandonment of arsenic bronze and its gradual replacement by the tin type, such as the superior properties of the latter⁸⁶, its controllable composition versus the difficulty to control that of arsenic bronze alloy (due to the high volatility of arsenic and its compounds), and the toxicity of fumes produce by arsenic, thus posing the risk of poisoning⁸⁷. Although the reason behind the replacement of arsenic bronze is still unknown, the employment of tin bronze most likely signifies the Bronze Age communities' achievement of a more mature metal technology and the existence of tin trade networks. In fact, the early use of tin bronze in Xinjiang, verified in the early second millennium BC in Eastern Xinjiang and in the Ili-Tacheng region, has often been associated with the expansion of the Andronovo community (ca. 1900-1200 BC)⁸⁸.

⁸² MEI Jianjun, 2003a, pp. 28-32.

⁸³ Other alloys were created, such as brass in Western Asia, but these have been called "inventions that failed to become innovations". KILLICK, FENN, 2012, p. 566.

⁸⁴ EATON, MCKERRE, 1976; MUHLY, 1988; CHERNYKH, 1992.

⁸⁵ As regards North-western China, in the second millennium BC the employment of arsenic bronze has been verified in the Gansu-Qinghai region during the Qijia (ca. 2300-1700 BC) Siba occupation (ca. 1900-1500 BC). MEI Jianjun, 2003a, pp. 13-15.

⁸⁶ When compared with arsenic bronze, tin-copper alloy it is harder and stronger, and shows better mechanical properties.

⁸⁷ Discussion on these options in: CHARLES, 1967; CHARLES, 1979; CHARLES, 1980; LECHTMANN, 1996. Alternative views on the arsenic bronze-to-tin bronze transition in: TYLECOTE, 1976, pp. 7-9, 14-15; RAVICH, RYNDINA, 1995.

⁸⁸ Recent research on ores has identified significant tin sources in Uzbekistan, Tajikistan and Afghanistan (which were part of the Andronovo territory) and there are cuneiform sources from Mari on the Euphrates, dating to the early second millennium BC, which shows that tin from Central Asia travelled all the way to the Mediterranean. In Xinjiang evidence of Andronovo tin metallurgy has been found in the Ili-Tacheng region. BOROFFKA, CIERNY, LUTZ, PARZINGER, PERNICKA, WEISGERBER, 2002, pp. 135-159;

The metalworking process is complicated and requires the ability to locate and select raw materials⁸⁹ and to make and use specialized stone or pottery objects (crucibles, moulds etc.). In addition, a sufficient supply of fuel had to be available. Furthermore, metallurgists had to be able to control the heat and the air flow, and to create, when necessary, reducing/oxidising conditions. Some of these skills, such as the ability to control the furnaces, may have been gradually acquired over centuries of pottery production⁹⁰. However, the complexity of the process and the narrow margin of error allowed (or else the whole process would fail) suggest that a successful metalworking would have required demonstrations and explanations by experts, which had to take place in person. For this reason, the emergence of metalworking has been often connected to migrations. These movements of skilled people did not involve intrepid independent metal smiths (the so-called “itinerant metal smith”), as Childe proposed⁹¹, it rather seems that broader groups moved to look for new resources or in response to climatic changes, and these communities included metalworkers. The receiving populations did not passively accept the new technology, but they had to fulfil the requirements of the “adoption process”, meaning firstly to be socially organized to support metalworking. In fact, if the metallurgy’s skills were presumably in the hands of a selected part of the community, metal production necessitated the commitment of a broader group, who supported the metallurgist with the collective part of the process (ore extraction and selection, fuel collection and sustenance for product consumption or trading). Therefore, the emergence of metallurgy required social organization. All these aspects, connected to the preconditions required to adopt and develop metallurgical technology, have been investigated in this research.

In China, typological research on metal items has often been subordinated to that on pottery and Xinjiang is no exception⁹². However, recent publications by Chinese scholars of typological studies conducted on metal objects from Xinjiang have shown that metallurgy has become crucial for the

POTTS, 2012, p. 116; GARNER, 2015.

⁸⁹ Tin sources have been identified in present-day Uzbekistan, Tajikistan and Afghanistan, while large copper deposits are located in the Gorno Altay region. Small, scattered copper and tin deposits are distributed throughout Xinjiang territory (see Fig. 8). BOROFFKA, CIERNY, LUTZ, PARZINGER, PERNICKA, WEISGERBER, 2002; GARNER, 2015; MEI Jianjun, 2000, p. 50.

⁹⁰ BAYELY, REHREN, 2007. It is known, however, that the aceramic community of Seima Turbino (ca. 1500 BC) was able to produce high-quality metal objects. CHERNYKH, 1992, 215-234.

⁹¹ CHILDE, 1930, pp. 4-11.

⁹² SHUI Tao 水涛, 1993; HAN Jianye 韩建业, 2005.

understanding of local prehistoric communities⁹³. Western contributions to the research are still limited: a good reference, especially for non-Chinese readers, is the two volumes monograph edited by Victor Mair *The Bronze Age and the early Iron Age peoples of Eastern Central Asia*, which includes a section devoted to Xinjiang metallurgy, comprising four papers on the topic by both Chinese and western scholars⁹⁴. Another useful writing is the collection of articles edited by Katheryn Linduff, *The Beginnings of Metallurgy in China*, which includes translations into English of several Chinese papers: despite the fact these essays are not focused on Xinjiang only, Xinjiang metallurgy is often taken into account⁹⁵. While typological studies continue to dominate the archaeometallurgical field in Xinjiang, there is a growing awareness that deposits' location, composition and structure of metal artefacts can provide useful information on local metal technology and interactions with neighbouring regions. Modern mineralogical research, mostly conducted by Chinese scholar⁹⁶, has provided some information on copper, tin, lead and other metallic ore deposits throughout Xinjiang territory (Fig. 8). These ores were potentially available to prehistoric communities and their very presence indicates a possible local production of metal. As noted by Mei Jianjun, the distribution of metallic deposits broadly matches that of metal objects found in Xinjiang⁹⁷, however at the moment there is no clear evidence of the exploitation these ores in the Bronze Age⁹⁸. Scientific research on Xinjiang metal artefacts has been conducted from the 1990s and up to now analyses have mostly been carried out by Chinese scientists, universities and institutions⁹⁹. Unfortunately, rather few elemental and metallographic examinations have yet been performed on Bronze Age remains, however their number is likely to increase due to the recent interest in the topic. A great contribution has been provided by Mei Jianjun: in the last two decades he analysed a large number of samples from various areas of Xinjiang. Among others, in his pioneering Ph. D. dissertation at Cambridge University *Copper and Bronze metallurgy in Late Prehistory, its cultural context and relationship with neighbouring regions*, Mei tried to reconstruct the early history of metallurgy in Xinjiang by conducting technical analysis on 168 samples taken from early metals and slags from different parts of Xinjiang¹⁰⁰. Other papers by Mei,

⁹³ SHAO Huiqiu 邵会秋, 2009; GONG Guoqiang 龚国强, 1997; LI Suyuan 李溯源, 2014; AN Zhimin, 1998; MEI Jianjun 2000; MEI Jianjun 2003a.

⁹⁴ MAIR (ed.), 1998.

⁹⁵ LINDUFF, HAN Rubin, SUN Shuyun, 2000.

⁹⁶ WANG Binghua 王炳华, 1985a, p. 56; ZHANG Hongzhao 章鸿钊, 1954, p. 19; YANG Lipu 杨利普, 1987, pp. 195, 220, 261, 286, 329; HE Yuejiao 何越教, ZHU Luxi 朱履熹, 1987, pp. 114, 122, 137, 150; Mei Jianjun, 2000, pp. 50-51.

⁹⁷ MEI Jianjun, 2000, p. 50.

⁹⁸ The exception is the Nulasai deposit in North-western Xinjiang, where a mining and smelting site was found, dating to the first millennium BC. See MEI Jianjun, 2000, pp. 50-57.

⁹⁹ QIAN Wei 潜伟, SUN Shuyun 孙淑云, HAN Rubin 韩汝玢, CHANG Xi'en 常喜恩, YAHE Fujiang 亚合甫江, 2001; LI Xiao 李肖, DANG Tong 党彤, 1995.

¹⁰⁰ MEI Jianjun, 2000.

in English and Chinese, follow a similar method, and an increasing amount of information on early technologies in various parts of Xinjiang is becoming available¹⁰¹.

Outlines of the research

This dissertation explores early bronze metallurgy in Xinjiang, through the analysis of archaeological evidence from Bronze Age sites (Fig. 6).

In the thesis I discuss three main issues:

- 1- When, where, and how the first metal-using societies settled in Xinjiang;
- 2- How metallurgy developed in these communities: in particular I attempt to identify internal developments, and at the same time, scale, mechanisms and impact of external influences on the local communities and their metallurgy;
- 3- What the role of Xinjiang Bronze Age communities was in the prehistoric system of east-west interactions: I intend to understand if Xinjiang was actually a crossroad of cultural connections during the Bronze Age, and if so, which areas of Xinjiang were involved in these early interactions.

In order to respond to the three questions, the dissertation is organized in four chapters, each devoted to one area: the Altay, the oases of Hami and Turfan (henceforth referred to as ‘the eastern region’), the western region (including the Ili-Tacheng and the Pamir regions) and the southern rim of the Tarim Basin (Fig. 7). The division has been made according to a geographical system because too little information on the ecology, the past environment and climate are currently available for allowing a reliable division on an ecological basis. However, the ecological approach is also considered in every single chapter to interpret the remains. Archaeological sites in Central Xinjiang have also been taken into account, though not examined in detail, considering the limited availability of archaeological

¹⁰¹ MEI Jianjun, SHELL, 1998; MEI Jianjun 梅建军, LING Yong 凌勇, CHEN Kunlong 陈坤龙, IRIDIS 伊第利斯, LI Wenying 李文, HU Xingjun 胡兴军, 2013; MEI Jianjun 梅建军, LIU Guorui 刘国瑞, CHNG Xi'en 常喜恩, 2002.

evidence from the Bronze Age and the fact that external influences must have initially affected the bordering regions, and only later reached the internal areas, if at all. Sites at Lop Nur have not been included in this dissertation, though often considered for comparison: the huge amount of studies already conducted specifically on Lop Nur have covered all the aspects of this community¹⁰², including its little metallurgy¹⁰³, while other areas have been neglected. Therefore I chose to concentrate on the latter, hoping to deepen the knowledge of the Lop Nur community through its relationship with the neighbouring cultural groups, which are the real focus of this dissertation.

Each of the four chapters includes five specific sections:

- Introduction: it provides general information on the examined area, starting from pre-Bronze Age settlements (if they existed), the selection of the sites to be examined and their chronology.
- Geographical setting: it examines the climatic and environmental conditions in which Bronze Age communities developed; the basis for this investigation is scientific studies published in international (*Palaeogeography, Palaeoclimatology, Palaeoecology, Quaternary Research, Journal of Arid Land, Quaternary International*) and Chinese national journals (*SCIENCE CHINA Earth Sciences, Gansu qu dili 干旱区地理– Arid Land Geography - Di si ji yanjiu 第四纪研究– Quaternary Science*) on the examined areas. This analysis has provided the “environmental context” for the remains, and at the same time, it has constituted a useful tool for their interpretation.
- Archaeological context: in this section I investigate burial and residential structures, anthropological remains, grave goods and archaeological findings. This analysis allows to establish the existence of the preconditions for the development of metallurgy (social organization, pyrotechnical knowledge etc...) and the cultural context in which metal production developed. I have collected the excavations reports published on specialized journals such as *Kaogu* 考古(Archaeology), *Xiyu yanjiu* 西域研究 (Western Regions Studies), *Kaogu Xuebao* 考古学报 (Acta Archaeologica Sinica), *Wenwu* 文物 (Cultural Relics) and

¹⁰² Among others, XIA, 2003; MAIR, 2006; WANG Binghua 王炳华, 2002; DENG Ying 邓莹, 2003; HOU Can 侯灿, 2002; WANG Binghua 王炳华, 1983a; BARBER, 1998; WANG Binghua 王炳华, 1983b; HAN Kangxin 韩康信, 1986.

¹⁰³ MEI Jianjun 梅建军, LING Yong 凌勇, CHEN Kunlong 陈坤龙, IRIDIS 伊第利斯, LI Wenyong 李文瑛, HU Xingjun 胡兴军, 2013.

especially *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics). Many papers were downloaded from the CNKI database, however a great part of the material, including the papers from the journal *Xinjiang Wenwu* (which are not available online) has been collected during my research period at the Sun Yat Sen University in Guangzhou. I have also referred to final excavation reports, museum catalogues and books, which I have acquired during my research periods in Xinjiang. Additional writings, mostly by western scholars, have been found in journals, such as *Journal of World Prehistory*, *Bulletin of the Museum of Far Eastern Antiquities* and in monograph series, as the *Sino-Platonic Papers* and the *Journal of Indo-European Studies*. Other data have been acquired from Russian books, kindly provided by Russian scholars throughout the years of my Ph. D., and journals, as *Archaeology, Ethnology and Anthropology of Eurasia*, mostly from the English version. Some pieces of information came from my exchanges with Russian and Chinese archaeologists and scholars in Saint Petersburg and Xinjiang in 2016.

- Metallurgy: although metal objects are part of the assemblages described in the previous section, I have dedicated a specific section to metallurgy, as it is the central theme of this dissertation. Metal objects discovered among the archaeological remains have been analysed typologically and compositionally. In addition to the excavation and examination reports, books, and catalogues, of great help for this investigation have been the personal exchanges (both in writings and verbal) and indirect contacts with Chinese experts, namely Wang Bo, Li Xiao, Dang Tong, Mei Jianjun and Liu Wensuo.
- Summary: it is divided into two parts, the first discussing features of local communities with special reference to their metallurgy, in order to recognize patterns of internal cultural developments; the second part attempts to recognize possible interactions between local communities and the neighbouring cultural groups.

In the whole the dissertation is articulated as follows:

1. An introductory chapter provides the background and outlines of the research.

2. The first chapter is devoted to the Altay region, and due to the extreme complexity of the archaeological context, it had to be organized in a different way in comparison with the other three. More specifically, the introductory section includes a specific part devoted to the chronology of the Qiemu'erqieke cemeteries. This is due to the fact that since the first excavation, their dating has been subjected to very different and conflicting solutions. Following the "Geographical setting", the occupation of the Altay region is dealt with. As this includes two different phases, they are analysed separately, but always according to the same scheme, that is "Archaeological context", "Metallurgy" and "Summary".

3. The second chapter concerns Bronze Age remains in Eastern Xinjiang, through the examination of Bronze Age sites in the oases of Hami and Turfan.

4. The third chapter regards Western Xinjiang and comprises materials from the Ili-Tacheng region, located in North-western Xinjiang and the Pamir region in south-west. Since they present different environmental features, the two areas have been analysed separately. Each of them has been methodically examined according to the structure "Introduction", "Geographical setting" "Archaeological context", "Metallurgy" and "Summary".

5. The fourth chapter is about remains found on the southern rim of the Tarim Basin, including the highlands contained in the Kunlun Range and the desert oasis in the Taklamakan Desert.

6. The conclusive chapter includes three sections, each dedicated to answering one of the three research questions, on which my thesis focuses.

A clarification to be made concerns the concept of archaeological culture and its application to Xinjiang prehistory. The concept of archaeological culture has been widely used, but surprisingly it has been very little explained. As pointed out by Harris, its best definition remains that coined by Childe, who, at the beginning of the twentieth century, stated that archaeological cultures are "certain types of

remains – pots, implements, ornaments, burial sites, house forms - constantly recurring together”¹⁰⁴. In other words, they “are devices for the basic classification of archaeological data into broad spatially and temporally coherent blocks”¹⁰⁵. In recent years the concept of archaeological culture has been severely criticized for two main reasons: its links to ethnography and its static character¹⁰⁶. In order to free the idea of “culture” from ethnography and to promote a more interaction-oriented concept of archaeology, new approaches to interpret groups of archaeological remains have been proposed. One of them is reading data from archaeological sites against a larger-scale perspective in time and/or space, which has resulted in term such as “civilisations”¹⁰⁷, “traditions”¹⁰⁸, “horizons”¹⁰⁹, “techno-complexes”¹¹⁰, “style zones”¹¹¹ and “metallurgical provinces”¹¹². Although these larger categories have been often employed in order to replace the traditional concept of archaeological culture, it seems that, if the denominations have changed, so have not their character: these devices are as static as the archaeological culture. The opposite approach, which focuses on micro-scale research, has proven to be problematic too, since it poses the risk of bordering on extreme specialism and leading to a fragmentation of the wider picture. The importance of the definition of archaeological culture and its related problems were discussed in 2007 during the conference held in Zadar, Croatia, in a devoted session *What is an archaeological culture? Approaching cultural transmission and variation*¹¹³. Interesting contributions have shown major attempts to create a more evolutionary model of archaeological culture, by considering, for example, cultural connections as main factors of the cultural variation. In spite of this effort, it seems that ultimately the concept of archaeological culture remains that of a “definable entity in space and time”¹¹⁴ which is basically the definition formulated by Childe.

If the concept of culture is still hard to define (or to be accepted), its application to the prehistory of Xinjiang seems even more difficult. Despite the extraordinary scholarly effort that has gone into the study of Xinjiang in the last decades, the “coherent blocks” of space and time, into which archaeological data are supposed to be organized (i.e. archaeological culture), are still very unclear. Among others, four main problems have hampered the establishment of cultural frameworks for

¹⁰⁴ CHILDE, 1929, v-vi, see HARRIS 1994.

¹⁰⁵ ROBERTS, VANDER LINDEN, 2011, p. 2.

¹⁰⁶ CLARK, 1966; RENFREW, 1977.

¹⁰⁷ DEMOULE, GILIGNY, LEHOERFF, SCHNAPP, 2005.

¹⁰⁸ OSBORNE, 2008.

¹⁰⁹ WILLEY, PHILLIPS, 1958.

¹¹⁰ BAR-YOSEF, ZILHAO, 2006.

¹¹¹ CUNLIFFE, 2005.

¹¹² CHERNYKH, 1992.

¹¹³ ROBERTS, VANDER LINDEN, 2011, p. 8.

¹¹⁴ ROBERTS, VANDER LINDEN, 2007.

prehistoric remains in Xinjiang. First, the insufficient number of archaeological excavations does not assure enough material for a larger scale analysis and a proper classification of the remains in archaeological cultures. The second issue, highlighted by Jacob-Tepfer, is the scholarly tendency of assuming that prehistoric remains completely reflect the culture of early communities¹¹⁵. This method is problematic for three reasons: the first is that the interpretation of the remains may represent a cultural ideal, neglecting all the nuances and “the conflicting textures found in real life”¹¹⁶; the second problem is the establishment of numerous archaeological cultures within small areas, some of which only comprise a single site; the third issue is that the application of this approach to the study of mixed archaeological contexts, enriched over centuries of cultural interaction, poses the risk of underestimating the role of cultural transmission and cultural variation. This has happened in Xinjiang, where archaeologists have sometimes failed to re-examine archaeological remains in a broader contexts, thus resulting in the creation of numerous archaeological cultures within a small areas¹¹⁷. The third problem in the organization of prehistoric remains in Xinjiang into cultural frameworks is the lack of paleoenvironmental studies, which prevents the establishment of a secure geographical context, in which prehistoric communities developed, while the creation of chronological frameworks for early cultural groups is hampered by the low (though constantly increasing) number of carbon dating and stratigraphic studies¹¹⁸. The fourth issue has been pointed out by Roberts and Linden and consists of a “methodological weakness” of the archaeological research¹¹⁹: despite being in theory based on the combination of several data, the actual way of defining archaeological cultures is usually founded on a single category of evidence, generally stone for early prehistory and pottery for late prehistory. However, the employment of pottery as standard for establishing Bronze Age cultural groups in Xinjiang has often turned out to be inefficient. The general scarcity and in some cases the absence of ceramics¹²⁰ has shown that pottery cannot be the only basis on which cultural groups in Xinjiang should be identified. Therefore data from other categories of evidence, such as metals, should have an equal position in the economy of the research. Considering these issues, I would agree with An’s statement, according to which “there is still a lack of concrete standards for establishing archaeological

¹¹⁵ JACOBS-TEPFER, 2015, pp. 66-71.

¹¹⁶ JACOBS-TEPFER, 2015, p. 70.

¹¹⁷ This has been verified in MEI Jianjun, 2000; ZHANG Feng 张凤, 2010.

¹¹⁸ Recently, most of the remains have been discovered by chance or during salvage excavations, therefore often lack of archaeological and stratigraphical contexts.

¹¹⁹ ROBERTS, VANDER LINDEN, 2011, pp. 8-9.

¹²⁰ In Xinjiang some aceramic sites were excavated, such as that of Gumugou and the Northern Cemetery on the Keriya River. See WANG Binghua 王炳华, 1983b; MAIR, CHENG Fangyi, 2013.

cultures and types” for the prehistory of Xinjiang¹²¹. Therefore in the present research, the term “culture” is not used, since this concept remains quite problematic. On the contrary, the words “community” and “cultural group” followed by a geographical reference are employed¹²². The term “cultural variant” is also used, and in doing so, I borrow Kuz’mina definition: “(A cultural variant) can correspond to the ancient tribe that occupied a territory and was separated from other tribal territories by a largely unoccupied zone”¹²³, which I interpret as an “adaptation” of what is considered the original cultural background of the community to a new environment and, sometimes, to the traditions of local groups.

Issues in the research of Xinjiang Bronze Age communities

As a field of study Xinjiang prehistory is still at its beginnings and numerous challenges remain to be overcome. The main problem regards chronology. In general the periods corresponding to the Mesolithic, Neolithic and the Copper Age of Eurasia and Siberia are very vague in Xinjiang¹²⁴. Specifically, the Copper Age has been rarely regarded as an independent period and more often it has been considered a simple transitional phase between the Stone and Bronze Ages, therefore “included” in the Neolithic period, as its last appendix¹²⁵. The result of this approach is that this deprives the analysis on later periods of reliable foundations. Relative chronologies of single and groups of site in Xinjiang are difficult to formulate, because of the lack of stratigraphic studies. Regulations of archaeological research in China have limited the fieldwork to almost only rescue excavations. Salvage campaigns must be quickly conducted, at the expenses of careful analysis, therefore, archaeological and stratigraphic contexts often go unrecorded. Although many preliminary reports exist, they usually include scarce detailed information and final conclusions, neglecting the complete descriptions of the findings, while questions of dating are only superficially discussed. In addition, despite the increasing employment of the radiocarbon method in many locations in China, absolute dating for Xinjiang prehistoric remains are still a few. Generally, chronologies from calibrated carbon dating can be more confidently accepted and compared to other areas of the world, however they present intrinsic

¹²¹ AN Zhimin, 1998, pp. 46-47.

¹²² The chronological position of the “community” or the “cultural group” are expressed as well.

¹²³ KUZ’MINA, MALLORY, 2007, p. 60.

¹²⁴ JIA, BETTS, WU Xinhua, 2009, p. 172.

¹²⁵ CHEN Ge 陈戈, 1994, p. 108.

problems: carbon dating results fall in a range of probability, thus reducing their reliability¹²⁶ and when it comes to calibration, it is still difficult to decide which system is more adequate. Sometimes the calibration of radiocarbon ages may lead to erroneous or inaccurate conclusions, therefore, these results should always be compared with data obtained by other methods¹²⁷. Other problems derive from the refusal by some scholars to adopt calibrated dates. Although this decision has been severely criticised by some¹²⁸, it has been supported by senior archaeologists¹²⁹, therefore major works on Xinjiang and its neighbouring regions contain inaccurate chronological data or expressed in different ways (BP, BC, AD, CE, etc...), increasing the potential misunderstanding. More confusion is caused by the tendency to report limited information on the carbon dating exams: data on laboratories and calibration methods are often missing, making impossible to trace and evaluate the results of the examinations. Concerning Xinjiang prehistoric remains, a list of calibrated C14 dates containing all the information on the examinations was published in 1991¹³⁰, however it has not been updated with new discoveries. In this dissertation dating has been based on the typological analysis of the remains combined with the available carbon dating results. Comparisons with other dated remains, such as those from South-western Siberia and China,¹³¹ have been regularly made, in order to correctly place the findings.

In addition to the chronological issues, there is confusion over the correct name of the archaeological sites, which causes misunderstandings when it comes to place them into chronological cultural frameworks. As Jia and Betts have clearly explained, as a rule in China the site takes the name of the closest village or council when first discovered¹³². However in Xinjiang, the coexistence of the Turkic Uighur language and the standard Chinese Mandarin causes confusion: Chinese names of locations in Xinjiang usually come from the closest pronunciation of the Turkic term, therefore their translation often presents more than one version. The most famous example of this issue is represented by the site of Qiemu'erqieke (切木尔切克)¹³³, also called Ke'ermuqi (克尔木齐)¹³⁴, Shamirshak in Turkic¹³⁵, and

¹²⁶ In particular, of limited value are data having large +/- ranges, as it happens when the analysis has been performed in different laboratories, on different material, and at different time.

¹²⁷ KANKAINEN, 2002.

¹²⁸ KOHL, 2007, pp. 19-21.

¹²⁹ SARIANIDI, 1998, p. 78; CHEN Ge 陈戈, 1990.

¹³⁰ IAC, 1991.

¹³¹ For example the Andronovo cultural group, which has been pretty safely placed around 1900-1200 BC, and the Siba (ca. 1900-1500).

¹³² JIA, BETTS, 2010, p. 278, footnote 2.

¹³³ JIA, BETTS, 2010.

¹³⁴ XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981, pp. 23-32; WANG Mingzhe 王明哲, 2013.

¹³⁵ JIA, BETTS, 2010.

Chemurcek¹³⁶ by Russian scholars. Similarly, the Subeixi site (苏贝希)¹³⁷ has been also called Subashi (苏巴什)¹³⁸. This problem has been slowly tackled, and now most of the publications have adopted one, official name, to identify new archaeological sites. However there is still potential for misunderstanding when dealing with old reports and discoveries. In this dissertation the geographical names come from the Chinese pronunciation, with the exception of those for which exists an internationally accepted English counterpart, such as “Turfan”, “Dzungaria”, “Ili (River)” “Barkol”, “Taklamakan”, “Irtysh River”, “Hotan River”, “Kashgar”. Concerning names of archaeological sites, the Chinese rule of using the denomination of the closest village or council is followed.

When dealing with Xinjiang prehistory, other important issues are the different approach to research taken by various scholarships and the language barriers, both derived from the mutual isolation suffered by western, Russian and Chinese scholars, from the end of the Second World War (1939-1945) until the 1990s¹³⁹. The first limit specifically is the different approach to the concept of cultural and technological transmission. As noted by Hakenbeck¹⁴⁰, despite the periodical challenges by diverse evolutionary approaches in time, phenomena of migrations and interactions among cultural groups have always been central themes in western archaeology. In relation to specific studies on Inner Eurasia, since they began formally in the early 1990s, western scholars have generally perceived the region as a whole, and considered short and long-distance movements of people and ideas as fundamental mechanisms for the formation and distribution of ancient communities from Palaeolithic to historical times¹⁴¹. On the contrary, following the Marxist particularistic and evolutionary model, Chinese archaeologists focused on remains within Chinese borders, while Russian scholars researched sites in Russia. The question of interactions among regions had been rarely discussed until recent years, and when this was the case, it was done under strong political constraints. Since the 1990s the Eurasian region has slowly but steadily been opening up to the west, and this has facilitated communication among scholars, encouraged the formulation of new models of interpretation and allowed the emergence of new important challenges. Recently, studies on the prehistory of Inner Eurasia have

¹³⁶ KOVALEV, 2011, KOVALEV KOBAJIEB, 2014, KOVALEV KOBAJIEB, 2015.

¹³⁷ Tulufan diqu Bowuguan 吐鲁番博物馆 (Turfan Museum), 2002.

¹³⁸ Tulufan diqu Wenguansuo 吐鲁番地区文管所 (Turfan Institute of Cultural Relics), 1984; Tulufan diqu Wenguansuo 吐鲁番地区文管所 (Turfan Institute of Cultural Relics), 1988.

¹³⁹ During the Cold War (1947-1991) scholars of the Eastern Bloc and the Western Bloc were isolated from each other (that means that western scholars were left out the research), while after the split of the Sino-Russian alliance, officially occurred in 1960 Chinese and Russian scholarships began to independently conduct their research.

¹⁴⁰ HAKENBECK, 2008, p. 1.

¹⁴¹ FRANCHETTI, 2011.

slowly been moving in a more collaborative direction, as demonstrated by the numerous joint programs aimed to provide students and scholars with mutual knowledge of differing approaches, the effort made by Chinese universities to teach western theories in class and offer courses in English and the publication of diverse papers on Chinese and Russian archaeological methods by or for western scholars¹⁴². In spite of this genuine scholarly interest in the diverse approaches to research, a “mutual methodological suspicion” still exists, and limits collaboration among scholars¹⁴³.

The second research limit, connected to the scholars’ mutual isolation in the mid-1990s, is the problem of language barriers, which still hampers research on Xinjiang. Since the beginning of the excavations in Xinjiang the majority of the recovered sites has been published only in Chinese and has been available only in Chinese databases, therefore reports and studies on the material generally have not reached the west nor Russia. The situation is slowly improving, as demonstrated, by the recent publication of translated works by major Chinese scholars¹⁴⁴ and the English version of the Chinese journal *Wenwu* 文物 (Cultural Relics). Similarly, reports and discussions on the huge quantity of sites excavated during the Soviet period published by the main cultural state infrastructure, the Academy of Science, are available in Russian only¹⁴⁵. Since early communities in South-western Siberia and Central Asia were spatially or temporally connected to each other and to Xinjiang, they play a significant role in the understanding of Xinjiang communities and their relations. Unfortunately, papers on these remain mostly unknown to western and Chinese scholars: presently, just a few works by major scholars have been translated into English¹⁴⁶, and only the English version of very few journals, as *Archaeology, Ethnology and Anthropology of Eurasia* exists, while reports of old and most of the new discoveries are still available in Russian only. Western scholars, on their hand, solved the language problem by ignoring Russian and Chinese literature; therefore, their studies were conducted overlooking a huge quantity of essential information. This scenario is slowly changing, as more and more student and scholars are learning Russian and Chinese. Thanks to the support by both Chinese and Russian scholars, I had the chance to become more familiar with their approaches and material.

¹⁴² HEIN, 2016; CHANG Kwang-chih, 1981; ZHANG Liangren, 2011.

¹⁴³ Critiques on the diverse approaches have been regularly raised. Since the 1950s, western scholars have sometimes judged methods by Chinese and Russian scholars, while since the first half of the 1990s, critiques from senior scholars on the western approach have been raised as well. Fu Simian stated that foreign archaeologists in China do not pay attention to the material representing indigenous Chinese cultures but are only interested in remains, which indicate cultural connections between China and the west, while Kohl correctly criticised the *provincialism* of western literature and the distance of western archaeologists from the cultural material. FU Sinian 傅斯年, 1996, p. 186; KOHL, 2007, p. 7.

¹⁴⁴ AN Zhimin, 1998; LINDUFF, HAN Rubin, SUN Shuyun (eds.), 2000.

¹⁴⁵ During the Soviet period more than 500 field expeditions, registered in more than 5000 annual reports, were conducted annually in the ex URSS. See TRIGGER, 1997.

¹⁴⁶ CHERNYKH, 1992; KOHL, 1981.

Unfortunately, I was also partially subjected to the problem of language barriers, therefore, the material in Russian, which I have used for this research, is limited. However, direct contact with Russian scholars, in particular Professors Kovalev, Polyakov, and Esin, to whom I am especially grateful, has helped me to overcome the artificially established limitation that is actual political borders. This means that my research takes into consideration regions and communities beyond today's PRC borders (Fig. 9).

1. THE ALTAY REGION

1.1 Introduction

The Altay region is located in Northern Xinjiang, corresponds to present-day Altay Prefecture and constitutes the northernmost part of the Dzungarian Basin (Fig. 10). Very little is known about this area prior to the Bronze Age (ca. 2000-1000 BC)¹⁴⁷, since almost all available evidence is constituted by chipped stone artefacts collected from the surface¹⁴⁸. Six groups of microliths were found in the upper E'erqisi Valley (Habahe County)¹⁴⁹ and, although their chronological position remains uncertain, similarities with microliths from surrounding areas suggest that they could belong to the Mesolithic period (ca. 8,000 BC)¹⁵⁰. Scattered remains assigned to the Neolithic period (ca. 3000 BC) and associated by scholars¹⁵¹ with the Kitoi community¹⁵², consist of few coarse red pottery fragments, microlithic composite tools and polished stone tools¹⁵³ (Fig. 11). Evidence pertaining to the Bronze Age is more substantial. The first Bronze Age site to be discovered was that at the Qiemu'erqieke village in Altay City, which consisted of three cemeteries. Despite the complexity of its dating and interpretation, this funerary site remains the cardinal part of reference for the Bronze Age period in Xinjiang, as it still is one of the earliest metal-using communities in the region¹⁵⁴. The discovery, made in 1963, is important as it is controversial: interpreting the remains is very difficult because of the extreme complexity of the site, which, despite offering only a small quantity of grave goods, has revealed an intricate mix of burial types and funerary rituals, that is now clear belonging to different time periods. Artefacts which can be related to two distinct phases were found: the early one, characterized by the presence of stone vessels, a small amount of pottery and a low number of extremely simple metal objects, can be attributed to the early Bronze Age and assigned to the

¹⁴⁷ This dating, suggested by Wang Binghua in 1985, coincides with the results of carbon dating examinations performed on material from Xinjiang, combined with the typological analysis on the remains. WANG Binghua 王炳华, 1985a.

¹⁴⁸ For further information see JIA, BETTS, WU Xinhua, 2008, pp. 171-175.

¹⁴⁹ IDRIS Abdouressul 伊弟利斯 阿布都热苏勒, ZHANG Chuan 张川, HAS Yet 阿斯叶提, 1998.

¹⁵⁰ Stone tools dating back to the Lower Paleolithic period have been recovered from Northern China and archaeologists found similarities with those from Siberia, Western and Central Asia, however no detailed information has been provided. DEREVIANKO, 1998; DEREVIANKO, PETRIN, TAIMAGAMBETOV, 2000; JIA, BETTS, WU Xinhua, 2009, pp. 171-175.

¹⁵¹ JIA, BETTS, WU Xinhua, 2008, p. 175.

¹⁵² The Kitoi population inhabited the Baikal region during the period ca. 3500-2500 BC. Material belonging to this community includes pottery, stone and nephrite objects. See OKLADINOV OKЛАДИНОВ, 1950; WEBER, 1995; WHITE, BUSH, 2010, pp. 15-20.

¹⁵³ Neolithic groups in Xinjiang were specifically characterized by one or more of three types of remains, namely, microliths, polished stone, and painted pottery. CHEN Ge 陈戈, 1994, pp. 105-107.

¹⁵⁴ An other early evidence is that at Suletangba'e in Shufu County (Kashen Prefecture). However its chronological and archeological positions are still unclear. WANG Bo 王博, 1995, p. 27; GONG Guoqiang 龚国强, 1997, p. 7.

Qiemu'erqieke cultural group¹⁵⁵, while the second phase, featuring mound graves and developed pottery and metal productions (including basic iron artefacts), can be attributed to the Karasuk community¹⁵⁶ (ca. 1200-800 BC).

The first preliminary excavation report on the three cemeteries at the Qiemu'erqieke village¹⁵⁷ has long been the main source of information on this site, and also of the prehistory in the Chinese Altay region. It was published by the Xinjiang Institute of Archaeology in 1981, almost two decades after the actual excavation, incorporating very limited information. During the 1980s and 1990s more investigations were conducted in a wider area in the Altay region, and numerous findings were recorded¹⁵⁸: in the mid-1990s Wang Bo used the name "Qiemu'erqieke culture"¹⁵⁹ to indicate the great number of cultural remains found in Northern Xinjiang¹⁶⁰. However, Kovalev criticized the application on this very name, Qiemu'erqieke, to the whole Altay region on the basis that Wang Bo had ignored the differences in the assemblages and object types that are usually taken into account to define communities and time phases¹⁶¹. Basically the limit of Wang Bo's research, which generated confusion, is the sovraposition of the Qiemu'erqieke name to both the cemeteries discovered in 1963 and the others sites excavated from the 1980s in the whole Altay region. Further studies on regional prehistoric remains have been conducted by a number of Chinese scholars, namely Wang Bo, Wang Lishan, Wang Mingzhe, Yu Jianjun, Lu Enguo, Liu Xuetao and Liu Wensuo. The information collected over the years was compiled in a summary, published in 2011 in the Chinese journal *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics)¹⁶² and, even more importantly, in the comprehensive volume *Xinjiang Aletai diqu*

¹⁵⁵ The name was used by Wang Bo in the 1990s and have since been employed to identify the community settled in the Altay region. Wang BO 王博, 1996.

¹⁵⁶ The Karsuk community occupied the Minusinsk Basin from the end of the second millennium BC. Seven villages and a high number of cemeteries have been attributed to this cultural group. Material of the Karasuk community includes pottery pots and bowls with carved decorations, bronze tools and ornaments and some gold. See LEGRAND, 2006; JETTMAR, 1950.

¹⁵⁷ XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981.

¹⁵⁸ They mostly consisted of steles.

¹⁵⁹ Wang Bo actually used the name "Ke'ermuqi culture". As mentioned in the introduction, confusion surrounds the name of the site and cultural group: it has been called "Ke'ermuqi" 克尔木齐, "Qiemu'erqieke" 切木尔切克, "Qie'ermuqieke" 切尔木切克 by Chinese scholars. Russian archaeologists often use the name "Chermuchek" to indicate the site and the culture. However, as Jia and Betts noticed, since the real name of the close river and the local township is "Qiemu'erqieke", this should be the correct name. JIA, BETTS, 2010, pp. 278-279.

¹⁶⁰ In reality Wang Bo used the name "Ke'ermuqi culture" for the very first time in 1986, but at that time he did not define it, but on the contrary associated it with the "Turkik culture" (Tujue wenhua 突厥文化). Xinjiang Weiwu'er Zizhiqu Bowuguan, 新疆维吾尔自治区博物馆 (Museum of the Xinjiang Uyghur Autonomous Region), Akesu diqu Wenguansuo 阿克苏地区文管所 (Akesu Region Office), Wensu Wenhuasuo 温宿县文化馆 (Wensu Cultural Center), 1995, p. 522.

¹⁶¹ KOVALEV, 2011, p. 2.

¹⁶² Zhongshan Daxue Lishi Renleixue Yanjiu Zhongxin 中山大学历史人类学研究中心 (Center for Historical Anthropology, Sun Yat Sen Univeristy), Fuyun xian Wenwu Ju 富蕴县文物局 (Cultural Relics Bureau of Fuyun County), Qinghe xian Wenwu Ju 青河县文物局 (Cultural Relics Bureau of Qinghe County), 2011.

kaogu yu lishi wenji 新疆阿勒泰考古与历史文集 (Collection of archaeological and historical works on the Altay region in Xinjiang)¹⁶³. This volume, published in 2015, includes the Chinese translation of Jia and Betts' paper, *A re-analysis of the Qiemu'erqieke (Shamirshak) cemeteries, Xinjiang, China*¹⁶⁴, which is one of the few publications by western scholars on the topic. In their study, the authors analyse in great detail the excavation report and identify two phases for the cemetery: an earlier stage related to the Bronze Age and a later phase connected to the production of iron objects. Other precious information has been published by Russian scholars, who excavated in Mongolia and Kazakhstan and recovered remains similar to those found in the Qiemu'erqieke village. Especially noteworthy are the publications by Kovalev, which included radiocarbon dating as well as high quality pictures and drawings¹⁶⁵. Excavations and more in-depth studies carried out since 2000 have greatly contributed to a better understanding of the prehistory of Northern Xinjiang, as they have located and considered not only remains at the Qiemu'erqieke village, but also a number of sites found scattered across the Chinese Altay region, in Altay City and the counties of Bu'erjin, Habahe, Fuyun, Jimunai and Qinghe¹⁶⁶. Some of these sites, such as that of Tuoganbai in Habahe County¹⁶⁷, were characterized by the presence of stone vessels and tools and an absence of metal objects, while others, such as Suke'erte and Sawudige'er in Fuyun County and Kuxi in Altay City, revealed well manufactured bronze objects and some iron artefacts. Kovalev, in highlighting the similarities with early findings in Mongolia and Kazakhstan dating to the third-second millennium BC, has assigned the first group of remains (that is the "Tuoganbai type") to the early Bronze Age, when he thinks the area was dominated by the Qiemu'erqieke community¹⁶⁸. Objects and grave structures from the second group of sites (especially pottery vessels and daggers from Kuxi) show analogies with assemblages of the Karasuk type (ca. 1200-800 BC)¹⁶⁹. This is very important as it pinpoints that at in the early stage the Altay region was dominated by the Qiemu'erqieke community, while in a later phase it was influenced by the Karasuk cultural group, who inhabited the Minusinsk Basin from the end of the second millennium BC. However, the assignments of single remains, as well as the existence of pottery and metallurgical production remain unclear.

¹⁶³ XIA, 2015a.

¹⁶⁴ JIA, BETTS, 2010.

¹⁶⁵ KOVALEV, 1999; KOVALEV, 2011; KOVALEV, ERDENEBAATAR, 2009; KOVALEV KOBAJIEB, 2014; KOVALEV KOBAJIEB, 2015.

¹⁶⁶ Among others, since 2000 cemeteries at Tuoganbai, Suke'erte and Sawudige'er have been excavated. XIA, 2014c; XIA, 2015d; XIA, 2015e; QI Xiaoshan 祁小山, WANG Bo 王博, 2008, pp. 218-228; QI Xiaoshan 祁小山, WANG Bo 王博, 2015, pp. 314-340.

¹⁶⁷ XIA, 2014c.

¹⁶⁸ Taken from a personal communication. I met Professor Kovalev in August and December 2106 at Saint Petersburg. For more information see KOVALEV KOBAJIEB, 2014; KOVALEV KOBAJIEB, 2015.

¹⁶⁹ SHAO Huiqiu 邵会秋, 2015, pp. 272-273.

1.1.2 Questions on dating and cultural attribution of the Qiemu'erqieke cemetery

The complexity of Qiemu'erqieke site has posed numerous questions on the chronological attribution of this specific context, which is still object of debate, therefore it needs to be examined more in detail. On the basis of the features of certain artefacts (such as a mirror, a *dou* cup and a red clay wheel-made vessel), the preliminary report suggested that the Qiemu'erqieke cemeteries belong to a period that ranges from the Han dynasty (206 BC-220 AD) to the Tang dynasty (618-907), while the steles, found close to the graves, were specifically associated with the Turkic occupation of Xinjiang and dating to ca. 400-700¹⁷⁰. In the following years, some scholars assigned the remains to the Iron Age¹⁷¹, while others to the late Bronze Age¹⁷². In the mid-1990s Wang Bo and Qi Xiaoshan first attempted to classify burial structures and stone material from Northern Xinjiang and South-western Siberia (Tuva and the Minusinsk Basin), and assigned them to the Bronze Age (ca. 2000-1000 BC)¹⁷³. Later on, studies on new remains indicated that Qiemu'erqieke complex contained findings which can be placed in the early Bronze Age, while others belong to the late Bronze Age and the Iron Age¹⁷⁴. The presence of ovoid vessels and similar burial rituals led scholars¹⁷⁵ to the assumption that the Qiemu'erqieke community was simultaneous with the Afanasevo cultural group¹⁷⁶ and that the former acted as the “missing link” between the western nomads and people of the Xiaohe cemetery¹⁷⁷. Further research on the Qiemu'erqieke material (especially on flat-based pots with punctuated incisions on the rim and bronze items), and a series of more reliable C14 dates on the Afanasevo remains (ca. 3500-2500 BC)¹⁷⁸ allowed scholars to date the Qiemu'erqieke cultural group to the second half of the third millennium BC. This date have also explained the numerous similarities with the Okunev material found in the

¹⁷⁰ XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archaeology, Xinjiang Academy of Social Science), 1981, p. 27.

¹⁷¹ DEBAINE, 1989, pp. 197-198; CHEN Ge 陈戈, 1995, pp. 6-72.

¹⁷² XIA, 1985, p. 4; CHEN Kwang-tzuu, HIEBERT, 1995, pp. 269-272.

¹⁷³ Wang BO 王博, 1996.

¹⁷⁴ MEI Jianjun, 2000, p. 14; JIA, BETTS, 2010.

¹⁷⁵ LIN Meicun 林梅村, 2002.

¹⁷⁶ The Afanasevo community was an Europoid community who occupied South-western Siberia from the second half of the fourth millennium BC. Findings belonging to this cultural group include coarse pottery with a pointed base and carved decoration, bone and stone tools and small copper implements. For further information see GRYAZNOV, 1969, pp. 46-50; GRYAZNOV, ГРЯЗНОВ, 1999.

¹⁷⁷ The cemetery, located in Loulan, was discovered in 1934 by the Swedish archeologist Folke Bergman and has been extensively excavated: among the grave goods a large quantity of textiles, ornaments, implements and other artifacts have been recovered. In addition, more than thirty well-preserved mummies, bearing Europoid traits, together with the coffins in which they were buried, were found. See XIA, 2007; MAIR, 2006.

¹⁷⁸ Soviet archaeologists performed a series of carbon dating exams in the 1950s, but the results have never been calibrated. Recently new C14 examinations have been carried out and their results have been published by Kovalev. KOVALEV, ERDENEBAATAR, 2009, p. 152.

Minusinsk Basin dating to around 2500-1700 BC¹⁷⁹. A later dating, to the early second millennium BC, has been proposed by Lin Yun¹⁸⁰, who connected the two bronze arrowheads found in grave M17 to one artefact and its mould recovered from the Huoshaogou cemetery (Gansu Province), assigned to the Siba cultural group¹⁸¹ and dated by Li Shuicheng and Shui Tao to around 2000-1800 BC¹⁸². Posing further confusion, the ovoid pots in Qiemu'erqieke have been linked to painted vessels found in the Tianshan Beilu site (Hami), which, in turn, is believed to be a mixed representation of Siba and steppe traditions¹⁸³: the Tianshan Beilu cemetery has been carbon dated to ca. 2000-1400 BC¹⁸⁴, and this dating has long been used as a reference for the Qiemu'erqieke remains¹⁸⁵. In addition, some of the Qiemu'erqieke stone arrowheads have been compared to those found in Xiaohe (near Lop Nur), which has been dated by C14 to around 1800 BC¹⁸⁶, while a bronze specimen from grave M30 has been associated with those found at Chawuhugou (in burials 216 and 305) and placed to 1000 BC¹⁸⁷.

Recently, research by Russian scholar has become known to Chinese and western scholars and revealed that numerous remains, similar to certain findings in Qiemu'erqieke, were located in Kazakhstan, Mongolia and South-western Siberia. In particular, the International Central-Asiatic Archaeological Expedition Team, in collaboration with the Institute of History of the Mongolian Academy of Science and Ulaanbaatar University, found and excavated several burial structures in Mongolia, in the Bulgan district (Khovd Province), and in the Alanhus district (Bayan-Ulgii Province)¹⁸⁸ (Fig. 12). These graves have been studied in-depth and showed distinctive characteristics, such as an elongate stone enclosure fencing a “stone box¹⁸⁹” (that is a squared or rectangular pit lined on the walls with large stone slabs), the presence of large quantity of stone round-based vessels and a peculiar pottery production: this has led Russian archaeologists to consider this remains as representative of a single community. Similar

¹⁷⁹ The Okunev community occupied the Minusinsk Basin from the mid-third millennium BC and was of the Mongoloid race. The original dating, proposed by Chen and Hiebert, was 2600-2000 BC (CHEN Kwang-tzoo, HIEBERT, 1995, p. 269), however thanks to new carbon dating results a more precise dating, to around 2500-1700 BC, has been established. The Okunevo burial structures were characterized by cists graves (walls and bottom were all lined with stone slabs) deeply dug into the ground, while grave goods included coarse pottery with round or flat bases and pricked or carved decorations, bones and stone tools, in addition to some simple metal elements. For further information see SOKOLOVA, 2007; GRYAZNOV, 1969, pp. 51-66.

¹⁸⁰ LIN Yun 林云, 2008.

¹⁸¹ LI Shuicheng 李水城, 2006, p. 134, fig. 3; SUN Shuyun 孙叔云, HAN Rubin 韩汝玢, 1997, pp. 77-78, 82-83. The Siba community occupied the Hexi Corridor between 1900 and 1500 BC. Their productions included painted pottery and arsenic bronze objects. For further information see YANG Jidong, 1998; LI Shuicheng 李水城, 1993; LI Shuicheng 李水城, SHUI Tao 水涛, 2000.

¹⁸² LI Shuicheng 李水城, SHUI Tao 水涛, 2000, pp. 41-43.

¹⁸³ LI Shuicheng 李水城, 1999, p. 61.

¹⁸⁴ HAN Jianye 韩建业, 2005, pp. 69-73.

¹⁸⁵ JIA, BETTS, WU Xinhua, 2008; LIN Yun 林云, 2008.

¹⁸⁶ MALLORY, MAIR, 2000, pp. 136-140.

¹⁸⁷ JIA, BETTS, 2010, p. 293; XIA, 1999b.

¹⁸⁸ KOVALEV, ERDENEBAATAR, 2008; KOVALEV, 2011, figs. 4, 5, 9, 10.

¹⁸⁹ KOVALEV, ERDENEBAATAR, 2009, p. 155.

features have been observed in certain Qiemu'erqieke graves.

According to the 1981 report, the three cemeteries (no. 1, 2 and 3 respectively) at the Qiemu'erqieke village contained different burial structures, which archaeologists organized into a very complicated scheme¹⁹⁰, here summarized:

Graves with enclosure		Graves with no enclosure		
Cist tombs with no mound (M17m1, M17m2)	Cist tombs with mound (M16m1-5)	Cist tomb with mound (M11)	Cist tombs with no mounds (M1)	Pit tombs with mound (M22)

Because of the complexity of this classification and because written information sometimes contradicts that provided by maps, here I propose a simpler subdivision: pit and cists tombs (Fig. 13). The first group consists of large pit tombs, mostly located in cemetery no. 3 and, despite the considerable dimensions, were not deeply dug into the ground. Generally, these graves did not have enclosures, on the contrary, they were often covered by a mound. No more than three steles have been connected with these burials¹⁹¹. This type of grave can be attributed to the later phase of the cemetery on the basis of the grave goods, comprising iron or refined bronze objects, and will be analysed in detail later. The second group of burials found at Qiemu'erqieke consists of single or multiple tombs, deeply dug into the ground and walled by stone slabs, forming the so called “stone boxes” (Fig. 14). They were usually fenced by a stone enclosure. The orientation of most graves was around 20°¹⁹². Burials of this type were recovered from Tuoganbai cemetery no. 2 (Habahe County), which was found void of pottery and metal items and was carbon dated to around 2200 BC¹⁹³, in Kobo'er cemetery (Bu'erjin County), where, by contrast, distinctive olive-shaped pottery *guan* pots and a footed cup were uncovered. This type of grave structure and grave goods can be associated with those unearthed in Mongolia by Russian archaeologists and assigned to the Qiemu'erqieke cultural group. Although it is possible to establish two phases, there are still problems with the assignment of some of the graves in the Qiemu'erqieke

¹⁹⁰ XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archaeology of Xinjiang Academy of Social Science), 1981, pp. 24-26.

¹⁹¹ It will be explained more in detail later that a number of graves were associated with one or more steles, placed on the eastern or southern side, and they constituted one of the main feature of the Qiemu'erqieke funerary tradition.

¹⁹² Interestingly, most graves in Qiemu'erqieke cemetery no. 1 (75%) were oriented exactly at 20°.

¹⁹³ XIA, 2014c, p. 28.

cemeteries to one of the two periods, as for some of them no information is available and, in other cases, grave goods and burial practice display mixed characteristics.

1.2 Geographical setting

The Altay region in Xinjiang occupies the northern part of Dzungaria¹⁹⁴. It includes the Dzungarian Basin, where the central Gu'erbantonggute Desert lies around 200 meters above sea level, and a small hilly region with many north-south oriented hills. The surrounding Altay Mountains, which run from Eastern Kazakhstan to Northern Xinjiang, rise quite rapidly to around 3000-4000 meters. The Altay region develops along a number of rivers, such as the smaller Qiemu'erqieke and Bu'erjin Rivers and the larger Irtysh River¹⁹⁵, fed by the melt water from the mountains. The region is characterized by the presence of a number of lakes, such as the Wulungu and Kanas. While the lower lands mostly consist of a semi-arid steppe, dominated by *Chenopodicea*, *Artemisia* and *Poaceae*, the highlands are home to large meadows and marshlands. Early archaeological remains were discovered along the rivers and streams on the grassland against the southern slope of the Altay Mountains, along the northern foothill plain of the basin on the lower mountain slopes, and in the oases created as the rivers run out into the desert.

The regional climate is cold and relatively humid: the cold moist air moves into the Dzungarian Basin from the west, causing a higher annual precipitation (500-600 mm)¹⁹⁶. Very few studies have been conducted on the early environment in the Altay region, though some paleoenvironmental and hydrological research has been carried out, mostly by Chinese scholars, on the Wulungu Lake area, which is about 60 km south of the Qiemu'erqieke village¹⁹⁷. Analysis on pollens and grains from the lake has revealed that during the Holocene epoch (11.700 years ago-present) climate in Northern Xinjiang was characterized by several oscillations of dry and humid phases. In the early Mid-Holocene (ca. 9500-6700 years ago), *Artemisia* dominated the grassland vegetation, which suggests more humid conditions. In addition, the grain-size and the types of lake sediments indicate the existence of a deep-

¹⁹⁴ Dzungaria is also called Beijiāng 北疆 (the northern border).

¹⁹⁵ More specifically, the northernmost section of Dzungaria is part of the Irtysh Basin, which ultimately drains into the Arctic Ocean.

¹⁹⁶ MEI Jianjun, 2000, p. 7, tab 2.1.

¹⁹⁷ MA Long, WU Jinglu, Jilili ABUDUWAILI, 2011; LIU Xingqi, HERTZSHUH, SHEN Ji, JIANG Qingfen, XIAO Xiayun, 2008; YANG Xiaodong 羊向东, WANG Sumin 王苏民, 1994; JIANG Qingfen 蒋庆丰, LIU Xingqi 刘兴起, [et al.], 2006.

water environment, hinting at a relatively high level of moisture¹⁹⁸. By contrast, during the later stage of the Mid-Holocene (ca. 6700-5000 years ago), the regional climate showed a warmer and dryer tendency, which, apparently, continued throughout the first phase of the Late Holocene. The disappearance of wetland plants, the characteristics of lake sediments and the grains size are indicators that the water level of the lake decreased. Around the mid-point of the second millennium BC the increased pollen flux, smaller quantities of *Pediastrum*¹⁹⁹ and a high A/C index²⁰⁰ highlight that the water level of the Wulungu Lake rose, precipitation increased and more humid conditions prevailed in the region. In the latest phase of Holocene (from around 500 years ago to present), a significantly smaller A/C index and the dominance of desert-vegetation taxa (such as the *Ephedra*) indicate an increase of temperature and evaporation level²⁰¹. A number of studies on lakes in Northern²⁰², North-western China²⁰³ and Mongolia²⁰⁴ have revealed similar climatic conditions to those of the Wulungu Lake, showing that Northern Xinjiang, Mongolia and the surrounding regions formed a consistent region from a climatic standpoint throughout the Holocene. Although the area has been affected by the phenomenon referred to as the “desiccation of Asia”²⁰⁵, and despite the cyclical occurrence of dry-wet oscillations, it seems that the climate in the Altay region has never been particularly dry. In addition, its soils have always been supplied with water from the numerous rivers originating in the Altay Range and South-western Siberia. These circumstances have been especially suitable for the development of early nomadic and semi-nomadic communities, which benefitted from large and green grasslands for pasturing²⁰⁶.

¹⁹⁸ YANG Xiaodong 羊向东, WANG Sumin 王苏民, 1994.

¹⁹⁹ *Pediastrum* is a free floating, non-settling alga, widely distributed in lakes and ponds and along shores, where water is rich in nutrients, especially nitrogen; they are rare in deep water.

²⁰⁰ When their total percentage covers more than 50% of the present taxa, the A/C (Artemisia/Chenopodiaceae ratio) can be used for differentiate desert and steppe condition. In fact, A/C ratios >0.5, between 0.5 and 1, and <1 mark desert, desert-steppe and steppe condition, respectively. EL MOSLIMANY, 1990, pp. 346-347; LIU Xingqi, HERTZSHUH, SHEN Ji, JIANG Qingfen, XIAO Xiayun, 2008, pp. 419-420.

²⁰¹ Especially, from 560 cal yr BP the dry conditions further increased due to the human activity. LIU Xingqi, HERTZSHUH, SHEN Ji, JIANG Qingfen, XIAO Xiayun, 2008, p. 420.

²⁰² SUN Xiangjun 孙湘君, DU Naiqiu 杜乃秋, WENG Chengyu 翁成郁, LIN Ruifen 林瑞芬, WEI Keqin 卫克勤, 1994.

²⁰³ HERZSCHUH, ZHANG Chengjun, MISCHKEB, HERZSCHUH, MOHAMMADI, MINGRAME, KQRSCHNER, RIEDEL, 2005; MISCHKE, FUCHS, RIEDEL, E. SCHUDACK, 2002.

²⁰⁴ PECK, FOWELL, PEARCE, HANSEN, SONINKHISHIG [et. al.], 2002; FOWELL, HANSEN, PECK, GANBOLD [et. al.], 2003; FENG Zhaodong, WANG Weiguo, NARANTSETSEG, JULL [et. al.], 2005; TARASOV, DOROFYUK, METEL'TSEVA, 2000.

²⁰⁵ HUNGTINGTON, 1906.

²⁰⁶ Specifically, some scholars believe that the vertical transhumance was the most common pattern of nomadic movement in the region, as it is today. JIA, BETTS, WU Xinhua, 2008, p. 169.

1.3 The first phase: the Qiemu'erqieke cultural group (ca. mid-third–early second millennium BC)

The Qiemu'erqieke community in the Altay region is represented by the remains discovered throughout present-day Altay City (Qiemu'erqieke, Kuxi, Kayna'er, Kalatasi)²⁰⁷ and the counties of Habahe (Tuoganbai²⁰⁸, Chonghu'er²⁰⁹ and Jiayilema) and Bu'erjin (Kobo'er²¹⁰ e Alepabulake²¹¹, Bolate²¹², Yuyimoke²¹³). Fewer findings (sometimes not accompanied by precise geographic references), were found in the counties of Fuhai (Kuyirekebayidengkuoerlasi), Qinghe (Basikekeren and Chaganguoleng), Mulei (Xiaodonggou)²¹⁴ Jimunai (Tuoputiereke)²¹⁵ and Fuyun (Ku'e'erqisi, Dure)²¹⁶, while scattered remains, mostly steles, were recovered further south, in Turfan and Jimusa'er, and further west in the Tacheng region²¹⁷ (Fig. 16). Numerous remains in the Altay region were similar to those excavated in Mongolia and Kazakhstan by Russian scholars²¹⁸ and, as mentioned above, their attribution to the early Bronze Age has generally been established on the basis of the analogies with carbon dated remains in those regions²¹⁹. Several carbon dating examinations were performed on different sites in present-day Mongolia, revealing that the Qiemu'erqieke community occupied this region from the mid-third-early second millennium BC (Tab. C14). Information on the Altay region are fewer and less reliable: radiocarbon examinations have been performed by scientists at the University of Uppsala on two bone samples from a robbed burial in Kayina'er village (Altay City). Findings from this site have not been reported, and only some pictures and a description by Kovalev are currently available²²⁰: according to this information Kayina'er remains share traits with those assigned to the Qiemu'erqieke

²⁰⁷ XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981; KOVALEV KOBALIEB, 2015, pp. 255-257.

²⁰⁸ XIA, 2014c.

²⁰⁹ QI Xiaoshan 祁小山, WANG Bo 王博, 2015, 326, fig. 4; QI Xiaoshan 祁小山, WANG Bo 王博, 2008, p. 227.

²¹⁰ XIA, 2013b.

²¹¹ KOVALEV KOBALIEB, 2015, p. 249.

²¹² KOVALEV KOBALIEB, 2015, p. 252; QI Xiaoshan 祁小山, WANG Bo 王博, 2015, p. 338.

²¹³ QI Xiaoshan 祁小山, WANG Bo 王博, 2008, pp. 326-327.

²¹⁴ QI Xiaoshan 祁小山, WANG Bo 王博, 2008, pp. 222-223.

²¹⁵ QI Xiaoshan 祁小山, WANG Bo 王博, 2015, pp. 339-340.

²¹⁶ QI Xiaoshan 祁小山, WANG Bo 王博, 2015, pp. 318-319.

²¹⁷ KOVALEV KOBALIEB, 2012, pp. 132-133; QI Xiaoshan 祁小山, WANG Bo 王博, 1996, pp. 136-141; JIA, BETTS, 2010, pp. 276, fig. 1.

²¹⁸ KOVALEV, 1999; KOVALEV, 2011; KOVALEV, ERDENEBAATAR, 2009; KOVALEV KOBALIEB, 2014; KOVALEV KOBALIEB, 2015.

²¹⁹ KOVALEV KOBALIEB, 2015; KOVALEV, 2011, pp. 1-10.

²²⁰ KOVALEV KOBALIEB, 2015, p. 273.

community²²¹. C14 examination results have placed the Kayina'er complex to ca. 2900-2300 BC²²², which is earlier, but still comparable to those Qiemu'erqieke-related remains in Eastern Mongolia²²³. According to these data, Kovalev's chronological framework, that places the early Qiemu'erqieke community around mid-third millennium-early second millennium BC, is conceivable. However, more carbon dating examinations on remains in Northern Xinjiang are required in order to understand whether the Altay region was inhabited earlier than the neighbouring Mongolian territories by the Qiemu'erqieke community.

1.3.1 Archaeological context:

As mentioned above, early Bronze Age graves in the Altay region mostly consists of "stone boxes", usually fenced by very elongated rectangular stone enclosures (Figs. 15.1, 2), which were similar to those recovered from Mongolia, Kazakhstan and South-western Siberia. The custom of surrounding one or more graves into a single enclosure was common among the Afanasevo, Okunev and Elunino²²⁴ communities in South-western Siberia: the Elunino population generally dug ditches around some groups of graves (which acted as "burial enclosures")²²⁵, the Afanasevo people surrounded their graves with round-shaped fences²²⁶, while the Okunev stone enclosures were usually rectangular, but not very elongated²²⁷ (Figs. 15.3, 4). Cist graves covered by mounds rarely occurred in the Qiemu'erqieke sites in Xinjiang²²⁸ and, when they did, they were usually made of soil²²⁹. On the contrary, a higher number of these structures, though made of pebbles, were recovered from Mongolia, for example in Bulgan²³⁰. According to Kovalev mounds from Mongolia were built from the centre to the outside²³¹ and represent a unique burial structure, different from all the others uncovered in neighbouring regions. He has

²²¹ Specifically, graves were characterized by an elongated stone fences and steles of the Qiemu'erqieke type (which will be discussed later) were erected on the eastern side. KOVALEV, 2011, pp. 6-10; KOVALEV КОБАЛЕВ, 2015, pp. 3-4; 253-254, 273.

²²² Material from a secondary burial in Kayina'er was object of carbon dating examinations, and it was placed within a range time 1830-1400 BC. This further supports the existence of two occupational phases in the Altay region during prehistory. KOVALEV, 2011, p. 3.

²²³ According to carbon dating results, combined with the typological examination of the remains, Kovalev has placed the Qiemu'erqieke community in Mongolia and Kazakhstan in the range 2500-1800 BC. KOVALEV, ERDENEBAATAR, 2009, pp. 150, 153.

²²⁴ The Elunino community consisted of stockbreeders, who occupied the Ob-Irtysh region around 2300-1700 BC. Settlements and cemeteries belonging to this group have been discovered. Funerary sites were characterized by a ditch, dug around the burial and their grave goods consisted of flat-based pottery pots decorated by carving, bone and stone tools and some simple metal objects. For more information see KIROUSHIN КНРЮШИН, GRUSHIN ТРУШИН, TISHKIN ТИШКИН, 2010, pp. 552-566.

²²⁵ KIROUSHIN КНРЮШИН, GRUSHIN ТРУШИН, TISHKIN ТИШКИН, 2003, pp. 245, 253, 327-328

²²⁶ GRYAZNOV, 1969, pp. 46-50.

²²⁷ Sokolova was able to identify five types of burial structures within the Okunevo funerary tradition and, except for the fifth group, all present a square or rectangular enclosure. SOKOLOVA, 2007, pp. 44-46; see also GRYAZNOV, 1969, pp. 51-66.

²²⁸ In the three Qiemu'erqieke cemeteries, for example, only cist graves M10, M11, M19 and M16m1-6 were covered by a mound.

²²⁹ JIA, BETTS, 2010, p. 287, fig. 2; I saw pictures of the Kaya'er funerary site (Altay City) and indeed the mound was made of soil with only some pebbles on the top.

²³⁰ KOVALEV, ERDENEBAATAR, 2009, pp. 155-160.

²³¹ KOVALEV, 2011, p. 11.

highlighted similarities with pebbles mound discovered in present-day France, the *terres tumulaires* and *dolmens* (dating to the fifth-fourth millennium BC and fourth-third millennium BC respectively)²³², thus speculated on a possible migration of the Qiemu'erqieke community from Europe. Although this theory is fascinating and the argumentations interesting, more fieldwork is required for these long-distance contacts to be demonstrated. In addition to burials with surface markers, small groups of flat graves were found in the cemeteries at Qiemu'erqieke, Tuoganbai and Kobo'er.

On the eastern or southern side of some fences one or more steles were recovered. In the Qiemu'erqieke site at least seventeen stone statues were discovered, seven of which connected to burials not yet investigated in cemetery no. 1. In the 1990s, Wang Bo and Qi Xiaoshan studied a number of steles found scattered in Xinjiang, including those in the Altay region, and others in the Minusinsk Basin and classified them into three phases, namely the Bronze Age, the Iron Age and later periods²³³. More recently other statues in South-western Siberia have been analysed by Russian scholars, who associated them with Wang and Qi's "Bronze Age" group of steles, forming the "Qiemu'erqieke type" of steles²³⁴. According to their descriptions they mostly represented female characters (although some males were also portrayed), with some common features, which have been summarized by Kovalev: "The flattened face is marked by protruding contours and a straight relief nose is usually connected with it. The eyes are marked by with protruding circles or disks. A girdle or a necklace, sometimes consisting of several rows is modelled on the neck. Judging from the indicated pectoral muscles, the figures are portrayed in nude"²³⁵. Other features were observed on these steles, such as the two roughly isosceles triangles with the two equal sides converging toward the centre of the face, creating the appearance of a mask (or a helmet²³⁶) (Fig. 18.2), and a cup or crook frequently held by the portrayed character (Figs. 17.1, 2). No crooks were found among the cultural remains of the Qiemu'erqieke community, however, in the third-second millennium BC these tools were rather widespread throughout South-western Siberia, as demonstrated by the remains in the Chumysh River²³⁷, in Sopka II²³⁸, in Preobrazhenka-6²³⁹, Kalinovka-2²⁴⁰ (Figs. 17.3, 4). These findings suggest

²³² KOVALEV, 2011, p. 10.

²³³ Their research also includes the few steles in Hami, and others in the Ili-Tacheng region, in Bortala and Akesu, see QI Xiaoshan 祁小山, WANG Bo 王博, 1996, pp. 106-216.

²³⁴ KOVALEV, 1999, pp. 135-178; KOVALEV КОВАЛЕВ, 2012.

²³⁵ KOVALEV, 2011, p. 15.

²³⁶ KOVALEV, ERDENEБААТАР, 2009, p. 155.

²³⁷ KUNGUROV КУНГУРОБ, GORBUNOV ГОРБУНОБ, 2001.

²³⁸ MOLODIN МОЛОДИН, DEREV'ANKO ДЕРЕВЯНКО, 1985.

²³⁹ MOLODIN, МОЛОДИН, ЧЕМУЯКИНА ЧЕМЯКИНА, ROZDUNAУАКОВА ПОЗДНЯКОВА, 2007.

²⁴⁰ KIROUSHIN КИРЮШИН, РАПИН ПАПИН, FEDORIK ФЕДОРЫК, SHAMSHIN ШАМШИН, 2005.

the existence of a far-reaching and consistent group of pastoralist communities in the area, which most likely included those in the Altay region. Some of the steles, which Kovalev assigns to the Qiemu'erqieke cultural group, such as that at Kuokeshimu, portray a character holding a double curved bow: this type of bow is usually considered of Scythian origin²⁴¹, therefore these steles should probably be assigned to a later period (Fig. 18.3). Statues similar to those described by Kovalev were uncovered in Qiemu'erqieke and Kayina'er villages, as well as in the counties of Bu'erjin, Fuyun and Qinghe²⁴² (Figs. 18.1, 2). The stele from Tuoganbai cemetery (Habahe County) was not very well preserved, as the face was removed, and only the necklace is still visible²⁴³ (Fig. 18.4). Further south these statues were found in Barkol County and Hami²⁴⁴ (Fig. 18.5). While there is no indication of the existence of steles in connection with the Afanasevo community²⁴⁵, the Okunev cultural group is well renowned for its early production of beautiful and mysterious steles, which were found in the Gorno Altay region²⁴⁶, and in the Minusinsk Basin²⁴⁷. The Okunev steles did not usually bear clearly interpretable scenes and are believed to represent mystic gods and masks not easy to identify²⁴⁸ (Fig. 18.6). Only one group of Okunev stones was decorated with realistic representations of human faces, however they do not show similarities with the "Qiemu'erqieke type" (Fig. 18.6 at the center). Stone steles were widespread not only throughout the Altay region, in South-western Siberia and Central Asia, but also further west, reaching Southern France and Spain (Fig. 18.7). Interestingly, according to Kovalev, Southern European steles dating to the fourth-fifth millennium BC share the closest characteristics to those produced by the Qiemu'erqieke community²⁴⁹. This has paved the way for the hypothesis that the Qiemu'erqieke people originated in the west²⁵⁰, although there is still a lack of evidence indicating the actual routes taken by this community as well as the "missing links" connecting the Altay region to Southern Europe.

Graves were fenced individually or in groups. A number of burials were grouped inside a single

²⁴¹ For more information see DWYER, 2003.

²⁴² KOVALEV, 1999, p. 142.

²⁴³ XIA, 2014c, p. 24.

²⁴⁴ QI Xiaoshan 祁小山, WANG Bo 王博, 1996, pp. 136-140; KOVALEV KOBALIEB, 2012, p. 132.

²⁴⁵ GRYAZNOV, 1969, pp. 46-50; GRYAZNOV, ГРЯЗНОВ, 1999.

²⁴⁶ KUBAREV, 2009.

²⁴⁷ ESIN, 2009; ESIN, 2011.

²⁴⁸ SOKOLOVA, 2012, pp. 438-439. Some of the figures carved out the Okunevo steles presented sun ray-like hairs and a horizontal line dividing the face into two parts. They are believed to represent a God connected to the Sun. See ESIN, 2009; ESIN, 2011.

²⁴⁹ In France Kovalev identified such steles at the dolmens du Rat (Saint-Sulpice) and de Pouget (Hérault), in Mont-Sauvy (Ordon), in the cemetery Château-Blanc (Ventabren, Bouches-du-Rhône) and in Prémian, while in Spain, he recognized the stele of Sejos (Cantabria). KOVALEV, 2011, pp. 10-14.

²⁵⁰ KOVALEV, 2011.

enclosure in cemetery no. 2 at Tuoganbai²⁵¹, cemetery no. 3 at Bolate (Bu'erjin County)²⁵² and in three cemeteries at the Qiemu'erqieke village (Figs. 16.1, 2; 19)²⁵³. The number of tombs inside these fences ranged from two to six and they were usually consistent with regards to structure, dimensions and type of grave goods. Different burial constructions inside the same enclosure were rarer, but also discovered: for example, among the four graves inside the enclosure M5 (in Qiemu'erqieke cemetery no. 1), M5m2 was the only cist in a group of pit tombs, and burial M5m1 contained iron, which was not found in the other graves inside the enclosure (Fig. 20). Jia and Betts explained the anomalies in this group of burials by arguing that the rectangular enclosure depicted in the plan included in the preliminary report was actually an arbitrary drawing by the archaeologists and that, in reality, the enclosure did not originally exist²⁵⁴. Accordingly, the four graves contained by the fence would have been independent structures with no surface markers. That is plausible, given that, in spite of the drawing on the map sketch, the text of the excavation report actually states that no stones slabs were discovered around the enclosure M5²⁵⁵. Another, more simple explanation for the inconsistency among the burials inside M5 could be that the enclosure was re-used. Indeed, it is possible that it was originally built to fence the cist grave M5m2 and that only later the three pits were dug inside the same enclosure. This is conceivable, though it should be observed that, usually, single cist graves were built at the centre of the enclosure, therefore had the fence been re-used, M5m2 would have been exceptionally placed to the very east. The opposite option, that is M5m2 being an independent grave and the enclosure being intended to fence the three pit graves, is also possible, though unlikely as no pit grave surrounded by fences was found in the Qiemu'erqieke site. As no more information is provided, this question remains unsolved, however structure and grave goods recovered from the four graves suggest that they belong to different periods, that are the early Bronze Age (M5m2) and the late Bronze Age (M5m1, 3, 4). Multiple burials positioned within a single fence were rather common among the tribal societies of South-western Siberia. In the Afanasevo cultural sites most of the enclosures contained between two and nine graves²⁵⁶, while most of the Okunev stone fences surrounded multiple burials²⁵⁷ (Figs. 16.3, 4). The existence of stone enclosures surrounding multiple graves suggests that the Qiemu'erqieke community was socially organized, most likely on a family/clan basis. As

²⁵¹ Three graves were fenced into the enclosure M2.

²⁵² Five graves were surrounded by the enclosure M18.

²⁵³ At least six groups of graves, namely M5, M7, M14, M16, M17, M18, were fenced by as many enclosures.

²⁵⁴ JIA, BETTS, 2010, p. 290.

²⁵⁵ XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981, p. 25.

²⁵⁶ GRYAZNOV, 1969, p. 47.

²⁵⁷ Sokolova classified burial structures of the Okunevo community in five types: group 1 was characterized by single burials while groups 2, 3, 4 presented multiples grave fenced inside the same enclosure. SOKOLOVA, 2007, pp. 44-46.

mentioned above, most of the graves assigned to the early Bronze Age in the Altay region were cist tombs (so called “stone boxes”), and they were found in the funerary site at the Qiemu’erqieke village, at Tuoganbai, Alepabulake, Kobo’er and Bolate. These rectangular or square burial constructions were characterised by large and narrow stone slabs, which were inserted into the soil forming precisely a “stone box” (Figs. 21.1, 2). The walls were lined, but not the bottom. Similar structures were recovered from Mongolia and Kazakhstan (Fig. 21.3)²⁵⁸ and considered by Kovalev as distinctive of the Qiemu’erqieke community²⁵⁹. Cists graves did not usually feature in the Afanasevo sites²⁶⁰, while they were widely discovered in cemeteries assigned to the Okunev community in the Minusinsk Basin, though presenting the bottom lined with stone slabs, differing from the Qiemu’erqieke structure²⁶¹.

Burial rituals of the Qiemu’erqieke community in Xinjiang are difficult to determine, as most of the graves were robbed²⁶². In Qiemu’erqieke funerary site twenty-one complete and preserved skeletons were unearthed and most of them were supine with bent legs²⁶³. The same position was verified for the bodies recovered from two recently excavated graves (M21 and M22) in the Ayituohan cemetery (Habahe County), placed to around the second half of the third millennium BC²⁶⁴. Similarly, the majority of the bodies from Qiemu’erqieke cultural sites in Mongolia and Kazakhstan were supine with bent legs²⁶⁵. This funerary posture was not unique to the Qiemu’erqieke cultural group, as the Pit Grave (ca. 3300-2600 BC)²⁶⁶ Afanasevo (ca. 3500-2500 BC)²⁶⁷ and Okunev (ca. 2500-1700 BC)²⁶⁸ communities also used to place their dead in a supine position with bent legs²⁶⁹. Supine bodies with bent legs and the head strictly pointing to the closest river were documented in connection with some

²⁵⁸ KOVALEV KOBAJIEB, 2014; KOVALEV KOBAJIEB, 2015.

²⁵⁹ KOVALEV, ERDENEBAATAR, 2009, pp. 155-160.

²⁶⁰ GRYAZNOV, 1969, pp. 46-50; GRYAZNOV, 1999.

²⁶¹ SOKOLOVA, 2012, pp. 446-447; GRYAZNOV, 1969, pp. 46-51.

²⁶² Among others, graves at Qiemu’erqieke and Tuoganbai were severely damaged and robbed.

²⁶³ Of the twenty-six bodies, fifteen laid supine with bent legs, five were placed supine and completely extended, while a peculiar prone and extended skeleton was found in grave M17m1. Since two of the extended bodies were recovered from graves rather certainly assigned to the Iron Age (namely, burials M5m1 and M28, which contained iron objects), a group of scholars connected this posture with the later phase of the cemetery, while supine bodies with bent legs would have represented rituals of the Bronze Age community. JIA, BETTS, 2010, p. 289.

²⁶⁴ YU Jianjun 于建军, 2015, p. 71.

²⁶⁵ In Kazakhstan and Mongolia a small number of undisturbed human remains were actually found, however they are usually placed in a supine position with bent legs. See for example funerary sites in Hurray (Western Mongolia) and Kanai (Eastern Kazakhstan). KOVALEV KOBAJIEB, 2014, pp. 186-204; KOVALEV KOBAJIEB, 2015, pp. 217-226.

²⁶⁶ The Pit-Grave community (also called Yamnaya) occupied the steppe area from the Danube River, in the west, to the Southern Urals, in the east, during the period around 3300-2600 BC. Very few settlement related to this cultural group have yet been found, so most of the material still comes from funerary contexts. Pit Grave cemeteries were characterized by cist tombs covered by mounds, the dead placed in a crouched position on its back, or bent on the right side, and sprinkled with ochre. The population practiced nomadic pastoralism and most likely already used wheeled vehicles. These people made and used copper tools, while their pottery mostly consisted of ovoid pots. See CHERNYKH, 1992, pp. 83-92. Dating taken from MORGUNOVA, KHOKHOLOVA, 2013, pp. 1286-1296.

²⁶⁷ TIURINA, ТЮРИНА, 2008, p. 125.

²⁶⁸ GRYAZNOV, 1969, p. 52.

²⁶⁹ CHERNYKH, 1992, p. 84.

artic communities, such as the Bel'kachi in Eastern Siberia (ca. 3000-1100 BC)²⁷⁰. Several bodies from the Altay region were covered by a red pigment, such as some of those in Tuoganbai cemetery grave M2a, resembling a custom of the Bel'kachi and Catacomb communities, in the east and west respectively²⁷¹. Although some graves contained single bodies, in Qiemu'erqieke, Tuoganbai and Ayituohan most of the burials were multiple-occupancy. In particular, "mass graves" were found: at least twenty beheaded bodies were recovered from the "mass grave" M17m2 in Qiemu'erqieke cemetery no. 2 (Fig. 22)²⁷², while eleven people had been buried in grave M2a at Tuoganbai. Decapitation was practised, as shown by the several bodies in Qiemu'erqieke and Tuoganbai (grave M3) found separated from their head, suggesting the existence of a form of social stratification. The discovery of groups of bones piled up on one side of the grave alone, or combined with complete skeletons (such as those found in graves M24 and M21 at Qiemu'erqieke), constitutes additional evidence of a hierarchical society, in which, perhaps, human sacrifices were part of funerary rituals. Although archaeologists have interpreted these remains as indications of the existence of a "slave class" in the Altay region²⁷³, this hypothesis needs more solid foundations to be accepted. In fact, if the practice of beheading was sometimes connected to slavery and warfare, such as during the Shang dynasty in the Central Plain (1600-1046 BC)²⁷⁴, and in the Bronze Age groups of Abashevo²⁷⁵ (ca. 2400-2200 BC) and Sintatsha²⁷⁶ (ca. 2100-1800 BC), more often, decapitation was post-mortem as part of the funerary ritual. The latter was documented for the Pit Grave cultural group (ca. 3300-2600 BC), who used to decorate the skulls once they were removed from the deceased's body²⁷⁷, while burial rites of the Catacomb community (ca. 2600-2000 BC), included decapitation and the maceration of the head, which was used to worship ancestors²⁷⁸. In South-western Siberia, and specifically in the Minusinsk

²⁷⁰ The Bel'kachi community inhabited the Lena River Basin, in Yakutia, during the late fourth-late third millennium BC. Burials assigned to this cultural group did not usually have surface markers, and their dead were placed supine and cover with ochre. Grave goods included stone and bones tools and weapons, while pottery featured ovoid shapes and stamped decorations. For further information see NUTTALL, 2005, pp. 225-226.

²⁷¹ The Catacomb cultural group occupied the territory roughly corresponding to the present-day Ukraina and practiced herding and subsistence farming. In funerary contexts assigned to this community, the dead were usually buried in a crouched position in catacomb niches of burial pits and sprinkled with ochre. Grave good included spherical pots, flint knives, bronze implements, and silver ornaments. For more information see CHERNYKH, 1992, pp. 124-131.

²⁷² In the same cemetery, graves M1, M18 and others also contained multiple, dismembered bodies.

²⁷³ XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981, p. 32.

²⁷⁴ THORP, 2006, p. 189; SUNG Yaoliang, 2015, p. 63 and fig. 2.5.

²⁷⁵ The Abashevo community inhabited the Don Basin, Middle and Upper Volga and Southern Urals in the second half of the second millennium BC. Burials of the Abashevo were covered by mounds and contained decorated pottery, copper and stone tools and silver ornaments. Horse remains were also found. For more information see CHERNYKH, 1992, pp. 200-204.

²⁷⁶ The Sintasha community occupied the area between the upper Ural and the upper Tobol Rivers during the period around 2100-1800 BC. Settlements included houses and remains of furnaces. The Sintasha community used chariots, which were buried with the dead together with horses and copper and bronze weapons. For further information see ANTHONY, 2009, p. 52.

²⁷⁷ SHISHLINA, 2006.

²⁷⁸ KISER, 2006; OTROSHCHENKO, p. 34.

Basin, the Okunev burial treatment also involved decapitation²⁷⁹.

Craniometric examinations were carried out on skulls from Qiemu'erqieke cemetery no. 1 and Alepabulake cemetery no. 2 (Altay City)²⁸⁰. Their results revealed that samples from the former were of the Mongoloid race, while those from Alepabulake were Europoid. Further research on human remains from Qiemu'erqieke cultural sites in Eastern Kazakhstan and Mongolia was conducted by the Institute of Genetics of the Russian Academy of Science and by the Department of Anthropology of the National University of Mongolia respectively: results of DNA examinations and craniometrical analyses suggested that the Qiemu'erqieke population came from the west, as they showed Europoid traits²⁸¹. If Qiemu'erqieke people were, indeed, Europoid, the occurrence of Mongoloid-type skulls in the Qiemu'erqieke cemetery may be due to a local contribution or the result of interactions with Mongoloid populations, such as the Okunev.

1.3.1.1 Grave goods

Among the grave goods several stone vessels and artefacts and some pottery vessels were recovered. No wooden items were unearthed, probably because they were not preserved due to the more humid conditions of the local climate.

Stone

The majority of the vessels recovered from the Altay region were made of stone, and, in some cases such as at the Tuoganbai site (Habahe County), only stone containers were found. However, typologies of stone goods were few and consisted of a significant amount of round-based *guan* pots with very short neck and large mouth, some flat-based *guan* specimens with straight walls, some handled *wan* cups and a few *shao* spoons (Fig. 23). The production of such a limited range of containers may have been connected to the nature of the material, as it was solid and not malleable, hardly allowing for more creative shapes. A particular specimen is a stone round-based double-*guan* pot recovered from grave M3 in the Qiemu'erqieke cemetery no.1. This double-pot, unique in the Qiemu'erqieke site, may reflect

²⁷⁹ According to Gryznov, while a number of skulls had been purposely removed, others were remains of earlier burials. GRYAZNOV, 1969, p. 52.

²⁸⁰ WANG Bo 王博, WU Dongjun 乌东军, ZHENG Jie 郑颀, 2005.

²⁸¹ KOVALEV, 2011, p. 10.

a special social position of the owner in the Qiemu'erqieke community²⁸² (Fig. 24). While most of the stone *guan* containers were void of decorations, a group of pots were carved with simple geometric signs, such as lines and zigzags, on the upper part. The shape and decoration of these pots have been connected by Lin Meicun with the grass baskets discovered in the Xiaohe cemetery in Lop Nur²⁸³, and although some scholars disagree²⁸⁴, this remains a valid hypothesis²⁸⁵. A stone cup with a zoomorphic handle and a round base was recovered from grave M16 at Qiemu'erqieke cemetery no. 2, while several scattered specimens were collected from the surface in the counties of Qinghe and Habahe and Altay City²⁸⁶ (Fig. 25.1-3). These containers were probably intended for cult practises: their round base suggests that they were not usually put down, but held during ceremonies²⁸⁷ or carried²⁸⁸. Despite having been assigned to the Qiemu'erqieke cultural group by several scholars²⁸⁹, the attribution of these zoomorphic-handled cups remains questionable: research on this type of containers reveals that they originated within the Iranian nomadic communities²⁹⁰ and were particularly appreciated and used by the Scythian-Sarmatian groups from the early first millennium BC²⁹¹ (Fig. 25.4). Therefore, these items may not be representative of the Qiemu'erqieke community, but part of the assemblage of a later period, perhaps around the first millennium BC, when, judging by the numerous remains, Scythian cultural groups settled in the Altay region²⁹².

In addition to vessels, stone was widely used for producing tools and ritual objects, including basic stone arrowheads, anthropomorphic figurines and phalli. The basic shape and manufacturing of the stone arrowheads found in the Qiemu'erqieke and Tuoganbai cemeteries are indicative of the early dating of these objects (Fig. 26). Jia and Betts have noted that no such arrowheads were found in Xinjiang after the beginning of the second millennium BC²⁹³, implying that their date is likely to fall within the early phase of the Bronze Age or even earlier. Several stone anthropomorphic figurines

²⁸² This consideration cannot be verified as no information on grave M3 has been provided neither by the excavation report, nor by other sources.

²⁸³ LIN Meicun 林梅村, 2002.

²⁸⁴ During my visit in Xinjiang in 2016, Professor Yuan Qiurong told me that no such a connection can be traced as the materials of which these containers were made is different.

²⁸⁵ The two communities seem to have shared a number of traits: in both cemeteries, graves were marked with either poles or steles; one or more bodies were placed in coffins made of wooden or stone slabs; grave goods included a high number of simple tools, round-bottomed vessels or baskets and anthropomorphic figures; pottery was either absent (Xiaohe) or rare (Qiemu'erqieke). For further information of Xiaohe cemetery see XIA, 2007.

²⁸⁶ KOVALEV KOBAJEB, 2015, p. 272.

²⁸⁷ KOROLKOVA, 2000, p. 61.

²⁸⁸ BONORA, 2007, p. 233.

²⁸⁹ KOVALEV KOBAJEB, 2015, pp. 240-280; JIA, BETTS, 2010.

²⁹⁰ The exact origin of the shape and decoration of these cups is still unknown. KOROLKOVA, 2000, p. 62.

²⁹¹ BONORA, 2007.

²⁹² For some pictures of Scythian zoomorphic-handled cups see: KOROLKOVA, 2000, pp. 61-64, figs. 54-57.

²⁹³ JIA, BETTS, 2010, p. 302.

were recovered from the Qiemu'erqieke cemeteries, while a few specimens were collected in Altay City and Xiadonggou in Mulei County (Fig. 17.1-3). Anthropomorphic figurines were rather common in prehistory as shown by the wide distribution of pottery, stone and, more rarely, wooden specimens throughout the whole Eurasian territory²⁹⁴. Most of them represented female characters, featuring an expanded abdomen and, sometimes, evident sexual attributes²⁹⁵, or were male figurines with overrepresented masculine features (though appearing significantly less frequently than their female counterparts²⁹⁶), suggesting their use during rituals connected to fertility. In the Altay region, portable figurines pertaining to the Qiemu'erqieke cultural sites were exclusively made of stone and portrayed male faces or, more often, individuals with an undefined gender²⁹⁷. The precise choice of employing a permanent and durable material, such as stone, in order to manufacture these objects, suggests that they were of high value and that the resulting image may have been one of worship²⁹⁸. Additionally, from a social point of view, the presence of such objects indicates the existence of a group of specialized and trained stoneworkers within the communities in the Altay region: as pointed out by Schmandt-Besserat and Talalay, these artisans were able to select the right raw material and possessed an advanced knowledge of geometry and carving skills²⁹⁹. As regards the function of this type of figurines, few studies have been conducted and numerous questions still linger. Some scholars, who examined similar specimens from the Ob-Irtysh River suggests that they were totemic-phalli³⁰⁰, however the representations carved on these statues, portraying faces of males or, more often, individuals with an undefined gender, suggest that the rituals performed in connection with these figurines may not have been directly linked to fertility. At present, the most probable hypothesis seems to be that formulated by Kiroushin and Grushin, who, more safely, consider these figurines as pestles used during ritual ceremonies involving grinding plants³⁰¹. Stone anthropomorphic figurines, similar to those recovered from the Qiemu'erqieke cultural sites, were rather common throughout the Altay region, South-western Siberia and Eastern Kazakhstan during the late third - early second millennium BC: they were found on the Naoluobulin Mountains in Inner Mongolia³⁰², at Korablik I³⁰³, Savvushka³⁰⁴, along the Ir and the

²⁹⁴ Evidence shows that they were produced in Western Asia as early as the ninth millennium BC. HANSEN, 2007, p. 66.

²⁹⁵ GIMBUTAS, 1991.

²⁹⁶ GIMBUTAS, 1991.

²⁹⁷ Often only the head (with basic human face's attributions) was carved, therefore there is no indication of the figurines gender.

²⁹⁸ SCHMANDT-BESSERAT, 1998, p. 115.

²⁹⁹ SCHMANDT-BESSERAT, 1998, p. 110; TALALALY, 1993, p. 32.

³⁰⁰ OKLADINOV ОКЛАДИНОВ, 1950, p. 331.

³⁰¹ KIROUSHIN, GRUSHIN, 2009, p. 69.

³⁰² QI Xiaoshan 祁小山, WANG Bo 王博, 1996, fig. 001-A-1.

³⁰³ GRUSHIN ТРУШИИ [et. al.], 2004.

³⁰⁴ KIROUSHIN КИРЮШИИ, 1991.

Tui Rivers³⁰⁵, in Zaysan³⁰⁶ and Semipalatinsk Oblast³⁰⁷ (Figs. 27.5-7). These figurines were also part of the cultural remains of the Okunev community in the Minusinsk Basin³⁰⁸ (Fig. 27.4). The wide distribution of these objects suggests the existence of rituals connected with stone anthropomorphic figurines, shared by the prehistoric communities inhabiting Eastern Kazakhstan, South-western Siberia and the Altay region.

Stone phallus-shaped objects, widely discovered among the cultural remains of the Qiemu'erqieke community in Jimunai County and Altay City (Figs. 28.1-3), were most likely used during fertility rites. Interestingly, a significantly smaller number of these objects were unearthed at the Qiemu'erqieke cultural sites in Mongolia and Kazakhstan, suggesting that this practice may have been local. On the contrary, phallus-shaped stones were discovered further south, in Xiaoheigou village (Barkol County)³⁰⁹, while several wooden specimens were found in Xiaohe cemetery, in Loulan³¹⁰ (Figs. 28.4-5).

Pottery

Pottery produced by the Qiemu'erqieke community was limited in terms of quantity and types and consisted of ovoid and, more rarely, flat-based *guan* pots and footed *dou* cups (referred to as “lamps” or “oil burner” by certain scholars³¹¹). Ovoid *guan* containers with impressed or carved decorations were found in Qiemu'erqieke cemeteries, Yuyimoke (Altay City), Chonghu'er and Kobo'er (Bu'erjin County) (Figs. 29, 31.1-3). On the basis of olive-shaped specimens from Qiemu'erqieke cultural sites in Mongolia and Kazakhstan, Kovalev was able to summarise the main features of the “Qiemu'erqieke type” of vessels as follows: “(they are) spheroid, ellipsoid, “bomb”, and flat bottom pot shaped of vessels, slightly narrowing to the mouth and base; vessels do not have emphasized neck or flared mouth, the mouths of all vessels being slightly contracted. The most usual decoration looks like a horizontal line with triangular scallops stretched under a vessel's rim”³¹². With respect to the vessels' shape, this description fits most of the specimens found in the Altay region, while the decorative

³⁰⁵ MOSHINSKAYA МОШИНСКАЯ 1952.

³⁰⁶ KIROUSHIN КИРЮШИН, 2002; GORELIK ГОРЕЛИК, 2011.

³⁰⁷ MARGULAN МАРГУЛАН, 1979.

³⁰⁸ QI Xiaoshan 祁小山, WANG Bo 王博, 1996, pp. 52-53 and figs. 25-B-2, 37-B-14.

³⁰⁹ Hani Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 108.

³¹⁰ XIA, 2007, p. 14 fig. 27.

³¹¹ JIA, BETTS, 2010, p. 304.

³¹² KOVALEV, 2011, p. 14.

patterns identified by Kovalev are rarer and have been verified for few specimens³¹³ (Fig. 29). The discovery of olive-shaped vessels in Northern Xinjiang led scholars to relate the Qiemu'erqieke sites to the Afanasevo cultural group³¹⁴. However, similar containers variously appeared in the Eurasian territory from the Neolithic period (ca. sixth millennium BC) to the Bronze Age (ca. second millennium BC). Neolithic ovoid pottery pots from South-western Siberia, including the Middle Yenisei, Angara and Baikal regions, were analysed by Sokolova and Berdnikov, who showed that this type of containers was produced in these regions as early as the sixth millennium BC³¹⁵. By the fourth-third millennium BC, ovoid pots were used across a large region stretching from the Urals to South-western Siberia, including present-day Kazakhstan and the Baikal region. Among others, these vessels were recovered as part of the cultural remains of the Afanasevo (ca. 3500-2500 BC)³¹⁶, Pit Grave (ca. 3300-2600 BC)³¹⁷, Botai (ca. 3500 BC)³¹⁸ and Kitoi (ca. 3500-2500 BC) communities (Figs. 30.1-4). Later specimens, with a more marked round base, were found in the Baikal region, assigned to the Serovo (ca. 3000-2000 BC)³¹⁹ cultural group, in the Minusinsk Basin, in correspondence to the earliest Okunev cultural sites (ca. 2500-1700 BC)³²⁰, in the Ob region³²¹ and in Northern Altay³²² (Figs. 30.5-8). Further west, some specimens were discovered in Abri de Bellefonds, in Southern France³²³, and have since been linked by Kovalev to the Qiemu'erqieke pottery³²⁴ (Figs. 30. 9,10), though this theory lacks of sufficient archaeological evidence. The wide distribution of these vessels indicates that, although some form of cultural interaction most likely occurred between the Afanasevo and Qiemu'erqieke communities, the still diffused assumption that the two cultural groups were simultaneous on the basis of pottery production should be reviewed³²⁵. A closer look at the decoration of the artefacts also highlights that this association lacks of solid support. Pots recovered from the Qiemu'erqieke sites usually carried impressed or carved patterns under the rim or covering the whole

³¹³ Decorations of the vessels in the Altay region are described later in this paragraph.

³¹⁴ LIN Meicun 林梅村, 2002.

³¹⁵ BERDNIKOV, SOKOLOVA, 2014.

³¹⁶ GRYAZNOV, 1999.

³¹⁷ Some specimens are exhibited at the Hermitage Museum at Saint Petersburg.

³¹⁸ The Botai community occupied Eastern Kazakhstan around the middle of the third millennium BC (the dating, however, is still object of debates). Pottery production was characterized by grey vessels with an ovoid shape. According to most of the scholars the Botai played a significant role in the domestication of horses. For further information see LEVINE, 1999; KISLENKO, TATARINTSEVA, 1999.

³¹⁹ The Serovo community occupied the Baikal region in the third millennium BC. Pottery of this cultural group had ovoid and round-based shapes, and was decorated with geometric patterns, such as triangles and rhombs. For more information see JORDAN, ZVELEBIL, 2009; OKLADINOV ОКЛАДИНОВ, 1950; WEBER, 1995.

³²⁰ SOKOLOVA, 2007, p. 47.

³²¹ JORDAN, ZVELEBIL, 2009, p. 214.

³²² KUNGUROVA, 2003.

³²³ PATTE, 1971, pp. 141-244, and fig. 14.

³²⁴ KOVALEV, 2011, pp. 10-17.

³²⁵ SEMONOV СЕМЕНОВ 1993; MOLODIN МОЛОДИН, ALKIN АЛКИН, 1997; LUO Wugan 罗武干, HU Xingjun 胡兴军, ZHANG Jie 张杰, YANG Yimin 杨益民, 2017.

body. On some vessels, prick-like signs were organized in rows or inside rhomboid frameworks, others presented short lines arranged into triangles, while in grave M16 in Qiemu'erqieke cemetery no. 2, an olive-shaped pot, carrying a decoration with a three-quarter concentric circles carved on the whole body, was found (Figs. 31.1-3). These peculiar patterns seem to have descended from some stone specimens, such as that found in Bolate cemetery (Bu'erjin County), which by featuring similar decorations, suggests the existence of a distinctive, local pottery production unique to the Qiemu'erqieke community (Fig. 31.5). In fact, although pricked and the comb patterns were frequently carved on prehistoric pottery vessels, such as those pertaining to the Afanasevo (ca. 3500-2500 BC)³²⁶, Okunev (ca. 2500-1700 BC)³²⁷ and Elunino (2300-1800 BC)³²⁸ communities, Qiemu'erqieke artisans showed a rather distinctive artistic view and an advanced knowledge of geometry. Vessels of the "Qiemu'erqieke type" were recovered from Gansu, where an olive-shaped specimen was found among the remains of the Qijia cultural group in Dahezhuang (Yongjing County)³²⁹, hinting at possible connections between the two communities (Fig. 31.4). A smaller number of flat-based *guan* containers with straight walls was found in the Altay region in association with ovoid-shaped specimens: the regular occurrence of both vessel types (with round and flat base), was verified in South-western Siberia where they have been documented as belonging to the Okunev community³³⁰. As observed by Kovalev, some flat-based pots found in Qiemu'erqieke cultural sites show some similarities with flat-based upward-flared Elunino vessels found in Northern Kazakhstan (ca. 2300-1800 BC)³³¹, suggesting the existence of cultural interactions between the two communities³³² (Fig. 32).

In addition to *guan* pots, several footed cups (sometimes referred to as "lamps" or "oil burners"³³³) were recovered from the Altay region. Among them, the specimen found in grave M8 in Qiemu'erqieke cemetery no. 1 was very simple, being just a large cup on a pedestal, decorated with a pricked design (Fig. 33.1), while that unearthed from Kobo'er (Bu'erjin County) presented an impressed ornament with a criss-cross design (Fig. 33.2). These containers have often been compared to similar items found among the cultural remains of the Afanasevo and Okunev communities, and some scholars have proposed that they were inherited from the Pit Grave and Catacomb (ca. 3300-2600

³²⁶ GRYAZNOV, 1999.

³²⁷ SOKOLOVA, 2007, p. 47.

³²⁸ KIROUSHIN КИРЮШИН, GRUSHIN ТРУШИН, TISHKIN ТИШКИН, 2010.

³²⁹ CHEN Xiaosan 陈小三, 2012, fig. 5.11.

³³⁰ SOKOLOVA, 2007, p. 47.

³³¹ KOVALEV 2011, p. 14.

³³² These connections are further suggested by similar bone objects, such as scutchers, and metal items. KOVALEV, 2011, p. 6.

³³³ JIA, BETTS, 2010, p. 304. Despite their names, the function of these containers is rather unclear.

BC and ca. 2600-2000 BC respectively)³³⁴ cultural groups in Western Eurasia (Figs. 33. 3-7)³³⁵. The chronological discrepancy between the communities in the Altay region (from the early or mid-third millennium BC to the early second millennium BC) and the Catacomb cultural group (ca. 2600-2000 BC) makes it difficult to accept a possible westward diffusion of these objects involving these two populations: if these cups came from the west, it is more plausible that they were an heritage of the Pit Grave (ca. 3300-2600 BC) containers. Cups were absent from the Andronovo³³⁶ assemblage (ca. 1900-1200 BC) because, according to Jia and Betts, these footed cups disappeared after ca. 2300 BC, thus during the mid-Okunev period³³⁷. This assumption is questionable when a wider perspective is considered: prehistoric communities, which occupied present-day Gansu and Qinghai produced footed cups at the end of the third millennium BC, as demonstrated by specimens found in the Qijia (ca. 2300-1700 BC) cultural sites³³⁸ (Fig. 33.8), suggesting the existence of early contacts with the steppe cultural groups in South-western Siberia and the Altay region (including the Qiemu'erqieke). In the second millennium BC (well after the dating 2300 BC established by Jia and Betts for the disappearance of these items) footed cups continued to be produced by the Siba community (ca. 1900-1500 BC), and their shape and decoration is rather similar to the specimens from the Altay region (Fig. 33.9)³³⁹. This suggests that the emergence of the Andronovo groups in Central Asia and South-western Siberia in the early second millennium BC, may have led to the disappearance of the footed cups in these regions, while further east, including the Gansu-Qinghai area and Eastern Xinjiang³⁴⁰, these objects continued to be produced and appreciated.

In spite of the fact that scholars has assigned the aforementioned pottery objects to the Qiemu'erqieke community³⁴¹, the very existence of a pottery production in this early phase raises some questions: a

³³⁴ SULIMIRSKI, 1970, pp. 225, 425; SHISHLINA, 2008, p. 46.

³³⁵ It has been proposed that Afanasevo and Pit Graves communities were genetically related and, more specifically, that the emergence of the former was due to eastward migration of western groups. If this was the case, these objects may have been western products brought to Siberia by the Afanasevo people. JIA, BETTS, 2010, p. 304; KUZ'MINA, MALLORY, 2007, p. 252.

³³⁶ The Andronovo community occupied Central Asia and South-western Siberia around the period 1900-1200 BC. They were mainly pastoralists, though they also practised some agriculture. Burial rituals were characterized by inhumation and cremation. The body was placed on one side with bent legs and usually a pottery vessel was located near the head of the deceased. Pottery consisted of pots with flat bases, decorated by carving with geometric patterns. Andronovo people developed an advanced tin bronze metallurgy. For more information see KUZ'MINA, MALLORY, 2007.

³³⁷ JIA, BETTS, 2010, p. 304.

³³⁸ Gansu Sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Xibei Daxue Wenhua Yichan yu Kaoguxue Yanjiu Zhongxin 西北大学文化遗产与考古学研究中心 (Northwest University Cultural Heritage and Archaeology Research Center), 2009, p. 12, fig. 3.

³³⁹ LI Shuicheng 李水城, 1993, p. 98 and tab. 7.

³⁴⁰ Footed cups have been recovered from Yanbulake cemetery and they are described in detail in the second chapter "Eastern Xinjiang".

³⁴¹ KOVALEV KOBALIEB, 2014; KOVALEV KOBALIEB, 2015; JIA, BETTS, 2010.

closer look to the remains in the Qiemu'erqieke cemeteries³⁴² reveals that in the overwhelming majority of the graves pottery had been buried together with well manufactured bronze objects or iron items (see graves M4, M7m1, M11, M17m1, M17m2, M22, M23, M24, M25, M28), suggesting a later dating for these burials. Only in graves M15, M16 and M24 were pottery vessels found alone. However, in burial M15 a supine extended body was unearthed and, as mentioned above, this posture was likely to have been related to a later stage of the cemetery. Additionally, the flat-based vessel with a row of small holes around the mouth, found in grave M16 is rather similar to the specimen recovered from burial M2 in the cemetery at Dongtaleide village (Habahe County), which the archaeologists placed to the first millennium BC (Fig. 34)³⁴³. Furthermore, in M24 a pottery cup was discovered together with the stone specimen with a zoomorphic handle, which, as mentioned above, may be a later object, connected to the Scythian occupation of the Altay region around the first millennium BC. For these reasons pottery production within the Qiemu'erqieke community in the Altay region remains questionable. This contrasts with findings from Qiemu'erqieke cultural sites in Mongolia and Kazakhstan, where pottery was found in association with stone vessels, bone and stone artefacts and, occasionally, small copper and lead elements³⁴⁴. This further supports the hypothesis, according to which Qiemu'erqieke sites in the Chinese Altay region were earlier to those recovered from the neighbouring areas.

1.3.2 Metallurgy

Metallurgical production of the Qiemu'erqieke community in the Altay region is problematic: cast metal objects (a knife, a mirror and two arrowheads) and two stone moulds were recovered from the Qiemu'erqieke cemetery and assigned to the Qiemu'erqieke community³⁴⁵. In particular, moulds found in grave M17 have long suggested the existence of a relatively advanced metallurgy in the Altay region during the early phase (Fig. 35). These moulds were intended for casting straight-bladed knives and celt-spades with a peculiar loop on one side. At first sight, the looped celt-spade would indicate the existence of cultural connections with the community of Qijia (ca. 2300-1700 BC) in present-day Gansu, given that a similar spade from Qijiaping³⁴⁶ was assigned to this cultural group, and its

³⁴² Remains at Qiemu'erqieke cemeteries have been taken as main reference because other pottery containers were found either on the surface or in poorly reported sites.

³⁴³ XIA, 2013d, p. 13 and fig. 9.1.

³⁴⁴ KOVALEV, ERDENEBAATAR, 2009, pp. 155-160; KOVALEV KOBAJIEB, 2014; KOVALEV KOBAJIEB, 2015.

³⁴⁵ JIA, BETTS, 2010, p. 298; KOVALEV KOBAJIEB, 2015, p. 245.

³⁴⁶ MEI Jianjun, 2003a, p. 6, fig. 2.12.

chronology is comparable to that of the Qiemu'erqieke. Indeed, the existence of interactions between the two communities has been already hypothesised based on the recovery of Qiemu'erqieke-type olive-shaped pots in the Qijia cultural site of Dahezhuang (Fig. 31.4). However, a closer look at the stone moulds from Qiemu'erqieke reveals that their attribution to the first phase of the funerary context is rather questionable. Firstly, they were assigned to grave M17m2, but were actually found outside the burial, 20 cm deep in the soil between graves M17m1 and M17m2³⁴⁷, therefore their connection with these graves is debatable. Moreover, judging by the Qiemu'erqieke cultural remains in Mongolia and Kazakhstan, there is no indication that in the third-second millennium BC this community was able to cast objects. It is unlikely that the acquisition of such an advanced metallurgical knowledge stemmed only from within the Qiemu'erqieke groups in the Chinese Altay region, when the neighbouring communities had long been able to produce only small copper implements. Furthermore, the scarcity of pottery raises questions not only as to the Qiemu'erqieke people's ability to operate furnaces, but also their interest in acquiring the pyrotechnical expertise required for developing pottery and metal productions. Although aceramic cultural groups did exist and achieved significant metallurgical feats (for example the Seima Turbino community³⁴⁸), metalworking usually depended on the pyrotechnical knowledge acquired from experience with pottery³⁴⁹. Considering the limited amount of pottery recovered from Qiemu'erqieke centres, it is unlikely that this community had already developed an efficient metallurgical technique, involving casting technology. The objects intended to be cast from the moulds found in the Altay region (side-looped celt-spades, perforated straight and curved knives³⁵⁰) as well as those actually recovered from cemeteries (a knife, a mirror and two arrowheads, which will be analysed more in detail in the following section), were in use from the late second millennium BC and were found among Karasuk and Tagar³⁵¹ cultural remains (ca. 1200-800 BC and ca. 800-200 BC) in the Minusinsk Basin. Specimens similar to those from these later communities constitute the overwhelming majority of cast objects recovered from the Chinese Altay region to date³⁵². This suggests that the moulds from grave M17 at the Qiemu'erqieke cemetery should be attributed to a later period.

³⁴⁷ KOVALEV KOBALIEB, 2015, p. 245.

³⁴⁸ The Seima Turbino community (around 1500 BC) is only known for its cemeteries, which were found scattered from Finland to the Altay region, and included extraordinarily manufactured bronze tools and weapons. For information see CHERNYKH, 1992, pp. 215-234.

³⁴⁹ More information on the importance of pottery in metalworking can be found in BAYELY, REHREN, 2007.

³⁵⁰ A stone mould intended for casting a curved knife was found in Bu'erjin County, and it will be discussed later.

³⁵¹ The Tagar community occupied the Minusinsk Basin during the first millennium BC. These people were Europoid, who herd sheep and goats and practised some agriculture. Among their remains there are pottery, metal tool and zoomorphic decorations. For more information see BOKOVENKO, 2006.

³⁵² They will be examined in the following section.

That said, no metal objects were recovered from the Altay region in the early phase³⁵³. On the contrary, during the excavations conducted in Qiemu'erqieke cultural sites in Mongolia and Kazakhstan small objects, such as copper, lead and lead-copper rings and plaques (Figs. 36.1, 2) were found, proving that local communities were in the early stage of a metallurgy culture. The majority of these objects were most likely used to fix stone and pottery vessels, as this was common practice for several steppe cultural groups such as the Afanasevo³⁵⁴ and Okunev³⁵⁵ (Fig. 36.4). Some containers holding metal plaques in correspondence to large cracks were recovered from several Qiemu'erqieke cultural sites in Mongolia (Fig. 37.3)³⁵⁶. In the Altay region, a number of cracked stone vessels, such as those from grave M2 in Qiemu'erqieke cemetery and burial M2a at Tuoganbai, had been perforated, probably with a view to inserting metal rings in order to prevent the crack from enlarging (Figs. 37.1, 2). This would indicate that, although no metal elements were found in these sites, they were probably made and used by the local population in the Altay region. Some simple ring-shaped elements, recovered from Mongolia, have frequently been interpreted as earrings and, based on the shape and material (lead, copper and copper-lead alloy) they have been linked to the lead metallurgy of the Elunino cultural group, though no serious research on the subject has yet been carried out³⁵⁷ (Fig. 36.3).

The discovery of simple copper, lead and lead-copper elements, such as small awls, rings, plaques and hooks, suggests that the community of Qiemu'erqieke had not yet entered the Bronze Age. Indeed, it would seem more appropriate to assign this group to a Copper Age context. As Gryaznov points out, it was precisely during this period that Siberian and Altay communities began producing copper and lead needles, rings and awls³⁵⁸. Objects produced during the Copper Age were basic articles that “gave the greatest scope for exploiting the advantages of metal compared to stone and bone”³⁵⁹, namely strength, malleability, suitability for making sharp cutting edges, and lustre for producing ornaments, while larger tools were still made of stone. Considering the use of pure copper and lead and the type of metal items found, the attribution of the Qiemu'erqieke community to the Copper Age seems reasonable.

³⁵³ It needs to be noticed that an “unknown” bronze item was recovered from grave M19. No description of the artefact has been provided and little is known about the grave and its other grave goods. According to the report, the “unknown” bronze item was found associated with a stone cup, which was not described nor illustrated. The cup may have been similar to the zoomorphic-handled specimen found in grave M16, or the four-footed cup, whose discovery was mentioned in the excavation report, though with no further related information. Given the scarce data it seems impossible to assign the bronze item from grave M19, therefore it is excluded from this analysis.

³⁵⁴ BORODOVSKY, 2013.

³⁵⁵ In the Okunev cultural sites a number of rings were found and they were most likely used for fixing objects. CHERNYKH, 1992, p. 184, fig. 65.

³⁵⁶ KOVALEV KOBALIEB, 2014, p. 372.

³⁵⁷ KOVALEV, ERDENEBAATAR, 2009, p. 158.

³⁵⁸ GRYAZNOV, 1969, pp. 45-66.

³⁵⁹ GRYAZNOV, 1969, p. 46.

1.3.2.1 Remarks on metallurgical examinations

Metal elements recovered as part of the Qiemu'erqieke cultural remains were made of copper, lead and lead-copper alloy. The raw material most likely came from the extensive deposits in the Rudny Altay region and also from the Chinese Altay. The former, located in the lower section of the Altay Range, contains deposits of complex ores, including abundant copper-lead-zinc ores (such as those of Orlovka, Zolotushka, Nikolaevka Belousovka, Berezovski and others) located in the Irtysh Crush Zone, in Eastern Kazakhstan. Although more information is available on the Andronovo exploitation of these deposits during the late Bronze Age³⁶⁰, the early and middle Bronze Age communities of Afanasevo, Elunino and Okunev probably also profited from these ores, since their territories were rather close to the deposits³⁶¹. This hypothesis has been supported by the discovery of some Afanasevo cultural remains in the vicinity of Rudny Altay ores³⁶². The availability of such ores suggests that the Qiemu'erqieke people may have exploited them as well. In the Chinese Altay region, copper and tin sources have been indentified, though little investigated. Tin and copper deposits, potentially available in the Bronze Age, are distributed in the counties of Fuyun (Kalatongke and Kamusite), Qinghe (Beilekuduke) and Habahe (Hashele)³⁶³, while the presence of lead has not been verified. Considering the territory occupied by the Qiemu'erqieke community, the local deposits in the Altay region and Rudny Altay may both have been exploited by this population³⁶⁴. Unfortunately there is still a lack of research on metal sources, which prevents the understanding of the Qiemu'erqieke metallurgy.

1.3.4 Summary

Evidence shows that the Qiemu'erqieke community consisted of Europoid pastoralist groups that herded sheep and goats, profiting from the large pasturages in the wide and relatively green valleys in the Altay Range. The existence of local pastoralist groups in the third-second millennium BC is indicated not only by the numerous sheep bones found among funerary remains, but also the images

³⁶⁰ The Andronovans probably exploited tin deposits in Kazakhstan, in the Kalba-Narym Mountains, and Uzbekistan, in the Zeravshan Valley. For more information see GARNER, 2013.

³⁶¹ CHERNYKH, 1992, p. 184-186; SUNCHUGASHEV СУНЧУГАШЕВ, 1975.

³⁶² CHERNYKH, 1992, p.185; CHERNIKOV, ЧЕРНИКОВ, 1960.

³⁶³ MEI Jianjun, 2000, p. 51.

³⁶⁴ The existence of lead-copper ores in Rudno Altay suggests that this region was the main source of raw materials for the production of Qiemu'erqieke metallic elements.

carved on the stone steles, portraying female figures holding a crook³⁶⁵. Sheep and goat meat was a significant component of the community diet: recent research on human remains from Neolithic, Bronze Age and Iron Age sites in the Minusinsk Basin (which was proven by paleoenvironmental studies to have shared environment and food sources with the Chinese Altay region) has revealed that the Neolithic and early-mid Bronze Age communities were mostly meat eaters, while later populations had a more varied diet, including plants from agriculture³⁶⁶. As regards the Qiemu'erqieke community, the majority of the meat most likely came from domestic sheep, while additional supply may have been acquired through hunting, considering the discovery of a number of flint-stone arrowheads³⁶⁷. These people were probably nomads, since no settlements were discovered. A nomadic lifestyle is also indicated by the Qiemu'erqieke vessel production, characterized by round and heavy, yet resistant, portable containers. In particular, the round base of these pots suggests that they were made to be carried. The Qiemu'erqieke community seems to have been socially organized, most likely on a clan basis, as shown by the practice of grouping multiple graves into the same enclosure. A form of social stratification can be hypothesised on the basis of some burial practices, such as "mass burials", or piling either a collection of single bones or a combination of singles bones with complete skeletons beside a grave, or interring decapitated and dismembered bodies. These human remains have been interpreted as slaves by archaeologists³⁶⁸, however this evidence is insufficient in demonstrating the establishment of a slavery-based society, as it may instead represent a particular funerary ritual³⁶⁹. Rituals of the Qiemu'erqieke community involved some of the items recovered from the funerary sites: ceremonies revolving around fertility were probably performed using stone phalli, such as those found in Qiemu'erqieke cemeteries, while stone anthropomorphic figurines may have been totemic-phalli, or more probably, pestles used during rituals with grinding plants. Female images carved on the steles placed on the eastern or southern side of the graves also had a ritual function. The preference for this gender might be rooted in the South-western Siberians' cults system, which has traditionally been female-centred³⁷⁰. In particular it seems that local prehistoric communities worshipped goddesses

³⁶⁵ In addition, a number of rocks were carved and painted representing sheep and goats. See some images in KOVALEV KOBALIEB, 2014, pp. 343-358.

³⁶⁶ SVYATKO, MURPHY, SCHULTING, MALLORY, 2007.

³⁶⁷ This kind of stone arrowheads was most likely connected to hunting, and their "decline" has been often linked to the development of metallurgy. See ROSEN, 1996.

³⁶⁸ XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981, p. 24.

³⁶⁹ The shamanism, for example, required human sacrifice. PRATT, 2007, p. 492.

³⁷⁰ Diverse female deities have been worshipped in Siberia: some populations, such as the Kent, have personified rivers as female deities (they have called the Yenisei River the "Great Mother"). The existence of a female goddess connected to water in the Altay region has been confirmed by the research on present-day nomadic populations in Southern Siberia by professor Olaf Günther, who kindly shared this information with me when I met him in Olomouc in 2016. See also ALEKSEYENKO AJIEKCEEHKO 1977, pp. 30-44.

connected to some form of natural power, such as the “Kaigus” or “the Mother Earth”, who were involved in the cycle of death and rebirth³⁷¹. Therefore, female images at the entrance of the graves may have represented one of these goddesses.

Considering the available material, it seems that the combination of peculiar stone vessels with round bases, an undeveloped metallurgy, scarce pottery production and peculiar “stone boxes”, surrounded by very elongated stone fence, allows for the remains in Northern Xinjiang to be assigned to a distinctive cultural group, namely the Qiemu’erqieke. Similar remains were recovered by Russian archaeologists from Mongolia and Kazakhstan hinting at the existence of a larger consistent community distributed across both slopes of the Altay Range, as suggested by Kovalev³⁷². Evidence shows that in the Kazakhstani and Mongolian contexts, assemblages were more varied and richer, including more pottery and some simple metal elements. On the contrary, in Tuoganbai no pottery was found, while in Qiemu’erqieke it was rarer and often found along with refined bronze objects or iron artefacts, which suggest a later dating. Therefore, the existence of an established pottery production by the Qiemu’erqieke cultural group in the Altay region is questionable³⁷³. Metal elements, including small rings, sometimes interpreted as ring-shaped earrings³⁷⁴, undecorated plaques and fasteners, were found in the Qiemu’erqieke cultural sites in Mongolia and Kazakhstan. They were absent in the Chinese Altay region, though traces on vessels, such as small holes perforated around cracks, indicate that an elementary metallurgy may have existed in Northern Xinjiang as well. More varied and richer assemblages in Mongolia and Kazakhstani Qiemu’erqieke sites suggest that remains in Northern Xinjiang may represent an earlier stage of the Qiemu’erqieke cultural development. This seems supported by carbon dating analyses, carried out on human remains from Kayina’er (Altay City), which have placed the site slightly earlier than those in Mongolia. However, as evidence is scant, more carbon dating examinations are required to support this thesis. Features of the Qiemu’erqieke findings suggest this cultural group should be assigned to the Copper Age, rather than the Bronze Age. Despite the fact that the Copper Age has been rarely regarded as an independent phase and more often “included” in the Neolithic period, as its last appendix³⁷⁵, Gryaznov correctly points out that it is characterized by

³⁷¹ Sometimes the two have been worshipped as a single goddess. For more information see JACOBSON, 1993, pp. 184-185; ANUCHIN АНУЧИН, 1914, pp. 12-13.

³⁷² KOVALEV КОБАЈЕВ, 2014; KOVALEV КОБАЈЕВ, 2015.

³⁷³ KOVALEV КОБАЈЕВ, 2015, p. 265.

³⁷⁴ KOVALEV, 2011, p. 8 and fig. 5.

³⁷⁵ CHEN Ge 陈戈, 1994, p. 108.

“certain processes which are peculiar to it alone”³⁷⁶: improvements in stone manufacturing and a basic production of simple tools for perforating and cutting and in some cases ornaments for repairing vessels³⁷⁷. These features fit the Qiemu’erqieke remains, which can accordingly be placed within a Copper Age context.

Dating of the Qiemu’erqieke community, established to around mid-third-early second millennium BC³⁷⁸, is supported not only by carbon-dating examinations on material from Mongolia and Xinjiang, but also similarities with cultural remains assigned to the Afanasevo (ca. 3500-2500 BC) and Okunev (ca. 2500-1700 BC) communities. While the former shared similar vases and the use of metal elements to fix containers with the Qiemu’erqieke group, analogies with the Okunev include some burial structures and rites, a number of vessels and several stone tools, such as anthropomorphic figurines. Contacts with the Elunino community (ca. 2300-1800 BC) are suggested by similar flat-bottomed vessels and the use of lead and lead-copper alloy. Interactions most likely occurred between the Qiemu’erqieke and Qijia (ca. 2300-1700 BC) groups, as demonstrated by the discovery of olive-shaped vessels in Gansu. The cultural influence from the Qiemu’erqieke community apparently spread south, where it can be recognized in the peculiar stele found in Barkol County³⁷⁹ and some features of the Xiaohe cemetery, such as round-bottomed vessels (or baskets), anthropomorphic figures, phallus-shaped objects and small metal rings³⁸⁰.

1.4 The second phase: thirteenth-eleventh century BC

As mentioned in the introduction, Bronze Age remains in the Altay region represent two phases: the Qiemu’erqieke occupation in the mid-third-early second millennium BC and a later phase, which has been recognized based on the types of archaeological remains, similar with those of the Karasuk community (1200-800 BC). Findings, which can be attributed to this later stage, have usually been found in multi-phase cemeteries, of which they represent the earliest period³⁸¹: graves M4, M5, M11,

³⁷⁶ GRYAZNOV, 1969, p. 45.

³⁷⁷ GRYAZNOV, 1969, pp. 45-46.

³⁷⁸ KOVALEV, 2011, pp. 1-9.

³⁷⁹ KOVALEV KOBALIEB, 2012, p. 132.

³⁸⁰ Some bronze rings were found in Xiaohe, however, the lack of ores in the vicinity of the site raises question about local metal production in Lop Nur. MAIR, 2006, p. 296.

³⁸¹ Only in Qiemu’erqieke cemetery the Karasuk type of material represents the late stage of the site.

M17, M19 (?), M22, M23, M25, M27-32 at Qiemu'erqieke³⁸², grave M8 in Tuwaxin cemetery (Bu'erjin County)³⁸³, graves M5, M10 and M16-M19 in the cemetery of Shankou Dianzhan (Bu'erjin County)³⁸⁴, M17-M22, M28, M50, M66-M71, M72 and M74-79 in Suke'erte cemetery (Fuyun County)³⁸⁵ and M1, M5, and M18-20 in the cemetery of Sawudie'erge (Fuyun County)³⁸⁶. Other scattered findings have been collected across the Altay region, in Chonghu'er (Bu'erjin County), Kuxi (Altay City) and Jiayilema (Habahe County), though they have not been reported in detail (Fig. 38)³⁸⁷. None of these remains have been subject to carbon dating, therefore their chronological attribution to the thirteenth-eleventh century BC was established only on the basis of typological comparison with findings from Karasuk sites³⁸⁸. The interpretation of the remains of the later phase in the Altay region is problematic due to the complexity of the multi-phase contexts in which they were found. In addition, most of the funerary sites have been very recently excavated³⁸⁹, therefore no serious typological analysis have been yet conducted. Furthermore, a large number of the objects have been recovered from the surface, thus lack of archaeological context.

1.4.1 Archaeological context

Most of the later graves excavated in the Altay region were marked on the surface by pebbles mounds or, more rarely, stone enclosures. Mounds came in different sizes, the diameter ranging from 2 m to 10m, and they usually covered more than one burial: in Suke'erte (Fuyun County) two groups of graves, namely M17-M23 and M66-M71 were each covered by one mound, while in Sawudie'erge (Fuyun County) a single mound covered graves M18-M20 (Figs. 39.1-3). A lower number of graves were surrounded by rectangular enclosures made of large stone slabs, individually or, more often, in groups, such as burials M16-M19 at Shankou Dianzhan (Bu'erjin County) (Fig. 39.4). These structures indicate that these communities were socially organized on a family/clan basis. Differently, in the Qiemu'erqieke site, single burials usually corresponded to a single mound, while in some cases, such as

³⁸² As mentioned above, the complexity of the Qiemu'erqieke cemetery does not allow the assignment of all the graves to a cultural period. Those mentioned in this list contain bronze and basic iron objects, therefore can be attributed to a later phase. The assignment of grave M19 is particularly problematic, as the burial structure shows characteristics of the first phase, while the discovery of an "unknown" bronze object would suggest the attribution to a later period.

³⁸³ XIA, 2015c, pp. 208-209.

³⁸⁴ XIA, 2015b, pp. 139-140.

³⁸⁵ XIA, 2015e, pp. 82-91.

³⁸⁶ XIA, 2015d, pp. 55-57.

³⁸⁷ KOVALEV KOBAJIEB, 2015, pp. 240-280.

³⁸⁸ SHAO Huiqun 邵会秋, 2015, p. 272, fig. 3.

³⁸⁹ Shankou Dianzhan was excavated in 2010, Suke'erte and Sawudie'erge were investigated in 2006-2008, while Tuwaxin was discovered in 2013.

burial M14, five single mounds were fenced by a stone enclosure. Graves in the Altay region were usually rectangular or square cists, built with large stone slabs, but in Qiemu'erqieke a combination of pit and cist graves was verified: while some burials such as M10, M11 and M19 were cists, a greater number of simple pits were recovered. The co-existence of diverse types of grave structures has been verified in the Karasuk territory: specifically Legrand argued that cists were most diffused in the Minusinsk Basin, while pits were characteristic of the late phase of Karasuk³⁹⁰. The orientation of the later burials in Northern Xinjiang usually fell within a range of 235°-345°, differing greatly from that of the earlier graves in the Qiemu'erqieke cemetery which was around 20°³⁹¹.

Very few human remains were unearthed from the excavated graves, as many of them were found empty. Based on this scant evidence it seems that only inhumation was practised and single-occupancy burials prevailed. The deceased usually laid on one side with bent legs (Figs. 40.1, 2). This position, distinctive of the Andronovo tradition, was apparently inherited by the Karasuk community in the first millennium BC and was especially diffused in the Altay region³⁹². The custom of placing a pottery vessel near the head of the dead, known for the Andronovo³⁹³ and Karasuk³⁹⁴, was verified in the Altay region, for example in grave M71 in Suke'erte cemetery³⁹⁵. Some supine bodies were found, such as in graves M8B at Tuwaxin cemetery and grave M11 in cemetery no. 2 at Qiemu'erqieke (Fig. 40.3). In addition, two extended bodies placed on one side were recovered from grave M5 in Shankou Dianzhan cemetery (Figs. 40.4). The combination of supine and sideways burials was observed in numerous Karasuk cemeteries. Legrand argues that ca. 84% of the Karasuk deceased were placed according to the Andronovo tradition, meaning on one side with bent legs with a vessel closed to the head. In a later phase of Karasuk a new burial rite was introduced and characterized by the dead deposited in a stretched position, lying on their backs³⁹⁶. The available evidence shows that the overwhelming majority of the graves contained adults, a pattern also observed for the Karasuk community³⁹⁷. Since very few children were recovered³⁹⁸, it is possible that they were buried elsewhere, perhaps in “children

³⁹⁰ LEGRAND, 2006, pp. 850.

³⁹¹ Exceptions to this are graves M10 in Qiemu'erqieke and M50 at Suke'erte, which were oriented to 10° and 115° respectively. In addition, grave M17m2 in Qiemu'erqieke was oriented to 20° but, because it contained refined bronze objects, it has been assigned to the later phase.

³⁹² GRYAZNOV, 1969, pp. 99-100; LEGRAND, 2006, pp. 851.

³⁹³ GRYAZNOV, 1969, p. 90.

³⁹⁴ LEGRAND, 2006, p. 852.

³⁹⁵ XIA, 2015e, p. 88.

³⁹⁶ LEGRAND, 2006, pp. 851.

³⁹⁷ LEGRAND, 2006, p. 851.

³⁹⁸ A child was found supine in grave M8 at Tuwaxin.

cemeteries”, often associated with some steppe communities³⁹⁹. However, as of yet no “children cemeteries” have been discovered in the Altay region. Some heads were found separated from their bodies⁴⁰⁰, indicating decapitation practices, rather widespread among steppe cultural groups (Figs. 40.1, 2)⁴⁰¹. As mentioned in the previous section, devoted to the early occupation of the Altay region, decapitation had been practiced in the area since the third millennium BC. There is little evidence of beheading practice in the Andronovo and Karasuk graves, therefore this may have been a local tradition, which propagated until the end of the second millennium BC. The association of dismembered human remains with complete skeletons was verified in some graves, for example in burial group M5 in Qiemu’erqieke: grave M5m1 included a complete skeleton, while burials M5m3 and M5m4, on its south-eastern and north-eastern side respectively, contained dismembered bodies. Although archaeologists believed that the confused remains in graves M5m3 and M5m2 were of slaves⁴⁰², it seems more reasonable to consider them as evidence of social stratification. The internment of animals, which was rather commonplace in the steppe communities, was surprisingly absent in the Altay region, arousing doubt as to whether some remains were found but not reported.

1.4.1.1 Grave goods

Numerous graves in the Altay region were void of human remains and grave goods, therefore objects pertaining to the later phase of this area are few. They mostly consist of pottery containers and stone artefacts, while no wooden objects were recovered⁴⁰³.

Pottery

The small quantity of pottery recovered from the Altay region resembles that of Karasuk (Fig. 41). The *guan* pot found in M20 at Sawudie’erge had a flat base and was globular in shape, while the decoration consisted of a zigzag line carved under the rim (Fig. 41.1). Specimens discovered in Chonghu’er (Bu’erjin County) and Kuxi (Altay city) presented a round base, a globular shape and a relatively high neck. They were carved with geometric patterns on the body, though the neck was not decorated (Fig.

³⁹⁹ Specifically they seem associated with some Andronovo-related groups. KUZ’MINA, MALLORY, 2007, p. 195.

⁴⁰⁰ In some cases, such as in burial M68 at Suke’erte, the head was not found.

⁴⁰¹ As mentioned in the previous section, decapitation was practised by the Okunevo and Qiemu’erqieke communities.

⁴⁰² XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981, p. 25; no indication on the possible function of grave M5m2 is provided.

⁴⁰³ Metal artefacts were also found, and they will be discussed in detail in the following paragraph.

41.2, 3). The *guan* container found in Jiayilema (Habahe County) had a flat base, wide shoulders and a large mouth, resembling some Andronovo specimens⁴⁰⁴, inherited by the Karasuk community (Fig. 42)⁴⁰⁵. The decoration of the Jiayilema pot, characterized by a pricket design covering the body and a row of bossed under the rim, is very close to the ornament of some Karasuk vessels, while differing from the Andronovo's (Fig. 42). Some *bo* bowls were recovered from Suke'erte cemetery, specifically from graves M20, M79 and M71. They all featured round bases but, while the former bore carved decoration on the neck, the specimen in burial M71 was undecorated (Fig. 33).

Other materials

Among the stone objects from the Altay region, there are some stone casting-moulds, which have been mentioned in the previous section. Two moulds were discovered in the enclosure M17 in Qiemu'erqieke cemetery no. 2 and one was collected in Bu'erjin County. They had been made for producing celt-spades with a peculiar loop on one side, straight-bladed and a curved knives respectively (Figs. 35, 44). Side-looped celt-spades, such as that carved into the mould from Qiemu'erqieke, have commonly been found in the Minusinsk Basin and Altay region in correspondence to Karasuk cultural remains⁴⁰⁶ (Fig. 45). Early specimens with "false side loops" (albeit not socketed) were found in Eastern Europe and assigned to the Catacomb cultural group (ca. 2600-2000 BC)⁴⁰⁷ (Fig. 86.2). Around the same period, side-looped socketed spades appeared in Gansu, among the remains of the Qijia community (ca. 2300-1700 BC)⁴⁰⁸ (Fig. 86.6). In the second millennium BC this objects had apparently spread more widely: they have been discovered in Southern Russia, in association with Timber Grave cultural remains (ca. 1900-1200 BC)⁴⁰⁹ and in the village of Kalinovka (Kursk area, now exhibited at the Hermitage Museum), while further east, a number of double-looped celt-spades were recovered from the Andronovo sites of Tosty-Butak and Bedak in Tajikistan (ca. 1900-1200 BC)⁴¹⁰. The majority of side-looped celt-spades came from Seima Turbino-related sites (around 1500 BC) and displayed an exceptionally refined manufacturing. It has been

⁴⁰⁴ Some specimens are exhibited at the Hermitage Museum at St. Petersburg.

⁴⁰⁵ MEI Jianjun, 2000, fig. 16.11(18).

⁴⁰⁶ More information on Karasuk metallurgy in GRAZNOV, 1969, pp. 101-103.

⁴⁰⁷ One specimen is displayed at the Hermitage Museum in St. Petersburg.

⁴⁰⁸ MEI Jianjun, 2000, p. 166, fig. 6.4

⁴⁰⁹ A specimen is exhibited at the Hermitage Museum. The Timber Grave community occupied the region of the Pontic-Caspian steppe during the second millennium BC. These people practiced stockbreeding in association with agriculture. Their pottery mainly consists of pots decorated by impression with a comb design or geometric patterns. Metallurgy was characterized by the employment of arsenic bronze and cast technology for producing tools and a large range of ornaments. For further information see CHERNYKH, 1992, pp. 204-210.

⁴¹⁰ KUZ'MINA, MALLORY, 2007, p. 71.

highlighted that The Seima Turbino has a great influence of on Karasuk metallurgy⁴¹¹ and this is evident from the high number of side-looped celt spades recovered from the Minusinsk Basin at the end of the second millennium BC⁴¹² (Fig. 45).

The second mould found in the enclosure M17 at Qiemu'erqieke was intended for casting straight-bladed knives, which were rather common in the steppe. In particular, perforated specimens were appreciated by the nomad populations, since they were perfect portable objects. In grave M17m2 a straight blade with a holed handle was found (Fig. 46.1)⁴¹³: the fact that the mould was discovered with the object indicates that these items were probably produced locally. Straight-bladed knives, sometimes with a perforated handle, have been discovered further south in Xinjiang, in Nanwan and Lanzhouwanzi (Barkol County) (Fig. 46.2), and other specimens, from the Gansu-Qinghai region, were assigned to the Siba and Kayue cultural groups, dating to around 1900-1500 BC and 1600-600 BC respectively⁴¹⁴ (Figs. 46.2, 4). Other knives were found in the Pamir region, in Aketala⁴¹⁵, and in the Tianshan Valleys, in the cemeteries at Chawuhugou⁴¹⁶, and these remains were all placed at around 1000 BC onwards. Straight blades were frequently found among the cultural remains of the Karasuk community (ca. 1200-800 BC) in the Minusinsk Basin and surrounding areas (Fig. 46.3)⁴¹⁷.

The curved knife carved into a mould found in Bu'erjin County had a decorated handle with a ring-shaped end. It is reminiscent of specimens from the Seima Turbino community (around 1500 BC), and those, slightly later, of Karasuk cultural group⁴¹⁸. Specifically, the intended object of the mould in Bu'erjin was similar to the specimens of the later phase of the Karasuk tradition, when a slightly curved shape was adopted, in contrast to the very curved blades of the early phase (Fig. 47.2)⁴¹⁹. In Xinjiang these knives have been commonly recovered and, with the exception of the early specimens from

⁴¹¹ CHERNYKH, 1992, p. 50.

⁴¹² GRYAZNOV, 1969, fig. 18.

⁴¹³ One straight-bladed knife with a perforated handle was collected on the surface in Qinghe County. QI Xiaoshan 祁小山, WANG Bo 王博, 2008, p. 317, fig. 6.

⁴¹⁴ Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 93; MEI Jianjun, 2003a, p. 8; MIYAKE Toshihiko 三宅俊彦, 2005, p. 78.

⁴¹⁵ Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uyghur Autonomous Region Museum), 1977.

⁴¹⁶ XIA, Hejing xian Bowuguan 和静县博物馆, 1992, p. 91, fig. 14.

⁴¹⁷ JETTMAR, 1950, pl. 4, fig. 4.

⁴¹⁸ As mentioned above, Karasuk metallurgy had apparently been influenced by the Seima Turbino's. CHERNYKH, 2008, p. 50.

⁴¹⁹ See the Karasuk knives evolution in JETTMAR, 1950, pl. 4. The later, slightly curved type spread widely in the first millennium BC and was inherited by some Scythian sub-groups, such as the Tagar and the Tuvan, which occupied South-western Siberia and probably the Altay region from ca. 800 BC. JETTMAR, 1950, pl. 4; BOKOVENKO, 1995a, p. 271.

Tianshan Beilu⁴²⁰, most of them came from Late Bronze Age and Iron Age contexts, dating to the late second-early first millennium BC. Curved blades were found in the Altay region in Sawudi'erge (Fig. 37.1), at Baiqi'er (eighth-third century BC)⁴²¹, in Hami and in the Tianshan Valleys, in Sa'ensa'yi cemetery (Urumqi), dating to the first millennium BC⁴²². Other specimens were recovered from Liushui cemetery (Yutian County) in Southern Xinjiang (Fig. 37.3). Further east, some well manufactured curved knives were part of the cultural remains of the Erlitou community, in Yanshi County (Henan Province), which has been dated as early as the second millennium BC⁴²³, while other specimens were uncovered in Yanqing, near Beijing (eighth-third century BC)⁴²⁴. In Anyang, bronze items and jade pendants shaped precisely like these knives were found⁴²⁵ (Fig. 179.6).

In the Altay region no wooden items were found. This does not mean that wooden artefacts were not used, rather the humidity of the climate did not allow for their preservation.

1.4.2 Metallurgy

Only a few metal objects were recovered from the cemeteries in the Altai region, while more numerous, scattered specimens were occasionally collected on the surface. Metal findings can be divided into three groups: personal ornaments, mirrors and tools.

1.4.2.1 Personal ornaments

Among the few personal ornaments recovered from the Altay region, one earring was found in grave M78 in Suke'erte cemetery (Fig. 48.1). It was a metal circle with a trumpet-shaped end, a type widely discovered in the Andronovo cultural sites and considered distinctive of this community⁴²⁶. In particular, the geographical distribution of these penannular earrings, throughout Central Asia,

⁴²⁰ Tianshan Beilu cemetery, in Hami, has been placed to around 2000-1400 BC and assigned to the Early Bronze Age. This site will be described in more in detail in the second chapter "Eastern Xinjiang".

⁴²¹ Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 159.

⁴²² They were found, for example in graves M1, M89, M101. XIA, 2013a, pl. 2 fig. 2, pl. 60 fig. 2, pl. 67 fig. 4.

⁴²³ Zhongguo Kexueyuan Kaogu Yanjiusuo Erlitou Gongzuo Dui 中国科学院考古研究所二里头工作队 (Chinese Academy of Sciences, Institute of Archeology, Erlitou team), 1975, p. 305.

⁴²⁴ Beijing shi Wenwu Yanjiusuo Shanrong Wenhua Kaogu Dui 北京市文物研究所山戎文化考古队 (Shanrong Culture Archaeological Team of the Beijing Institute of Cultural Relics) 1989, pp. 28-29.

⁴²⁵ Jade specimens are known to specifically belong to the Shang and Zhou dynasty contexts. BAUMER, 2012, p. 152.

⁴²⁶ More information on the Andronovo earrings are provided in the third chapter "Western Xinjing".

Kazakhstan⁴²⁷, Uzbekistan⁴²⁸ and South-western Siberia⁴²⁹, suggests that they may have pertained specifically to the eastern Andronovo groups (Fig. 48.2). Further east smaller quantities of these ornaments, dating to the second millennium BC, were recovered from the Chinese territory: bronze, silver and gold trumpet-ended earrings were found at Zhukaigou (Ordos City, Inner Mongolia), assigned to the Zhukaigou tradition (ca. 2000-1400 BC)⁴³⁰, and in Donghuishan village (Minle County, Gansu Province), attributed to the Siba cultural group (ca. 1900-1500 BC)⁴³¹. Other specimens featured in Hebei, Tianjin, Beijing and Liaoning, in correspondence to sites pertaining to the Lower Xiajiadian community (ca. 2200-1600 BC)⁴³² (Fig. 48.3). The early dating of these Chinese sites has raised questions on how Andronovo penannular earrings spread. Their early appearance in North-eastern China suggests the existence of a route, which by crossing Central Asia, South-western Siberia and North-western China, connected the Andronovans with communities in Eastern Asia from the beginning of the second millennium BC. This ancient road apparently bypassed the Chinese Altay region, as later Andronovo remains were found there (Suke'erte cemetery has been placed to the thirteen-eleventh century BC). Judging by this evidence, the theories proposed by Bunker and Mei on the existence of early routes, alternative to the "Prehistoric Silk Road", connecting Central and Eastern Asia find support⁴³³. However, whether ancient communities used the "Fur Route"⁴³⁴ or the "Steppe Road"⁴³⁵ or other ways to interact is still unknown, as despite of the potential validity of these theories the actual routes are yet to be identified.

1.4.2.2 Mirrors

Two types of mirrors, round and handled, were discovered in the Altay region and they were found in

⁴²⁷ In the Borovoe, Sanguyur and Tautari cemeteries, and in the Tash-Tyube, Tasty Butak and Targimen-sai sites. KUZ'MINA, MALLORY, 2007, pp. 264-267; KUZ'MINA, MAIR, 2008, p. 201, fig. 57.

⁴²⁸ In the Dzarkutan site. KANIUTH, 2007, p. 29.

⁴²⁹ In the Malyi cemetery, close to Tomsk. GIMBUTAS, 1965, p. 101, fig. 61.

⁴³⁰ WU En 乌恩, 2007, p. 76 fig. 35, 1-15; p. 82 fig. 39, 1-4; p. 78 fig. 36.

⁴³¹ Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Jilin Daxue Beifang Kaogu Yanjiu shi 吉林大学北方考古研究室 (Laboratory of Northern Archaeology of the Jilin University), 1998, p. 7, fig. 7; p. 24, fig. 19; p. 51, fig. 44; p. 93, fig. 69.

⁴³² Among others, penannular earrings were found in Hebei, in several sites in Lijiadian County (JIN Junli, 2009, p. 421), in Jianxin site, Laishui County (Hebei sheng Wenwu Yanjiusuo 河北省文物研究所 [Hebei Institute of Cultural Relics], 1992), and in Xiaoshangdong village, Qian'an County (LI Zongshan 李宗山, YIN Xiaoyan 尹小燕, 1995); other specimens were recovered from Zhangjiayuan, Ji County, Tianjin (Tianjin shi Lishi Bowuguan Kaogu Dui 天津市历史博物馆考古队 [Team of Archaeology of the Tianjin History Museum], 1993), in Lujiahe village in Beijing (LIN Yun, 1986, p. 249, fig. 50.8), and in Pingdingshan village, Fuxin County, Liaoning (Liaoning sheng Wenwu Kaogu Yanjiusuo 辽宁省文物考古研究所 [Liaoning Provincial Institute of Cultural Relics and Archaeology], Jilin Daxue Kaoguxue 吉林大学考古学 [Department of Archeology, Jilin University], 1992).

⁴³³ BUNKER, 1993, p. 31; MEI Jianjun, 2003a, pp. 28-32.

⁴³⁴ BUNKER, 1993, p. 31.

⁴³⁵ MEI Jianjun, 2003a, pp. 28-32.

Qiemu'erqieke (grave M24) and Sawudie'erge (grave M21) respectively. The mirror from Qiemu'erqieke had a central loop on its back and was void of decoration (Fig. 49.1). The origin of round mirrors is currently the subject of debates. The high number of specimens recovered from Eastern Xinjiang, in the cemeteries of Yanbulake⁴³⁶ and Tianshan Beilu⁴³⁷ has led some scholars to believe that round mirrors originated precisely from Eastern Xinjiang at the beginning of the second millennium BC and later spread westward and eastward⁴³⁸. Further east, an earlier mirror from grave M25 in Gamatai cemetery (Guinan County, Qinghai Province) has been assigned to the Qijia cultural group and placed to the end of the third millennium BC (Fig. 82.2). This early date has led some scholars to argue that round mirrors originated in Gansu-Qinghai region and only later circulated westward throughout Xinjiang and Central Asia⁴³⁹. The eastern origin of these items has been challenged by the discovery of early specimens in Southern Turkmenistan, Bactria and Margiana dating as early as the third millennium BC⁴⁴⁰. In particular Kuz'mina has argued that from Central Asia, round mirrors spread further east and reached the Zaman-Baba cultural group (first half of the second millennium B.C) in present-day Uzbekistan⁴⁴¹, where these products were in use also during the Andronovo period (ca. 1900-1200 BC). In the second millennium BC mirrors were widely used in Semirech'e⁴⁴², and from this region, they would have reached China via Xinjiang⁴⁴³. As early contacts most likely occurred between the steppe communities and those inhabiting North-western China⁴⁴⁴, the hypothesis that these objects spread eastward (or westward) as result of these early interactions has a potential validity. However, the almost synchronous appearance of round mirrors in Western and Eastern Asia indicates that the independent invention of these objects by different communities should be considered. The specimen found in grave M24 at Qiemu'erqieke (Fig. 49.1) features typical characteristics of the early Chinese mirrors which have been placed by Enoch to around 2000-1000 BC and listed as follows: “(early Chinese mirrors) ranged from 6 cm to 12 cm in diameter, were not

⁴³⁶ Xinjiang Weiwu'er Zizhiqu Wenhuating Wenwuchu 新疆维吾尔自治区文化厅文物处, (Xinjiang Uygur Autonomous Region Department of Cultural Relics), Xinjiang Daxue Lishixi Wenbo yu Ganbu Zhuanxiu ban 新疆大学历史系文博干部专修班 (Department of History, Xinjiang University), 1989, pp. 344-345.

⁴³⁷ Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 36.

⁴³⁸ LIU Xuetao 刘学堂, 1993; LIU Xuetao 刘学堂, 1998.

⁴³⁹ SONG Xinchao 宋新潮, 1997.

⁴⁴⁰ FITZGERLD-HUBER, 1995, p. 53; KUZ'MINA, MALLORY, 2007, p. 264

⁴⁴¹ The Zaman-Baba community occupied the area of the Zaman-Baba Lake, in the lower reaches of the dried-up Makhani Darya River, to the west of the Bukhara Oasis, in present-day Uzbekistan, during first half of the second millennium BC. These peoples were settled farmers and stock breeders. Settlements have been excavated as well as burials. Graves were pits or catacombs and contained modeled flat or round-based pottery, bronze objects, flint arrowheads and stone beads. For more information see GULYAMOV ГУЛЯМОВ, 1966.

⁴⁴² Mirrors were uncovered in Semirech'e, in the Shamshi hoard, in the Dashti-Kozi cemetery and in Kul'say. See KOZHOMBERDIEV КОЖОМБЕРДИЕВ, KUZ'MINA КУЗЬМИНА, 1980.

⁴⁴³ KUZ'MINA, MALLORY, 2007, p. 263-264.

⁴⁴⁴ FITZGERLD-HUBER, 1995, pp. 43-52.

ornate, and had a centred pierced knob or raised area on the ornamented back surface. The knob served as a means of holding the mirror or for tying it to a supporting cord. These early mirrors were generally thin, and raised ridges included in patterns on their rear surfaces possibly provided some rigidity”⁴⁴⁵. These features have characterized the Qijia specimen from Guinan (ca. 2300-1700 BC) and those of the early Shang dynasty period (1600-1046 BC). Similar mirrors were found among the cultural remains of the Scythian communities from Northern Caucasus⁴⁴⁶ to the Irtysh River, including Central Asia⁴⁴⁷, Tuva⁴⁴⁸ and the Minusinsk Basin⁴⁴⁹(Fig. 49.2-5). Considering chronology and types, the specimen from Qiemu'erqieke may have been imported from China, where this specific type of round mirror was most likely conceived before the second millennium BC and later spread westward.

Handled mirrors, such as that found in Suke'erte (Fig. 50.1), seem to have originated in the west at an earlier date than their round counterparts. During the excavations of Catal Huyuk settlement in Anatolia in 1961⁴⁵⁰ the earliest handled mirrors, made of polished obsidian, were found: the settlement was placed around 6000-5900 BC, as were the mirrors⁴⁵¹. Early specimens were recovered in Egypt, in El Badari (around 4500 BC)⁴⁵², in the Tigri-Eufrate Valley (around 4000 BC) and Iraq, in Uruk and Tello (second half of the fourth millennium BC)⁴⁵³. By the beginning of the second millennium BC they featured among the cultural remains of the Andronovo community⁴⁵⁴, who may have contributed to the diffusion of these items from Western to Central Asia (Fig. 50.2). A millennium later handled mirrors were still used by the Karasuk and Scythian cultural groups in South-western Siberia⁴⁵⁵ (Fig. 50.3).

1.4.2.3 Tools

Of the weapon-tools discovered in Northern Xinjiang a shaft-hole axe was found on the surface in Dure village (Fuyun County). It featured a heavy head and a shaft hole, while the blade was roughly rectangular, with a triangular section. The butt was carved with loop-like and net-like decorations,

⁴⁴⁵ ENOCH, 2006, pp. 777-778.

⁴⁴⁶ PETRENKO, 1995, p. 20.

⁴⁴⁷ YABLONSKY, 1995b, pp. 211, 218.

⁴⁴⁸ BOKOVENKO, 1995a, pp. 275-276, 278.

⁴⁴⁹ BOKOVENKO, 2006, pp. 874-875; BOKOVENKO, 1995c, pp. 308, 312.

⁴⁵⁰ MELLAART, 1962; MELLAART, 1963.

⁴⁵¹ ALBENDA, 1985, p. 2.

⁴⁵² There is a controversy on the chronology of El Badari, see LILYQUIST, 1979.

⁴⁵³ ALBENDA, 1985, p. 2

⁴⁵⁴ KUZ'MINA, MALLORY, 2007, fig. 84.

⁴⁵⁵ BOKOVENKO, 1995a, p. 278.

clearly resembling the specimens of the Andronovo type⁴⁵⁶ (Figs. 51.1, 2). Originating in Northern Caucasus around the fourth millennium BC⁴⁵⁷, these objects spread eastward and, by the second millennium BC, were distinctive of the Andronovo community in Central Asia⁴⁵⁸. In particular, shaft-hole axes, earlier than those pertaining to the Andronovo, did not generally carry the peculiar decoration on the butt⁴⁵⁹, suggesting that the carved loop- and net-like designs may have been a later, eastern development of this object⁴⁶⁰ (perhaps conceived by the Andronovo people). Notably, the specimen discovered at Dure bore a loop on the back, which was absent from Andronovo axes. Shaft-holed axes with loops on the rear were found among the cultural remains of the Karasuk community⁴⁶¹, though their shape was very different from that of the Andronovo type and the Dure specimen. The Karasuk axes were L-shaped, characterized by with a tubular socket and back loop (Fig. 51.3)⁴⁶². The Dure specimen features the combination of the Andronovo shape and the peculiar Karasuk loop on the rear, suggesting that it be representative of the “transitional phase” marking the decline of the Andronovo taste and the emergence of the Karasuk tradition.

Two daggers, with a decorated ringed-handle and a rhomboid blade were recovered on the surface in Qinghe County (Fig. 52.1)⁴⁶³. These artefacts are similar to those found at Karasuk cultural sites, which had apparently evolved from the (few) Andronovo types⁴⁶⁴ (Figs. 52.2, 3). These daggers seem to have been inherited by Scythian communities at the beginning of the first millennium BC, as they were found in Tuva⁴⁶⁵ and Mongolia⁴⁶⁶, in association with Tagar and Tuvan remains (Fig. 52.4). From the same period are the specimens found in Kazakhstan, Uzbekistan, the Aral Sea region⁴⁶⁷ and western Pamir⁴⁶⁸, in correspondence to the territories occupied by Saka communities.

A copper sickle with a very curved shape and a perforated handle was found on the surface in Habahe County (Fig. 53.1). Sickles were specific farming tools, and their discovery suggests that the local

⁴⁵⁶ For some high-quality images of Andronovo shaft-hole axes see: IVANOV ИБАHOB, 2014, see in particular figs. 1-5.

⁴⁵⁷ CHERNYKH, 1992, pp. 153-156

⁴⁵⁸ More information on this type of axes are provided in the third chapter “North-western Xinjiang”.

⁴⁵⁹ KUZ'MINA, MALLORY, 2007, pp. 153-156.

⁴⁶⁰ KUZ'MINA, MALLORY, 2007, pp. 153-156.

⁴⁶¹ JETTMAR, 1950, pl. 3.

⁴⁶² JETTMAR, 1950, pl. 3.

⁴⁶³ QI Xiaoshan 祁小山, WANG Bo 王博, 2015, p. 227, fig. 8.

⁴⁶⁴ JETTMAR, 1950, pl. 6.

⁴⁶⁵ BOKOVENKO, 1995a, pp. 268-269, 274-277.

⁴⁶⁶ VOLKOV, 1995, p. 322, fig. 1.

⁴⁶⁷ MEI Jianjun, 2000, p. 171.

⁴⁶⁸ In Western Pamir daggers of this type were recovered from the Tamdinsky cemetery (ca. eighth-sixth century BC). YABLONSKY, 1995b, p. 236, fig. 100.

community was, at least partially, devoted to agriculture. It is known that curved sickles were used by the Timber Grave⁴⁶⁹, Andronovo⁴⁷⁰ and Chust⁴⁷¹ cultural groups in the second millennium BC (Figs. 53.2-4), however none of them resembled the specimen recovered from the Altay region. In fact, while Timber Grave sickles had a upward pointed end and no perforation, the Andronovo sickles were usually made of bronze, perforated and had a wave-like shape. The Chust specimens were stone semilunar implements with no perforation. Sickles, similar to that from Qinghe County, featured in the Minusinsk Basin, in some Tagar cultural sites from the early first millennium BC (Fig. 53.5)⁴⁷², it is therefore possible that this specific shape represented a local taste.

Several socketed arrowheads have been found in the Altay region: in Qiemu'erqieke two specimens were recovered from grave M17m2 and one from burial M30 (Fig. 54), while one arrowhead was found in grave M74 in Suke'erte cemetery. The two bronze specimens from grave M17m2 were connected by several scholars to one artefact and its mould recovered from the Huoshaogou cemetery⁴⁷³, in Gansu Province, which has been assigned to the Siba community and placed to around 2000-1800 BC⁴⁷⁴. In spite of this early example, it needs to be noticed that most of the specimens, similar to those from the Altay region were later: for example, socketed arrowheads from Eastern Xinjiang, corresponded to the later phase of the Yanbulake cemetery, meaning from the second half of the second millennium BC⁴⁷⁵. The specimen from grave M30 has been associated with those found in burials 216 and 305 at Chawuhugou (Hejing County), which have been placed to around 1000 BC⁴⁷⁶.

1.4.3 Summary

As mentioned in the introduction and shown by the analysis, the interpretation of the Altay region's remains is problematic. Multi-phase funerary sites have not yet been completely understood and their chronological attribution is not always clear. In addition, most of the graves were poor in grave goods and several of them were found empty. The largest number of objects have been recovered from the

⁴⁶⁹ GIMBUTAS, 1961, pp. 14-22, see specifically p. 19, fig. 8. A specimen is displayed in the Hermitage Museum in St. Petersburg.

⁴⁷⁰ KUZ'MINA, MALLORY, 2007, pp. 161-162.

⁴⁷¹ The Chust community was a farming cultural group settled in Fergana during 1300-800. KOHL, GARDIN, FRANCFORT, 1984, pp. 188-191.

⁴⁷² BOKOVENKO, 1995c, pp. 305, 307, fig. 10.

⁴⁷³ LI Shuicheng 李水城, 2006, p. 134, fig. 3; SUN Shuyun 孙叔云, HAN Rubin 韩汝玢, 1997, p. 76, fig. 8.

⁴⁷⁴ LI Shuicheng 李水城, SHUI Tao 水涛, 2000, pp. 41-42.

⁴⁷⁵ Dating of Yanbulake cemetery (1700-1100 BC) has been object of debate as some carbon dating results are confused and contradict the typological study. This will be explained more in detail in the second chapter "Eastern Xinjiang".

⁴⁷⁶ JIA, BETTS, 2010, p. 293; for further information on Chawuhugou site see XIA, 1999b.

surface and lack of archaeological context. This scant evidence only allows for limited considerations. Late Bronze Age communities in the Altay region practised some farming, as suggested by the discovery of a copper sickle in Kuxi, while there is no evidence of pastoralism. The absence of animal bones in the Altay contexts is very uncommon and arouses doubt as to whether some remains were found but not reported⁴⁷⁷. These people were socially organized, most likely on a family-clan basis, as shown by the custom of grouping certain graves under the same mound. The discovery of dismembered human remains, in association with complete skeletons, such as in the grave group M5 at Qiemu'erqieke, suggests the existence of a form of social stratification. Metallurgy was rather developed, including casting technology, as demonstrated by the several moulds found in Qiemu'erqieke and Bu'erjin. In particular, the discovery of moulds accompanied by cast metal objects indicates that metal production was a local practice. The existence of copper and other complex ores in the vicinity of the sites, in the Altay region and in the Rudny Altay, is further evidence of a local metallurgy in Northern Xinjiang.

Following the decline of the Qiemu'erqieke tradition, the Altay region seems to have been sporadically inhabited by Andronovo-related populations. Representative of this irregular and scarce occupation by the Andronovans are remains at Suke'erte, which show similarities with those of the Andronovo with respect to burial rituals and metal objects. Other Andronovo-related remains have occasionally been collected on the surface, as in the case of the shaft-holed axes found in Fuyun County. In the following centuries a more intense occupation by the Karasuk community has been demonstrated by a higher quantity of distinctive cultural findings: not only metal tools, but also the few pottery containers found in the examined funerary sites are reminiscent of Karasuk types. As regards burial rituals, the combination of cist and pit graves, the prevalence of single internments and the exclusive practice of inhumation further suggests the existence of close connections with the Karasuk communities.

The discovery of metal objects, similar to Karasuk types in the Altay region, Tianshan Valleys, Eastern Xinjiang and along the southern rim of the Tarim Basin indicate that at one point a group of the Karasuk community moved south and penetrated the Xinjiang territory. This southward shift may represent a pattern of north-south migration waves, which seems to have regularly occurred throughout the centuries. If the Qiemu'erqieke people did indeed reach Lop Nur, as proposed by some scholars, it

⁴⁷⁷ Among others, animals' bones were used for building mounds or filling the graves and, even in cases when they were not intentionally placed into the burials, some remains are usually found.

can be hypothesised that the southward migration of the Karasuk cultural groups may have been made possible by this same route. However, scarce remains and insufficient studies on the findings do not yet allow for the safe tracing of ancient routes within the Xinjiang territory.

2. EASTERN XINJIANG

2.1 Introduction

The Eastern Xinjiang region roughly corresponds to the present-day prefectures of Hami and Turfan, which lend their names to the two respective oases⁴⁷⁸. The area has been inhabited since the Mesolithic period, as demonstrated by remains discovered in the villages of Qijiaojin and Sandaoling in Hami⁴⁷⁹, consisting of more than seven hundreds microliths. Neolithic sites have also been found, including Dikan'er, Xinge'er and Asitana in Turfan⁴⁸⁰. Remains uncovered in these areas display an advanced microlithic industry and feature some painted pottery items⁴⁸¹. During the Bronze Age (ca. 2000-1000 BC)⁴⁸² larger territories of Eastern Xinjiang were occupied and numerous traces of human activities have been found in the counties of Hami, Barkol and Yiwu, as well as in different areas of the Turfan Prefecture. Of these sites, the most relevant in terms of archaeological evidence and availability of material are the cemeteries at Tianshan Beilu (ca. 2000-1400 BC)⁴⁸³, Wupu (ca. 1400- 1000 BC)⁴⁸⁴, Yanbulake (1700-1100 BC)⁴⁸⁵ and Aisikexia'er (around 1100 BC)⁴⁸⁶ in Hami County (now Yizhou District), discoveries at Nanwan⁴⁸⁷, Langzhouwanzi⁴⁸⁸ and Shigeda⁴⁸⁹ in Barkol County, and the

⁴⁷⁸ Even though some publications have limited the definition of Eastern Xinjiang to the Hami Prefectures (ZHANG Feng 张凤 2010; MEI Jianjun 梅建军, LIU Guorui 刘国瑞, CHANG Xi'en 常喜恩, 2002), I chose to follow Guo Wu (GUO Wu 郭物, 2012) line and to include the territory of Turfan in the "Eastern Xinjiang" region because of the similarities of the Bronze Age remains with those from Hami.

⁴⁷⁹ CHEN Ge 陈戈, 1994, pp. 104-105; CHEN Ge 陈戈, 1987, pp. 343-351; DEBAINE considers these sites as representative of the Neolithic period. DEBAINE, 1988, p. 10.

⁴⁸⁰ DEBAINE, 1988, pp. 7-14; CHEN Ge 陈戈, 1994, pp. 105-107.

⁴⁸¹ According to Chinese archaeologists Neolithic groups in Xinjiang were characterized by one or more of three types of remains, namely, microliths, polished stone, and painted pottery. CHEN Ge 陈戈, 1994, p. 105.

⁴⁸² This dating was suggested by Wang Binghua in 1985, and it coincides with the results of carbon dating examinations performed on material from Eastern Xinjiang, combined with the typological analysis on the remains. WANG Binghua 王炳华, 1985a.

⁴⁸³ The report of the excavation has yet to be published, the site has been carbon dated to around 2000-1400 BC. HAN Jianye 韩建业 2005, p. 70.

⁴⁸⁴ Dating has been established by carbon dating. XIA, 1992, p. 10; HAN Jianye 韩建业, 2005, p. 70.

⁴⁸⁵ Nine out of twelve carbon dating results have placed most of the remains from Yanbulake into the range 1700-1100 BC, while a few fall in the range period 830-400 BC. Archaeologists proposed the dating 1300-550 BC, which is supported by the recovery of some iron elements, however it contradicts some pottery and wooden items. As it is plausible that the site was in use for a long period (including the Bronze Age and the Iron Age), based on the archaeological evidence (which will be explained in detail in the present chapter) I chose to include Yanbulake in a Bronze Age context, though accepting that it was probably occupied until the very end of this period. Zhongguo Shekeyuan Kaogu Yanjiusuo 中国社科院考古研究所 (Chinese Academy of Social Sciences Institute of Archaeology), 1991, pp. 318-320; Xinjiang Weiwu'er Zizhiqu Wenhuating Wenwu chu 新疆维吾尔自治区文化厅文物处 (Xinjiang Uygur Autonomous Region Department of Cultural Relics Office), 1989, p. 354.

⁴⁸⁶ The dating was established by typological comparison with remains in Yanbulake and Wupu. XIA, Hami diqu Wenwu Guanlisuo 哈密地区文物管理所 (Cultural Relics Management Office of the Hami District), 2002, p. 40.

⁴⁸⁷ Only the excavation report two graves has been published. They have been placed to around 1300-900 BC by carbon dating. XIA, 1987b; CHANG Xi'en 常喜恩, 1985, pp. 4, 16; HAN Jianye 韩建业, 2005, pp. 69-70.

⁴⁸⁸ The site, poorly reported, has been carbon dated to around 1300 BC. CHEN Ge 陈戈, 1990, p. 367.

findings at Yanghai in Turfan⁴⁹⁰ (Fig. 55). Unfortunately, excavation reports on these sites are either unpublished or ambiguous. Even important sites, such as Tianshan Beilu and Langzhouwanzi have not yet gone to print, while reports on the remains in Wupu and Nanwan have been only partially published. However, information on these sites are available on research on specific aspects of the sites (such as metallurgy, pottery and research on human remains), summaries and museum catalogues, while more data have been acquired through personal communication with archaeologists, especially Chang Xi'en, Lu Enguo and Wang Bo, who I met in Xinjiang in 2016. A further problem regards the sites' chronology: while some of the remains have been dated accurately by carbon dating, others have vaguely been attributed to the Bronze Age using less reliable methods, therefore they fall in a less precise range of time usually corresponding to 2000-1000 BC⁴⁹¹.

2.2 Geographical setting

The oases of Hami and Turfan are two depressions located on the eastern section of the Tianshan Range, separated by its south-eastern spur, the Kuluketage Mountains. The area sits at the head of the Gansu Corridor, which lies on its eastern border, while on the north-western side the Dafeng Pass leads to Urumqi. The two oases are covered by loess, making them fertile lands suitable for agriculture. The region receives little precipitation annually, yet it is moistened by the melt water from ice and snow that forms small streams flowing from the Tianshan Mountains. In the valley these streams become rivers, the most important being the Kaidu, the Kongque, the Hei and the Shule⁴⁹². Additionally, in Turfan melt water originating from snow on the Tianshan Mountains funnels into three main gorges, which determine where the water enters in the oasis: the Toyuk Gorge, the Shengjinkou Gorge and the Turfan Gorge⁴⁹³. A number of small, enclosed lakes, such as the Barkol and the Aiding, are mostly fed by the limited rainfalls⁴⁹⁴.

Eastern Xinjiang is located in the Earth's Temperate Zone and is characterized by a continental desert

⁴⁸⁹ These remains have been carbon dated to around 1000 BC. CHEN Ge 陈戈, 1990, p. 367.

⁴⁹⁰ Yanghai cemetery presents multiple phases, the earliest can be attributed to the Bronze Age and it is represented by burials IM21, IM96, IM99, IM3, IM103, IM25B, IM26, IM61. XIA, Tulufan diqu Wenwu ju 吐鲁番地区文物局 (Turfan Regional Cultural Relics Bureau), 2004; Tulufan diqu Wenwu ju 吐鲁番地区文物局 (Office for Cultural Relics of Turfan), 2011.

⁴⁹¹ This dating, suggested by Wang Binghua in 1985, has generally accepted for the Bronze Age in Xinjiang, on the basis of carbon dating examinations, combined with the typological analysis on the remains. WANG Binghua 王炳华 1985a; MEI Jianjun, 2000, p. 5.

⁴⁹² MAILLARD, 1973, p. 6.

⁴⁹³ BERTRAND, 2010, p. 31.

⁴⁹⁴ Rainfall average in Turfan is 16.6 mm a year. BERTRAND, 2010, p. 31.

climate. It has been affected by the “desiccation of Asia”⁴⁹⁵, a phenomenon which has led to the disappearance or substantial decrease of a number of rivers, in addition to significantly accelerated desert formation in the eastern and western sections of the oases⁴⁹⁶. This pattern is evident when one considers the conditions of the lakes: several examinations conducted on the Barkol Lake have revealed that its surface used to be wider. It would also seem that the lake has gradually become more saline, due to the shortage of a fresh water supply and higher levels of evaporation⁴⁹⁷. Similarly, the Aiding Lake, which is also saline, was at one time reached by streams and rivers flowing from the Turfan Gorge, while at present it is only fed by a low amount of precipitations and underground water⁴⁹⁸. Sedimentological examinations of the Barkol Lake have provided some data on the past regional climate. It appears that during the Holocene the climate was characterized by fluctuations of warm-cold and dry-humid conditions. According to analyses on autogenetic carbonate stable isotopes, carbonate contents and grain size, the region around the lake was characterized by a dry-cold/temperate climate from around 4000 BC to 3000 BC, while roughly between 3000 and 2000 BC dry-warm conditions appeared. In the following period, until around 1000 BC the climate was cold and dry⁴⁹⁹. In spite of these climatic fluctuations, it seems that over the millennia the oases in Eastern Xinjiang have formed a fertile environment, which has allowed for agricultural practices, especially the cultivation of millet, wheat and grapes, in addition to livestock farming⁵⁰⁰.

2.3 Archaeological context

Cemeteries, discovered in Eastern Xinjiang shared numerous characteristics. Generally the graves did not have any surface markers, unlike those of the steppe communities, which were usually marked by stone fences and mounds⁵⁰¹. Two burial structures prevailed, namely pit and mud-brick graves. The latter were recovered from the cemeteries at Yanbulake⁵⁰², Wupu and Tianshan Beilu; they were not

⁴⁹⁵ HUNTINGTON, 1906, p. 352.

⁴⁹⁶ BERTRAND, 2010, p. 31; see also HUNTINGTON, 1907.

⁴⁹⁷ ZHONG Wei, PEN Zhanghong, XUE Jibin, OUYANG Jun, TANG Xiaohong, CAO Jiayuan, 2012; XUE Jibin, ZHONG Wei, 2011, pp. 603-614; XUE Jibin 薛积彬, ZHONG Wei 钟巍, 2008.

⁴⁹⁸ BERTRAND, 2010, p. 31.

⁴⁹⁹ ZHONG Wei, PEN Zhanghong, XUE Jibin, OUYANG Jun, TANG Xiaohong, CAO Jiayuan, 2012, pp. 12; XUE Jibin 薛积彬, ZHONG Wei 钟巍, 2008, p. 617.

⁵⁰⁰ HILL, 2009, p. 15.

⁵⁰¹ Stone fences characterized graves assigned to the Afanasevo, Okunev and Qiemu'erqieke communities, mounds covered some Qiemu'erqieke and Andronovo burials, while deep ditches were dug around the Elunino graves. See KOVALEV КОБАЛЕВ, 2015; SOKOLOVA, 2007, pp. 44-46; GRYAZNOV, ГРЯЗНОВ, 1999, pp. 93, 98, 100-103; KIROUSHIN КИРЮШИИ, GRUSHIN ТРУШИИ, ТИШКИИ, 2003, especially p. 244, fig. 3.

⁵⁰² According to excavation report, the cemetery included three types of graves: shaft-pits, shaft pits with a internal platform and mud-

lined at the bottom, but some were sealed with wooden slabs or poles placed across the top (Fig. 56). In some cases, such as graves M19 and M22 in Yanbulake cemetery, burials were built overlapping one on other, while in the same cemetery, graves M60 and M61 were placed adjacent to one another (Fig. 57), suggesting a multi-phase occupation of the cemetery⁵⁰³. Mud-brick burials in Eastern Xinjiang appear to be different from any Bronze Age graves in other areas of the Xinjiang territory. However, the use of mud bricks in prehistory has been verified in a number of cultural remains pertaining to the farming communities of Pakistan and India, where they were employed as early as 4000 BC⁵⁰⁴: in Mehrgarh this kind of structure was used by local agricultural groups who cultivated barley and wheat and domesticated cattle and sheep⁵⁰⁵. More than a millennium later, mud-brick buildings and graves were still being built by the Harappa community⁵⁰⁶ (ca. 2600-1900 BC) in present day Pakistan⁵⁰⁷. Similar funerary structures were recovered from North-western Iran, in contexts assigned to the Hissar Turang Tepe community dating to the second millennium BC⁵⁰⁸, and they also appeared in Eastern Xinjiang roughly at the same time. Mud-brick graves seem to have been unique to farming and sedentary societies, as no such structures were found in association with nomad communities in the steppe. As regards pit graves, those discovered were usually rectangular or oval. Some of them, for example in Wupu and Yanbulake, contained wooden structures and furniture, such as funerary beds. The bottom was often covered by layers of grass, with wooden slabs and poles placed across the top of the pit, where, in some cases, an additional grass layer was also laid. One particular pit burial is noteworthy, namely grave M95 in Nanwan cemetery (Barkol County). It has an irregular shape and contains two complete skeletons, while in a smaller grave, built on the southern side, two groups of piled-up human bones were found, leading archaeologists to interpret the tomb as a sacrificial burial (Fig. 58)⁵⁰⁹. If this was the case, this discovery is of particular interest as it suggests the existence of a form of a hierarchical social organization in Eastern Xinjiang.

bricks graves. Xinjiang Weiwu'er Zizhiqu Wenhuating Wenwu chu新疆维吾尔自治区文化厅文物处 (Xinjiang Uygur Autonomous Region Department of Cultural Relics Office) Xinjiang Daxue Lishixi Wenbo yu Ganbu Zhuanxiu ban 新疆大学历史系文博干部专修班 (Department of History, Xinjiang University), 1989.

⁵⁰³ The scarcity of human remains and grave goods do not allow for a conclusive hypothesis. Similarities in the burial structure, however, suggest that these graves were all built roughly at the same time.

⁵⁰⁴ SHAFFER, TAPHAR, 1992, pp. 125-126.

⁵⁰⁵ SHAFFER, TAPHAR, 1992, pp. 125-126.

⁵⁰⁶ The Harappa community occupied the area roughly corresponding to North-eastern Afghanistan, Pakistan and North-western India. A periodization of three phases has been generally accepted by scholars for the Harappan group: Early (3300-2600 BC), Mature (2600-2000 BC) and Late (2000-1700 BC). In particular from about 2600 BC (Mature Harappa) began to flourish planned cities with baked brick houses and elaborate drainage systems. For further information see WRIGHT, 2010.

⁵⁰⁷ For example at Mohenjo-daro. DANI, TAPHAR, 1992, p. 282.

⁵⁰⁸ MASSON, 1992, p. 340.

⁵⁰⁹ According to the excavation report this is not a secondary burial, however the limited information contained in the three-pages account leaves some questions. XIA, 1987b, p. 7.

Available material indicates that the burial practice in Eastern Xinjiang included only inhumation. This differs from the contemporaneous neighbouring communities of Siba (ca. 1900-1500 BC), in Gansu, and Andronovo (ca. 1900-1200 BC), in Central Asia, who practiced both inhumation and cremation simultaneously⁵¹⁰. Graves were usually single-occupancy, though the practice of secondary burial has been verified in some multi-level graves, especially in Yanbulake cemetery, but also in grave M66 at Nanwan and in burials 151 and 152 in Wupu. Multiple internments mostly consisted of the inhumation of two bodies, generally an adult couple (male and female), while only in some cases the couple was accompanied by a child. Judging by the remains, children represented less than 24% of the total recovered bodies, and they were mostly buried with adults, suggesting the existence of a family-based social organization. There is also evidence of “mass graves”: burial M44 in Yanbulake cemetery contained around twenty confused and dismembered bodies⁵¹¹, among which there were seven adults of both sexes, and ten children. In the same cemetery, grave M75 included nine bodies. These graves are reminiscent of those recovered from the Altay region, in Qiemu’erqieke, which archaeologists believed to have been of slaves⁵¹². Although the discovery of burials containing numerous dismembered bodies suggests the existence of a hierarchical form of social organization, it seems insufficient evidence of a slave society. The overwhelming majority of the bodies recovered from Eastern Xinjiang were placed on one side with bent legs. Some different burial postures have been identified in graves at the Yanbulake cemetery, where the adult male buried in burial M30 was placed prone and extended with the head lying on a large brick, while the female in grave M11 was deposited supine with bent legs (Fig. 59). Sideways flexed burials were common in prehistory in Western and Central Asia, though they were less frequent in China, where the extended position was preferred⁵¹³. In North-western China, in the Gansu-Qinghai region, the Qijia (ca. 2300-1700 BC) and Siba (ca. 1900-1500 BC) communities, buried skeletons in a range of positions, however, rarely laid bodies flexed on one side⁵¹⁴. At the beginning of the second millennium BC, the flexed position was more common west of Xinjiang, for example within the Andronovo community (ca. 1900-1200 BC) in Central Asia and South-western Siberia⁵¹⁵ and, further west, the Timber Grave cultural group (ca. 1900-1200 BC),

⁵¹⁰ LIU Li, CHEN Xingcan, 2012, pp. 334-335; KUZ’MINA, MALLORY, 2007, p. 18.

⁵¹¹ The number of the children could not be established with certainty. Xinjiang Weiwu'er Zizhiqu Wenhuating Wenwu chu 新疆维吾尔自治区文化厅文物处 (Xinjiang Uygur Autonomous Region Cultural Department Cultural Relics Office), Xinjiang Daxue Lishixi Wenbo yu Ganbu Zhuanxiu ban 新疆大学历史系文博干部专修班 (Department of History, Xinjiang University), 1989, p. 360.

⁵¹² XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981, p. 24.

⁵¹³ HAN Jianye, 2008 pp. 169-170.

⁵¹⁴ In the case of the Qijia cultural group the sideway, flexed position was preferred only when a female accompanied a supine extended male body. JIAO Tianlong, 2001, p. 56.

⁵¹⁵ KUZ’MINA, MALLORY, 2007.

diffused in Western Asia⁵¹⁶. Evidence shows that in Eastern Xinjiang the direction of the head varied, yet it seems that it was rarely oriented towards the west⁵¹⁷. In the cemetery of Tianshan Beilu heads were positioned in a more systematic manner: female heads pointed to the north-east and males' oriented towards the south-west. In the same cemetery, a pottery vessel was usually found placed close to the legs or the feet of the deceased, which appears to have been a distinctive feature of the Tianshan Beilu community⁵¹⁸. This custom has also been occasionally identified in graves in Yanbulake cemetery, such as M52 and M60, and in burial M3 at Aisikexia'er (Fig. 60).

Of the human remains in Eastern Xinjiang, twenty-four skulls from Tianshan Beilu cemetery were analysed in order to trace morphological affinities with Europoid and Mongoloid samples. Results revealed that the population at Tianshan Beilu had its own unique morphological characteristics, and had both eastern and western ancestors (Fig. 61)⁵¹⁹. Examinations' results on skulls from Yanbulake cemetery also showed the co-existence of eastern and western races in Eastern Xinjiang: of the twenty-nine skulls examined, twenty-one had Mongoloid characteristics, while eight were classified as belonging to the western or Europoid race⁵²⁰. Han Kangxin, who performed the tests on the Yanbulake cemetery samples, suggests that they share morphological traits with those from the Gumugou site⁵²¹ (located on the lower reaches of the Kongque River)⁵²², which, in turn, have been linked to certain populations of Southern Siberia, Kazakhstan, and the Volga River⁵²³.

Finally, the internment of animals accompanying the dead was documented for most of the graves. Sheep and goat remains were sometimes found scattered at the base of the burial, hinting at a food-offering custom during funerary rites. Ox bones were also recovered from Yanbulake, though unique to grave M30, while no horse remains were found.

⁵¹⁶ KUZ'MINA, MALLORY, 2007, p. 241.

⁵¹⁷ Only in grave M53 at Yanbulake the deceased had the head pointed toward the west.

⁵¹⁸ Chang Xi'en personal communication; the material has not yet been published.

⁵¹⁹ WEI Dong 魏东, ZHAO Yongsheng 赵永生, CHANG Xi'en 常喜恩, ZHU Hong 朱泓, 2012.

⁵²⁰ HAN Kangxin, 1994, p. 3.

⁵²¹ HAN Kangxin 韩康信, 1990; HAN Kangxin 韩康信, 1986.

⁵²² The Gumugou cemetery is located in the Lop Nor region of the Tarim Basin, This area was occupied by a Europoid population whose origins remain unclear. See WANG Binghua 王炳华, 1983b; HAN Kangxin 韩康信, 1986.

⁵²³ HAN Kangxin 韩康信, 1986.

2.3.1 Grave goods

Numerous pottery containers and wooden objects were unearthed in Eastern Xinjiang, together with sheep and goat bones, and some poorly reported items, such as stone beads.

Pottery

Grave goods discovered in Eastern Xinjiang comprised red pottery containers, while only a few grey and white specimens were recovered. Shapes varied from *guan* pots, to *bei*, *wan* and *dou* cups, *bo* bowls, *hu* vases and few *guanliu guan* pitchers, but they were not evenly distributed: among the objects recovered from Tianshan Beilu cemetery, only few *guanliu guan* pitchers were found, while *guan* containers comprised the remaining discovered artefacts. *Guan* pots also prevailed in Nanwan site. In contrast, the pottery assemblage at Wupu was more varied and included *guan* pots, a few *bei* cups and *bo* bowls. At Yanbulake, in addition to the aforementioned types, *wan* cups, *hu* vases and *dou* cups were also discovered. Concerning *guan* containers, two distinct shapes were prevalent in Eastern Xinjiang. The first featured a flat base, a globular body, short neck and usually two handles (sometimes they can be only one). This type was found in Tianshan Beilu, Wupu and Yanbulake cemeteries (Figs. 62.1-3). Notably these pots share similarities with specimens recovered from the Gansu-Qinghai region, assigned to the Machang (ca. 2300-2000 BC), Qijia (ca. 2300-1700 BC) and Siba (ca. 1900-1500 BC) communities⁵²⁴ (Figs. 62.4-7). The second type of *guan* was less diffused and only featured in Tianshan Beilu and Yanbulake. It was characterized by a basket-shaped body, less globular in comparison with the previous type, very short neck and two small handles placed under the rim (Figs. 63.1-6). These vases are reminiscent of the stone and pottery pots unearthed in the Altay region and assigned to the Qiemu'erqieke community⁵²⁵, and also resemble the grass baskets found in the Xiaohe cemetery in Lop Nur⁵²⁶ (Figs. 63.7,8). The decoration is characterized by lines or rhomboid patterns painted in white or black all around the body, and seems to imitate the interlacing pattern of Xiaohe baskets⁵²⁷ and carved decoration on the Qiemu'erqieke pottery vessels⁵²⁸. Although these two main types of *guan* container made up the majority of vases unearthed in the Eastern Xinjiang territory,

⁵²⁴ Qinghai sheng Wenwu Kaogu Dui 青海省文物考古队 (Archaeological Team of the Qinghai Province), 1986, see specifically pl. 5-6; LI Shuicheng 李水城, 1993.

⁵²⁵ KOVALEV KOBALIEB, 2015, pp. 240-280.

⁵²⁶ See XIA, 2007, pp. 19, 23.

⁵²⁷ Many of the baskets found at Xiaohe were woven of grass, straw, and other plant materials, while for some specimens the community relied on animal derived, such as leather and felt, in addition to wood. See MAIR, 2006, pp. 296-298.

⁵²⁸ For more information on the Qiemu'erqieke vessels see the previous chapter "the Altay region".

certain other typologies are noteworthy. For instance, a peculiar large grey pottery specimen, void of decoration and featuring four handles, was discovered in the Nanwan site (Fig. 64.1). From Tianshan Beilu is an other particular *guan* pot: the container rests on a high splayed foot, decorated with triangles carved in open-work (Fig. 64.4). A globular specimen with a round base, a short neck and a single handle was recovered from Wupu (Fig. 64.3), while a flat-based pot with no handles was unearthed from grave M4 at Yanbulake (Fig. 64.2). *Guanliu guan* pitchers were not common in Eastern Xinjiang (Fig. 65), however a peculiar specimen was discovered in Tianshan Beilu: the pitcher is equipped with a long, tubular spout, placed on the shoulder, while the handle is attached to the side. (Fig. 65.1). In Wupu and Yanbulake cemeteries some *bo* bowls were found, and they have a wide mouth, short body and an irregular flat base (Figs. 66.1, 67.4, 5). The *bo* bowls recovered from Yanbulake usually have a looped handle (Figs. 67.4, 5). *Bei* cups were recovered from Tianshan Beilu, Wupu and Yanbulake sites. These containers usually have a flat or irregular base, a roughly globular shape and one handle (Figs. 66.2, 67.1, 2). In Yanbulake some straight-walled specimens were found, which are reminiscent of containers recovered among the remains of the Bronze Age farming communities of Central Asia, such as the Chust (ca. 1300-800 BC)⁵²⁹. However, while the cups from Eastern Xinjiang had one handle, this characteristic rarely featured on Chust straight-walled containers (Figs. 67.3). A number of *hu* vases were found in Yanbulake, while a single specimen was unearthed from Aisikexia'er cemetery (Figs. 68.1-3). These containers were characterized by a round body, two handles on the intersection between sides and shoulders and a tall trumpet-shaped neck. They resemble some Siba specimens recovered from the Gansu-Qinghai region, though the latter had a shorter neck⁵³⁰ (Fig. 68.4). *Dou* containers unearthed from Yanbulake feature a large cup with a small handle, supported by a high pedestal (Fig. 69.1). Similar specimens were found among the cultural remains of the Qijia⁵³¹ and Siba⁵³² communities (ca. 2300-1700 BC and ca. 1900-1500 BC respectively), though they did not have handles (Figs. 69.2, 3). Some footed cups were discovered further east, as part of the cultural remains of the Lower Xiajiadian (ca. 2200-1600 BC)⁵³³ and Zhukaigou (ca. 2000-1400 BC)⁵³⁴ communities in

⁵²⁹ ASKAROV, 1992, p. 441.

⁵³⁰ LI Shuicheng 李水城, 1993, p. 107.

⁵³¹ Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Xibei Daxue Wenhua Yichan yu Kaoguxue Yanjiu Zhongxin 西北大学文化遗产与考古学研究中心 (North-west University Cultural Heritage and Archaeology Research Center), 2009; Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Xibei Daxue Sichou zhi Lu Wenhua Yichan Baohu yu Kaoguxue Yanjiu Zhongxin 西北大学丝绸之路文化遗产保护与考古学研究中心 (Center for Cultural Heritage Protection and Archaeology of the Silk Road, Northwest University), 2014; Qinghai sheng Wenwu Kaogu Dui 青海省文物考古队 (Archaeological Team of the Qinghai Province), 1986.

⁵³² LI Shuicheng 李水城, 1993, p. 98.

⁵³³ LINDUFF, HAN Rubin, SUN Shuyun, 2000, p. 310, fig.b.

⁵³⁴ LINDUFF, 1997, p. 423 fig. 5.

North-eastern China (Fig. 69.4). Cups supported by pedestals were also found in South-western Siberia: they appeared as early as the fourth millennium BC among the remains of the Afanasevo (ca. 3500-2500 BC)⁵³⁵ community in the Yenisei region and were later inherited by the Okunev (ca. 2500-1700 BC)⁵³⁶, the Qiemu'erqieke (mid-third millennium BC-early second millennium BC)⁵³⁷ groups in the Minusinsk Basin and the Altay region respectively (Figs. 69.5-8). Considering that communities in Northern China most likely had contacts with the steppe cultural groups⁵³⁸, these footed cups may have been products of these early interactions, while the small handle on the Yanbulake specimens may represent a local element.

Some of the pottery vessels found in Eastern Xinjiang were void of ornaments, while decorated items included few specimens carved with a pricked design (Fig. 70.1) and numerous containers painted in black or white. Specifically, it can be noticed that, while the black colour was used more often and on all kinds of vessels, white was usually employed on the basket-shaped *guan* pots found in Tianshan Beilu, suggesting that they may have been special vessels. The most common decorative patterns in Eastern Xinjiang were lines designed in a horizontal or vertical direction, triangles and concentric circles or rhombi. Some specimens stand out for their peculiar decorations: a white pottery *guan* pot found in Tianshan Beilu was covered with black dots contained in double-rhomboid frameworks (a decoration reminiscent of that carved on certain Qiemu'erqieke pottery vessels)⁵³⁹ and on the neck some bow-shaped decorations were also painted in black (Fig. 70.2). This is interesting given that bow-shaped pendants made of bronze were recovered from several graves in Tianshan Beilu cemetery⁵⁴⁰, suggesting that this design was of some symbolic significance in this community. A red pottery *guan* pot with two handles bore a painted decoration on the neck representing upward triangles, while the character 王 was depicted on the body (Fig. 70.3). Arrow-shaped signs were painted in black on a similar specimen (Fig. 70.4). A peculiar pot, found in Tianshan Beilu cemetery, was decorated with two anthropomorphic figurines, painted in black on the body. One was distinctively wearing a hat, with the body represented by two triangles connected to form the shape of a bow (similar to the aforementioned bronze decorations, widely found in this cemetery, which will be discussed later). Masculine sexual attributions define this figure as a male. The other character painted on the pot was

⁵³⁵ Some of the Afanasevo specimens are currently displayed at the Hermitage Museum. Around the same period footed cups were part of the assemblage of the Pit Grave community (ca. 3300-2600 BC) in Western Asia (Fig. 15.6). SULIMIRSKI, 1970, pp. 225, 425.

⁵³⁶ SOKOLOVA, 2007, p. 47.

⁵³⁷ KOVALEV KOBALIEB, 2015, p. 264.

⁵³⁸ FITZGERLD-HUBER, 1995, pp. 43-52; MEI Jianjun, 2003b.

⁵³⁹ For more information on the Qiemu'erqieke pottery vessels see the previous chapter "The Altay region".

⁵⁴⁰ These objects will be described in detail in the following paragraph, devoted to metal artefacts.

different and had a pointed head and triangular body. This figure has been recognized as female (Figs. 70.5-7). These images, and especially, the stress on the sexual attributes suggest the existence of some form of cults linked to fertility. The *dou* containers recovered from Yanbulake cemetery bore a distinctive embellishment consisting of a cross painted on the inside walls (Figs. 71.1-3). Similar decorations were found inside *dou* cups assigned to the Siba cultural group (ca. 1900-1500 BC), though they were more refined and characterized by straight lines forming geometrical shapes (Fig. 71.4). The cross design appeared on all the *dou* cups from Yanbulake, suggesting that these objects may have been used in precise rituals, which were shared with neighbouring communities in the Gansu-Qinghai region. The painted vessels in Eastern Xinjiang, and more specifically those from Tianshan Beilu cemetery, represent the first appearance of painted pottery in the region, occurred in the first half of the second millennium BC. That said, painted pottery was widely spread throughout the east and can be traced back to the Neolithic communities of Baijia in the Shaanxi-Gansu region (5800 BC-5000 BC)⁵⁴¹ and Yangshao (ca. 5000-3000 BC), represented by the Banpo site near Xi'an (ca. 4500 BC)⁵⁴². By the third millennium BC painted vessels were present in the Gansu-Qinghai region, amongst the Machang (ca. 2300-2000 BC) and Qijia communities (ca. 2300-1700 BC)⁵⁴³ and a millennium later they were still produced by the Siba cultural group (ca. 1900-1500 BC)⁵⁴⁴. By contrast, the steppe communities appear not to have appreciated painted pottery, as they mostly employed carving technologies to adorn their containers. Therefore, the presence of painted pottery in Eastern Xinjiang is evidence of close connections with eastern cultural groups.

Other materials

In addition to pottery, wooden and horn objects, bone decorations, stone phalli and shells were recovered from sites around Eastern Xinjiang. Among the wooden objects found, there were dishes, containers, waving tools, anthropomorphic figurines and combs. Of particular interest are the anthropomorphic figurines. Wooden figurines are rather rarely found, and this can most probably be attributed to the perishable nature of the material, rather than an actual lack of production. Instead, anthropomorphic clay figurines have been discovered more frequently. Evidence shows that they were

⁵⁴¹ Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo 中国社会科学院考古研究所 (Institute of Archeology of the Chinese Academy of Social Sciences), 1994; Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), 2006.

⁵⁴² ZHANG Lizhi 张礼智, 2007, pp. 52-66.

⁵⁴³ In the Qijia contexts a lower quantity painted vessels have been found.

⁵⁴⁴ For review on research on painted pottery in China see HAH Jianye, 2012.

produced in Western Asia as early as the ninth millennium BC, and later spread in all directions⁵⁴⁵, where they were put to different use according to the cultural taste of the receiving population. It seems that clay figurines were appreciated by sedentary populations⁵⁴⁶, while some pastoralists communities in the Altay region and South-western Siberia produced stone specimens⁵⁴⁷. In Eastern Xinjiang, several wooden anthropomorphic figurines, found in Yanbulake and Wupu cemeteries, represent standing males and females with slim bodies and marked sexual attributes, which suggest their employment during fertility rites (Fig. 72.1, 3). In this regard they differ from the steppe specimens, recovered from the Qiemu'erqieke and Okunev cultural sites in the Altay region and South-western Siberia, which do not exhibit any sexual signs, thus probably connected to some form of rituals not linked to fertility⁵⁴⁸. With respect to material and style, more similar to the figurines from Eastern Xinjiang were the wooden specimens unearthed from the Gumugou site in the Lop Nur region⁵⁴⁹: in particular the emphasized sexual attributes of the represented characters suggest that the communities in Eastern Xinjiang and Lop Nur shared a similar ritual system connected to fertility (Fig. 72.4). Also noteworthy is the fact that some of the figurines found in Eastern Xinjiang were dressed with colourful fabrics, as it would indicate (especially also taking into account discoveries of wooden and stone waving tools) that the local communities were, at least partially, devoted to textile activities (Fig. 72.3). A number of wooden and horn combs were found in the Wupu and Aisikexia'er cemeteries (Figs. 73.1-5). They were, in essence, undecorated polished objects varying in shape: some had a curved bump on the top of the handle, while others were simply perforated. Bronze Age combs have usually been identified as originating from two different production traditions, namely the "steppe" and "southern" (or tropical) traditions⁵⁵⁰. The "steppe" combs consisted of several pieces of wood enclosed in a frame, into which wooden sticks were inserted, while the combs pertaining to the "southern" tradition were made of a hollow piece of wood, into which sticks were inserted and secured with woollen laces. Only one specimen, found in grave M4 at the Aisikexia'er cemetery can be attributed to the "steppe" tradition (Fig. 73.5), while of the remaining combs in Eastern Xinjiang none can be assigned to either one of these traditions. They are more similar to the specimens recovered from Shahr-I Sokhta (Iran),

⁵⁴⁵ HANSEN, 2007, p. 66.

⁵⁴⁶ TOSI, MALEK SHAHMIRZADI, JOYENDA, 1992, p. 187.

⁵⁴⁷ KOVALEV KOBALIEB, 2015, pp. 240-280; QI Xiaoshan 祁小山, WANG Bo 王博, 1996, pp. 52-53 and figs. 25-B-2, 37-B-14; KIROUSHIN, GRUSHIN, 2009, pp. 67-70. For further information see the previous chapter "The Altay region".

⁵⁴⁸ Specimens from the Qiemu'erqieke and Okunev sites usually portrayed only human faces, while the body (including sexual attributes) is not represented. For a discussion see the previous chapter "The Altay region".

⁵⁴⁹ WANG Binghua 王炳华, 1983b, pp. 119-120.

⁵⁵⁰ ZHENG Juxin 郑巨欣, 2008, chapter 3.

dating to 3200-1800 BC, which were clearly waving tools (Fig. 73.6)⁵⁵¹. The high quantity of combs recovered from Eastern Xinjiang further indicates that Bronze Age local communities were devoted to textile activities.

At Tianshan Beilu numerous cowries were discovered, while in the Aisikexia'er cemetery two unspecified shells were found (Fig. 74). Cowries are presently distributed across the Pacific and Indian Oceans and the South China Sea, but as Ke Peng noted, the temperature and salinity of the latter were higher during the period 6000-1000 BC than they are today, therefore the presence of cowries was impossible at the time⁵⁵². Consequently, those recovered from Xinjiang must have come from the Indian Ocean⁵⁵³. Actually, these shells have also been identified in the Red Sea, and a theory on the existence of one or more "Cowry Roads" connecting the Red Sea to Qinghai was proposed by Ke Peng in 1995, however it lacks of sufficient archaeological foundations⁵⁵⁴. That said, the distribution of cowries was extremely wide and, from the Neolithic period onwards, they were found in numerous sites over a large area stretching from the Western Asia to Central China⁵⁵⁵. This makes rather difficult the identification of their origins, function, and the routes along which they were transported, especially considering that this subject has attracted little attention from scholars. In fact, although the wide distribution of cowries and the high number of specimens available make them one of the most important markers of cultural and trading exchanges, few studies have yet been carried out on them. It is known that in India and its neighbouring regions they were used as currency⁵⁵⁶, and a similar function has been recently proposed for specimens found in Siba cultural sites in the Gansu-Qinghai region⁵⁵⁷, but no theories have been formulated for cowries recovered from Xinjiang⁵⁵⁸. If not a form of currency, cowries in Xinjiang were most likely still precious objects, given their exotic character and the small quantity, albeit wide distribution, of these shells found in each site. Despite their relatively unknown function, unclear pattern of transmission and the questions surrounding their origin, the discovery of cowries and shells at Tianshan Beilu and Aisikexia'er indicates that the area was a centre of early interactions.

⁵⁵¹ COSTANTINI, 1987, pp. 36-40

⁵⁵² KE Peng, ZHU Yanshi, 1995, p. 2.

⁵⁵³ KE Peng, ZHU Yanshi, 1995, p. 14; BIN Yang, 2001, p. 7.

⁵⁵⁴ KE Peng, ZHU Yanshi, 1995, pp. 17-18

⁵⁵⁵ A useful list of sites where cowries were found has been published in KE Peng, ZHU Yanshi, 1995, pp. 6-13.

⁵⁵⁶ PANDEY, 1996, p. 133; HEIMANN, 1980, p. 48.

⁵⁵⁷ YANG Jidong, 1998, p. 13; Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Jilin Daxue Beifang Kaogu Yanjiu shi 吉林大学北方考古研究室 (Laboratory of Northern Archaeology of the Jilin University), 1998, p. 186.

⁵⁵⁸ In addition to the cowries from Eastern Xinjiang, other specimens were found in Southern Xinjiang. See JIANG Aili, 2013. See also the fourth chapter of this dissertation "The southern rim of the Tarim Basin".

2.4 Metallurgy

Metal objects recovered from Eastern Xinjiang dating back to the Bronze Age varied considerably, including personal ornaments, mirrors and tools. Their features often coincided those of a number of cultural items belonging to eastern and western prehistoric communities.

2.4.1 Personal ornaments

Decorations and personal ornaments, despite having numerous parallels with specimens from Central Asian and Chinese cultural groups, share only very few traits, and in some cases none at all, with items from other areas of Xinjiang. Decorative rectangular copper or bronze plaques inlaid with stones were found in the cemetery of Tianshan Beilu (Fig. 75.1) and show similarities with much more refined specimens, often depicting wild animals, recovered from sites in Henan attributed to Phase III of the Erlitou community (ca. 1600-1300 BC)⁵⁵⁹ (Fig. 75.3). Although dating has proven that the Erlitou and Tianshan Beilu remains overlapped by a few centuries, it has also been established that the Tianshan Beilu artefacts had been in use since the beginning of the second millennium BC, suggesting that communities in North-western China first utilized these plaques before they spread eastward. This hypothesis is supported by the discovery of a similar inlaid rectangular plaque in Tianshui, in present-day Gansu, dating to the Qijia period (ca. 2300-1700 BC)⁵⁶⁰, definitely earlier than the Erlitou specimens (Fig. 75.2). The existence of early contact between the communities of Qijia and Erlitou has been suggested by Fitzgerald-Huber on the basis of Qijia jade pieces found in the Central Plain, and the similarities of a number of objects found in Erlitou cultural sites with those of the steppe type⁵⁶¹. If this hypothesis is correct, these interactions may also have involved the communities in Eastern Xinjiang. Understanding the origin of these inlaid rectangular metal plaques is of great importance, as they have been considered one of the first representations of the Chinese *Taotie*⁵⁶². It has been observed that a pre-*Taotie* image may have been carved on jade artefacts assigned to the Liangzhu cultural group on

⁵⁵⁹ ALLAN, 2007, pp. 479-481

⁵⁶⁰ MEI Jianjun, 2003a, p. 24, fig 12.

⁵⁶¹ FITZGERLD-HUBER, 1995, pp. 43-52; FITZGERLD-HUBER, 2003, pp. 65-67. The theory has some foundations as some bronze weapons from Erlitou, such as the knives with a curved blade and ringed handle, show a clear steppe taste. Zhongguo Kexueyuan Kaogu Yanjiusuo Erlitou Gongzuo Dui (Erlitou Team of Institute of Archeology, Chinese Academy of Sciences), 1975, p. 305; LINDUFF, 1997, 421, fig. 3; MEI Jianjun, 2003a, p. 24.

⁵⁶² ALLAN, 2007, pp. 479-481.

the Yangtze River (ca. 3300-2000 BC)⁵⁶³ (Fig. 75.4), however, a more consistent group of early examples of this image were found on the aforementioned Erlitou plaques⁵⁶⁴. As observed by Allan, these early *Taotie* representations were two-eyed wild animals' faces⁵⁶⁵, a design generally attributed to an iconographic concept linked to the steppe. Considering that early examples of inlaid metal plaques were recovered in North-western China (known for having been influenced by the steppe tradition), there are indications that the steppe communities might have indeed contributed to the creation of these decorative objects, which, in turn, may have been the origin of the Chinese *Taotie*.

The radial, grooved decorative object recovered from the Tianshan Beilu site has no parallel in Xinjiang⁵⁶⁶ (Fig. 76.1). It is similar to silver and bronze decorative seals recovered in the Gonur I site in Margiana, radiocarbon dated to around 2000 BC⁵⁶⁷ (Fig. 76.2). Theories on possible contacts between the communities of the Bactria-Margiana Archaeological Complex (BMAC) and Eastern Xinjiang have been formulated by senior scholars, such as Mallory and Sarianidi⁵⁶⁸, and despite being supported by some archaeological evidence more research is needed for this hypothesis to be demonstrated. A radial object, comparable to that from the Tianshan Beilu cemetery, was found among the remains of the Kayue community (ca. 1600-600 BC), in Qinghai Province⁵⁶⁹, suggesting a eastward transfer of this object (Fig. 76.3).

Bow-shaped ornaments, which were discovered in several graves at Tianshan Beilu (Fig. 77.1), apparently had no counterparts in Xinjiang, though they were similar to bronze pendants from grave M266 at the Huoshaogou cemetery in Gansu, attributed to the Siba cultural group (ca. 1900-1500 BC)⁵⁷⁰, while in Qinghai a modest quantity of these particular ornaments was recovered among remains pertaining to the Kayue community (ca. 1600-600 BC) (Figs. 77.2, 3). The discovery of bow-shaped decorations on a number of vessels from the Tianshan Beilu cemetery suggests that this design had a special symbolic significance in the local communities, which perhaps was adopted by (or shared with) the eastern cultural groups of Siba and Kayue.

⁵⁶³ LI Xueqin, 1993, p. 61.

⁵⁶⁴ ALLAN, 2007, p. 481; LI Shuicheng, 2006, pp. 134, fig. 4; BAI Yunxiang, 2003, p. 163, fig. 10.

⁵⁶⁵ ALLAN, 2007, p. 479.

⁵⁶⁶ The actual function of this object is still unclear.

⁵⁶⁷ Dating was established on the basis of thirteen carbon dating results. SARIANIDI, 2007, pp. 99-107, 337.

⁵⁶⁸ SARIANIDI, 1998, p. 157; Mallory has hypothesized that the origin of the Yanbulake community may have been connected to the migration of tribes from the BMAC area. MALLORY, MAIR, 2000, p. 269.

⁵⁶⁹ LIU Baoshan 刘宝山, DOU Xuyao 窦旭耀, 1998, p. 8.

⁵⁷⁰ CHEN Xiaosan 陈小三, 2012, fig. 5.14.

A number of small bells with perforated walls were recovered from the sites of Tianshan Beilu and Wupu, and in correspondence to the early phase of the Yanghai cemetery in Turfan⁵⁷¹ (Figs. 78.1, 2). As the latter were found attached to a pair of trousers, it can be hypothesized that they had a ritual function. Bells seem to have originated in China before spreading westward, in fact, according to archaeological evidence, western communities did not produce bells earlier than 1000 BC⁵⁷². Early specimens made of pottery and copper were found in Dahecun (Henan), pertaining to the Yangshao cultural group and dating to the third millennium BC⁵⁷³, in the Longshan cultural site of Taosi (Shanxi) dating earlier than 2000 BC⁵⁷⁴, and among the remains of the Erlitou community in Henan (ca. 1600-1300 BC)⁵⁷⁵ (Figs. 78.3, 4). These items were rather simple and had no perforated walls. Bells, almost identical to those from Eastern Xinjiang, were found among remains attributed to the later Kayue community (ca. 1600-600 BC), at Chengxi, Shanpingtai, Huangjiashai, Dahuazhong Zhuang, Huabiliang, Luanshan and Panjialiang⁵⁷⁶ (Fig. 78.5), further suggesting the existence of close relationships among cultural groups in North-western China. The origin of these objects is unclear, even though their distribution suggests that they result from the interactions with eastern communities in the Central Plain.

A distinctive earring bearing an engraved sheep-head decoration was recovered from the Wupu site (Fig. 79.1). On the basis of its ornament, it can be linked to the pastoralist and agro-pastoralist communities in South-western Siberia and Central Asia, who widely used sheep images as decorative motifs⁵⁷⁷. In Xinjiang objects and ornaments bearing this representation seem to spread later, around the end of the second millennium BC, as demonstrated by the numerous objects, bearing a sheep-like decoration, recovered from the Tianshan Valleys, the Ili-Tacheng region and the Pamir area⁵⁷⁸. Furthermore, a similarly-shaped earring found at the Wupu cemetery was recovered from the Wulapo

⁵⁷¹ QI Xiaoshan 祁小山, WANG Bo 王博, 2008, p. 103, fig. 11.

⁵⁷² VON FALKENHAUSEN, 1993, p. 132.

⁵⁷³ VON FALKENHAUSEN, 1993, p. 133, fig. 53.

⁵⁷⁴ Shanxi Working Team, 2000, pp. 201-208.

⁵⁷⁵ BAI Yunxiang, 2003, p. 161, fig. 7.

⁵⁷⁶ CHEN Xiaosan 陈小三, 2012, fig. 5.14.

⁵⁷⁷ For example, images of sheep were carved on rocks, vessels and portable ritual stone figurines by the Qiemu'erqieke and the Okunev communities as early as the third millennium BC. In Central Asia, in the BMAC sheep representations appeared on vessels, or were modeled on pins-top or carved into seals. The macehead with four projecting ram heads, recovered from Huoshaogou (Gansu), was attributed to the Siba community, but Bunker considers it comparable to specimens from Central Asia. KOVALEV KOBAJEB, 2015, p. 263, fig. 2; KIROUSHIN, GRUSHIN 2007, pp. 68, 70; SARIANIDI, 2007, see in particular pp. 102-106; BUNKER, 1998, pp. 609-610.

⁵⁷⁸ Among others, goat-shaped objects were recovered from sites at Alagou (Turfan), Baiqi'er (Yiwu County), Sa'ensa'yi (Changji County) and in Xinyuan County. XIA, 2014b, pp. 25, 33; Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 160; CHEN Ge 1995, p. 46, fig. 20; XIA, 2013c, pl. 91, fig. 2.

site (Urumqi City), dating to the first millennium BC⁵⁷⁹ (Fig. 79.2). For these reasons, a later dating for the specimen from Wupu, perhaps at the beginning of the Iron Age, is to be considered.

Bronze personal ornaments, including simple round-shaped earrings, rings and bracelets were accompanied by other specimens made of gold and silver. Specifically, they were recovered from the cemetery of Tianshan Beilu. Despite their simple shapes, their presence in Eastern Xinjiang is particularly relevant as gold and silver are considered “western materials”, since their occurrence was concentrated in Central Asia. A pair of round-shaped earrings from Tianshan Beilu were made of gold (Fig. 80.1). The use of gold for making jewellery is an important indicator for connecting users to western cultural groups given that pastoralist tribes of the steppe regions, as well as farming communities of Central Asia were able to cast gold objects in significant quantities. The development of gold production in these areas was facilitated by the large supply of raw material in Central Asia, where large ores were located in the Urals region, Kazakhstan and Fergana⁵⁸⁰. Additionally, high quantities of gold can be found in the Zeravshan, Vakhsh and Kafirnigan Rivers⁵⁸¹. Gold assemblages discovered among the remains of the BMAC have demonstrated that gold was cast in Central Asia as early as the late third millennium BC⁵⁸². During the second millennium BC, gold ores and placers were exploited by the Andronovo community, as shown by the numerous discoveries of cultural objects in the vicinity of deposits⁵⁸³. Centuries later, Karasuk (ca. 1200-800 BC) and Scythian communities (first millennium BC) inhabiting Central Asia and South-western Siberia were still using gold⁵⁸⁴. Further east, few golden objects were found in association with Siba cultural remains, in Huoshaogou (two penannular earrings of the Andronovo type)⁵⁸⁵ (Fig. 80.3), while there is some evidence of gold smelting in the later phase of the Kayue cultural group (around 1000 BC)⁵⁸⁶. On the contrary, though ores, placers and alluvial deposits existed across the Central Plain, gold was rare and mostly ignored:

⁵⁷⁹ WU Yong 吴勇, 1999, p. 90.

⁵⁸⁰ More specifically, in Northern Kazakhstan deposits were located in Borovoe, Stepnyak, Bayanaul district (Altyn-Kazgan, Altyntas) and Karaganda district (Zhosaly, Kushoku, Kenshoku); in Central Kazakhstan silver ores were exploited in the Karkaraly district (Altynsu, Alabuga, Kyzyl-Espe, Akchagyl, Akzhal, Murza-Shoku) and on the Ulutau Mountains (Akshoku, Sorkuduk, Koskol, Obaly); in Eastern Kazakhstan, in the vicinity of Lake Balkhash (Sayak) and the Irtysh River (Kazanchunkur), silver was extracted from the Kuseevskiy mines. CHUKHROV ЧУХРОВ, 1950, pp. 4, 54; SAL'NIKOV, САЛЬНИКОВ, 1967, pp. 278-279; KUZ'MINA, MALLORY, 2007, pp. 89-90.

⁵⁸¹ KUZ'MINA, MALLORY, 2007, p. 89.

⁵⁸² SARIANIDI, 2007, pp. 176-177. Earlier evidence of gold mining was found in present-day Georgia: the Sakdrissi mine was exploited in the fourth-third millennium BC. See the PDF version of the report in HAUPTMANN, STOLLNER, 2013.

⁵⁸³ GRYAZNOV ГРЯЗНОВ, 1935; CHERNIKOV ЧЕРНИКОВ, 1960, pp. 118-119.

⁵⁸⁴ The Karasuk community employed gold to make small objects, such as harpins and gold clips, which were applied on vessels with cracks. The Scythians groups in Central Asia (Saka) manufactured a large range of golden ornaments, while in South-western Siberia the Tagar and the Tuvan produced exquisite golden objects, such as those found in Arzhan. OKLADINOV, 1990, p. 86; DANI, MOHEN, 1996, p. 1049; YABLONSKY, 1995a; ARMBRUSTER, 2009; BOKOVENKO, 2006, p. 867.

⁵⁸⁵ Emma BUNKER, 1998, p. 607.

⁵⁸⁶ WANG Guodao 王国道, CUI Zhaonian 崔兆年, 2003; LIU Li, CHEN Xingcan, 2012, pp. 334.

indeed, it sometimes appeared simply in foils and was generally used for decorating other items⁵⁸⁷. Since the disregard for gold was not due to a lack of availability of the raw material, nor to technological shortcomings⁵⁸⁸, the absence of golden objects in the Central Plain may have been the result of cultural choice, as suggested by Bunker⁵⁸⁹. She also identified four groups, who used to cast golden pieces of jewellery outside the Central Plain, in the second-first millennium BC⁵⁹⁰: these gold users were the pastoralist tribes in the regions of Hebei-Liaoning, Northern Shanxi, Sichuan and Gansu, who apparently had access to Central Asia through what she calls the “Fur Route”, roughly corresponding to the route travelled today by the trans-Siberian railroad⁵⁹¹. In this regard, Xinjiang can be considered a fifth peripheral region, since gold was actually rather widespread, even though the number of manufactured objects was low and the typology limited to jewellery and ornaments⁵⁹². That said, the existence of contacts between communities in Eastern Xinjiang and Gansu with respect to golden objects is questionable: while the specimens found in grave M79 at Huoshaogou are two trumpet-ended earrings of the Andronovo type⁵⁹³ (Fig. 80.3), those from the Tianshan Beilu cemetery where simple circles, therefore it would seem that the origin of golden objects found in the two regions was different.

In the cemetery of Tianshan Beilu a pair of silver earrings was found (Fig. 80.2). They were simple circles with a forked end, made with a bent silver wire. Despite the simple shape of these items, the silver material used to make them suggests the existence of contact with the steppe cultural groups in Central Asia. In fact, by the second millennium BC, the Andronovo communities were already able to extract silver, which was intensively used in Semirech'e for producing ornaments, such as those found in Tash-Tyube⁵⁹⁴. In particular, the Andronovans seem to have exploited the polymetallic deposits in the Kansay mines and this has been suggested by the discovery of Andronovo-type stone mining tools

⁵⁸⁷ BUNKER, 1994, pp. 29-30.

⁵⁸⁸ According to Bunker, gold mining is scarcely documented before the Tang dynasty, though there is a great deal of evidence of copper mining available from different centuries BC. Additionally, the melting points of gold and copper are almost identical, however little evidence has been found from prehistory of the working of gold, while there is well known evidence that the Central Plain communities were able to produce refined copper and bronze cast objects. It would therefore appear that gold was not used in the Central Plain as a result of a simple cultural preference. As noted by Bunker, in early China metal was not worn in contact with the skin, so the production of metal personal adornments was limited. Metal was instead used to cast ritual vessels, for which the required quantity of material was significant (larger than for producing ornaments). It is possible that, despite its presence, gold might have never been found in the necessary quantity and was therefore neglected. For further information see BUNKER, 1993; BUNKER, 1998.

⁵⁸⁹ BUNKER, 1998, pp. 604.

⁵⁹⁰ BUNKER, 1993, p. 27.

⁵⁹¹ SO, BUNKER, 1995, p. 65; BUNKER, 2012, p. 16; BUNKER, 1993, p. 31.

⁵⁹² Golden objects were also found in Western and Southern Xinjiang. WU Yong 吴勇.

⁵⁹³ BUNKER, 1998, pp. 607, fig. 1.

⁵⁹⁴ KUZ'MINA, MALLORY, 2007, p. 90.

in the nearby area⁵⁹⁵. Other silver mines are located in Central Kazakhstan at Berkkara and Kyzyl-Espe, though it has not yet been established whether they were exploited by the Andronovans⁵⁹⁶. Silver was present in North-western China, and deposits have been discovered in Shanxi, Ningxia and Gansu, however there is no evidence that they were mined during prehistory⁵⁹⁷. Actually silver working seems to have been unknown in China until the Warring States period (491-221 BC)⁵⁹⁸, therefore silver items would have been brought by western cultural groups. Other evidence seems to support this theory, specifically the shape of the silver earrings from the Tianshan Beilu cemetery, which is reminiscent of bronze earrings and pendants found in the Tajikistani site of Kumsay (ca. 2000 BCE)⁵⁹⁹ (Fig. 80.5). Moreover, findings from the Siba site of Huoshaogou include a trumpet-ended silver nose ring (Fig. 80.4). Considering that the fashion of wearing nose-rings can be traced to the Qiang communities in Gansu⁶⁰⁰ or, further west, in Western Asia⁶⁰¹, and that the shape of the specific item from Huoshaogou is distinctive of the Andronovo, it is clear that these silver objects were most likely imported from the western steppe.

2.4.2 Mirrors

Two types of mirrors, handled and round respectively, were discovered in Eastern Xinjiang. A single handled specimen was unearthed from Wupu cemetery (Fig. 81) and, as stated in the previous chapter, a western origin of these objects it has been generally accepted by scholars⁶⁰². The round specimens were recovered in larger quantities in the cemeteries of Yanbulake⁶⁰³, Tianshan Beilu⁶⁰⁴, Wupu⁶⁰⁵ and, as mentioned in the first chapter of this dissertation, some scholars believe that round mirrors

⁵⁹⁵ KUZ'MINA, MALLORY, 2007, p. 90.

⁵⁹⁶ MARGULAN MAPYJIAH, 1972, pp. 29-30.

⁵⁹⁷ BUNKER, 1998, p. 605.

⁵⁹⁸ BUNKER, 1998, p. 606.

⁵⁹⁹ The cemetery of Kumsay is located in the piedmont of the Hissar (Tajikistan). It has been carbon dated to around 2000 BC, however, it is difficult to be assigned to a single community, because of the mix material found in the graves, mostly belonging to the Andronovo and Sapalli cultural groups. KUTIMOV КУТИМОВ, 2013, p. 87.

⁶⁰⁰ Qiang population inhabited the present-day Sichuan Province, but their presence was also verified in areas close to the Tibetan Plateau and the Hexi Corridor. They have been mentioned in ancient Chinese texts such as the *Xi Qiang Zhuan* 西羌传 (Western Qiang Biography) in the *Hou Han shu* 后汉书 (Book of the Later Han - fifth century AD), however their archaeological position, especially during prehistory is still unclear. For further references and information on the Qiang community and its relations with the Siba people see YANG Jidong 1998.

⁶⁰¹ BUNKER, 1998, pp. 608-609.

⁶⁰² The earliest handled mirrors were found in the Catal Huyuk settlement in Anatolia. MELLAART, 1962; MELLAART, 1963. For some detailed information on handled mirrors see the previous chapter of this dissertation "The Altay region".

⁶⁰³ Xinjiang Weiwu'er Zizhiqu Wenhuating Wenwu chu 新疆维吾尔自治区文化厅文物处 (Xinjiang Uygur Autonomous Region Cultural Department Cultural Relics Office), Xinjiang Daxue Lishixi Wenbo yu Ganbu Zhuanxiu ban 新疆大学历史系文博干部专修班 (Department of History, Xinjiang University), 1989, pp. 344-345.

⁶⁰⁴ Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 36.

⁶⁰⁵ CHEN Ge 陈戈 1995, p. 27.

originated precisely from Eastern Xinjiang and only later spread westward and eastward⁶⁰⁶. However, further east, these objects were circulating as early as the third millennium BC in Gansu and Qinghai, where they occurred in association with the local communities of Qijia (ca. 2300-1700 BC), in the site of Gamatai⁶⁰⁷, and continued to be used by the Siba (ca. 1900-1500 BC)⁶⁰⁸, Kayue (ca. 1600-600 BC)⁶⁰⁹ and Shajing (around 1000 BC)⁶¹⁰ cultural group. In particular, the early date of the Qijia mirrors has led some scholars to argue that the round specimens originated in the Gansu-Qinghai region and only later circulated westward throughout Xinjiang and Central Asia⁶¹¹. Contrarily, another direction of research has placed the origins of these round, flat or concave mirrors in the farming communities of Southern Turkestan, Bactria and Margiana assigned to the third millennium BC⁶¹². Following this hypothesis, Kuz'mina believes that from these regions, round mirrors spread further east and reached the Zaman-Baba cultural group (first half of the second millennium B.C) in Central Asia⁶¹³, where these products were in use also during the Andronovo period (ca. 1900-1200 BC)⁶¹⁴. In particular, during the second millennium BC, round mirrors were mostly found in Semirech'e⁶¹⁵, where they appeared together with handled specimens and, according to Kuz'mina, from this region, they reached China via Xinjiang. In fact, she asserts that they were "decorated with geometric ornament, foreign to the Shang art style, but with analogies in the decoration of Andronovo artefacts"⁶¹⁶. In addition to the region of Semirech'e, round mirrors were also in use in Fergana and Western Siberia, in association with squared and handled specimens⁶¹⁷. Although a number of scholarly opinions support the notion that these items originated in the north and west⁶¹⁸, the recovery of early specimens from the Qijia cultural sites of Gamatai and Qijiaping as well as their abundance in North-western China puts into question this genesis of round mirrors. Moreover, if, on the one hand, a chronological discrepancy makes it difficult to consider the Andronovo community (ca. 1900-1200 BC) as an intermediary in the

⁶⁰⁶ LIU Xuetao 刘学堂, 1993; LIU Xuetao 刘学堂, 1998.

⁶⁰⁷ LI Shuicheng, 2006, pp. 133, fig. 2; BAI Yunxiang, 2003, 159, fig. 2.

⁶⁰⁸ Specimens were found, for example at Huoshaogou. MEI Jianjun, 2000, p. 127.

⁶⁰⁹ Qinghai sheng Huangyuan xian Bowuguan 青海省湟源县博物馆 (Museum of the Hangyuan County, in Qinghai Province) [et al.], 1985, p. 20; MIYAKE Toshihiko 三宅俊彦, 2005, p. 78, tab. 3.

⁶¹⁰ Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu institute of Archaeology and Cultural Relics), 2001.

⁶¹¹ SONG Xinchao 宋新潮, 1997.

⁶¹² FITZGERLD-HUBER, 1995, p. 53; KUZ'MINA, MALLORY, 2007, p. 264.

⁶¹³ GULYAMOV ГУЛЯМОВ, 1966.

⁶¹⁴ KUZ'MINA, MALLORY, 2007, p. 263-264.

⁶¹⁵ Mirrors were uncovered in Semirech'e, in Shamshi hoard, Dashti-Kozi cemetery and Kul'say. See KOZHOMBERDIEV КОЖОМБЕРДИЕВ, KUZ'MINA КУЗЬМИНА, 1980; KUZ'MINA, MALLORY, 2007, p. 667.

⁶¹⁶ KUZ'MINA, MALLORY, 2007, p. 263.

⁶¹⁷ KUZ'MINA, MALLORY, 2007, p. 259, 263-264, 407-410; KUZ'MINA, MAIR, 2008, p. 104; KUZ'MINA КУЗЬМИНА, 1966, pp. 66-69, pl. XIII. Tishkin and Seregin's research on mirrors from Siberia, reveals that in this region they were precious rarities, indicating the high status of women. TISHKIN, SEREGIN, 2014.

⁶¹⁸ LIN Yun, 1986; LINDUFF, 1995; LINDUFF, 1997; LINDUFF, 2003; KUZ'MINA, MALLORY, 2007, p. 263.

transmission of these objects to Gansu, on the other hand, the almost synchronous appearance of these objects in Western and Eastern Asia also raises certain questions. Since early contacts had probably been established by the Qijia community (although it is not known yet when and how) between Central Asian and steppe cultural groups⁶¹⁹, the hypothesis that round mirrors were imported cannot be ruled out. However, an eastern, independent invention of this object should be considered.

Of the round mirrors unearthed in the cemetery of Tianshan Beilu, one had a decorated surface representing a round human face with numerous rays emitting in all directions (Fig. 82.1). At first sight it seems to symbolize the sun or a sun-related image. A decoration resembling a celestial body was found on the mirror from the Qijia cultural site of Gamatai, where a seven-pointed element has been regarded as a star (Fig. 82.2)⁶²⁰. However, this image did not feature human characteristics. On the contrary, representations of round faces surrounded by sun-rays, round eyes, and straight mouths were engraved on the Okunev steles discovered in the Minusinsk Basin as early as the third millennium BC and these decorations are regarded as images of the “Sun-headed deity”⁶²¹ (Fig. 82.3). Since the Tianshan Beilu (ca. 2000-1400 BC) and Okunev (ca. 2500-1700 BC) communities overlapped by few centuries, the existence of some form of relation between these two groups is to be considered⁶²². However, an other interesting possibility is that this human face, surrounded by rays, may represent the legendary hero Kersaspa, described in Avesta⁶²³. He seems to have been a popular personage in Bactria and Margiana during the third-second millennium BC, as he was portrayed on numerous objects (such as pins and seals)⁶²⁴ and some of these representations are rather similar to the image portrayed on the Tianshan Beilu mirror (Fig. 82.4). As mention above, possible contacts between the communities of the Bactria-Margiana Archaeological Complex (BMAC) and Eastern Xinjiang have been proposed by Mallory and Sarianidi⁶²⁵, and the image on this mirrors seems to support this theory. An other interesting mirror from Eastern Xinjiang is that bearing an ornament with concentric circles (Fig. 82.5),

⁶¹⁹ FITZGERLD-HUBER, 1995, pp. 43-52; SARIANIDI, 1998, p. 157; Mallory has hypothesize that the origin of the Yanbulake community may have been connected to the migration of tribes from the BMAC area. MALLORY, MAIR, 2000, p. 269.

⁶²⁰ LIU Li, CHEN Xingcan, 2012, p. 332.

⁶²¹ Representations on the Okunev steles included the deity’s body, consequently it is frequent to find only the upper half of the head surrounded by the rays. See ESIN, 2009.

⁶²² In Eastern Xinjiang distinctive Okunev awls were found, further suggesting the existence of contact between these cultural groups.

⁶²³ Avesta is the one of the most important collections of texts of the Zoroastrianism: in the texts Kersaspa is described as ferocious and savage, with curly hairs. According to Sarianidi some of the images found in Bactria and Margiana (such as that in fig. 82.4) correspond to these definitions and were very diffused, however other representations of Kersaspa existed: he was depicted as a winged beast with a snake’s tail, or as an anthropomorphic monster, whose arms consisted of twisting snakes. with widely open jaws and unnaturally big severe eyes. SARIANIDI, 2007, pp. 176-177.

⁶²⁴ SARIANIDI, 2007, pp. 176-177.

⁶²⁵ SARIANIDI, 1998, p. 157; Mallory has hypothesize that the origin of the Yanbulake community may have been connected to the migration of tribes from the BMAC area. MALLORY, MAIR, 2000, p. 269.

which showed a clear parallel with that found in the tomb of Fu Hao pertaining to the Shang dynasty in Anyang (Henan Province) and dating to the latter half of the second millennium BC (Fig. 82.6). The decorations on the mirrors found in Eastern Xinjiang represent support to the theory that the area was a centre where different cultural traditions converged.

2.4.3 Tools

Besides personal ornaments, a high number of tools were recovered from Bronze Age sites in Eastern Xinjiang, indicating that metal had already been used for utilitarian purposes. In this regard, especially noteworthy are farming tools, such as bronze hoes (tied to a wooden stick) found in Wupu and Aisikexia'er and sickles from Tianshan Beilu (Figs. 83.4-6): their recovery suggests that agriculture was commonly practised, and at the same time indicates that, other than holding a social (or ritual) significance, metal had already had a relevant impact on the economy of these communities. Some of the tools found in Hami and Turfan oases were of the steppe variety: the bronze awls with cylindrical wooden handles recovered from the sites of Wupu, Aisikexia'er and Yanghai were distinctive of the Okunev cultural group⁶²⁶ (Figs. 83.1-3), while the curved sickle with a perforated handle found at Tianshan Beilu was of the Andronovo type (Fig. 83.6)⁶²⁷. Other objects, unearthed in the cemeteries of Yanghai (Turfan) and in Shigeda (Kuisu Town)⁶²⁸, were L-shaped shaft-hole axes, with a tubular socket and back loop (Figs. 84.2, 3). The L-shaped axes seem to have diffused around the middle of the second millennium BC or later⁶²⁹, in fact, they were uncovered among the remains of the Kayue community (1600-600 BC) in Qinghai⁶³⁰, Xicha (ca. 1400-1000 BC) in Inner Mongolia⁶³¹ and Weifang III in Hebei (ca. 1300-1000 BC)⁶³² (Figs. 84.4-6). Considering this evidence, tubular L-shaped axes most likely began to diffuse across the borders of present-day China, in the north-western region, towards to Inner Mongolia, to North-eastern China. According to Mei, an early L-shaped unpublished specimen has been assigned to the Siba community (1900-1500), supporting the theory that this type of axe was first used in North-western China⁶³³. Other evidence is the recovery of two interesting specimens, in Dure (Fuyun County, Altay region) and Tianshan Beilu: they are broadly similar to the

⁶²⁶ CHERNYKH, 1992, pp. 182-185.

⁶²⁷ See KUZ'MINA, MALLORY, 2007, p. 689. For further information see the third chapter "Western Xinjiang".

⁶²⁸ MEI Jianjun, 2000, p. 119, fig. 3.3.

⁶²⁹ According to Mei they began to diffuse from the late second millennium BC. MEI Jianjun, 2000, p. 27.

⁶³⁰ MIYAKE Toshihiko 三宅俊彦, 2005, p. 77, fig. 2.

⁶³¹ CHEN Xiaosan 陈小三, 2012, p. 420, fig. 110.

⁶³² CHEN Xiaosan 陈小三, 2012, p. 423, fig. 112b.

⁶³³ The specimen was included in the collection of the Gansu Provincial Museum, when he saw it in 1996. MEI Jianjun, 2000, p. 27, footnote 4.

Andronovo type (which developed earlier than the L-shaped⁶³⁴), but had a loop and a bulge respectively on the back (Figs. 51.1, 84.1), suggesting that they may have been “hybrid types”. Furthermore, the tubular L-shaped shaft-hole axe unearthed at the Yanghai cemetery in Turfan has been placed around 1000 BC⁶³⁵ (Fig. 84.3). The late dating for this site suggests another form of transmission involving the Karasuk communities in Western Siberia and the Minusinsk Basin, where tubular L-shaped shaft-hole axes were used during the first millennium BC⁶³⁶ (Fig. 51.3). The existence of connections between the societies in Turfan and those who settled in the north is further demonstrated by the discovery of a bronze curved knife in the cemetery of Yanghai, which can be associated with the Karasuk production (Fig. 87.n, o)⁶³⁷. For these reasons, it is plausible that the presence of tubular L-shaped shaft-hole axes may have been the result of north-south interactions that occurred from the second half of the second millennium BC and continued during the first millennium BC.

At the Shigeda village in Kuisu Town, a chisel was found and placed to around the first millennium BC by the results of two carbon dating examinations⁶³⁸ (Fig. 85.1). This dating seems supported by the specimen’s characteristics, which are similar to those of the chisels from Fergana (now exhibited in the Hermitage Museum), from the eastern site of Baohaishen, in Inner Mongolia, dating around the first millennium BC⁶³⁹ (Fig. 85.2).

A socketed celt-spade with side loops was found in Tianshan Beilu, while an other specimen from Hami was collected on the surface⁶⁴⁰ (Fig. 86.1). The available material indicates that looped celt-spades (although carrying “false side loops” and being not socketed) were employed by the Catacomb cultural group, who occupied the area north of the Black Sea and the Caucasus during the third millennium BC (Fig. 86.2)⁶⁴¹. Around the same period socketed specimens appeared in Gansu, for example in Qijiaping, where they were found as part of the remains of the Qijia community (ca. 2300-1700 BC) (Fig. 86.6). Few socketed celt-spades with side loops dating back to the second millennium BC have been discovered in Western Asia and assigned to the Timber Grave cultural group (ca. 1900-

⁶³⁴ Dating of the Andronovo material (based in several carbon dating results) is 1900-1200 BC.

⁶³⁵ XIA, *Tulufan diqu Wenwu ju* 吐鲁番地区文物局 (Turfan Office of Cultural Relics), 2004.

⁶³⁶ JETTMAR, 1950, pl. 3.

⁶³⁷ XIA, *Tulufan diqu Wenwu ju* (Turpan Regional Cultural Relics Bureau), 2004.5, p. 5, fig. 11; JETTMAR, 1950, pl. 5.

⁶³⁸ CHEN Ge 陈戈, 1990, p. 367.

⁶³⁹ *Yike Zhaomeng Wenwu Gongzuozhan* 伊克昭盟文物工作站 (Yike Zhaomeng Cultural Relics Workstation), 1987.

⁶⁴⁰ *Hami Bowuguan* 哈密博物馆 (Hami Museum), p. 99.

⁶⁴¹ A specimen is part of the collection of the Hermitage Museum.

1200 BC) (Fig. 86.3)⁶⁴², while further east, a number of specimens were recovered from the Andronovo sites of Tosty-Butak and Bedak in Tajikistan⁶⁴³ (ca. 1900-1200 BC) (Fig. 86.4, the item in the picture has been assigned to the Andronovo community, however, the origin is unknown). In spite of the relative diffusion of this item prior to the mid-second millennium BC, the majority of side-looped celt-spades was later and came from Seima Turbino-related sites (around 1500 BC) (Fig. 86.5): it was precisely through contact between this community and Qijia that, according to some scholars, the spade found in Qijiaping reached Gansu⁶⁴⁴. Unfortunately, the chronological position of the Seima Turbino cultural group, as well as its links to eastern communities, such as the Qijia⁶⁴⁵, constitutes an issue, in terms of patterns and dating, which remains unresolved⁶⁴⁶. If the two communities were indeed connected, these early interactions may have not crossed Xinjiang territory: according to carbon dating results, Tianshan Beilu remains were later than the Qijia's by some centuries and, since no looped spade have been discovered in relation to the Qiemu'erqieke communities on the Altay (nor in Bronze Age Western Xinjiang), these items may have reached present-day Gansu via a northern route bypassing the territory of present Xinjiang⁶⁴⁷. Consequently, the specimens found in Tianshan Beilu may have been a product of cultural connections with the Qijia community, and this is supported by its similarity, in terms of shape and manufacturing, with the celt-spades from Qijiaping (Figs. 86.1, 6). However, only serious research on the Seima Turbino cultural group will allow a better understanding on the relations between communities in North-western China and the steppe.

In Eastern Xinjiang different types of knives were discovered and, based on their shape, can be divided into three main groups, namely curved knives, straight blade, and wave-shaped blade (Fig. 87). The first group comprises curved knives with a grooved or decorated handle. The specimens from the Tianshan Beilu cemetery (Fig. 87.a) were of the Seima-Turbino type (around 1500 BC) (Fig. 87.d)⁶⁴⁸ and, perhaps as a result of the aforementioned, still unclear interactions between the two communities,

⁶⁴² Remains of the Timber Grave community include one stone mould for producing a single looped spade, GIMBUTAS, 1961, p. 18.

⁶⁴³ KUZ'MINA, MALLORY, 2007, p. 71.

⁶⁴⁴ FITZGERLD-HUBER, 1995, pp. 43-52.

⁶⁴⁵ FITZGERLD-HUBER, 1995, pp. 43-52; MEI Jianjun, 2003b.

⁶⁴⁶ For discussion on the topic see: AN Zhimin 安志敏, 1993; DEBAINE, 1995; FITZGERLD-HUBER, 1995; MEI Jianjun, 2003b.

⁶⁴⁷ Moulds for casting socketed looped celt-spades have been discovered in the Altay region, while some artefacts were found in Southern Xinjiang, however they all have been placed around the first millennium BC. XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981, p. 24, fig. 2; Xinjiang Shehui Kexueyuan Kaogu Yanjiu Suo Xinjiangdui 中国社会科学院考古研究所新疆队 (Xinjiang Archaeological Team, Institute of Archaeology, Chinese Academy of Social Science), 2006, p. 36, fig. 3.

⁶⁴⁸ CHERNYKH, 1992, pp. 215-234.

they were found in some sites attributed to the Qijia cultural group (ca. 2300- 1700 BC) (Fig. 87.g)⁶⁴⁹. Curved knives also formed part of the sets of tools pertaining to the Siba (ca. 1900-1500 BC) and Kayue (ca. 1600-600 BC) communities in the Gansu-Qinghai region (Fig. 87.l). The second group consists of a few straight-blade knives recovered from the sites of Wupu and Lanzhouwanzi, some of which had a perforated handle (Fig. 87.b). These knives were similar to specimens discovered in the Gansu-Qinghai region corresponding to the Siba and Kayue cultural sites, dating to around 1900-1500 BC and 1600-600 BC respectively (Figs. 87.h,m). Other specimens found in Xinjiang were more recent: the straight-blade knife unearthed from grave M17 in the no. 2 cemetery at Qiemu'erqieke (Fig. 87.e), those recovered from the Pamir region⁶⁵⁰ and the Tianshan Valleys⁶⁵¹, were all placed around 1000 BC onwards⁶⁵². Knives with a wave-shaped blade, found in the cemeteries of Tianshan Beilu, Wupu, Aisikexia'er and at Yuandong Xinshichang (Hami) (Fig. 87.c), shared numerous traits with specimens from the cultural sites of Siba, Kayue and Siwa (ca. 1400-600 BC) in North-western China (Figs. 87.f,i). On the contrary, it appears that no similar objects were produced by the western neighbouring communities in the second millennium BC. One distinctive knife from Yuandong Xinshichang and is shaped roughly like a key (Fig. 88)⁶⁵³. This specimen seems to have been unique, since no similar objects in Xinjiang, nor its neighbouring regions, have been uncovered.

2.4.4. Remarks on metallurgical examinations

According to the results of metallurgical analysis on more than one hundred samples from Tianshan Beilu and a lower number of fragments from the sites of Wupu and Yanbulake, in Eastern Xinjiang tin-copper and arsenic-copper alloys were both used during the Bronze Age (ca. 2000-1000). Specifically, the majority of the examined samples from Tianshan Beilu were made of tin-copper, while objects made of arsenic-copper made up the 10% of the total⁶⁵⁴. The fragments from the cemetery of

⁶⁴⁹ An earlier broken specimen was found at Jiangjiaping and assigned to the Machang community. MEI Jianjun, 2003a, p. 4, fig. 2.

⁶⁵⁰ In the Pamir region a broken copper knife was recovered from the Aketala hoard, dating to around 1000 BC. Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uyghur Autonomous Region Museum), 1977, p. 107, fig. 2.5.

⁶⁵¹ XIA, Hejing xian Bowuguan 和静县博物馆 (Hejing Museum), 1992, p. 91, fig. 14; XIA, 1987a, p. 7; XIA, 1995, p. 294.

⁶⁵² As mentioned in the previous chapter, the knife found at Qiemu'erqieke has long been attributed to the Bronze Age, and only recently has been assigned to a later phase of the cemetery, corresponding to the Scythian occupation of the region (first millennium BC). This information has been taken from a personal conversation with Professor Kovalev in Saint Petersburg in August 2016. His studies on Xinjiang Qiemu'erqieke remains have been published in KOVALEV KOBAJIEB, 2015, pp. 240-280.

⁶⁵³ Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 92.

⁶⁵⁴ Beijing Keji Daxue Yejin yu Cailiaoshi Yanjiusuo 北京科技大学冶金与材料史研究所 (Institute of Metallurgy and Materials, Beijing University of Science and Technology), XIA, Hami diqu Wenwu Guanlisuo 哈密地区文物管理所 (Hami Cultural Relics Management Office), 2001, pp. 79-89; MEI Jianjun, 2003a, pp. 17-18.

Yanbulake were made exclusively of copper and tin-copper, while the two specimens from Wupu were made solely of arsenical bronze⁶⁵⁵. On the basis of the above evidence, it is clear not only that metal technology was widespread throughout Eastern Xinjiang, but also that it was developed with contributions from different cultural groups, resulting in the employment of various alloys. The use of diverse technologies, such as casting, forging, annealing and cold working, has been identified by the metallographic examinations carried out by Mei Jianjun⁶⁵⁶ (Fig. 89).

Tin bronze, which appeared in South-western Asia as early as the fourth millennium BC and was then attested to Central Asia a millennium later⁶⁵⁷, was probably transported eastward across the steppe⁶⁵⁸, following the narrow belt, where ores were located, stretching from Europe to South-eastern Asia. Specifically, it has been documented that technical knowledge on tin bronze was predominant during the Bronze Age throughout the Andronovo territory (ca. 1900-1200 BC)⁶⁵⁹. The Andronovans, who supposedly exploited tin deposits in Kazakhstan, in the Kalba-Narym Mountains, and Uzbekistan, in the Zeravshan valley⁶⁶⁰, have indeed been associated with the expansion of tin bronze⁶⁶¹. However, the assumption that tin bronze was a western importation, perhaps introduced by the Andronovo people, has been put into question by the discovery of a tin-bronze knife in Linjia (Dongxiang County in Gansu) pertaining to the Majiayao cultural group and dating back to 3300-2740 BC⁶⁶². This issue, despite being the object of hot debates among international scholars, remains unresolved⁶⁶³. Nevertheless, the presence of a number of tin-copper objects in Qijia cultural sites demonstrates that this alloy was made in today's North-western China (at least) as early as the turn of the second millennium BC⁶⁶⁴. On the contrary, most scholars agree on the "western origin" of the use of the arsenic-copper alloy, which was employed in Western Asia as early as the fourth millennium BC and was extensively utilized by Western and Central-Asian Bronze Age communities, such as the Abashev (2500-1900 BC) and Timber Grave (ca. 1900-1100 BC)⁶⁶⁵. In North-western China it was largely employed by the Siba and Kayue communities from the beginning of the second millennium BC and, apparently to a smaller extent, the Tianshan Beilu population. The choice of alloy employed by the

⁶⁵⁵ MEI Jianjun, 2000, p. 39.

⁶⁵⁶ MEI Jianjun, 2000, pp. 38-41.

⁶⁵⁷ ROBERTS, THORTON, PIGOTT, 2009, p. 1015.

⁶⁵⁸ PIGOTT, CIARLA, 2007, p. 80

⁶⁵⁹ CHERNYKH, 1992, pp. 210-215.

⁶⁶⁰ See an overview of the researched areas and ore deposits in Kazakhstan in GARNER, 2013.

⁶⁶¹ GARNER, 2015.

⁶⁶² BAI Yunxiang, 2003, p. 157.

⁶⁶³ For a discussion on the earliest metal remains in China see: AN Zhimin, 2000.

⁶⁶⁴ AN Zhimin, 2000.

⁶⁶⁵ CHERNYKH, 1992, p. 213.

Siba and Kayue communities may have partially depended on external factors, but largely on the availability of raw materials, which, in this case, constituted extensive arsenic copper resources located in present-day Gansu⁶⁶⁶. The exploitation of local ores has been proven by the recent discovery of a copper smelting site at Xichengyi near Zhangye City, in the middle of the Hexi Corridor (Gansu Province), dating to the early second millennium BC⁶⁶⁷. Analysis of ore samples from this site has revealed that the region was abundant with copper oxide minerals (some of which were rich in arsenic) and additional studies have validated the actual use of this deposit⁶⁶⁸.

The employment of arsenical bronze in Eastern Xinjiang suggests the existence of contact with bronze-using communities of the Gansu-Qinghai region, especially those of Siba and Kayue. However, while the Kayue metallurgists only employed cold-forging and mould-casting technologies⁶⁶⁹, the wider range of techniques used in Eastern Xinjiang suggests closer relations with the Siba. At the same time, the use of both alloys, tin-copper and arsenic-copper, gold and silver suggests that Eastern Xinjiang people established strong connections not only with the cultural groups in Gansu-Qinghai, but also with western and northern communities who made use of tin bronze, silver and gold.

2.5 Summary

Judging by the remains found in the oases of Hami and Turfan, it is clear that the local Bronze Age community was rather unique in Xinjiang: although pastoralism was practised, as demonstrated by the discovery of numerous sheep and goat bones, agriculture was a relevant part of the economy⁶⁷⁰. This is indicated not only by the recovery of numerous farming tools, such as hoes, spades and sickles, but also the discovery of millet grains and wheat-made desiccated food found in the Wupu cemetery (Fig. 90). Furthermore, analysis on human remains in Tianshan Beilu revealed that these two grains, millet and

⁶⁶⁶ LINDUFF, MEI Jianjun, 2009, p. 8.

⁶⁶⁷ Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Beijing Keji Daxue Yejin yu Cailiaoshi Yanjiusuo 北京科技大学冶金与材料史研究所 (Institute of Metallurgy and Materials History of the Beijing University of Science and Technology), Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo 中国社会科学院考古研究所 (Institute of Archaeology of the Chinese Academy of Social Sciences), Xibei Daxue Wenhua Yichan Xueyuan 西北大学文化遗产学院 (Cultural Heritage Institute of the North-western University), 2014; CHEN Guoke 陈国科, LI Yanxiang 李延祥, QIAN Wei 潜伟, WANG Hui 王辉, 2015.

⁶⁶⁸ Copper was very likely to be smelted first from relatively clean copper ores, and then alloyed with arsenic-rich ores in a separated cementation/co-smelting process. CHEN Kunlong, LIU Siran, Li Yanxiang [et al.], 2017, p. 37.

⁶⁶⁹ CHEN Xiaosan 陈小三, 2012, p. 100.

⁶⁷⁰ It will be discussed in the following chapters that, according to archaeological evidence, most of the Bronze Age communities in Xinjiang were pastortalists, who practiced little farming.

wheat, were an integral part of the population's diet⁶⁷¹. The presence of millet and wheat indicates the existence of interactions with western and eastern communities respectively, since, while wheat was cultivated in Western Asia as early as the ninth millennium BC and then spread eastward to Central and Southern Asia⁶⁷², millet was a vital element of Chinese agriculture⁶⁷³ and, around the third-second millennium BC, spread westward. This has been proven by the remains found in Tianshan Beilu and further west in Begash (Kazakhstan)⁶⁷⁴. The communities in Eastern Xinjiang built their graves using mud brick and already had an established funerary ritual, which involved the offering of food, as demonstrated by the findings of wheat dough in the Wupu cemetery (Fig. 90). During these funerary ceremonies, bronze bells, anthropomorphic wooden figurines and stone phalli were most likely utilized, suggesting that fertility rites were performed. Evidence shows that at the beginning of the second millennium BC Eastern Xinjiang communities began producing painted pottery, which further suggests that local people were devoted to farming and most likely sedentary. In fact as Tosi, Malek Shahmirzadi and Joyenda pointed out, sedentary farming communities generally shared three main traits, namely the use of mud brick for building houses and graves, the manufacturing of anthropomorphic figurines for performing fertility rites and the production of painted pottery⁶⁷⁵. All these three factors have been verified in the archaeological sites in Eastern Xinjiang, indicating that during the Bronze Age the area was occupied by an early agricultural community.

Judging from the evidence, it seems that in the second millennium BC Xinjiang was a centre of early interactions and more specifically:

1. Discoveries of painted pottery suggest the existence of close connections with eastern communities in the Gansu-Qinghai region. Despite the debate on the origin of painted pottery initiated by Andersson in the 1960⁶⁷⁶, followed by Chinese scholars such as Li Ji⁶⁷⁷, Pei Wenzhou⁶⁷⁸, Su Bingqi⁶⁷⁹, Yan Wenming⁶⁸⁰ and Chen Ge⁶⁸¹, recent research on the distribution

⁶⁷¹ WANG Tingting, WEI Dong, CHANG Xi'en, YU Zhiyong, ZHANG Xinyu, ZHANG Changsui, HU Yaowu, FULLER, 2017.

⁶⁷² At present, the earliest evidence of wheat in China was recovered in Gansu, and according to most of the scholars it was transported via Southern Siberia through Mongolia, to the pre-existing millet users farming communities in North-western China. The route through Xinjiang, has been also proposed, but lacks clear evidence. For further information see DODSON, LI Xiaoqiang, ZHOU Xinying, ZHAO Keliang, SUN Nan, ATAHAN, 2013; BETTS, JIA, DODSON, 2014.

⁶⁷³ FRANCHETTI, SPENGLER, FRITZ, MAR'YASHEV, 2010, pp. 994-996.

⁶⁷⁴ SPENGLER, FRANCHETTI, DOUMANI, ROUSE, CESARETTI, BULLION, MAR'YASHEV, 2014.

⁶⁷⁵ TOSI, MALEK SHAHMIRZADI, JOYENDA, 1992, p. 187.

⁶⁷⁶ ANDERSSON, 1923, pp. 1-68; ANDERSSON, 1925, pp. 56-128.

⁶⁷⁷ LI Ji 李济, 1996, pp. 57-60.

⁶⁷⁸ PEI Wenzhong 裴文中, 1942, pp. 34-39.

⁶⁷⁹ SU Bingqi 苏秉琦, 1965, pp. 51-82.

pattern of these containers suggests a westward expansion of the Machang cultural group (ca. 2300-2000 BC) in the late third millennium BC⁶⁸², which contributed to the formation of the Siba community (ca. 1900-1500 BC)⁶⁸³ and stimulated the early use of painted pottery in Eastern Xinjiang⁶⁸⁴. Decorations patterns on vessels from Eastern Xinjiang have indeed eastern counterparts, as in the case of the cross design painted on the *dou* cups from the Yanbulake site. However, the early development of a distinctive local taste is shown by the handled-*dou*, the male images and the bow-shaped decorations depicted on a number of vessels found in Tianshan Beilu cemetery⁶⁸⁵. Northern and Western traditions played some role in the development of pottery in Eastern Xinjiang, as demonstrated by a number of large pots with small handles under the rims, which bear close resemblance to the findings at Qiemu'erqieke.

2. Contributions from cultural groups from Central Asia, South-western Siberia and the Gansu-Qinghai region are evident also from metal evidence, which suggests that Eastern Xinjiang was already a centre for east-west and north-south exchanges as early as the beginning second millennium BC. Indeed, if certain tools, such as sickles and spades, were of the Central Asian steppe variety, others, such as awls, pertained to the Okunev cultural group in the Minusinsk Basin, while some were reminiscent of the objects from the farming communities of the BMAC in Central Asia. Additionally, items of eastern origin were also recovered, such as bronze bells, and, according to some scholars, round mirrors. Moreover, the discovery of objects made of various metals and metal alloys (copper, silver, gold, arsenic-copper, tin-copper, and bronze alloys containing other elements, such as lead), in addition to the employment of various technologies (casting, forging, annealing and cold working), points towards the existence of strong connections with the cultural groups of Siba and Kayue in Gansu, and also with western and northern communities who made use of tin bronze, silver and gold. Furthermore, if accepted the evolutionary sequences of metallurgy proposed by Theodore Wertime⁶⁸⁶ and Jim Charles⁶⁸⁷, that basically develops through four main steps, namely from native copper to

⁶⁸⁰ YAN Wenming 严文明, 1978, pp. 62-76.

⁶⁸¹ CHEN Ge 陈戈, 1982, pp. 77-103.

⁶⁸² MEI Jianjun, 2003a, pp. 24-25; LI Shuicheng 李水城, 2001, p. 132; HAH Jianye, 2012, pp. 34-35.

⁶⁸³ LIU Li, CHEN Xingcan, 2012, p. 333.

⁶⁸⁴ MEI Jianjun, 2003a, p. 25.

⁶⁸⁵ On the contrary, the female representation has been connected by some scholars to some images painted on the Machang vessels. YAN Wenming 严文明, 1978, pp. 62-76; HAH Jianye, 2012, p. 35.

⁶⁸⁶ WERTIME, 1964, pp. 1257-1267; WERTIME, 1973, pp. 875-876.

⁶⁸⁷ CHARLES, 1980.

smelted copper to arsenical copper to tin bronze⁶⁸⁸, the use of both arsenical and tin bronze in North-western Xinjiang, (including Eastern Xinjiang and the Gansu-Qinghai region) may suggest that at the beginning of the second millennium BC, local communities were experiencing the abandonment of arsenical bronze and its gradual replacement by tin bronze⁶⁸⁹. If so, an eastern impulse should be considered, perhaps from the Majiayao and Machang cultural groups, dating to the early and late fourth millennium BC respectively, who employed tin bronze. In fact, given the scant cultural remains, it is very unlikely that the Andronovo and Andronovo-related communities (whose expansion has been generally connected to the spread of tin bronze throughout Eurasia) had given some contributions to this transition. Unfortunately no research has yet been conducted on the topic.

3. The convergence of diverse cultural influences is also demonstrated by studies on human remains. Craniometrical examinations of more than fifty samples have revealed that people buried in the cemetery of Tianshan Beilu had mixed Proto-European and Mongoloid features⁶⁹⁰, while those in Yanbulake indicated a community of both Mongoloid and Western people living together⁶⁹¹. Similar results were obtained from DNA exams, which have shown that the genetic heritage of Tianshan Beilu community included European and Mongoloid components⁶⁹².

Considering the aforementioned elements, it seems that Eastern Xinjiang was indeed a key point in the “Prehistoric Silk Road”⁶⁹³. However, evidence shows that there is a number of objects of the steppe variety, which occurred in Gansu earlier than Xinjiang, highlighting the possible existence of alternative routes that bypassed Xinjiang and linked the northern steppe with the region of Gansu-Qinghai. One of these objects is the Okunev-type awl, utilized by the Qijia community some centuries earlier than the appearance of the Tianshan Beilu cemetery. There was no trace of such an awl among the remains of the Qiemu’erqieke community in the Xinjiang Altay region from the third millennium BC. Other objects include the products of the Seima-Turbino variety, which seem to have reached Gansu during the period corresponding to the Qijia cultural group (ca. 2300-1700 BC), but share characteristics with later specimens in Eastern Xinjiang. Additionally, Andronovo metal objects have

⁶⁸⁸ These theories have been sometimes criticised for employing geological determinism to argue that the same sequence would be observed in any region where metallurgy appeared. KILLICK, FENN, 2012, p. 564.

⁶⁸⁹ For a review of theories on the replacement of arsenic bronze with the tin variety see the introduction of this dissertation.

⁶⁹⁰ WEI Dong 魏东, ZHAO Yongsheng 赵永生, CHANG Xi'en 常喜恩, ZHU Hong 朱泓, 2012.

⁶⁹¹ HAN Kangxin, 1998, p. 561.

⁶⁹² GAO Shizhu 高诗珠, 2009, p. 68.

⁶⁹³ MEI Jianjun, 2003a, pp. 24-28.

been widely recovered from Western Xinjiang, in the Ili-Tacheng and Pamir regions, dating around 1500 BC. On the contrary, similar remains from Northern Xinjiang were only occasionally discovered (such as the axe found in Fuyun County, see fig. 51.1)⁶⁹⁴, or dating rather late (for instance the trumpet-ended earring unearthed in the cemetery of Suke'erte, dating to the first millennium BC and assigned to the late Bronze Age, see fig. 48.1)⁶⁹⁵. At the same time, Andronovo remains in the Tianshan Valleys, recovered around Urumqi, were associated with sites which mostly have not been carbon dated⁶⁹⁶. Metal remains in Eastern Xinjiang reveal rather weak links with the Andronovo culture. That said, in the second millennium BC a number of Andronovo-type objects appeared in North-eastern China, in Beijing, Hebei and Liaoning⁶⁹⁷ and, considering the above evidence, it can hardly be proposed that they crossed Xinjiang; instead alternate routes may have existed linking the northern steppe with communities in Gansu-Qinghai and North-eastern China⁶⁹⁸.

⁶⁹⁴ QI Xiaoshan 祁小山, WANG Bo 王博, 2015, p. 319, fig. 8.

⁶⁹⁵ XIA, 2015e, p. 95, fig. 59.7.

⁶⁹⁶ MEI Jianjun, 2000, p. 96, fig. 2.26.

⁶⁹⁷ BUNKER 1998, pp. 607-611; BUNKER 1993, pp. 30-32.

⁶⁹⁸ Different theories have been formulated on these ancient routes: Bunker has put forth the theory of the existence of a "Fur Route", while Mei has proposed a "Steppe Road", however the actual routes are far from clear and more field work is required. BUNKER, 1993, p. 31; MEI Jianjun, 2003a, pp. 28-33.

3. WESTERN XINJIANG

3.1. THE ILI-TACHENG REGION (NORTH-WESTERN XINJIANG)

3.1.1 Introduction

The north-western part of the Xinjiang Province, roughly corresponding to the present-day prefectures of Ili (Ili Kazakh Autonomous Prefecture), Bortala (Bortala Mongol Autonomous Prefecture), Tacheng and Karamay, forms what in this research is called the “Ili-Tacheng region” (Fig. 1). It is a fertile green land, which has been inhabited since the Palaeolithic period (100,000-10,000 BC), as shown by some large sites, such as that of Luotuoshi, where choppers, scraper flakes and other stone implements were found⁶⁹⁹. Since some of the stone remains showed close analogies with those from the dated context of Shuidonggou (Ningxia Province)⁷⁰⁰, and with the lithic industries of the Altay and Mongolia⁷⁰¹, the Luotuoshi prehistoric manufacturing field was assigned to the Early Upper Palaeolithic and placed at around 40000 BC⁷⁰². Other two groups of remains, consisting of fossils, flakes and few stone tools, were found in the counties of Jinghe⁷⁰³ and Nileke⁷⁰⁴, and attributed to the same period by typological comparison. Findings assigned to the Neolithic period are still few⁷⁰⁵, while by the Bronze Age (ca. 2000-1000 BC) it seems that numerous small communities had settled in the Ili-Tacheng region (Fig. 91). Remains attributed to the Bronze Age, consisting of settlements, cemeteries, hoards and worship places, were, in fact, relatively widely recovered and usually published on Chinese journals, such as *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), *Wenwu* 文物 (Cultural Relics), *Kaogu* 考古 (Archaeology) and *Xiyu Yanjiu* 西域研究 (Western Regions Studies). Settlements, despite having been investigated, generally were not well preserved and sometimes not well-reported, thus limited data can

⁶⁹⁹ QI Xiaoshan 祁小山, WANG Bo 王博, 2015, p. 340; DEREVIANKO, GAO Xing, OLSEN, RYBIN, 2012.

⁷⁰⁰ CHEN Fuyou 陈福友, LI Feng 李锋, WANG Huimin 王惠民, PEI Shuwen 裴树文, FENG Xingwu 冯兴无, ZHANG Shuangquan 张双权, ZHANG Le 张乐, LIU Decheng 刘德成, ZHANG Xiaoling 张晓凌, GUAN Ying 关莹, GAO Xing 高星, 2012.

⁷⁰¹ For example those of Orkhon-1 and Tolbor-4. For further information see DEREVIANKO ДЕРЕВЯНКО, KANDYBA КАНДЫБА, PETRIN ПЕТРИН, 2010; DEREVIANKO, ZENIN, RYBIN, GLADYSHEV, TSYBANKOV, OLSEN, TSEVEENDORJ, GUNCHINSUREN, 2007.

⁷⁰² DEREVIANKO, GAO Xing, OLSEN, RYBIN, 2012, p. 16.

⁷⁰³ QI Xiaoshan 祁小山, WANG Bo 王博, 2015, p. 368

⁷⁰⁴ In addition, a group of Palaeolithic remains from the village of Keqikekusubutai in Nileke County was displayed at the exhibition “Xinjiang Yili caoyuan wenwu he minzu fengqing zhan 新疆伊犁草原文物和民族风情展” (Culture and traditions in the Ili Grassland, Xinjiang) in the Xuzhou Museum (Xuzhou City, Jiangsu Province) in 2016.

⁷⁰⁵ Few Neolithic sites are known in this region, the most famous being the deposit at the village of Jilintai, in Nileke County. RUAN Qiurong, 阮秋荣, 2004.

be gained from their discovery⁷⁰⁶. However, the area seems to have recently attracted an increasing interest and it is currently the object of new excavations, therefore information on its prehistory are likely to increase in the near future. For now, important information on the remains found in the Ili-Tacheng region are included not only in the relatively numerous reports of single sites, but also in the summaries, regularly published on a number of Chinese journals: especially useful is the summary on the discoveries on the upper reaches of the Ili River, recently published by Liu Xuetao on *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics)⁷⁰⁷, which provides information on old and recent archaeological findings and offers useful considerations and comments by the author. Additionally, studies have been conducted, almost exclusively by Chinese scholars, on single objects and their relation with the Andronovo materials (ca. 1900-1200 BC)⁷⁰⁸. The existence of interactions between the communities in the Ili-Tacheng region and the Andronovo cultural group has been generally accepted by scholars, although the extent of the influence from the latter on the former is still unclear. Actually, the existence of these early contacts, and more specifically the discovery of a large quantity of Andronovo-type material in North-western Xinjiang, have been among the most important indicators for dating archaeological sites in the Ili-Tacheng region to the second millennium BC. They were, in fact, frequently attributed to the Bronze Age by typological comparison with material found precisely in Andronovo carbon dated sites (ca. 1900-1200 BC), while only for few findings, such as wooden fragments and charcoal from Adun Qiaolu (Wenquan County), Jirentaigoukou (Nileke County) and Kuokesuxi (Tekesi County), carbon dating was employed and placed the remains in the range period 1900-1500 BC⁷⁰⁹.

3.1.2 Geographical setting

The Ili River Valley is a fertile and relatively flat valley, shut off from the Dzungaria Basin and the rest of Xinjiang by the Borohoro Mountains in the north and the Tianshan Range in the south. The area is well watered, not only by the Ili River and its tributaries, the Tekesi and Gongnaisi Rivers, but also by

⁷⁰⁶ Publications usually include separated descriptions of the settlement and the cemetery: the former generally occupies few pages, while more information (including images of the objects) are provided on cemeteries.

⁷⁰⁷ LIU Xuetao 刘学堂, 2011.

⁷⁰⁸ SHAO Huiqiu 邵会秋, 2009; LI Suyuan 李溯源, 2014; LI Suyuan 李溯源, 2005; Among the few western research: MEI Jianjun, SHELL, 1999; JIA, BETT, CONG, JIA, DOUMANI, 2017.

⁷⁰⁹ JIA, BETT, CONG, JIA, DOUMANI, 2017, p. 633; ZHANG Hongchi 张鸿墀, LIU Jie 刘杰, 2015.

a number of small brooks and streams, making the region suitable for human life and activities. The present-day Bortala Mongol Autonomous Prefecture, consisting of a low basin formed along the Bortala River, lies on the northern border of the Ili Kazakh Autonomous Prefecture. The two areas are separated by the eastern spur of the Borohoro Mountains which, despite its height, contains a number of passes, allowing for a relatively easy cross. The Bortala Basin is bounded on its western side by the westernmost spur of the same range, which also presents large passes, such as the Dzungaria Gate, providing a number of easy ways to cross the mountains. Rivers and streams, originating from the Borohoro Mountains, flow down and form several lakes, such as the Aibi, Manas and Sayram. The Bortala Basin is separated from the northern Tacheng region (roughly corresponding to the present-day Tacheng and Karamay Prefectures) by the Alatau Mountains, though these are quite low, in this specific area, and accessible via numerous passes. The Tacheng region is relatively flat and fertile. It is also closed to the remaining part of Xinjiang by the Ta'erbagatai Mountains in the north and north-east, while it opens to the Kazakh steppe. If the Bortala area is bounded on its western side (though mountains are relatively easy to be crossed), the Ili River Valley and the Tacheng region are both completely open to the semi-arid steppe of modern-day Kazakhstan: the whole area forms part of the temperate desert-steppe zone and has a continental climate with a relatively high level of precipitation, due to the influence of the westerlies.

North-western Xinjiang is part of the temperate desert-steppe zone. Despite the present conditions, during the Holocene, Xinjiang climate has been characterized by fluctuations of warm and cold phases and alternatively dry and humid epochs⁷¹⁰. As regards the micro-region of Ili-Tacheng, a number of paleoclimatic and paleoenvironmental studies were carried out on specific areas, offering an insight into the prehistoric climatic and environmental conditions. Of particular interest are the results of the examinations on the lacustrine sediments from the Aibi, Manas⁷¹¹ and Sayram lakes⁷¹², which revealed that around 3000 BC the surface of these lakes was larger than at present, suggesting the existence of more humid conditions. Moreover, as reported by the palynological studies, in the same period meadow and steppe vegetation expanded and the first signs of the occurrence of a dry phase only recommenced around 1500 BC⁷¹³. Accordingly, during roughly the first half of the Bronze Age (ca. 2000-1000 BC), the climate in the Ili-Tacheng region must have been much more humid than present and the territory,

⁷¹⁰ HSU 1998.

⁷¹¹ MA Long, WU Jinglu, ABUDUWAILI Jilili, 2011.

⁷¹² JIANG Qingfeng, JI Junfeng, SHEN Ji, MATSUMOTO Ryo, TONG Guobang, QIAN Peng, REN Xuemei, YAN Dezhi, 2013.

⁷¹³ MA Long, WU Jinglu, ABUDUWAILI Jilili, 2011, p. 3; JIANG Qingfeng, JI Junfeng, SHEN Ji, MATSUMOTO Ryo, TONG Guobang, QIAN Peng, REN Xuemei, YAN Dezhi, 2013, p. 349.

covered by larger meadows, was suitable for the practice of pastoralism. Although these studies, on different micro-areas and of different types, provide precious information on prehistoric climatic conditions in North-western Xinjiang, it is difficult to compare them and to re-evaluate the results in a broader context, because the material used for comparison often varies across research, while chronological references are different in each study. For these reasons, a review of the ancient maps may be of some help: in fact, the hypothesis that, generally, in the past the climate used to be wetter than at present is also confirmed by historical documents, such as the Qing dynasty (1644-1911) book *Xichui Zongtong Shilue* 西陲总统事略 (General Affairs of the Western Border), in which a number of maps show the existence of diverse rivers and small streams that today have already disappeared⁷¹⁴ (Fig. 92).

Considering the currently available information, the Ili-Tacheng region seems to have been a suitable area for transhumance, as during Summer grazing animals were moved to the mountains, while in Winter sheep and goats were taken back to the inner valleys⁷¹⁵. Some agricultural activities may also have been practiced, even though no botanical evidence of cultivation was found in the archaeological sites in North-western Xinjiang⁷¹⁶. However, just to the north of the Ili River valley, in the Kazakhstani site of Begash, on the Zhalgyzagash River (an upper tributary of the Koksu River), remains of wheat, dating to the late third millennium BC, were found, demonstrating that agriculture was practised in that area⁷¹⁷, and, at the same time, suggesting the existence of a small-scale form of farming close to the Ili-Tacheng region.

3.1.3 Archaeological context

Few settlements, a high number of hoards, several cemeteries and two ritual places were found in the Ili-Tacheng region. Settlements were relatively numerous, but not always well reported, therefore, data on such remains are often very limited. The scarcity of information from settlements is also due to the

⁷¹⁴ MILLWARD, 2007, p. 78, fig. 2.

⁷¹⁵ CHEN Kwang-tzuu, HIEBERT, 1995, p. 249.

⁷¹⁶ BETTS, JIA, DODSON, 2014, p. 165; for an overview of the sites in China, where cereals were found see DODSON, LI Xiaoqiang, ZHOU Xinying, ZHAO Keliang, SUN Nan, ATAHAN, 2013, p. 110.

⁷¹⁷ Dating for the phase Ia of the pastoralist site at Begash has been established at 2500-1950 Cal. BC. FRANCHETTI, SPENGLER, FRITZ, MAR'YASHEV, 2010.

intrinsic fact that they were built on the surface, thus easily subjected to depredations. Residential sites were often built close to the cemeteries, as in the case of that found in Adun Qiaolu village (Wenquan County)⁷¹⁸ (Fig. 93). This settlement was divided into three areas, called F1, F2 and F3, among which F1 district was the best preserved. It was rectangular and surrounded by a ditch. Still clear are the traces of ancient streets: in particular, one larger road connected the northern district to the southern, where two main doors were located. On the south-eastern and south-western corners two quadrant-shaped structures were built with pebbles, containing remains of fires, bones and pottery shards. The function of these buildings has not yet been investigated, nor have other structural remains studied, such as the walled rectangular structures, which were spread around the settlement perimeter. The settlement found in the village of Ji'ertaigoukou (Nileke County)⁷¹⁹, also located close to the cemetery, consisted of five smaller and larger rectangular stone structures, supported by wooden poles. According to archaeologists, the small structures were real houses, while the larger were common manufacturing zones. In addition, fifty ashcans, eight stoves and several wells were recovered from different areas of the residential site. In the Abudula Reservoir (Tacheng City)⁷²⁰, five stone structures (four round-shaped and one square), interpreted as houses, were placed by archaeologists to around 2000 BC, on the basis of the similarities of the objects recovered with those from the sites of Sazi (Tuoli County) and Weixiao (Tacheng City)⁷²¹ (Fig. 94). Inside the house no. F2, a circular structure made of pebbles was found and, since traces of fire and bones were discovered in it, it was regarded as a oven (Fig. 94.1). Artefacts found in the settlements were usually very limited in number and they generally consisted of some pottery shards, stone tools and, in a few cases, metal objects. In the Adun Qiaolu site fragments of pottery vessels, stone tools and, exceptionally, one bronze awl were found. Similarly, pottery fragments and stone artefacts were recovered from the poorly reported settlements (as usual built close to the cemetery) at Weixiao village (Tacheng City)⁷²² and in Qialege'er (Nileke County)⁷²³. Of particular interest is the material unearthed from the Ji'ertaigoukou site, in F2 district, which included numerous pottery shards, stone tools, a copper knife, some copper and bronze beads and five pottery moulds for producing mirrors and awls.

A high number of small hoards, containing copper and bronze objects, were uncovered in the Ili-

⁷¹⁸ IAC 2013, pp. 26-28; JIA, BETTS, CONG, JIA, DUPUY, 2017, pp. 626-629.

⁷¹⁹ WANG Yongqiang 王永强, RUAN Qiurong 阮秋荣, 2016, pp. 132-133.

⁷²⁰ XIA, 2016, pp. 56-57.

⁷²¹ Sazi and Weixiao sites have not been carbon dated, however, their assignment to the Bronze Age is validated by clear similarities of pottery and metal objects with those of the Andronovo cultural group.

⁷²² LI Xiao 李肖, 1991, p. 104.

⁷²³ XIA, 2014e.

Tacheng region, in the highlands as well as the lower valleys. They can be interpreted as evidence of seasonal pastoralism in the region, since the objects may have been temporarily concealed in the deposits (when the community, or part of it, moved for grazing livestock), and used again the following year. According to Kuz'mina, the discovery of bronze hoards in the steppe region⁷²⁴ reflects the cultural and political changes occurred at the end of the Bronze Age (ca. thirteenth -ninth century BC) throughout Eurasia. More specifically, as early as 1966, she identified two kinds of hoards, namely the “family’s hoards” and “founders’ hoards”⁷²⁵. The former contained different used objects, which most likely were property of one family and were concealed in the earth as a consequence of growing military tensions. Such hoards have also been considered as evidence of a process of property stratification. The “founders’ hoards” generally included a single type of bronze object and moulds (which were probably owned by a metallurgist or his clan), reflecting the development of metallurgical technology, on one side, and the appearance of a specialized group of metalworkers, on the other⁷²⁶. Hoards examined in the Ili-Tacheng region usually contained numerous metal objects: in the Aga’ersen hoard (Gongliu County) thirteen copper tools were found (including sickles, socketed axes and chisels)⁷²⁷, while in the deposit at the Zeketai village (Xinyuan County) six bronze items (a knife, a chisel and three mirrors) were unearthed⁷²⁸. In some cases, such as the hoard at the village of Xiakalangu’er (Ergong County), some pottery and stone items were discovered in association with metal tools⁷²⁹. Judging from the objects uncovered in the hoards, in the Ili-Tacheng region the “family’s hoards” prevailed, suggesting that a family-based social division existed in these communities. At the same time, the absence of the “founders’ hoards” indicates that metallurgy was still a collective activity and not yet a prerogative of a specialized social class. Despite their significance from a social standpoint, hoards are sometimes difficult to analyse, date and understand, because of their lack of context. Nevertheless, deposits found in the Ili-Tacheng region have been rather safely assigned to the Bronze Age, on the basis of clear analogies with material from the Andronovo cultural sites. In particular, by examining the findings from Aga’ersen hoard in Gongliu County, Kuz'mina established two manners for dating steppe hoards: “The chronology of the hoards is established in the following manners: 1) Objects that have analogies in the western steppes are dated by the European chronology. These comprise chisels, sickles, and especially razors from the Shamshi

⁷²⁴ As mentioned in the previous paragraph (“Geographical setting”), North-western Xinjiang is part of the temperate desert-steppe zone.

⁷²⁵ KUZ'MINA КУЗЬМИНА, 1966, p. 98.

⁷²⁶ KUZ'MINA, MALLORY, 2007, p. 97.

⁷²⁷ WANG Bo 王博, CHENG Zhengguo 成振国, 1989.

⁷²⁸ LI Suyuan 李溯源, 2005; LI Suyuan 李溯源, 2014.

⁷²⁹ YU Zhiyong 于志永, 1998.

hoard that had a very limited sphere of distribution. This evidence makes it possible to date these hoards back to the 13th-9th centuries BC⁷³⁰. 2) The discoveries of the types present in the hoards in assemblages such as the following: an axe mould from Kayrak-Kum; axes in the Altai; adzes, chisels, sickles, single-bladed knives in the settlements of Fergana, and Eastern, Central, and Northern Kazakhstan, where such objects are found with ceramics with applied-roller that are clearly dated to the 13th-9th centuries BC on the basis of a wide set of analogies from the Danube and the Ukraine to Anatolia (Troy VIIB) and Iran (Tepe Giyan). This fact determines the original date of these hoards as well as the Agarshin (Aga'ersen) hoard⁷³¹. Accordingly, a plausible date for deposits in the Ili-Tacheng region may be around the second half of the second millennium BC until its end, corresponding to the final phase of the Andronovo tradition⁷³².

Cemeteries recovered from the Ili-Tacheng region were rather spread and most of them included graves marked on the surface by a round earth or stone mound. The mounds came in different sizes: in Sazi cemetery (Tuoli County) the diameter range was from 3.9 m to 8.4 m⁷³³, mounds in Tangbaleisayi (Nileke County) ranged from 5 m to 10 m⁷³⁴, while in Kuokesuxi cemetery no. 2 (Tekesi County) mounds ranged in diameter from 15 m to 35 m⁷³⁵. A lower number of sites included stone-fenced graves with no mounds and, in some cases, one enclosure contained more than one grave: for instance, at Adun Qiaolu (Wenquan County) two, three or even more tombs were fenced by a single rectangular enclosure. In the same cemetery an interesting arrangement “in rows” of three, five and even ten graves was observed during the last excavations in 2011-2012 and in 2014: these burials, mainly located in the southern side of the cemetery, were small and intentionally dug, one next to the other⁷³⁶ (Fig. 95). In 2013 in Wutulan village (Tekesi County), a large central grave, surrounded by sixteen smaller rectangular burials made of stone slabs, was recovered⁷³⁷. The whole complex was fenced by a round stone enclosure (Fig. 96). These kinds of burial arrangements suggest the existence of a tribal type of

⁷³⁰ This manner had already been proposed by Kozhombardiev and Kuz'mina in the 1908s. KOZHOMBERDIEV КОЖОМБЕРДИЕВ, КУЗ'МИНА КУЗЬМИНА, 1980.

⁷³¹ КУЗ'МИНА, MALLORY, 2007, pp. 262-263.

⁷³² Since objects from hoards in the Ili-Tacheng region shared numerous traits, Kuz'mina's considerations on the Aga'ersen material can be extended to the other aforementioned deposits.

⁷³³ XIA, 1996.

⁷³⁴ XIA, 2012b, pp. 13-16.

⁷³⁵ XIA, 2012a, pp. 4-6.

⁷³⁶ This arrangement was observed for at least six tombs (namely SM35, SM36, SM37, SM48, SM49, SM50), which were organized in two rows. Unfortunately limited information is provided since only the report of the excavation in 2011-2012 has been published, see: IAC, 2013, pp. 25-33; for further information see: JIA, BETTS, CONG Dexin, JIA Xiaobing, DUPUY, 2017, pp. 629-632.

⁷³⁷ XIA, 2014d, pp. 52-57; XIA, 2014a, pp. 38-44.

social organization in the communities in North-western Xinjiang⁷³⁸. The majority of the graves were rectangular, oval or square, while just in a few cases they were round or trapezoidal, such as those discovered at the Adun Qiaolu and in the Weixiao cemeteries respectively. A few distinctive burials were recovered from Wutulan (Tekesi County) and Kuokesuxi cemeteries (Zhoasu County), and specifically, graves with corridors or eastern semi-circular extensions (Fig. 97)⁷³⁹. Most of the graves were made of pebbles (Figs. 98.1, 2), even though some tombs built with stone slabs were found in Adun Qiaolu, Weixiao and Wutulan cemeteries (Fig. 98.3, 4). Simple pits were recovered from the funerary sites at the villages of Tangbaleisayi and Weixiao (Fig. 98.5). Sometimes different types of burial occurred in the same cemetery, such as at the Weixiao site. In a number of graves, long wooden slabs structures, regarded as funerary beds, were found (Fig. 99). Burial rites of cremation and inhumation were both practiced and sometimes they occurred in the same graves, as in burial M51 at Kuokesuxi, where a middle-aged man was buried together with some burned human remains (Fig. 100). Remains of cremated bodies alone were found in some of the graves in Weixiao and Wutulan cemeteries and in burial M16 in the village of Tangbaleisayi (Fig. 101.1). Regarding inhumation, the dead was generally placed inside the grave, but in a few cases, namely in burials M24 and M82 in the Kuokesuxi cemetery, the body was found in an eastern semi-circular extension (Fig. 101.2). As a rule, the dead lied on one side with bent legs, the head angled towards the west facing the north, and one or more pottery vessels situated next to or over the head (Figs. 102.1, 2). That said, a few bodies placed in different positions were discovered: in burials M24 and M82 in Kuokesuxi cemetery two skeletons were found on one side and supine respectively, both with the head angled towards the north and facing east (Fig. 102.3), while in grave M3 in Sazi cemetery a male body was discovered supine and extended, the head angled towards the west and facing the north (Figs. 102.4). No anthropological examinations have been performed on human remains from Bronze Age contexts in the Ili-Tacheng region. However, the analysis by Han Kangxin on several skulls from a later cemetery in Zhaosu County may provide some insights into the early population in North-western Xinjiang⁷⁴⁰. Thirteen skulls were taken from the Tudun cemetery (placed to around 400 BC-200 AD by carbon dating and typological comparison), and examined: according to the results, eleven skulls were Proto-European, pertaining to the Pamir-Fergana race, while two of them, both female, were of the Mongoloid race (Fig. 103). According to Ginzburg, the Pamir-Fergana race developed from an intermixture of the two Central Asian types,

⁷³⁸ The peculiar characteristics of the Wutulan site (which will be discussed later) suggest that this structure is unlikely to have been a regular cemetery, but it was probably a place where special ceremonies and rituals were performed.

⁷³⁹ XIA, 2014d, pp. 51, 54; XIA, 2014a, pp. 37-38; XIA, 2012a, pp. 4-6.

⁷⁴⁰ HAN Kangxin 韩康信, PAN Qifeng 潘其风, 1987; HAN Kangxin, 1998.

namely the Andronovo, which underwent through a gracilization process, and a Central Asian variant of the Mediterranean type that became brachycephalic⁷⁴¹. Despite the fact that this theory has been recently questioned⁷⁴², skulls of the Pamir-Fergana type have frequently been found in correspondence to remains of the Andronovo type, in various areas of Central Asia, from the Urals to Fergana and the Minusinsk Basin⁷⁴³. Additionally, several scholars have observed an admixture of Proto-European and Mongoloid types of skulls, occurring in the same context, in a number of sites in the north-eastern periphery of the Andronovo territory⁷⁴⁴: it is therefore plausible that during the Bronze Age the population of present-day Zhaosu County (and, perhaps, of the wider Ili-Tacheng region) was Proto-European, of the Pamir-Fergana type, and that the presence of Mongoloid skulls was due to a local or a later participation of Siberian people. The majority of the graves was single, even though, in some cases, double burials also occurred: in Weixiao cemetery some of the slab-stone graves contained two bodies, in burial SM50-2 in Adun Qiaolu site a 25-30 years-old woman was buried together with an infant, while in Tangbaleisayi, bodies of two old people (male and female) were found in grave M17⁷⁴⁵ (Fig. 104). Cemeteries in North-western Xinjiang were characterized by the interment of animal bones accompanying the deceased: in numerous cases sheep and goat bones were found inside the burials. On the contrary very few horse remains were found in Wutulan and Kuokesuxi sites.

An interesting structure, believed to have been a place of worship, was found in 2013 in Wutulan village⁷⁴⁶. It consisted of three parts (J1-J3), all investigated, which shared the same shape and characteristics (Fig. 105). The mysterious constructions had a radial plan, at the centre of which the head of an ox and a wooden pole were placed in J1, while the other two structures were empty in the centre. The radial grooves were filled with some metal ornaments, pottery fragments and several “biscuit-shaped” pebbles, of the type frequently found in the Ili-Tacheng region⁷⁴⁷ (Fig. 106). According to archaeologists, the shape of the worship structure showed analogies with the ceremonial

⁷⁴¹ GINZBURG, 1966.

⁷⁴² This theory, accepted for a long period, has recently been challenged by new research on human remains in Russia and Kazakhstan, which has opened a debate on the anthropological features of the ancient nomadic populations of the steppe and favoured the rise of a number of divergent opinions on this subject. For more information see: KOZINTSEV, 2008; HENKEY, HORVATH, 1998.

⁷⁴³ KUZ'MINA, MALLORY, 2007, p. 169.

⁷⁴⁴ See, for example, DREMOV ДРЕМОВ, 1997.

⁷⁴⁵ With respect to these burials, Professor Lev Klein (Saint Petersburg State University) has proposed a connection with the ancient Indian ritual of *deeksha* (or *diksha*). If Andronovans were Iranians, as a significant part of the scholars believes, it can be a plausible theory, since some Indo-Iranian rituals have been observed in the Andronovo funerary practice. However, there are still senior archaeologists, such as Professor Molodin, who show more caution. For more information and pictures of the recent discovery of Andronovo double burials and the interview with archaeologists see: LIESOWSKA, 2013; for more information on the Indo-Iranian in relation to the Andronovo rituals see: KUZ'MINA, MALLORY, 2007, pp. 185-198.

⁷⁴⁶ XIA, 2014a, pp. 44-46; XIA, 2014d, pp. 57-60.

⁷⁴⁷ XIA, 2014a, p. 56.

sites of the Catacomb cultural group (ca. 2600-2000 BC)⁷⁴⁸, while the stone artefacts recovered from the grooves resembled those found among the cultural remains of the Sintasha-Petrovka communities (dating to the end of the third millennium-beginning of the second millennium BC)⁷⁴⁹, suggesting the existence of ancient rituals in the Ili-Tacheng region brought from the west via the steppe. The funerary structure M3 (Fig. 107.1), recovered from the same village, may have also had a specific ritual function: the central larger grave was filled only with a few scattered human remains accompanied by a number of complete skeletons of a variety of animals (including sheep, goats, dogs, wolves and chickens), suggesting that this place was devoted to sacrificial/ritual activities (Fig. 107.2). Almost all the surrounding graves contained one child each⁷⁵⁰, further supporting the ritual function of this structure, and suggesting that local ceremonies involved children.

3.1.3.1 Grave goods

Besides not specified beads, poorly reported stone and bone tools and metal objects (which will be discussed later), grave goods consisted of pottery. Excavations in the Ili-Tacheng region have revealed that the main pottery production in the area consisted of *guan* containers made of grey sandy pottery. However, in a limited number of cases, such as in the hoards in the Xiakalanggu'er village (Ergong County) and Tangbaleisayi site, specimens made of red pottery prevailed. Pottery types were very few, the majority consisting of hand-made pots with a slightly flared rim, folded shoulders and a deep belly, while a very small group of flat-based *bei* cups was recovered from the site of Adun Qiaolu. Despite the fact that the assemblage was rather consistent, the *guan* pots could either have a flat or a solid base (Figs. 108.1-4). A small group of containers did not present any ornaments, such as some of those from the Tangbaleisayi, Wutulan and Kuokesuxi cemeteries (Figs. 108.1-4). If, on the contrary, they were decorated, *guan* pots were richly adorned with impressed or carved designs. Upward triangles, zigzag lines and pinched patterns covered the whole body, as on the specimen found in burial M3 in Sazi cemetery (Gongliu County) (Fig. 109.1), or were placed only on the portion under the rim, such as on the pots recovered from the Kuokesuxi and Weixiao cemeteries (Fig. 109.2). The hoard discovered in the village of Xiakalanggu'er contained numerous fragments of decorated pottery and, according to archaeologists, most of the original vessels were adorned under the rim with carved pinched patterns,

⁷⁴⁸ XIA, 2014a, p. 46.

⁷⁴⁹ XIA, 2014d, p. 62.

⁷⁵⁰ Of the sixteen graves, M16 contained an adult, while one double burial, including the cremated bodies of one adult and one child was also found. Unfortunately no other information on the latter grave has been provided. The remaining fourteen graves contained a single body of a child.

small crosses, small oblique lines and other simple motifs (Fig. 109.3). The type of pottery found in the Ili-Tacheng region and its decoration resemble the Andronovo tradition: evidence shows that similar containers were widely diffused throughout Central Asia, especially the Semirech'e region, and were also recovered from South-western Siberia⁷⁵¹ (108.5, 6).

Despite the fact that the aforementioned types of pots constitute the overwhelming majority of the vessels found in the Bronze Age sites in the Ili-Tacheng region, a distinctive and isolated specimen was recovered from the hoard at Xiakalangu'er village. This vessel was a red pottery pot with a flat base, prominent belly, four small mouths and relatively high necks (Fig. 110.1). One of the mouths was larger and placed in the centre, surrounded by the three other smaller openings. No similar vessels have been found in sites dating to the second millennium BC in North-western Xinjiang and its neighbouring regions. To a closer look, this single specimen is vaguely reminiscent of red pottery containers, with a globular shape and high neck, recovered from later contexts, such as the cemeteries at Sudunbulake (Chabucha'er County)⁷⁵² and Tiemulike (Xinyuan County)⁷⁵³, both dating to around the first millennium BC⁷⁵⁴. A later dating for this container is further supported by the discovery of a similar item in the Velikaja Aleksandrovka village, in the Ukrainian region of Cherson, dating to the Cimmerian period and, specifically, to around the eighth century BC⁷⁵⁵ (Fig. 110.2). It is therefore plausible that the four-mouthed vessel was placed in the hoard at a later date, perhaps sometime in the first millennium BC. In this period, North-western Xinjiang was occupied by Scythians groups, with whom Cimmerians were in contact⁷⁵⁶.

Noteworthy is also a small group of pottery containers from Wutulan, Jirentaigoukou and Adun Qiaolu (Fig. 111), which have been labelled as *guan* pots in the excavation reports⁷⁵⁷. These pots, characterized by a bucket-shaped body, a solid base and thick walls, share remarkable similarities with

⁷⁵¹ KUZ'MINA, MALLORY, 2007, p. 637, fig. 26; MOLODIN, MYLNIKOVA [et.al] 2014.

⁷⁵² XIA, 1999a, p. 24.

⁷⁵³ XIA, 1988, p. 63.

⁷⁵⁴ This consideration is made on the basis of the style only. None of the pottery pots recovered from Sudunbulake and Tiemulike have four mouths.

⁷⁵⁵ Although the specimen from the Velikaja Aleksandrovka village presents a more pronounced globular body, the peculiar shape of the vessel allows for a comparison with that from the Xiakalangu'er site. For a brief description of the Ukrainian pot and further information see: GLEIRSCHER, 2007, pp. 118-130, 339.

⁷⁵⁶ In particular by the beginning of the first millennium BC the Scythians conquered the Cimmerian territory and drove them away from Southern Russia. For an account see SULIMIRSKI 1954.

⁷⁵⁷ XIA, 2014d, p. 56; WANG Yongqiang 王永强, RUAN Qiurong 阮秋荣, 2016, p. 34; JIA, BETTS, CONG, JIA, DUPUY, 2017, p. 631, fig. 10.1.

the ingot moulds of the “cup type” recovered from South-eastern Asia⁷⁵⁸. The discovery of ingot moulds is of great importance for the understanding of the early communities in North-western Xinjiang, as indicates the existence of a local metallurgy. These metalworking-related containers were mostly found in residential sites and only few specimens, one from Wutulan and one from Adun Qiaolu, were included in a funerary context, accompanied by “regular” pots. This supports the theory that sees metallurgy as a communal activity in the Ili-Tacheng region during the Bronze Age. Furthermore, similarities with specimens from Non Pa Wai in Central Thailand (Fig. 111.3), not only gives strength to the existence of connections between South-eastern Asia and the northern steppe⁷⁵⁹, but also suggests that Xinjiang communities may have had a role in this system of exchange. However, more research is needed, especially on materials from Xinjiang, in order to have a clear picture of these possible early interactions.

3.1.4 Metallurgy

Small quantities of copper and bronze items were found in settlements, while in cemeteries and, to a greater extent, in hoards their number was considerably higher. Types of metal objects were few and, apparently, rather well established, consisting of ornaments, mirrors and several types of tools.

3.1.4.1 Personal ornaments

Decorative objects in the Ili-Tacheng region featured exclusively in cemeteries, while they were absent in settlements and hoards. Despite the relatively high number of ornaments found in the area, typologies can be grouped into only two categories: earrings and bracelets/anklets. Earrings were generally metal circles with a trumpet-shaped end, precisely of the type generally accepted to be distinctive of the Andronovo tradition (Figs. 112.1-4). However, among the specimens from North-western Xinjiang, a peculiar group of those found in the cemetery at Tangbaleisayi consisted of “double” trumpet-shaped-ended circles, presenting a smaller trumpet inside a larger one (Fig 112.3). These earrings were buried in association with the “classic” penannular specimens, suggesting that they may have been a local variant of the traditional Andronovo version. In structure M3 at Wutulan, and specifically in grave M3fm15, an extraordinary large earring was recovered: according to the picture

⁷⁵⁸ Taken from a personal conversation with Prof. Ciarla.

⁷⁵⁹ PIGOTT, CIARLA, 2007; WHITE, HAMILTON, 2009.

included in the report, the specimen had a diameter of nearly 10 cm (the average diameter is 4-5 cm), which would indicate that it was made for ritual purpose only (Fig. 112.4). Another explanation can be that this object was not a earring, but a different personal object, such as a bracelet: if this was the case, it can be interpreted as a local product, whose shape was adopted from that of the Andronovo earrings. Unfortunately, information on this item is rather incomplete and contradictory, thus it is difficult to formulate a valid interpretation⁷⁶⁰. In spite of these few different items, evidence shows that the overwhelming majority of the earrings recovered from Bronze Age sites in the Ili-Tacheng region were of the type widely found in the Andronovo territory. In particular, judging from their geographical distribution, penannular earrings seem to have been specifically peculiar of the Andronovo eastern communities⁷⁶¹. In fact, they were mostly spread in the territory throughout Kazakhstan⁷⁶², Uzbekistan⁷⁶³ and South-western Siberia⁷⁶⁴, where specimens made of gold or gilded were recovered in association with those made of copper and bronze⁷⁶⁵ (Figs. 112.5-8). While most of the specimens from the Ili-Tacheng region were made of bronze, in the Adun Qiaolu site a gilded penannular earring was found (Fig. 112.1). This discovery is additional evidence of close relationships between local communities and western gold-producing groups, such as the Andronovans⁷⁶⁶. Further east, these penannular earrings occasionally featured in China during the second millennium BC, in Gansu, Inner Mongolia, Hebei, Tianjin and Beijing. Specifically, bronze, silver and gold trumpet-ended earrings were found at Zhukaigou site (Ordos City, Inner Mongolia), belonging to the Zhukaigou tradition (ca. 2000-1400 BC)⁷⁶⁷, and in Donghuishan village (Minle County, Gansu), assigned to the Siba cultural group (ca. 1900-1500 BC)⁷⁶⁸. Other specimens featured in Hebei, Tianjin, Beijing and Liaoning, in correspondence to sites assigned to the Lower Xiajiadian community (ca. 2200-1600 BC), especially to its later phase represented by the finds at Datuotou (ca. 1900-1400 BC), and in several Weifang III cultural centres (c. 1300-1100 BC)⁷⁶⁹ (Figs. 112.9-11). The discovery of these earrings in early Chinese

⁷⁶⁰ In spite of the information recorded in the illustration, the text reports a diameter of 5.3 cm. In addition, the grave was found in poor conditions, therefore it is impossible to establish the original position of the ornament.

⁷⁶¹ KUZ'MINA КУЗЬМИНА, 1966, pp. 75-76.

⁷⁶² In Borovoe, Sanguyur and Tautari cemeteries, and in the Tash-Tyube, Tasty Butak and Targimen-sai sites. KUZ'MINA, MALLORY, 2007, pp. 264-267; KUZ'MINA, MAIR, 2008, p. 201, fig. 57.

⁷⁶³ In Dzarkutan site. KANIUTH, 2007, p. 29.

⁷⁶⁴ In Malyi cemetery, close to Tomsk. GIMBUTAS, 1965, p. 101, fig. 61.

⁷⁶⁵ KUZ'MINA, MALLORY, 2007, p. 264

⁷⁶⁶ For a discussion see the second chapter of this research, "Eastern Xinjiang".

⁷⁶⁷ WU En 乌恩, 2007, p. 76 figs. 35, 1-15, p. 82 figs. 39 1-4, p. 78 fig. 36.

⁷⁶⁸ Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Jilin Daxue Beifang Kaogu Yanjiu shi 吉林大学北方考古研究室 (Laboratory of Northern Archaeology of the Jilin University), 1998, p. 7 fig. 7, p. 24 fig. 19, p. 51 fig. 44, p. 93 fig. 69.

⁷⁶⁹ Among others, penannular earrings were found in Hebei, in several sites in Lijiadian County (JIN Junli, 2009, p. 421.), in Jianxin site, Laishui County (Hebei sheng Wenwu Yanjiusuo 河北省文物研究所 [Hebei Institute of Cultural Relics], 1992), and in the Xiaoshandong village, Qian'an County (LI Zongshan 李宗山, YIN Xiaoyan 尹小燕, 1995); other specimens were recovered from the Zhangjiayuan site,

sites has raised a number of questions about their diffusion in Eastern Asia. In fact, assuming that penannular earrings were actually Andronovo cultural products, evidence shows that they reached prehistoric communities in Eastern China in the same period, or even earlier, than they featured in the Ili-Tacheng region. In this regard, the theories by Bunker and Mei on the existence of northern routes connecting Central Asia and North-eastern China, bypassing the territory of Xinjiang (the “Fur Route” and “Steppe Route” respectively, already mentioned in the previous chapters of this research)⁷⁷⁰, may provide an explanation of the presence of Andronovo earrings in Eastern Asia in such early times⁷⁷¹. In spite of the potential validity of these theories, they still lack sufficient evidence, therefore, questions on the spread of the Andronovo penannular earrings still remain unanswered. That said, according to the available material, it seems that by the second millennium BC, these items featured regularly in the eastern Andronovo territory, which was geographically very close to the Ili-Tacheng region. Therefore, it can be rather safely argued that the specimens recovered from North-western Xinjiang may have been products of connections established between the Andronovans and the local communities in the Ili-Tacheng region in the second millennium BC. Notably, according to the excavated material, it seems that no other kinds of earrings were used in that period in North-western Xinjiang.

Bracelets and anklets made of small bronze and copper beads were found in some graves in the Ili-Tacheng region: in the double burial M17 in Tangbaleisayi cemetery, an old female wore one anklet on each foot and one bracelet, while a male wore only one anklet (Figs. 113.1-3). In the same funerary site, burial M15 contained a male body wearing anklets on both feet⁷⁷² (Fig. 113.4). The bracelet and the anklets found in burials M17 and M15 in Tangbaleisayi cemetery are some of the rare complete (or almost complete) specimens discovered in the Ili-Tacheng region. In fact, more often only a small number of scattered beads were found among the archaeological remains: in the cemetery at Kuokesuxi (Tekesi County) and Abudula (Tacheng City), a few holed beads were recovered from burials M51 and M1 respectively⁷⁷³. The custom of adorning the dead with anklets and bracelets made of beads can be traced back to the fourth millennium BC, when the Pit Grave community (ca. 3300-2600 BC), in Western Asia and the Afanasevo cultural group (ca. 3500-2500 BC) in South-western Siberia produced

Ji County, Tianjin (Tianjin shi Lishi Bowuguan Kaogu Dui 天津市历史博物馆考古队 1993), and around Beijing (Beijing shi Wenwu Guanli chu 北京市文物管理处 [Beijing Municipal Cultural Relics Administration Office], 1976), and in Pingdingshan village, Fuxin County, Liaoning (Liaoning sheng Wenwu Kaogu Yanjiusuo 辽宁省文物考古研究所 [Liaoning Provincial Institute of Cultural Relics and Archaeology], 1992).

⁷⁷⁰ BUNKER, 1993, p. 31; BUNKER, 2012, p. 17; MEI Jianjun, 2003a, pp. 24-28.

⁷⁷¹ BUNKER, 1993, p. 31.

⁷⁷² XIA, 2012b, pp. 14-15.

⁷⁷³ XIA, 2012a, p. 7, fig. 10; beads found in grave M1 in Abudula cemetery were made of iron, suggesting a later dating for this site, though archaeologists placed it around 2000 BC. XIA, 2016, pp. 58, fig. 25.

similar objects, though made animal bones and only occasionally of metal beads⁷⁷⁴. Simple bracelets and anklets made of bones beads were found in association with others, made of copper circles and beads, in the cultural sites of the Catacomb community (ca. 2600-2000 BC) in Western Asia (Figs. 113.5-7). In the second millennium BC they featured among the Andronovo remains. Although the cone-shaped spiral-ended bracelets have been considered more distinctive of this community (among others, they were widely recovered from Tuva, Upper Ob region, Tomsk, Baraba, middle Irtysh region, Eastern, Central, Northern and Southern Kazakhstan, forest-steppe Tobol region and Central Asia⁷⁷⁵), beads forming bracelets and anklets have been rather commonly discovered in Andronovo cultural sites. They featured in the Kazakhstan, at Tasty Butak and Tash-Tyube II, and they regularly appeared in correspondence to the Andronovo cultural remains in the Yenisei region⁷⁷⁶ (Figs. 113.8-10). Furthermore, they were found in the residential and funerary sites of the Andronovo-type community of Pakhomovskaya, in the forest-steppe region of the Tobol-Irtysh Basin⁷⁷⁷ (Fig. 113.11).

3.1.4.2 Mirrors

Mirrors were recovered from a number of archaeological sites in North-western Xinjiang, such as the Nazituobie and Zeketai hoards (Tekesi County and Xinyuan County respectively), where round plain mirrors with no handles were found⁷⁷⁸ (Figs. 114.1, 2). Notably, in Jirentaigoukou site moulds for casting round mirrors with back handles were unearthed from settlement no. F2⁷⁷⁹ (Fig. 114.3), suggesting the existence of an established local metallurgy. As stated in second chapter (“Eastern Xinjiang”), the origin of round mirrors with or without protruding handles is still object of debate. Whether they were produced for the first time in the west (Turkmenia or Bactria)⁷⁸⁰ or in the east (North-western China, Gansu-Qinghai region and Eastern Xinjiang)⁷⁸¹, it seems that by the second millennium BC mirrors were produced by the communities in Eastern Xinjiang⁷⁸² and Gansu-Qinghai⁷⁸³, while further west, a wide range of mirrors (round and square in shape, with protruding,

⁷⁷⁴ GRYAZNOV, 1969, fig. 3; GRYAZNOV ГРЯЗНОВ, 1999, p. 92. Some specimens related to the Pit Grave and Afanasevo cultural groups are displayed at the Hermitage Museum.

⁷⁷⁵ KOVTUN KOBTYH, 1999, pp. 21-26.

⁷⁷⁶ KUZ'MINA, MAIR, 2008, p. 172, fig. 28.

⁷⁷⁷ MOLODIN, MYLNIKOVA, SELIN [et. al], 2015.

⁷⁷⁸ LI Suyuan 李溯源, 2014, pp. 102-103.

⁷⁷⁹ WANG Yongqiang 王永强, RUAN Qiurong 阮秋荣, 2016, p. 134, fig. 1.

⁷⁸⁰ FITZGERALD-HUBER, 1995, p. 53; KUZ'MINA, MALLORY, 2007, p. 264.

⁷⁸¹ SONG Xinchao 宋新潮, 1997, pp. 147-169; LIU Xuetang 刘学堂, 1993, pp. 121-131; LIU Xuetang 刘学堂, 1998, pp. 55-72.

⁷⁸² See some pictures in Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, pp. 36, 89.

⁷⁸³ MEI Jianjun, 2000, p. 127.

round or long handles) was discovered throughout an expansive area including Central Asia, South-western Siberia and the Altay region, in correspondence to Andronovo cultural sites (Figs. 114.4-6). The geographical proximity of the Andronovo territory suggests that mirrors in the Ili-Tacheng region were products of connections established with this cultural group. Despite the variety of the Andronovo mirrors, their number remained relatively low⁷⁸⁴. This is especially true for some areas, such as South-western Siberia and the Altay region, where mirrors were usually found in association with richer graves, suggesting that in these territories they were rather valuable items and significant indicators of the social position of the dead⁷⁸⁵. It is not clear yet whether the same high value was given to these objects by the Ili-Tacheng communities. However, since the overwhelming majority of mirrors was recovered from hoards, one can speculate that, although not necessarily connected with funerary rituals (very small quantities of them were indeed found in cemeteries), they were still included among the “precious objects” to be concealed. According to archaeological evidence, in Xinjiang territory round mirrors were not common before the first millennium BC: in fact, with the exception of the specimens discovered in Eastern Xinjiang⁷⁸⁶ and in the Ili-Tacheng region, most of the mirrors were related to later contexts, generally assigned to the final stage of the Bronze Age or early Iron Age and placed from 1000 BC onward⁷⁸⁷. This further supports the theory according to which the presence of mirrors in North-western Xinjiang was connected to the Andronovo influence in the region.

3.1.4.3 Tools

During the Bronze Age, metal assemblages in the Ili-Tacheng region included a wide range of copper and bronze tools. Judging from the high quantity of common utensils unearthed from hoards, they were probably used by the local community on a regular basis, indicating that metal implements had now completely superseded stone ones⁷⁸⁸. The fairly numerous metal tools recovered from funerary sites

⁷⁸⁴ TISHKIN, SEREGIN, 2014, pp. 63-65.

⁷⁸⁵ TISHKIN, SEREGIN, 2014, pp. 64-65.

⁷⁸⁶ Among others, mirrors were recovered from cemeteries at Tianshan Beilu, Wupu and Yanbulake. Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, pp. 36, 57, 89, 107, 145.

⁷⁸⁷ Among others, mirrors were discovered in the cemeteries at Liushui (Yutian County, Hetian Prefecture), Qiemu'erqieke (Altay City, Altay Prefecture) and Qunbake (Luntai County, Bayingolin Mongol Autonomous Prefecture). Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Archaeological Team, Institute of Archaeology, Chinese Academy of Social Science), 2006, p. 36, fig. 2.5; QI Xiaoshan 祁小山, WANG Bo 王博, 2008, p. 223, fig. 6; Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Team of the Institute of Archeology, Chinese Academy of Social Sciences), Xinjiang Bayinguoleng Menggu Zizhizhou Wenguan Suo 新疆巴音郭楞蒙古自治州文管所 (Institute of Cultural Relics of the Xinjiang Bayingolin Mongolian Autonomous Prefecture), 1987, p. 993, fig. 10.

⁷⁸⁸ It seems that stone continued to be used only on a small scale for manufacturing mills, pestles and other simple objects, as shown by the remains from Weixiao. LI Xiao 李肖, 1991, p. 104.

were also very common in style, suggesting that they were buried with the owner after their use, rather than made only for ritual purposes. Bronze and copper utensils were discovered in a very limited number of settlements, such as that at Adun Qiaolu, where an awl was found. The scarcity of metal tools in the residential sites may be due to the fact that they were put in “family’s hoards” when the community temporarily abandoned the settlement, during the seasonal movement of livestock, with the intention of using them again the following year. An other explanation can be that, since settlements were easy targets for outside invaders, these objects were simply stolen⁷⁸⁹. Among weapon-tools a fairly large quantity of shaft-hole axes was recovered, mostly from hoards. As observed by Chernykh, these objects were among the most precious items, due to the significant quantity of metal used to make them. In fact, these axes featured a heavy head, a shaft hole, while the blade was roughly rectangular, with a triangular section. The butt was carved with loop-like or net-like decorations, clearly resembling the Andronovo specimens⁷⁹⁰ (Figs. 115.1, 2). Chernykh analysed the distribution of this specific tool in Eurasia, providing a valid theory on its spread throughout prehistory⁷⁹¹. Shaft-hole axes seem to be widespread already in the fourth millennium BC in Northern Caucasus⁷⁹². The discovery of similar specimens dating to around the same period in modern Tajikistan is still unexplained, although Chernykh tentatively connected them to the Namazga III community (Fig. 115.4)⁷⁹³. By the end of the fourth-early third millennium BC, shaft-hole axes were present in Northern Caucasus, in Transcaucasia and in the Eastern European steppe region, where they were found in correspondence to the cultural remains of the Kuro-Araks⁷⁹⁴ (ca. 3500-2500 BC), Maikop⁷⁹⁵ (ca. 2900-2300 BC) and Pit Grave (ca. 3300-2600 BC) communities respectively (Figs 115.5-7). During the Middle Bronze Age (ca. third-

⁷⁸⁹ Considering that some tools (like axes) were made with a great amount of bronze, they most likely were of some value, since they could be melted in order to re-use metal material.

⁷⁹⁰ For some clear images of Andronovo shaft-hole axes see: IVANOV ИБАHOB, 2014, in particular, see figs. 1-5.

⁷⁹¹ CHERNYKH, 1992, pp. 153-156.

⁷⁹² More generally, Chernykh believes that Copper Age communities occupied Western Asia in the fourth millennium BC. CHERNYKH, 1992, pp. 67-82.

⁷⁹³ CHERNYKH 1992, p. 48. One specimen, similar to those found in Eastern Europe and Eastern Asia, was a surface finding, collected in 1983 in the settlement of Sarazm, where numerous remains of the Namazga III have been discovered. In spite of a possible dating for the axe by Isakov to the fourth millennium BC (ISAKOV ИСАKOB, 1983, p. 56), the cultural position of the intere site, as well as its chronology, remains unclear. For more information on the Sarazm settlement see: ISAKOV, 1981, chapter 12; ISAKOV ИСАKOB, 1983.

⁷⁹⁴ The Kuro-Araks community occupied Transcaucasia from 3400-2000 BC and was mainly devoted to agriculture, even though evidence of domesticated goats, sheep, cattle and horses was found. Cemeteries were characterized by kurghans and flat burials. Metal objects belonging to this group include tools and flat bracelets. For further information see CHERNYKH, 1992, pp. 57-67; KOHL, 2007, pp. 86-101.

⁷⁹⁵ The Maikop group occupied Northern Caucasus in the fourth millennium BC and was socially stratified: extremely rich kurgans containing bronze, gold and silver artefacts have been regarded as “royals”. For more information see CHERNYKH, 1992, pp. 66-83; KOHL, 2007, pp. 72-85.

second millennium BC) these objects, not only still featured among the remains of the Trialeti⁷⁹⁶ (ca. 2000-1500 BC), Karabudakhkent⁷⁹⁷ (second half of the third-early second millennium BC) and Catacomb (ca. 2600-2000 BC) cultural groups in Western Asia and Eastern Europe⁷⁹⁸ (Figs. 115.8-10), but they spread further east to the Volga and Ural regions up to Uzbekistan, as demonstrated by the findings in sites assigned to the Poltavka⁷⁹⁹ and Namazga IV-V⁸⁰⁰ communities⁸⁰¹. By the Late Bronze Age (ca. second-first millennium BC) they were distinctive objects of the Andronovo cultural group in Central Asia (Figs. 115.11, 12). Notably, shaft-hole axes, earlier than the Andronovo's, did not generally carry the peculiar decoration on the butt⁸⁰². This suggests that the carved loop and net-like designs may have been a later and eastern development of this object, perhaps introduced by the Andronovans, and then spread to the Ili-Tacheng region. Chernykh's theory, which basically suggests that shaft-hole axes originated in the west, is valid, though it neglects the remains from Central Asia. It is true, however, that findings assigned to the Copper Age and early Bronze Age in Central and Eastern Asia remain very confused, especially with respects to the relative and absolute chronologies: the complicated stratigraphy of many excavated sites has not yet allowed the organization of the remains into a safe cultural framework, and the still too few carbon dating yet performed, prevent the establishment of their chronology. As a consequence, some important artefacts, such as the early mysterious shaft-hole axe found in the residential site at Sarazm, in present-day Tajikistan, is still difficult to assign, date and understand. The axe can be attributed to a Copper Age metal-using local community, such as that of Namazga III, as suggested by Chernykh⁸⁰³ on the basis of Isakov's tentative dating to ca 4000 BC⁸⁰⁴. However, as Isakov himself correctly noticed, the settlement can be assigned to the Copper Age (Namazga III), early Bronze Age (Namazga IV) or mid-Bronze Age (Namazga V)

⁷⁹⁶ The Trialeti community, settled in Southern Georgia during the second millennium BC, is mostly known from funerary contexts, which were characterized by kurgans. Burial objects include painted pottery and metal objects, bronze weapons and gold and silver vessels. For further information see CHERNYKH, 1992, pp. 110-114.

⁷⁹⁷ The Karabudakhkent community followed the Kuro-Araks and was characterized by a sedentary lifestyle. Material belonging to this cultural group includes pottery, cornelians and various beads, in addition to a large quantity of arsenic bronze objects. For more information see CHERNYKH, 1992, pp. 122-124.

⁷⁹⁸ Among others, they were recovered from the Skankun (Northern Caucasus) and Rybakovka deposits, in present Ukraine. Additionally, more specimens were found in the Kurgan 6 at Bichkin Buluk, in the Lower Volga region. For a more complete list of the sites, where axes were found see CHERNYKH, 1992, pp. 126-131.

⁷⁹⁹ The Poltavka community consisted of herders, who occupied the Volga-Ural region during the first half of the third millennium BC. Poltavka burials were characterized by single kurgans and a small quantity of funerary goods, while the practice of horse sacrifices was verified. ANTHONY, 2010, pp. 386-388.

⁸⁰⁰ Namazga-Tepe is a multi-phase archaeological site, excavated by Masson, Sarianidi and Khlopin from the 1950s, which set the chronology for the Bronze Age sites in Turkmenistan. For further information see MASSON, SARIANIDI 1972.

⁸⁰¹ As it will be explained later, this assertion did not take into account the mysterious shaft-hole axe found in Sarazm, which may have been the predecessor of those recovered from Namazga IV-V.

⁸⁰² KUZ'MINA, MALLORY, 2007, pp. 153-156.

⁸⁰³ CHERNYKH, 1992, p. 48.

⁸⁰⁴ ISAKOV ИСАКОВ, 1983, p. 56.

on the basis of typological comparisons⁸⁰⁵, therefore the chronology of the shaft-hole axes still remains unclear⁸⁰⁶. If shaft-hole axes from the Ili-Tacheng region were similar to those of the Andronovo community, they differed from the specimens called “L-shaped”, recovered from Eastern Xinjiang, in the Gansu-Qinghai region and further East in Hebei and Liaoning⁸⁰⁷. As stated in the previous chapter, it is still unclear whether the two types of axes had a common origin or were distinctive products of separated cultural groups. Nevertheless, according to the available sources, it is plausible that the type of shaft-hole axes found in the Ili-Tacheng region originated in the west and reached North-western Xinjiang via the mediation of nomad populations, most likely the Andronovans.

Numerous sickles were found in the north-westernmost part of Xinjiang, suggesting that local communities practised some agriculture. Specimens from the Ili-Tacheng region mostly came from deposits and were curved and perforated. In some cases, the blade and the head were divided by a deep groove and the upper part was sometimes decorated by impression with simple lines or net designs (Figs. 116.1, 2). In the second millennium BC, metal curved sickles seem to have been products of two main Bronze Age cultural groups: the Timber Grave (c. 1900-1100 BC) in the west⁸⁰⁸ (Fig. 116.3), and the Andronovo (ca. 1900-1200 BC) in the east (Figs. 116.4, 5). According to Kuz'mina, in the second half of the second millennium BC these curved sickles were widely diffused throughout a large area from Eastern Europe (among others, they were found in the Alexeevka deposit in present Moldavia) to the Volga region (Sosnova-Maza hoard) to Xinjiang, to South-western Siberia⁸⁰⁹, suggesting that farming had spread among the semi-nomads communities, including those in the Ili-Tacheng region. Although artefacts from these regions shared some traits, sickles recovered from the Ili-Tacheng region were clearly similar to those found in the Andronovo cultural sites in Central Asia and, specifically, in the Semirech'e region: the curved perforated sickles, with no upward pointed end, found in North-western Xinjiang, had parallels with findings from the hoards in Kyrgyzstan, such as that at Sukuluk and Sadovoe, and in the deposits on the Chu River, as well as those in Kazakhstan, in Kent and Shamshi⁸¹⁰ (Figs. 116.4, 5). Except for the Ili-Tacheng region, in other parts of Xinjiang Province these sickles were rare in the second millennium BC. Some curved specimens were found in sites placed to

⁸⁰⁵ The attributions were made according to chronological indices, such as polychrome pottery, shaft-hole axes, and so on. However, these artefacts were mostly surface or accidental findings, thus lacking of archaeological and chronological contexts. ISAKOV, 1981, chapter 12.

⁸⁰⁶ New information can be gained in PARZINGER, 2013.

⁸⁰⁷ See the second chapter of this dissertation “Eastern Xinjiang”.

⁸⁰⁸ GIMBUTAS, 1961, p. 21.

⁸⁰⁹ KUZ'MINA, MALLORY, 2007, pp. 142-144, 260.

⁸¹⁰ KUZ'MINA КЫЗЬМИНА, 1966, pp. 11-14; KUZ'MINA, MALLORY, 2007, p. 260; IVANOV ИВАНОВ, 2014, in particular see figs. 1-5.

end of the millennium at Aketala, in the Pamir region (ca. 1000 BC) (Fig. 146)⁸¹¹ and Niya Beifang (ca. 1000 BC) in Southern Xinjiang⁸¹² (Fig. 184), however they were made of stone and not perforated. One sickle, identical to those from the Ili-Tacheng region, was recovered from Tianshan Beilu cemetery in the Hami oasis (Hami Prefecture) dating to ca. 2000-1400 BC⁸¹³ (Fig. 83.6). Although the early dating of the sickle from the Tianshan Beilu cemetery is of high interest in the perspective of a possible eastward expansion of the Andronovo community, the failure in reporting the site only allows for some speculative considerations: first, according to the available material, only one specimen was found⁸¹⁴, suggesting the existence of a weak and most likely indirect influence of the Andronovo traditions on the communities in Eastern Xinjiang; second, the involvement of the communities in the Ili-Tacheng region in the early contacts between the Andronovans and the populations of Tianshan Beilu, is possible, yet not convincing, since the dating of the latter is very early. Actually most of the remains of the Andronovo-type have been recovered from sites in Western Xinjiang, while in other areas of the province only few and scattered findings have been occasionally discovered⁸¹⁵: therefore at the moment it seems premature to speculate on the existence of west-east interactions across the Xinjiang territory during the second millennium BC.

In Xinjiang spades and celt-spades have rarely been found in sites dating prior to the first millennium BC, and earlier specimens, dating to the second millennium BC, were discovered only in Eastern Xinjiang and in the Ili-Tacheng region (Figs. 117, 118.1-3). However, while the former had a loop on each side⁸¹⁶, specimens from the Ili-Tacheng region were roughly square in shape, had an oval protruding socket and, sometimes, were decorated by carving with triangles, lines or crosses designs (Fig. 117). Although in the Bronze Age spades or celt-spades of this type were widely diffused throughout Kazakhstan and South-western Siberia, the highest quantity of these objects was recovered

⁸¹¹ Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977, p. 109.

⁸¹² YUE Feng 岳峰, YU Zhiyong 于志勇 1999, pp. 12-13.

⁸¹³ Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 94.

⁸¹⁴ The site has not been reported. This information comes from the examination of the catalogue of the Hami Museum, and my personal conversation with scholars and archaeologists during my visit to Xinjiang in 2016.

⁸¹⁵ One sickle was recovered from Tianshan Beilu cemetery, while few remains of the Andronovo type were found in the Altay region: an axe was found on the surface in Dure County and a penannular earring was unearthed from grave M78 in Suke'erte, dating to the end of the second millennium BC. These objects have been described in the previous chapter "The Altay region".

⁸¹⁶ Outside the Ili-Tacheng region, most of the spades found in Xinjiang, such as those from Hami, were double looped, a type, which has been considered distinctive of the Seima-Turbino metallurgy (CHERNYKH, 1992, p. 219). In addition, later looped spades from Southern Xinjiang were most likely connected to the Karasuk production (ca. 1200-900 BC). Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Archaeological Team of the Institute of Archaeology, Chinese Academy of Social Science), 2006, p. 36; QI Xiaoshan 祁小山, WANG Bo 王博, 2008, p. 57, fig. 4; see also the fourth chapter of this research "The southern rim of the Tarim Basin", especially fig. 201.

from the Semirech'e region and in the Fergana Valley⁸¹⁷ (Figs. 118.4, 5). In particular, celt-spades featuring carved decorations on the sides of the socket were recovered from sites at Ringitam, Tup (or Tyup) and Beshkek⁸¹⁸ (Figs. 118.4b, 4f). Given the geographical distribution of these findings, it has been suggested that the centre of production was limited to the present-day Kyrgyzstani territory (specifically the regions of Semirech'e and Fergana)⁸¹⁹ and from here they spread to the neighbouring regions, including North-western Xinjiang, sometime in the second half of second millennium BC.

Despite having been rarely found in Xinjiang, a small number of miniature celt-hammers was discovered in the Arg'esen hoard⁸²⁰ (Figs. 119.1, 2). These specimens shared characteristics with findings in the Sodovoe and Shamshi hoards in present-day Kyrgyzstan⁸²¹ (Fig. 119.3).

Single-bladed knives were largely recovered from hoards, while they were more rare in other contexts in North-western Xinjiang: among others, in Nazituobie village nine items were discovered, at the Zeketai hoard two knives were found, while a number of specimens were unearthed in non-specified locations in the Xinyuan County⁸²² (Figs. 30.1,2). The single-bladed knives in the Ili-Tacheng region generally presented a clear distinction between the narrower handle, which was usually grooved around the contours, and the wider blade. Similar knives have been widely recovered from the Andronovo cultural sites in Kyrgyzstan, at Issyk-kul and Sadovoe (Figs. 120.3, 4), and in South-western Siberia, in the hoard of Preobrazhenka (Fig. 120.5).

Chisels found in the Ili-Tacheng region usually had a round socket with a lug and a flat blade (Figs. 121.1-3). The specimens unearthed from the hoards at Aga'ersen and Zeketai and those collected in the Zhaosu County, resembled chisels recovered from the hoards of Shamshi, Sukuluk, Sodovoe and Beshkek (Kyrgyzstan) (Figs. 121.4-7). The latter were all located in the region of Semirech'e, which was occupied by the Andronovo people during the second millennium BC⁸²³, suggesting that the occurrence of this type of chisels in the Ili-Tacheng region was connected with the Andronovans.

⁸¹⁷ KUZ'MINA КУЗЬМИНА, 1966, pp. 24-25; SILVI-TONINI, ВАЈПАКОВ, 1999, fig. 33; KUZ'MINA, MALLORY, 2007, pp. 261, 961 fig. 77.

⁸¹⁸ KUZ'MINA КУЗЬМИНА, 1966, pp. 24-25.

⁸¹⁹ KUZ'MINA, MALLORY, 2007, p. 261.

⁸²⁰ LI Suyuan 李溯源, 2014, fig. 1.12.

⁸²¹ KUZ'MINA КУЗЬМИНА, 1966, p. 23.

⁸²² LI Suyuan 李溯源, 2014, p. 105, fig. 5.8.

⁸²³ KUZ'MINA КУЗЬМИНА, 1966, p. 26; KUZ'MINA, MALLORY, 2007, p. 259; KUZ'MINA, MAIR, 2008, p. 102.

3.1.4.4. Remarks on metallurgical examinations

A number of metallurgical studies have been conducted on metal objects from the Ili-Tacheng region since the 1990s. Of particular interest are the results of Li and Dang's metallurgical research on bronze samples, taken from three objects recovered from Tuoli and Gongliu Counties and Tacheng City⁸²⁴. The artefacts were placed by the authors to around 1500-1000 BC by typological comparison and assigned to the Bronze Age. The analysed fragments were found to be made of tin bronze. Specifically, samples taken from two axes found in the villages of Woxuete (Tuoli County) (91TW:1) and Axi'er (Tacheng City) (91TA:1) had a tin content of 2.88% and 6.8% respectively, with an additional presence of lead, at 3.68% and 4.69% respectively. A sample taken from a sickle recovered from the Aga'ersen hoard (Gongliu County) (76GLA:6) was made of an alloy of copper, tin and zinc, but, unfortunately, the content of the single components is not available (Fig. 122). Despite the useful results, the work of Li and Dang has been criticised for the lack of information regarding the methods used for the analysis, and for failing to treat the samples adequately during testing, as the results may have been influenced by the presence of corrosion impurities⁸²⁵. A few years later, Mei carried out further examinations on three samples, taken from as many objects, found in unspecified contexts in the Tacheng region⁸²⁶. These objects were a sickle and two axes, the latter possibly being those from the villages of Woxuete and Axi'er, which had been previously analysed by Li and Dang⁸²⁷. The artefacts were placed to around 1500-1000 BC using the typological comparison employed by Li and Dang years earlier. The sickle was found to be made of tin bronze, although the tin content was very low (1.98%), while the two axes were also manufactured with the same alloy, albeit containing a higher percentage of tin (6.03% and 9.6% respectively) (Fig. 123). The samples additionally underwent metallographic analysis in order to understand their microstructure and therefore, their technological production processes. The sickle and one of the axes (nos. 113 and 117)⁸²⁸ presented a twinned structure, which demonstrates that the objects were forged and annealed after casting. Taking into consideration the distorted twin planes and the irregular shape of the grains, Mei stated that the axe was most likely subjected to a heavy cold-working after annealing. In both cases, the dendritic structure, which was distinctive of ancient

⁸²⁴ LI Xiao 李肖, DANG Tong 党彤, 1995.

⁸²⁵ MEI Jianjun, 2000, p. 38.

⁸²⁶ It is not clear whether the "Tacheng region" corresponds to the present-day Tacheng Prefecture or Tacheng City. MEI Jianjun, 2000, pp. 41-43.

⁸²⁷ Whether the samples examined by Li and Dang in 1995 and by Mei in 2000 were taken from the same axes is not specified in Mei's work. However, judging by illustrations and references this appears likely.

⁸²⁸ In Mei's work the sickle has been numbered 113, while the two axes has been referred to as nos. 116 and 117. MEI Jianjun, 2000, pp. 41-43.

castings, was erased by later processes of forging, annealing and cold-working⁸²⁹ (Figs. 124.1, 3). The structure of the third sample (no. 116) was characterized by polygonal grains: specifically, the irregular grains and several deformation bandings indicate that the object was not intensively forged, but subjected to some cold-working⁸³⁰ (Fig. 124.2).

Despite the low number of samples examined, some considerations may be drawn. As stated in the previous chapter, tin bronze appeared in South-western Asia as early as the fourth millennium BC and reached Central and Eastern Asia in the following millennia via the steppe. This process was probably connected to the growth of the Andronovo community, who exploited the ores located in the narrow belt stretching from Europe to South-eastern Asia⁸³¹. To a closer look, the results of the metallurgical examinations on samples from the Ili-Tacheng region reveal that they generally contained a percentage of tin within a range of 2 to 10%. As early as the beginning of the 1990s, Chernykh established that 90-100% of Andronovo bronze objects contained nearly the same amount of tin⁸³², which suggests the existence of a common metallurgical knowledge, to the Andronovans and the communities in North-western Xinjiang. With respects to the technological processes, the analysis showed that techniques of casting, forging and annealing were all employed in the Ili-Tacheng region. These processes, especially those of forging and casting, have been known since the fifth millennium BC in a wide area stretching from the Balkans to the Dnieper region and, probably, even to the Volga River⁸³³. Since then, these metallurgical technologies spread widely throughout Eurasia and beyond, probably as a consequence of the rise of nomadic metal-using communities in the Eurasian steppe. Early evidence of forging and casting technologies in North-western China are controversial and currently object of hot debates⁸³⁴. They were employed in the late third millennium BC by the Qijia community (ca. 2300-1700 BC) and, later, the Siba cultural group (ca. 1900-1500 BC)⁸³⁵. However, cast knives found at Linjia and Liancheng (Gansu), assigned to the Majiayao community (ca. 3400-2000 BC), have suggested an earlier dating for casting technology in North-western China⁸³⁶. Nevertheless, the geographical vicinity and the type of manufactured objects indicate that the sources of the metallurgical knowledge of the Ili-Tacheng communities were the Andronovans. That said, although details on metallurgical processes

⁸²⁹ MEI Jianjun, 2000, p. 42.

⁸³⁰ MEI Jianjun, 2000, p. 42.

⁸³¹ BOROFFKA, CIERNY, LUTZ, PARZINGER, PERNICKA, WEISGERBER, 2002, pp. 135-159; POTTS, 2012, p. 116.

⁸³² CHERNYKH, 1992, p. 213

⁸³³ GREGORIEV, 2015, pp. 766-672.

⁸³⁴ For a review see: AN Zhimin, 2000.

⁸³⁵ MEI Jianjun, 2000, pp. 62-64.

⁸³⁶ For further information see: AN Zhimin.

employed in North-western Xinjiang are still relatively unknown for the Bronze Age, there is evidence of a local and rather consistent metallurgy based around a single bronze-using tradition, similar to the Andronovo's in many respects: not only were the same technologies used for metal working, but even the alloy combination was similar, suggesting that the two communities possessed the same metallurgical knowledge.

3.1.5 Summary

The comprehensive exam of the remains in the Ili-Tacheng region reveals that in the Bronze Age (2000-1000 BC) the area was occupied by semi-nomadic populations of the Europoid race, who practised some form of agricultural activities, as shown by the discovery of farming-tools, and further suggested by remains of wheat in the nearby Bagesh site. However, it seems that these populations were mainly seasonal pastoralists, who, judging by the zoological remains, herded sheep and goats. Their residential sites were usually located in the lower valleys, therefore, it is plausible that these were occupied in Winter, when livestock was moved here to find less harsh weather conditions. Settlements were made of stone and arranged in private and public spaces, suggesting that the local communities were socially organized. The existence of a social organization based on a family/clan system is also reflected in the funerary sites, such as that at Adun Qiaolu village, where more graves were contained in a single enclosure, and several burials, arranged in a number of rows, were discovered. In addition, the importance of family, as the basis for the social organization of these communities, is further suggested by the placement of the buried bodies inside some of the graves: for example, the double burial SM50-2 at the Adun Qiaolu cemetery contained a woman accompanied by an infant, while in the Tangbaleisayi cemetery an old couple had been buried together. The social arrangement of the Ili-Tacheng region communities does not seem to have been connected to labour divisions, and, specifically, there is no evidence of the existence of a “clan of metallurgists”. In fact, the absence of the “founders’ hoards” suggests that metallurgical production was still a communal affair, and no social division between metallurgists and the rest of the population had yet been established. The existence of some form of hierarchical social stratification is evident in the diversity of the grave goods and, according to the findings, it may have been age-based: in fact, in burial M17 at the Tangbaleisayi cemetery, an old couple (male and female) was accompanied by the highest quantity of bronzes in the

whole cemetery⁸³⁷. Apparently the communities in the Ili-Tacheng region had a well-established belief system, as demonstrated not only by the three radial structures found in Wutulan village, interpreted as places of worship, but also by the funerary complex M3, recovered from the same village and consisting of a larger pit surrounded by sixteen smaller burials. In the central larger grave only few scattered human remains were found, and they were accompanied by complete skeletons of several animals (including sheep, goats, dogs, wolves and chickens), suggesting that this place was devoted to sacrificial/ritual activities. The overwhelming majority of the surrounding graves were single and contained one child each⁸³⁸. However it is unlikely that sacrifices included children: according to recent studies, human sacrifices, especially children's, never acquired a mass form in the Andronovo and Andronovo-related communities⁸³⁹. On the contrary, the occurrence of a high number of children bodies in one single cemetery seems to have been connected to the seasonal character of the children funerary ceremonies in the steppe pastoralists groups: bodies of children who died in Winter (when infant mortality highly increased because of bitter climate conditions), were not immediately inhumated or cremated, but were collected and buried together in Spring⁸⁴⁰, perhaps in "children cemeteries". In fact, a number of "children cemeteries" is known for some steppe communities and specifically some Andronovo tribes⁸⁴¹. Therefore, structure M3 in the Wutulan village may be interpreted as a "children cemetery", with a larger central sacrificial place.

By closely analysing the typology of grave goods recovered from the Ili-Tacheng region, one can observe the lack of proper weapons and the abundance, on the contrary, of weapon-tools, which suggests that no conflicts occurred in the area. In spite of this, according to Kuz'mina the spread of the "family's hoards" is evidence of growing of military tensions, which required precious goods to be concealed⁸⁴². In this regard, even though typological studies and available carbon dating suggest that Bronze Age communities in the Ili-Tacheng region developed during the whole second millennium BC, some hoards, such as that of Aga'ersen, have specifically been attributed to the last centuries of the

⁸³⁷ In addition, it can be observe that in the Ili-Tacheng region children's graves were generally poor in grave goods (usually limited to one pottery pot) or were void of objects. The same scant quantity of grave goods was observed in children burials of the Andronovo community. KUZ'MINA, MALLORY, 2007, p. 23.

⁸³⁸ Only grave M16 included an adult. The report also mentions an other burial containing cremated remains of a child and an adult, however no further indications are provided.

⁸³⁹ КУРЯНОВА КУПИЯНОВА, 2004, p. 82.

⁸⁴⁰ КУРЯНОВА КУПИЯНОВА, 2004, pp. 82-84.

⁸⁴¹ KUZ'MINA, MALLORY, 2007, p. 195.

⁸⁴² KUZ'MINA КУЗЬМИНА, 1966, p. 98; KUZ'MINA, MALLORY, 2007, p. 97.

millennium (ca. thirteenth-ninth century BC)⁸⁴³, which roughly coincides with the period of decline of the Andronovo cultural community. If this chronology is accepted (the second millennium BC for settlements and cemeteries and the end of the second millennium BC for hoards), it could be that the emergence of the “family’s hoards” in the Ili-Tacheng region was stimulated by the collapse of the Andronovo cultural community, and the cultural and political changes that followed in Central Asia.

The remains from the Ili-Tacheng region dating back to the Bronze Age point towards the Andronovo traditions⁸⁴⁴. Most types of burial structures recovered from North-western Xinjiang are known in Andronovo cultural sites in Central Asia and South-western Siberia⁸⁴⁵. However, in the Ili-Tacheng region, in a single cemetery a variety of burial structures, in contrast with the homogeneity of funerary rites and grave goods, can be observed. This scenario has been puzzling scholars, who are currently investigating the phenomenon⁸⁴⁶. In particular, there is a small group of distinctive burial structures, such as graves M24 and M82 in the Kuokesuxi cemetery, which had peculiar eastern semi-circular extensions. These burials shared similarities with those found in the later cemeteries at Sudunbulake⁸⁴⁷, Tiemulike⁸⁴⁸ and Qiongkeke⁸⁴⁹, which have been placed around the first millennium BC and contained painted pottery and iron objects: therefore, graves M24 and M82 at Kuokesuxi are likely to have been later, and can be assigned to the early Iron Age. Like most of the burial structures, funerary rites (including the position of the dead and the placement of a pottery vessel next to the head), types, shapes, decorations and chemical composition of the grave goods were distinctive of the Andronovo cultural community, especially of some of its eastern variants, such as the Pakhomovskaya in the Tobol-Irtysh interfluvium⁸⁵⁰ and the Andronovo groups in South-western Siberia⁸⁵¹, and in Semirech’e⁸⁵². Anthropological studies suggest that most of the population in the Ili-Tacheng region was of the Europoid race, and specifically of the Pamir-Fergana type, which some scholars have referred to as “Andronovo type”⁸⁵³, highlighting the close link between the Andronovans and the populations in North-western Xinjiang. If there is little doubt on the existence of early contacts between the two

⁸⁴³ The chronological position of hoards in the Ili-Tacheng region has usually been established by typological analysis. KUZ’MINA, MALLORY, 2007, pp. 262-263.

⁸⁴⁴ This consideration of mine was confirmed by Professor Ruan Qiurong during my visit in Xinjiang in 2016.

⁸⁴⁵ KUZ’MINA, MALLORY, 2007, p. 192

⁸⁴⁶ Taken from a personal conversation with Professor Ruan Qiurong during my visit to the Institute of Archaeology in Urumqi in 2016.

⁸⁴⁷ XIA, 1999a, pp. 17-22.

⁸⁴⁸ XIA, 1988, p. 62.

⁸⁴⁹ LIU Xuetang 刘学堂, RUAN Qiurong 阮秋荣, 2003; XIA, 2002b; in spite of its later dating some scholars insist that Qiongkeke site was influenced by the Andronovans, see SHAO Huiqiu 邵会秋, 2009, paragraph 6.

⁸⁵⁰ For comparison see MOLODIN, MYLNIKOVA, SELIN, NESKOROV, 2014.

⁸⁵¹ LIESOWSKA, 2013.

⁸⁵² At Dasht-i-kozi, in Tajikistan. KUZ’MINA, MALLORY, 2007, p. 661, fig. 48.

⁸⁵³ KUZ’MINA, MALLORY, 2007, p. 169.

communities, mechanisms, nature of these interactions, and the extent of the Andronovo cultural influence on the investigated region, are more difficult to pinpoint. The archaeological evidence shows that the theory according to which the Ili-Tacheng cultural groups were simply “influenced” by the Andronovo tradition⁸⁵⁴ is not convincing, as it underestimates the close similarities between the two, involving almost all the economic and cultural aspects of the communities. More Specifically:

1. People in the Ili-Tacheng region were mainly seasonal pastoralists, who practised little agriculture. Andronovans had a similar economy, based on sheep, goats and, in some cases, cattle breeding and the growing of wheat, as demonstrated, not only by the recovery of farming tools, but also the remains of burned grains found in some pits in the Tobol region⁸⁵⁵ and in the Begash site⁸⁵⁶. According to the evidence, Bronze Age communities in the Ili-Tacheng region were socially organized on a family/clans basis, as were the Andronovans⁸⁵⁷. Notably, “founders’ hoards” were absent in both, the Ili-Tacheng region and the Andronovo territory, suggesting that the social organization of the two communities was not based on labour divisions and that metallurgists in both societies were not yet a recognized group⁸⁵⁸.
2. Burial structures and rites in North-western Xinjiang generally resemble those of the Andronovo tradition, even though some distinctive features can be recognized, such as the aforementioned eastern extensions in graves M24 and M82 at the Kuokesuxi cemetery (which, however may have been later), and the evidently lower number of horses found in the Ili-Tacheng region, compared to Andronovo sites. However, as suggested by Kuz’mina, numerous Andronovo sites have been regarded as representative of local variants of this cultural group. Specifically, a cultural variant “can correspond to the ancient tribe that occupied a territory and was separated from other tribal territories by a largely unoccupied zone”⁸⁵⁹, and, implicitly, adapted its original cultural and economic traditions to a different environment, and in most cases, to the customs of the local communities. Thus, remains in the Ili-Tacheng region may represent an eastern variant of the Andronovo cultural group.
3. People in the Ili-Tacheng region were mostly of the Europoid race of the Andronovo type.
4. Pottery in the Ili-Tacheng region was solely of the Andronovo type and no other tradition

⁸⁵⁴ MEI Jianjun, SHELL, 1999.

⁸⁵⁵ OKLADINOV, 1959, pp. 23-24.

⁸⁵⁶ FRANCHETTI, SPENGLER, FRITZ, MAR’YASHEV, 2010.

⁸⁵⁷ GRYAZNOV, 1969, p. 68

⁸⁵⁸ KUZ’MINA, MALLORY, 2007, p. 97.

⁸⁵⁹ KUZ’MINA, MALLORY, 2007, p. 60.

(neither local nor external) was represented. Only one artefact, namely the four-mouthed pottery vessel from the Xiakalangu'er hoard (Ergong County), did not belong to this cultural background, but most probably it was a later inclusion. .

5. Metal artefacts from North-western Xinjiang were analogous to the Andronovo's, typologically, technologically and chemically, suggesting that the two communities had the same metallurgical knowledge. In addition, it seems that no other Bronze Age metal-using cultural group, but the Andronovo, was represented in the Ili-Tacheng region. As stated in the introductory chapter of this research, metallurgical production was a complicated process, which required direct contact with experienced metallurgists, in order to be fully adopted⁸⁶⁰. Since archaeological evidence shows that the earliest metal remains in the Ili-Tacheng region were, indeed, of the Andronovo type⁸⁶¹, it is plausible that a group of Andronovo people settled in North-western Xinjiang in the second millennium BC and brought their metallurgy in the area.

The climate change in the second millennium BC caused waves of migrations throughout Eurasia and nomadic and semi-nomadic populations were forced to move and exploit new areas. For the Andronovo communities in Central Asia, the Ili-Tacheng region must have been easy to reach, given the natural opening of the valleys towards Central Asia and the numerous passes linking it with Xinjiang. Therefore, a “immigration” of the Andronovans to North-western Xinjiang is a plausible hypothesis. Evidence from the Neolithic site in the Jilintai village (Nileke County), consisting of a deposit of microliths sealed with a layer of distinctive Andronovo material⁸⁶², further supports this theory: in fact, besides demonstrating the presence of a pre-Andronovo community in this area (which some scholars believe to have been from the Siberian Altay region⁸⁶³), these remains suggest the occurrence of a real “occupation” of the Ili-Tacheng region by the Andronovans, who introduced their metal technologies (and perhaps pottery) in North-western Xinjiang sometimes at the beginning of the second millennium BC. Therefore, it is likely that the Bronze Age people in the Ili-Tacheng region were indeed Andronovans, and that the area was an eastern periphery of the Andronovo territory.

⁸⁶⁰ GREGORIEV, 2015, p. 23.

⁸⁶¹ At the moment, pre-Andronovo remains only consist of Neolithic sites, void of metal objects, such as the deposit at the Jilintai village, in Nileke County. RUAN Qiurong, 阮秋荣, 2004.

⁸⁶² RUAN Qiurong, 阮秋荣, 2004.

⁸⁶³ JIA, BETTS, WU Xinhua, 2009, p. 173.

3.2 THE PAMIR REGION (SOUTH-WESTERN XINJIANG)

3.2.1 Introduction

The south-western area of Xinjiang Province roughly corresponds to the present-day Kezileisu Prefecture (Kizilsu Kyrgyz Autonomous Prefecture), Kashen Prefecture (Kashgar Prefecture) and to the western part of the Akesu Prefecture (Aksu Prefecture). In the present research, this area is called the “Pamir region” (Fig. 125). The Pamir region was very early inhabited, as shown by the discovery of the Palaeolithic site of Jirigale (Tashenku’ergan County)⁸⁶⁴ and the Neolithic findings at Suletangba’e, Huojiakuona⁸⁶⁵ and Tuotituohereke⁸⁶⁶ (Wupa’er County). Remains unearthed from these sites consist of microliths, and black or reddish-brown handmade coarse pottery, fired at relatively high temperature⁸⁶⁷ (Fig. 126). Additionally, at the site of Suletangba’e seventeen copper items were found, most of which being only fragments. The presence of copper items suggests that this group of remains should be assigned to the Copper Age. However, archaeologists placed it in a Neolithic context, around 2000 BC, on the basis of the analogies of the stone and pottery finds with the Neolithic remains at Dzhanbas Kala, in present Uzbekistan, attributed to the Kalteminar cultural group (second-first millennium BC)⁸⁶⁸. Recent research has raised questions about the association between the copper remains and the Suletangba’e site⁸⁶⁹, however, it is difficult to verify, as the chronological attribution of these early contexts is still confused. In fact, on one side, the Copper Age is still regarded by many archaeologists as a simple intermediate phase between the Stone and Bronze Ages (and therefore, often included in the Neolithic period, as its last appendix)⁸⁷⁰, on the other, no carbon dating has yet been performed on these remains, hampering the establishment of their absolute chronology. In addition,

⁸⁶⁴ Xinjiang Weiwu'er Zizhiqu 新疆维吾尔自治区 (Xinjiang Uygur Autonomous Region), Beijing Ziran Bowuguan 北京自然博物馆 (Beijing Natural History Museum), Xinjiang Weiwu'er Zizhiqu Dizhi ju Cehui Dadui Lianhe Kaocha Dui 新疆维吾尔自治区地质局测绘大队联合考察队 (Xinjiang Uygur Autonomous Region Geological Bureau for Surveying and Mapping Joint Investigation Team), 1995; XIREN Kurban 西仁·库尔班, 2002, pp. 79-80.

⁸⁶⁵ Dating for the Neolithic phase of these sites has been established to ca. 5000-3000 BC by the typological analysis of microliths and pottery fragments, however it will be seen later that a later dating (3000-2000 BC) has been also proposed. WANG Bo 王博, 1994, p. 56; WANG Bo 王博, 1995.

⁸⁶⁶ QI Xiaoshan 祁小山, WANG Bo 王博, 2008, p. 180, fig. 2.

⁸⁶⁷ WANG Bo 王博, 1994, p. 51.

⁸⁶⁸ WANG Bo 王博, 1995, p. 27; GONG Guoqiang 龚国强, 1997, p. 7; according to the material excavated by Tolsov, the Kalteminar community practised fishing and hunting. Settlements consisted of large houses built on an oval support made of wood and stone. Pottery could be painted or decorated by impression or carvings. Microliths, bone tools and shell pendants were also found. Chronology of the Kalteminar group has been established by typological analysis. For further information on the Kalteminar community see: TOLSTOV TOJCTOB, 1948, pp. 32, 59-66; OKLADINOV, 1990, pp. 64-67.

⁸⁶⁹ MEI Jianjun 2000, p. 9.

⁸⁷⁰ CHEN Ge 陈戈, 1994, p. 108.

they were poorly reported in old, and often out-dated, publications, which usually did not provide illustrations nor comments and were rarely reviewed in the light of new discoveries⁸⁷¹.

As regards Bronze Age remains, the summary published by the Office of Cultural Relics Surveys in 1993 provides scant information on numerous findings recovered from the Prefecture of Kashgar⁸⁷². According to this material and other scattered documents, the territory corresponding to that of the present-day oasis of Kashgar and, more specifically, Shufu County, is particularly rich of late Neolithic and Bronze Age remains⁸⁷³. Among others, in Shufu County, the four deposits of Aketala were discovered and published separately in a brief excavation report in 1977⁸⁷⁴. By contrast, other areas, even the adjacent ones, are apparently void of prehistoric material⁸⁷⁵. Since the small territory of Shufu County is unlikely to have been the only hub of civilization, surrounded by extremely poorly inhabited lands⁸⁷⁶, this scenario points out that excavation campaigns have almost exclusively focused on the remains in Shufu County, while other areas have been neglected. Recently this trend has been changing, as shown by the investigation of Xiabandi cemetery (Tashenku'ergan County), almost 300 km south-west of Shufu County, at the beginning of the 2000s⁸⁷⁷. Despite the objective scarcity of data on the Bronze Age in the Pamir region, the well preserved and documented cemetery AII at Xiabandi village (Tashenku'ergan County) and the well known groups of remains at Aketala (Shufu County)⁸⁷⁸ provide precious information on the early communities in South-western Xinjiang. The remains at Aketala were only surface findings and no carbon dating was carried out on this material. They were assigned to the Late Neolithic period (around 1000 BC), by archaeologists on the basis of typological

⁸⁷¹ In new works a tendency of “repeating” old informations, with no further analyses and comments can be observed. WANG Bo 王博, 1995, pp. 39-40; GONG Guocheng 龚国强, 1997, p. 7; MEI Jianjun, 2000, p. 9.

⁸⁷² Zizhi Wenwu Pucha Bangongshi 自治文物普查办公室 (Office of Cultural Relics Survey), Kashen diqu Pucha Dui 喀什地区普查队 (Cultural Relics Survey Team of Kashgar), 1993, pp. 1-112, in particular see pp. 5-18 and 63-67 for all the remains in Shufu County.

⁸⁷³ For a review of the sites unearthed in Kashgar Prefecture see: Zizhi Wenwu Pucha Bangongshi 自治文物普查办公室 (Office of Cultural Relics Survey), Kashen diqu Pucha Dui 喀什地区普查队 (Cultural Relics Survey Team of Kashgar), 1993; for some information and pictures of Wufulate, Yaku'ergan and Halayu'ergun sites see: QI Xiaoshan 祁小山, WANG Bo 王博, 2008, p. 180; Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977, p. 110, footnote 2.

⁸⁷⁴ Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977.

⁸⁷⁵ This observation was based on the information contained in the summary, regarding remains found in the whole Kashgar region. Most of them have never been reported in detail.

⁸⁷⁶ In fact, the territory of present-day Shufu County, defined as such by an arbitrary political choice, shared the same desert oasis-type of resources, morphological and climatic conditions with the neighbouring lands.

⁸⁷⁷ XIA, 2012c; in addition a brief summary of the prehistoric remains found in the Tashenku'ergan County was published in 2002: XIREN Kurban 西仁·库尔班, 2002.

⁸⁷⁸ As it will be explained in detail later, the so-called “deposits of Aketala” consisted of four groups of remains discovered around the village of Aketala.

studies⁸⁷⁹. On the contrary, carbon dating analysis was carried out on five specimens from the cemetery AII at the Xiabandi village, thus allowing to attribute the site to two time ranges: 1900-1500 BC and 900-770 BC respectively⁸⁸⁰. These dating are supported by the typological analysis on the remains and specifically, the early phase is characterized by Andronovo-type material, while findings in the later graves reflect a different tradition⁸⁸¹. Besides providing a reasonably secure basis for the assignment of the Xiabandi cemetery AII to the Bronze Age, the presence of Andronovo material in the early graves is evidence of the existence of some form of interaction between the communities in the Pamir region and the Andronovans, as early as the first half of the second millennium BC. As well as for the Ili-Tacheng region, analysed in the previous section⁸⁸², the existence of early contacts between the communities in South-western Xinjiang and the Andronovans has been widely accepted by scholars, although the extent and mechanisms of these interactions remain unclear⁸⁸³.

3.2.2 Geographical setting

The Pamir region lies on the eastern slope of the Pamir Range and corresponds to the south-westernmost part of Xinjiang Province. It is surrounded by the Tianshan, the Pamirs, and the Kala Kunlun ranges (Karakorum) to its north, west, and south respectively, and faces the Taklamakan Desert in the east. Despite the height of the surrounding mountain ranges, a number of passes connects the region with the neighbouring northern and western territories. The Pamir region basically consists of the highlands within these high mountains, from which rivers and streams flow into the Taklamakan Desert, forming a number of oases, such as that of Kashgar. As they do today, in prehistory the high, wide valleys on the highlands, carved by ancient glaciers, naturally provided large lands for extensive pasturages, while their rich soil allowed for a small-scale dry agriculture⁸⁸⁴. The desert oases, fed by the rivers flowing down the surrounding mountains, were also suitable areas for farming. At present these rivers constitute the most important water supply, in fact the regional climate is characterized by

⁸⁷⁹ Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977, pp. 107-110.

⁸⁸⁰ Six carbon dating have been carried out on material taken from cemetery AII. Among them, that performed on a wooden fragment recovered from grave M13, has revealed that this grave was much later than the others, specifically 550-670 AD. A closer look to the remains confirms this dating. Precisely because of the late dating of this grave, it has been excluded from the present research. As regards cemetery AID, it was very poor preserved and contained only a broken pottery vessel, therefore, most of the information on the Bronze Age in the Pamir region was gained from cemetery AII. XIA, 2012c, pp. 144-145.

⁸⁸¹ More detailed information will be provided in the following paragraphs.

⁸⁸² See the previous section "The Ili-Tacheng region".

⁸⁸³ SHAO Huiqiu 邵会秋, 2009, paragraph 4; WU Yong 吴勇, 2012, pp. 40-43.

⁸⁸⁴ CHEN Kwang-tzuu, HIEBERT, 1995, p. 248.

severe drought, averaging only 40-80 millimetres of precipitation per year, and a marked continentality⁸⁸⁵. However, it is well known that, despite its general condition of aridity since the Tertiary period (66-2,6 millions years ago), in the Holocene (11.700 years ago-present) the climate in Xinjiang has been characterized by periodical fluctuations of wet and dry conditions⁸⁸⁶. Although data on the ancient environment and climate of the Pamir region are still very limited, some palinological exams have been conducted by Chinese and Australian researchers on the micro-area of Wupa'er (Shufu County) and their results have revealed that during the second-first millennium BC the regional climate was indeed more humid than present⁸⁸⁷. In this wet phase, the occurrence of three short periods of aridity, namely 1500 BC, 1300 BC and 1000 BC, has been demonstrated by the study of long-distance pollens, conducted in the same area⁸⁸⁸. The humid trend during the second millennium BC, and the abrupt climatic change occurred around the middle of the same millennium have also been observed in the Ili-Tacheng region in the north⁸⁸⁹ and in other areas on the eastern slope of the Pamir Range. In fact, sedimentological studies carried out on the Karakul Lake, in Eastern Tajikistan, have demonstrated that until roughly 1500 BC, the lake was quite big and deep, characterized by a high melt water inflow from glaciers, snowfields and frozen ground in the catchment⁸⁹⁰. Around 1500 BC an abrupt change of the climatic conditions caused a reduction of the lake productivity, a rapid decrease of the melt water discharge and, consequently, a significant drop in the water level. In the following period, the increment of humidity allowed the amount of water to increase again, and, as shown by the aforementioned studies, this renewed moist trend was recognized in the micro-region of Wupa'er as well. It has been observed that the humidity in the Kashgar area during the second-first millennium BC was synchronous with the Holocene Bond Event 2 in the North Atlantic deep-sea records⁸⁹¹. More specifically, it has been argued that the conditions in the North Atlantic Ocean affected the southward migration and increased strength of the mid-latitude westerly system, which, in turn, would have

⁸⁸⁵ MEI Jianjun, 2000, p. 7.

⁸⁸⁶ JIANG Fengqing 姜逢清, HU Ruji 胡汝骥, MA Hong 马虹, 1998, pp. 1-9.

⁸⁸⁷ Specifically, in the period 1900-600 BC the high level of humidity was demonstrated by the high content of Cannabaceae (average 21,5%) and the high ratio of Cenopodiaceae/Ephedra. ZHAO Keliang, LI Xiaoqiang, DODSON, ATAHAN, ZHOU Xinying, BERTUCH, 2012, p. 19.

⁸⁸⁸ The quantity of long-distance transported pollen can be interpreted as an indicator of sparse vegetation, due to cold or dry climate conditions: the component of long-distance transported pollen in the pollen assemblage is generally small when regional pollen production is high and the climate is humid; it is greater when the regional vegetation is sparse, the local pollen production is low, under dry conditions. HERZSCHUH, WINTER, WUNNEMANN, LI Shijie 2006.

⁸⁸⁹ MA Long, WU Jinglu, ABUDUWAILI Jilili, 2011, pp. 2-3; JIANG Qingfeng, JI Junfeng, SHEN Ji, MATSUMOTO Ryo, TONG Guobang, QIAN Peng, REN Xuemei YAN Dezhi, 2013. See also the previous section "The Ili-Tacheng region".

⁸⁹⁰ MISCHKE, RAJABOV, MUSTAEVA, ZHANG Chengjun, HERZSCHUH, BOOMER, BROWN, ANDERSEN, MYRBO, ITO Emi, SCHUDACK, 2010.

⁸⁹¹ BOND, KROMER, BEER, MUSCHELER, EVANS, SHOWERS, HOFFMANN, LOTTI-BOND, HAJDAS, BONANI, 2001.

increased the amount of Winter snowfall on the Kunlun Mountains⁸⁹². These conditions brought a larger quantity of melt water to the desert oases. According to the aforementioned studies, climate in the Pamir region during the Bronze Age was relatively humid, especially in the first half of the second millennium BC, while it changed, becoming increasingly drier, around the middle of the millennium.

3.2.3 Archaeological context

As mentioned above, two main Bronze Age sites were recovered from the Pamir region, namely the cemetery AII at the Xiabandi village (Tashenku'ergan County) and the group of hoards at Aketala (Shufu County). No settlements have yet been discovered in the area. The Xiabandi funerary site is a group of fourteen cemeteries discovered on the highlands in the county of Tashenku'ergan (Kashgar Prefecture) (Fig. 127). Despite the fact that the first cemetery was found in 1989, it was only in 2001, during the construction of water canals, that other and more numerous prehistoric remains were brought to light, recognized as such, and formally investigated from 2003. In that year, cemeteries AID, AI-AIII, AV, AVI were excavated, and 147 graves unearthed, while in 2004 cemeteries AVI and BI-BVII were explored and 178 burials examined. Ninety-two graves, found in the funerary site AII, and one from cemetery AID, have been attributed to the Bronze Age, on the basis of the typological analysis of the funerary structures and grave goods, confirmed by carbon dating, carried out on material from five graves in cemetery AII. On this basis, Bronze Age graves have been divided into two groups: the first representing an early phase, dating to 1900-1500 BC, the second placed to 900-770 BC⁸⁹³. In the Xiabandi cemetery AII, 24% of the graves were marked by a mound, while 37% were fenced by an oval or rectangular stone enclosure. The combination of the two structures in relation to the same burial was also observed for eleven graves, while eighteen tombs did not have any mark. Under each mound or inside each fence there was usually one grave, but in seven cases corresponding to burials M5 (a-d), M52 (a, b), M18 (1 and 2), and M54-57, one mound covered two or more pits. This occurrence suggests the existence of some form of clan-based social organization in the Xiabandi community. In this regard, a closer look to the buried individuals reveals patterns of child-adult and adult female-male internments, suggesting that the community arrangement was, indeed, family-based. More specifically, mound M52 covered two burials: grave M52a, located in the middle of the mound, included a couple of adults (male and female), while burial M52b, built on the western side, contained the body of an infant

⁸⁹² SEONG Yeong Bae, OWEN, YI Chaolu, FINKEL, 2009.

⁸⁹³ XIA, 2012c, pp. 144-145.

(Fig. 128.1). In the case of burials M54-57, all surrounded by a single large mound, the main grave M54 included an adult female, while in each of the two smaller tombs, M55 and M56, was buried a child (Fig. 128.2)⁸⁹⁴. As regards the fenced graves, in one case a stone enclosure included more than one burial: in grave M110 four pits, dug in rows, were fenced by a single enclosure, though only two contained cremated human remains, while the others only included a few objects (Figs. 128.3, 4). This structure of pits arranged in rows is similar to that observed in the southern district of the Adun Qiaolu cemetery (Wenquan County) in the Ili-Tacheng region (Fig. 95)⁸⁹⁵. Burials were usually simple pits, although six stone cists were also found. The majority of the graves were rectangular with rounded corners, while only two round burials were discovered. Wooden poles and slabs, widely found inside and outside the graves were placed at the entrance, to seal the burial (Fig. 129). Fifty graves had a layer of grass spread on the bottom and, since the dead was frequently found lying on it, it may have been a funerary bed. A lower, but still considerable number of burials (twenty-six) presented, in addition to that on the bottom, a layer of grass at the entrance. The size of the graves varied from 0.41 m to 1.7 m in length, and they were usually not deeply dug into the ground⁸⁹⁶. Adults' burials were larger, often more than one meter long, while those including children or infants were smaller, generally not exceeding one meter in length⁸⁹⁷. Two types of funerary rites were performed by the Xiabandi community: cremation and inhumation. In spite of this, no consistent structural differences were observed between graves including cremated or inhumated bodies, and in some cases, such as in graves M29 and M102, cremated and inhumed human remains were buried in the same grave (Fig. 130). This combination was verified for a number of Bronze Age funerary sites in the Ili-Tacheng region⁸⁹⁸. As regards the ritual of cremation, based on where the body was burned, archaeologists distinguished two types of ceremonies: the cremation was "direct" when the dead was burned inside the grave, while if the body was set on fire elsewhere and, only later, put into the burial, the ritual was called "indirect". The performance of one or the other rite was visible to archaeologists from the conditions of the graves' walls and the funerary objects, which, in the case of direct cremation, appeared black and burned. On the contrary, when an indirect ritual was carried out, undamaged walls and grave goods were found. Sixteen out of eighteen burials, showed evidence of direct cremation, while, the deceased

⁸⁹⁴ From grave M57 no human remains were recovered.

⁸⁹⁵ IAC, 2013, pp. 28-31; JIA, BETTS, CONG Dexin, JIA Xiaobing Jia, DUPUY, 2017, pp. 629-632.

⁸⁹⁶ The overwhelming majority of the burials were less than a meter deep.

⁸⁹⁷ This was verified for all the graves except for M98, which was a round burial with a diameter of 0.71 m and contained an adult female.

⁸⁹⁸ For instance, in grave M51 at Kuokesuxi cemetery (Zhaosu County), a middle-aged man was buried together with some burned human remains, see Fig. 100.

found in graves M108 and M110 had probably been cremated elsewhere⁸⁹⁹. Of the sixty-five graves containing inhumated bodies, more than 95% was single, while only four burials were multiple, namely M18, M31, M36, M52, including two bodies each⁹⁰⁰. While grave M36 contained an adult female and an infant, both crunched and facing the ground (Fig. 131.3), burials M18, M31, M52 included an adult couple each (male and female), placed on one side with bent legs, facing the same direction (Fig. 131.4). In grave M18, the discovery of a body in a lower level indicates the practice of secondary burial, which, however, has not been verified in none of the other graves. As a rule, in the Xiabandi cemetery AII, the dead was placed on one side with bent legs, and usually one, more rarely two vessels were located close to the head (Fig. 131.1). Although these funerary rites resembled those of the Andronovo community⁹⁰¹, small differences have been recognized, suggesting the development of some local practices. For example, in the Pamir region the internment of several bodies in an extremely bent position, almost crunched on one side, was observed⁹⁰² (Fig. 131.2), while the vessels placed around the deceased's head were often made of wood, whereas Adronovans employed pottery containers⁹⁰³. In addition, as regards double graves, those investigated in the Xiabandi cemetery AII contained bodies facing the same direction, while in the Andronovo burials they faced each other (Fig. 131.5). According to Han Jianye's study of the flexed burials in ancient China, the funerary posture documented in the Bronze Age site at Xiabandi belong to the "Xinjiang sub-group" of the "western tradition"⁹⁰⁴, which is characterized by the thighbone not being too close either to the abdomen or to the shank bone. In line with Han's arguments, most of these bodies, sometimes associated with evidence of cremation, were usually placed in stone cists or adobe chambers and covered by an earth or stone mound⁹⁰⁵. In addition to the graves in the cemetery AII at Xiabandi, several Bronze Age burials recovered from Eastern Xinjiang, and specifically, from Tianshan Beilu and Yanbulake cemeteries (Hami City) and Nanwan site (Barkol County), have also been included by Han in the "Xinjiang sub-group" of flexed burials of the "western tradition". Even though Han has stressed that the tradition of burying flexed bodies most likely came from the west, as they seldom occurred in China⁹⁰⁶, there are

⁸⁹⁹ From these graves undamaged wooden plates and pottery vessels were recovered.

⁹⁰⁰ Out of ninety-two graves assigned to the Bronze Age, eighteen contained cremated remains, one only contained animals' bones, while eight were empty.

⁹⁰¹ GRYAZNOV, 1969, p. 90; KUZ'MINA, MALLORY, 2007, pp. 185-198.

⁹⁰² In the Andronovo burials the dead was usually placed on one side with bent legs, however, rare crunched bodies were also found.

⁹⁰³ KUZ'MINA, MALLORY, 2007, pp. 185-198.

⁹⁰⁴ While according to Han the "sub-tradition" of Xinjiang appeared around 1900 BC and disappeared during the first century BC, temporal and spatial distribution of the more general "western tradition" was wider, and, in fact, flexed burials were found at cemeteries of the Tripol'e-Cucuteni, the Pit Grave and the Andronovo communities, in a period span of at least 4000 years, from 5000 to 1000 BC. CHERNYKH, 1992, pp. 36, 84, 211.

⁹⁰⁵ HAN Jianye, 2008, p. 170.

⁹⁰⁶ In China supine bodies generally had extended legs. HAN Jianye, 2008, p. 170.

some problems with his theory: besides the fact that a number of bodies in the Xiabandi cemetery AII were found crunched, thus not completely fitting Han's description of the "Xinjiang sub-group" of flexed burials, the assimilation of funerary rites from Western, Central and Eastern Xinjiang is equally not convincing. In fact, if grouping together these burials may be useful for an analysis of the body postures limited to the Chinese territory (which is perhaps the intended framework of the Han's research), it lacks archaeological support when a wider context, such as that of Eurasia, is considered. Archaeological evidence has shown that the Bronze Age communities in the Pamir region were in contact with the Andronovans, from whom they most likely inherited the funerary position, together with other rituals⁹⁰⁷. On the contrary, prehistoric groups in Eastern Xinjiang seem to have been little influenced by the Andronovo tradition, therefore, their funerary rituals probably had a different origin⁹⁰⁸. Almost 90% of the flexed bodies in Xiabandi cemetery AII were placed on the left side, which seems to have been a widely spread funerary custom in the second millennium BC in Central Asia: among others, it was observed in correspondence to cultural sites assigned to the Namazga VI community⁹⁰⁹ and to the Andronovo cultural groups⁹¹⁰, in present Turkmenistan and Kyrgyzstan respectively. Interestingly, graves in the Iron Age cemetery at the Xiangbaobao village (Tashenku'ergan County), located close to the Xiabandi funerary site and carbon dated to 900-400 BC, also included bodies placed on their left side with bent legs⁹¹¹, suggesting that this burial posture remained part of the funerary rituals in the Pamir region for a long period, encompassing the Bronze Age and the Iron Age. Almost half of the graves (specifically 44%) contained infants or children's bodies. As mentioned in the first section of this chapter ("The Ili-Tacheng region")⁹¹², special graveyards for infants and children only, sometime located close to the adults', are known for some steppe communities and, more specifically, for some Andronovo tribes⁹¹³. Nonetheless, since a number of adult bodies were found as well, the cemetery AII at Xiabandi is unlikely to have been one of these children funerary sites. However, this hypothesis can not be completely ruled out: although it was

⁹⁰⁷ SHAO Huiqiu 邵会秋, 2009, paragraph 4.

⁹⁰⁸ Specifically, in Eastern Xinjiang, flexed bodies were often buried in mud-brick graves or stone cists, accompanied by a painted pottery vessel located close to the deceased's knees and by a number of metal tools and ornaments. Burial structures and rites were different from the Andronovo's. For further information on Eastern Xinjiang see the second chapter of this research "Eastern Xinjiang"; for data on the Andronovo mortuary practice see KUZ'MINA, MALLORY, 2007, pp. 185-198.

⁹⁰⁹ KUZ'MINA, MAIR, 2008, p. 72; dating for this phase was established at mid-second-first millennium BC by carbon dating. KIRCHO КИРЧО, ПОПОВ ПОПОВ, 1999, pp. 356-361.

⁹¹⁰ Among others, this practise was observed in the Prigorodnoye, in Kulan-say and Kyzyl-say cemeteries. For more information see KUZ'MINA, MALLORY, 2007, pp. 243-244.

⁹¹¹ The cemetery of Xiangbaobao was located on a tableland on the left bank of the Tashenku'ergan River and its dating was obtained by carbon dating on materials taken from three graves. See Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Xinjiang Institute of Social Science), 1981.

⁹¹² See the previous section of this chapter, "The Ili-Tacheng region".

⁹¹³ KUZ'MINA, MALLORY, 2007, p. 195; KUPYANOVA КУПИЯНОВА, 2004.

verified that some children were buried together with adults, the fact that the exact location of the single graves is uncertain (as the planimetry of the site has not been completely published) it is impossible to establish a feasible geographical pattern for the infant burials in the cemetery. Concerning human remains found in the Pamir region, no examinations have yet been carried out on those unearthed from the earlier graves at Xiabandi cemetery. Therefore, although the archaeological material suggests that the local Bronze Age population was close to the Andronovans, actual anthropological data are almost null. One skull was collected in Xiangbaobao cemetery and examined by Han Kangxin in the 1980s: the skull presented strong Western features⁹¹⁴, close to those of both the modern East Mediterranean and the ancient Saka in Southern Pamir⁹¹⁵, but different from the traits observed in the populations belonging to the Andronovo community⁹¹⁶. In addition, some DNA examinations have been performed on physical evidence found in a later grave at the B district of the Xiabandi site, revealing the existence of an admixture of Mongoloid and Eastern Mediterranean characteristics. The B cemetery has been carbon dated to 610-720 AD⁹¹⁷. Despite the late dating of these remains, results of the phylogenetic exams, let scientists to considerate the hypothesis that these people may have been the descendants of Central Asian populations, having Andronovo ancestors⁹¹⁸. This theory leaves room for speculating that in the early phase of the Xiabandi cemetery AII the area was indeed occupied by Andronovo-related populations. As a matter of facts, it is well known that in the second millennium BC, an admixture of communities of diverse origins inhabited Central Asia⁹¹⁹, and there have been several discoveries of skulls of the Eastern Mediterranean-type in cemeteries assigned to the Andronovo cultural group, such as those at Muminabad⁹²⁰ and Kotcha⁹²¹. It is possible that during the Bronze Age the Xiabandi territory was occupied by a Central Asian Andronovo population, featuring Eastern Mediterranean characteristics, however a specific anthropological research needs to be conducted on Bronze Age human remains in Xiabandi the for this hypotheis to be

⁹¹⁴ Skull presented a small frontal slope, unpronounced superciliary arc and glabella projection, a marked nasal projection, narrow nasal aperture, strong facial projection, and a narrow facial dimensions.

⁹¹⁵ HAN Kangxin 韩康信, 1987.

⁹¹⁶ NING Chao, GAO Shizhu, DENG Boping, ZHENG Hongxiang, WEI Dong, LU Haoze, LI Hongjie, SONG Li, WU Yong, ZHOU Hui, CUI Yinqiu, 2016, p. 107.

⁹¹⁷ NING Chao, GAO Shizhu, DENG Boping, ZHENG Hongxiang, WEI Dong, LU Haoze, LI Hongjie, SONG Li, WU Yong, ZHOU Hui, CUI Yinqiu, 2016, pp. 103-108. The cemetery from which the tested human remains were taken is not specified in the paper, and there is a little bit of confusion on their chronology: in the paper the reported dating is 720-610 BP, which does not correspond to any carbon dated B cemetery in Xiabandi. According to the final excavation report, of the seven B cemeteries (BI-BVII), the latest is BVI, carbon dated to 610-720 AD. XIA, 2012c, p. 144.

⁹¹⁸ The examined human remains contained the haplogroup U5a2a, which mostly belongs to the Central and Eastern Europeans and is also present in lower frequency in other Eurasian populations in Central Siberia and Central Asia, in Kazakhstan, Kyrgyzstan and Uzbekistan, as a result of ancient migrations of steppe populations, such as the Andronovans. NING Chao, GAO Shizhu, DENG Boping, ZHENG Hongxiang, WEI Dong, LU Haoze, LI Hongjie, SONG Li, WU Yong, ZHOU Hui, CUI Yinqiu, 2016, p. 107.

⁹¹⁹ KUZ'MINA, MALLORY, 2007, p. 170.

⁹²⁰ KHODZHAYNOV ХОДОЖАЙНОВ, 1977, p. 9.

⁹²¹ TROFIMOVA ТРОФИМОВА, 1960, p. 114.

demonstrated.

The complex of Aketala consists of four major groups of similar findings, collected in 1972 in as many villages in Shufu County, (namely Aketala, Wenguluoke, Kunluketala and Dewoleke)⁹²², which for the sake of convenience have been called “Aketala deposits”⁹²³. Although for these remains a small number of scholars have proposed an early chronology ca. 3000 BC⁹²⁴, other scholars and archaeologists have placed it to around 1000 BC and assigned it to the Late Neolithic period, on the basis of the typological analysis of the excavated material⁹²⁵. The main reason for this attribution was the lack of painted pottery and bronze items⁹²⁶. However, there is a number of experts, who have put forward a possible assignment of the Aketala hoards to the Early Bronze Age: for example Francfort and An Zhimin observed that some of the recovered objects, consisting of stone implements, large fragments of pottery, a single bone tool and one broken copper knife, parallel some findings recovered from Henan Province and assigned to the Shang and early Zhou dynasties (1600-1046 BC and 1045-771 BC respectively)⁹²⁷. Furthermore, crescent-moon stone knives and sickles from the Pamir region have been compared to specimens recovered from the site of Halahezhou (Turfan City), carbon dated to 1100-840 BC⁹²⁸. These objects were also found among the cultural remains attributed to the Chust community in the Fergana Valley⁹²⁹, dating to the late second-early first millennium BC⁹³⁰. These data further support the assignment of the Aketala findings to a period corresponding to around 1000 BC⁹³¹, while their attribution to a precise prehistoric period remains the object of debate.

⁹²² Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977,.

⁹²³ MEI Jianjun, 2000, p. 9; DEBAINE, 1988, pp. 23-24.

⁹²⁴ GONG Guoqiang 龚国强, 1997, p. 7.

⁹²⁵ Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977, p. 110; CHEN Ge 陈戈, 1987, p. 344.

⁹²⁶ GONG Guoqiang 龚国强, 1997, p. 7; Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977, p. 110.

⁹²⁷ DEBAINE, 1988, pp. 23-24; AN Zhimin, 1992, p. 320.

⁹²⁸ MEI Jianjun, 2000, p. 9.

⁹²⁹ DEBAINE, 1988, pp. 23-24; ZADNEPROVSKII ЗАДНЕПРОВСКИЙ, 1962, p. 36, fig. 12.

⁹³⁰ A secure chronology for the Chust cultural group is still to be established: the C14 dating proved to be ineffective so far, since the results were too different for each of the examined site and often contradicted archaeological evidence. Several scholars tried to define the chronological position of the Chust cultural group by typological analysis: Kohl assigned this community to the Early Iron Age and placed its beginning to about 1500 BC, while Francfort differentiated three periods: 1500-1000; 1000-700; 700-400 BC. More recently, scholars seem to have agreed on the dating around 1300-800 BC, though earlier dating, back to 1500 BC are accepted. KOHL, GARDIN, FRANCFORT, 1984, pp. 188-189; FRANCFORT, 2001, pp. 221-222; MEI Jianjun, 2003a, p. 28.

⁹³¹ AN Zhimin, 1992, p. 332.

3.2.3.1 Grave goods

Pottery

Pottery found in cemetery AII at Xiabandi consisted of grey and reddish-brown coarse handmade containers⁹³². In two burials, specifically M55 and M61, reddish-yellow pottery pots were exceptionally found (Fig. 132). A total of eighty-seven pottery items were found in Xiabandi cemetery AII and half of them consisted of flat and solid bottomed *guan* pots, characterized by a large mouth, absent or very short neck and high, wide shoulders with no handles (Fig. 133). A distinctive specimen, found in grave M18, presented, on the contrary, a globular body, two small handles, tall neck and round base (Fig. 138.1). These containers were generally not decorated, and only a single pot, recovered from grave M42, was impressed with a nine seed-shaped pattern on the shoulders (Fig. 133.5).

In addition to the *guan* vessels, sixteen pottery *bei* cups were recovered, presenting a variety of shapes: in fact, while they generally have a flat or solid base (Figs. 134.1, 2, 4, 5, 8, 9), three cups, found in burials M62 and M109, were round-based (Fig. 134.3, 6, 7). Generally, these cups did not have handles, however, a specimen with a vertical handle was found in burial M109 (Fig. 134.3). Among the containers labelled as *bei* cups in the excavation reports, there are some specimens with a very pronounced solid base, for example in graves M45, M89 and M62 (Figs. 134.4, 5, 8, 9). Judging from the shape, size and colour of these cups, they may have been ingot moulds, of the type recovered from the Ili-Tacheng region (Figs. 111.1, 2), and similar to the specimens from South-Eastern Asia (Fig. 111.3). Other cups from grave M62 (Figs. 134.6, 7; 135. 1), characterized by a round base and thick walls are reminiscent of the crucibles found in Thailand, at Non Pa Wai (mid-late second millennium BC) (Fig. 135.2)⁹³³. These discoveries are of high significance as they demonstrate that the Xiabandi people were able to smelt metal locally. Most of these metalworking-related containers have been recovered from single burials and constituted the only objects included into the graves. However, whether metallurgists were a recognized group within the community is still questionable as ingots and crucibles were often found in graves void of human remains (such as M62), or in children's burials

⁹³² More than 65% were reddish-brown pottery vessels, while the remaining containers were dark grey.

⁹³³ Taken from a personal communication with Prof. Ciarla.

(M89). In addition, the recovery of these objects, similar to the specimens from Thailand, further supports the existence of connections between South-eastern Asia and North-western China⁹³⁴.

Wan cups⁹³⁵ were usually globular-shaped, although the curvature of the walls was more pronounced in some of the specimens, such as the three found in burials M55, M59 and M97 respectively (Fig. 136.3-5). Only in grave M100 a straight-walled *wan* cup was discovered (Fig. 136.7).

Two pottery *bo* bowls were unearthed from burials M18 and M107 (Fig. 137). The body of these vessels was globular with a round base. The specimen from grave M18 had two holes drilled by the edge, close to a crack (Fig. 137.2). These holes most probably had a utilitarian purpose: a stripe or a plaque could be inserted in order to prevent the crack from enlarging, as it was observed for the broken vessels of the steppe communities of Afanasevo (3500-2500 BC)⁹³⁶, Qiemu'erqieke (ca. 2500-1800 BC)⁹³⁷, Timber Grave (ca. 1900-1200 BC)⁹³⁸ (Fig. 139.1). A study conducted in the Sayan-Altai region on several Afanasevo wooden vessels presenting these peculiar holes, has revealed that the decorative component of the inserted plaques, may have given a special ritual significance to these perforated containers (Fig. 139.2)⁹³⁹. Unfortunately, no plaques were recovered from cemetery AII at Xiabandi .

In grave M18 four *fu* cauldrons were found. Among them, two specimens had a globular body and two handles, placed upward, as on specimen C2 (Fig. 138.2), or downward, as on cauldron C3 (Fig. 138.3). The *fu* vessel C5 stands out for its elongated shape and short neck (Fig. 138.4), and, as well as the aforementioned cauldrons, was not decorated. On the contrary, triangles and rows of holes-like ornamentations were carved on the upper part of the *fu* cauldron C4 (Fig. 138.5): these simple patterns were similar to the decorative designs engraved on vessels found among the cultural remains of the Qiemu'erqieke community (ca. 2500-1800 BC) in South-western Siberia and Northern Xinjiang⁹⁴⁰.

Flat-based *guan* pots featuring high and wide shoulders recovered from Xiabandi cemetery AII show

⁹³⁴ PIGOTT, CIARLA, 2007; WHITE, HAMILTON, 2009.

⁹³⁵ Ten *wan* cups were unearthed from the cemetery.

⁹³⁶ BORODOVSKY, 2013.

⁹³⁷ Specifically it was verified in Qiemu'erqieke cemetery no. 1 grave M2 (Altay City) and in the funerary sites at Bulgum-sum and Khovd-sum (Khovh Aimag, Mongolia). For detailed information and pictures see KOVALEV, 2011, fig. 21.

⁹³⁸ BEREZANSKAYA БЕРЕЗАНСЬКА, TSVEK ЦВЕК, KLOCHKO КЛОЧКО, LYASHKO ЛЯШКО, 1994, p. 146, fig. 43.

⁹³⁹ Generally these copper plates carried a peculiar punched ornamentation. BORODOVSKY, 2013.

⁹⁴⁰ Among others, in the cemeteries at Shar-sum I and at Khaadat ovoo, both in Khovh aimag (Mongolia) and in that at Kuxi, (Altay region, Xinjiang), vessels with impressed triangles-like decoration on the short neck and shoulders were found. These sites were assigned to the Qiemu'erqieke community. KOVALEV, 2011, fig. 21. For further information and high quality pictures see: KOVALEV KOBALIEB, 2014; KOVALEV KOBALIEB, 2015.

clear analogies with the Andronovo vessels⁹⁴¹. Some similar containers were found in the Ili-Tacheng region, in North-western Xinjiang and, specifically, in the sites of Sazi⁹⁴² and Weixiao⁹⁴³, placed to the second millennium BC⁹⁴⁴. Other close specimens were discovered in the Semirech'e region, in the Andronovo-related sites on the Issyk Kul Lake, and Arpa, dating to ca. 1400-1100 BC⁹⁴⁵ (Fig. 140.1, 2). *Guan* pots with solid bottom also had parallels in the Andronovo cultural groups⁹⁴⁶, and they were discovered in Central and Southern Kazakhstan, in Atasu and Tautary cemeteries⁹⁴⁷ (Fig. 140.3, 4). In spite of the similar shapes, vessels recovered from the aforementioned Andronovo-related cultural sites were usually richly decorated by carving geometric designs on the whole body or on the upper part only⁹⁴⁸ (Fig. 140). By contrast, the overwhelming majority of the specimens from the cemetery AII at Xiabandi were void of ornaments⁹⁴⁹, resembling a specific distinctive group of Andronovo-type undecorated potteries found in the Semirech'e region⁹⁵⁰, particularly in the cemeteries of Kulsat⁹⁵¹, Uzunbulak I⁹⁵², Tash-Tyube II⁹⁵³ and Tegermen-say⁹⁵⁴ and in the settlement of Ikpen⁹⁵⁵ (Fig. 141). Despite their assignment to the Andronovo community⁹⁵⁶, Bronze Age remains in the Semirech'e region dating from the second millennium BC⁹⁵⁷ usually show a number of strong, consistent, local features, leading archaeologists to the conclusion that an eastern variant of the larger Andronovo cultural group developed in this area, specifically the "Semirech'e type"⁹⁵⁸. Judging from material evidence, vessels found in Xiabandi cemetery AII can be linked to the pottery production of this Andronovo sub-group.

⁹⁴¹ KUZ'MINA, MALLORY, 2007, p. 620.

⁹⁴² See fig. 109.1.

⁹⁴³ QI Xiaoshan 祁小山, WANG Bo 王博, 2008, p. 231, figs. 4, 5.

⁹⁴⁴ Chronology for these sites was established by typological comparison with Andronovo materials. See the previous section of this chapter, "The Ili-Tacheng region".

⁹⁴⁵ SHAO Huiqiu 邵会秋, 2009, fig. 2; KUZ'MINA, MALLORY, 2007, p. 29.

⁹⁴⁶ KUZ'MINA, MAIR, 2008, pp. 168-169.

⁹⁴⁷ KUZ'MINA, MAIR, 2008, pp. 170-171.

⁹⁴⁸ FRANCHETTI, 2008, p. 32; for further and more detailed information on the Andronovo decorations see KOVTUN KOBTYH, 2016.

⁹⁴⁹ The only decorated vessel recovered from Xiabandi cemetery AII was the *guan* pot found in grave M42, which carried an impressed ornament on the shoulders.

⁹⁵⁰ Other than in Semirech'e, they sometimes featured among the Andronovo remains of the Alakul type in the Urals region. KUZ'MINA, MAIR, 2008, p. 167.

⁹⁵¹ GORYACHEV, MARYASHEV, 1998, 1, p. 77, fig. 6; GORYACHEV ГОРЯЧЕВ, MARYASHEV МАРЬЯШЕВ, 1993, pp. 19-27, and fig. 4.

⁹⁵² GORYACHEV, Alexei N. MARYASHEV, 1998, p. 77, fig. 6; SHAO Huiqiu 邵会秋, 2009, fig. 2.

⁹⁵³ KUZ'MINA, MALLORY, 2007, p. 687, fig. 73b.

⁹⁵⁴ SHAO Huiqiu 邵会秋, 2009, fig. 2; KUZ'MINA, MALLORY, 2007, p. 687.

⁹⁵⁵ KUZ'MINA, MAIR, 2008, p. 172.

⁹⁵⁶ The attribution was based on the similarities of metal artefacts, burial structures and pottery. KUZ'MINA, MALLORY, 2007, pp. 29-30.

⁹⁵⁷ The sites have been placed to the second millennium BC. KUZ'MINA, MALLORY, 2007, pp. 243-244.

⁹⁵⁸ KUZ'MINA, MAIR, 2008, pp. 82-84.

Despite the consistency of the aforementioned pottery assemblages, a small group of graves in Xiabandi cemetery AII (M18, M107 and M109) stood out for containing a different type of vessels: while most of the burials included flat and solid bottomed Andronovo-type vases, in graves M18, M107 and M109 only handled containers with round bases were found (Fig. 138), which indicates that the latter represent a different, perhaps new, tradition. This theory is supported by the results of the carbon dating, which have placed burial M18 in the range 900-770 BC⁹⁵⁹. The similar style of pottery recovered from grave M18 with that of the vessels found in burials M107 and M109 (especially the globular shape and the round base) suggests that the three graves were roughly contemporaneous (Figs. 137, 138). Whilst pottery vessels found in graves M18, M107 and M109 differ evidently from most of the containers discovered in the earlier graves, they show analogies with specimens recovered from the Aketala hoards⁹⁶⁰. In fact, although only two almost complete vases were collected from the four deposits (Figs. 142.1, 2), fifty-nine large pottery shards allowed archaeologists to establish that the assemblage consisted of handmade, round-based, globular-shaped vessels, sometimes with handles, which, to a closer look, are similar to the specimens found in the later graves at Xiabandi cemetery AII (Fig. 142)⁹⁶¹. However, while the latter had no ornaments, containers from the Aketala hoards were decorated, and specifically, on the inside walls with textiles impressions, and on the outside with rows of holes. The textile-impressed decoration has been rarely found on vessels from the Pamir region, however it was a rather spread motif in prehistoric Eurasia. In fact, incidental impressions of fabric on pottery can be traced back to the upper Palaeolithic period in Eastern Europe, (ca. 26.000 BC)⁹⁶², while the intentional process began in the Upper Paleolithic in Eastern Russia (ca. 10.500 BC)⁹⁶³ and in the Neolithic period in Eastern Europe (ca. sixth-fifth millennium BC)⁹⁶⁴. From here it spread during the early Bronze Age in the Caucasus (ca. fourth-third millennium BC)⁹⁶⁵. Vessels with an impressed textile decoration continued to be produced by the Bronze Age hunter-gather and pastoralist communities from the third millennium BC, not only in Western Eurasia, as shown by the remains

⁹⁵⁹ XIA, 2012c, p. 144.

⁹⁶⁰ This type of vessels was also found in other deposits in Shufu County, for example in the Jiang'ge'er district of the Boshenkeremu village. However these remains have only been briefly mentioned, and, in some cases, some low quality illustrations have been provided, making them difficult to evaluate. Zizhi Wenwu Pucha Bangongshi 自治文物普查办公室 (Office of Cultural Relics Survey), Kashen diqu Pucha Dui 喀什地区普查队 (Cultural Relics Survey Team of Kashgar), 1993, p. 11.

⁹⁶¹ Of the pottery remains recovered from the Aketala deposits, forty-three were made of brown pottery, eleven were grey and five were red. They were all made of coarse pottery fired at relatively low temperatures. Types varied and archaeologists were able to recognize *guan* pots, *bo* bowls, *wan* and *bei* cups and numerous *fu* cauldrons. Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977, pp. 108-109.

⁹⁶² SOFFER, ADAVASIO, ILLINGWORTH, AMIRKHANOV, PRASLOV, STREET, 2000.

⁹⁶³ HYLAND, ZHUSHCHIKHOVSKAYA, MEDVEDEV, DEREVIANKO, TABAREV, 2002.

⁹⁶⁴ CHERNAI ЧЕРНЫЙ, 1981.

⁹⁶⁵ HEINSCH, VANDIVER, 2006.

from the Volga region⁹⁶⁶, but also in Northern Kazakhstan⁹⁶⁷, Western Siberia and in the Minusinks Basin⁹⁶⁸. Among them, evidence found in the pastoral settlement of Begash, in the region of Semirech'e, was object of systematic studies by Doumani and Franchetti, who specifically analysed eighteen samples of fabric-impressed coarse wares, dating back to the early/middle and late Bronze Age (carbon dated to 2450-1700 BC and 1600-1000 BC respectively)⁹⁶⁹. Research on impressed waves and fibres on the Begash samples revealed precious information on the type of fabric, technologies, as well as the existence of strong influences from the Sintasha (ca. 2100-1800 BC) and the Andronovo (ca. 1900-1200 BC) weaving traditions. Unfortunately no such a detailed analysis has yet been conducted on specimens from the Pamir region, however, the discovery of fabric-impressed pottery, not only indicates that there was a part of the Aketala population devoted to waving, but also that this community was indeed connected with western and northern steppic cultural groups. Globular round-based vessels found in the Aketala hoards show analogies, not only with specimens from the later phase of Xiabandi cemetery AII, but also with containers recovered from the neighbouring archaeological sites at Xiangbaobao⁹⁷⁰ and Ji'ertzankale⁹⁷¹ villages (Tashenku'ergan County), carbon dated to the first millennium BC⁹⁷² (Fig. 143). In the latter cemeteries, a number of iron objects and rather refined bronze and golden items were found. In addition, evidence from these funerary sites shows the abandonment of some significant Andronovo funerary practices⁹⁷³ and the adoption of new rituals, that numerous scholars connected to the occupation of the Pamir region by the Scythian cultural group of Saka⁹⁷⁴. Therefore, Xiangbaobao and sites have been rather safely assigned to the Iron Age⁹⁷⁵.

⁹⁶⁶ LAVENTO LABEHTO, PATRUCHEV ПИТРУШЕВ, 2015.

⁹⁶⁷ OLSEN, HARDING, 2008.

⁹⁶⁸ OKLADINOV, 1959, pp. 22-31.

⁹⁶⁹ DOUMANI, FRANCHETTI, 2012.

⁹⁷⁰ Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981, pp. 206-207.

⁹⁷¹ Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 2014, pp. 17, 19.

⁹⁷² In the 1970s carbon dating on wooden samples taken from three graves in Xiangbaobao were carried out. The results were not calibrated: grave M40 was placed to 4885± 85 BP, M13 to 2505±80 BP and M17 to 2665±120 BP (Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 [Institute of Archeology, Xinjiang Academy of Social Sciences], 1981, p. 201). New examinations on four samples, taken from graves M21, M17 and M13, were published in 1991 and, in the light of the new and calibrated data, Xiangbaobao cemetery was dated to 900-400 BC (IAC, 1991, p. 294). In spite of this, there are senior scholars, who still rely on non-calibrated dating: among them, Shui Tao reported that the dating for Xiangbaobao cemetery was 2750± 65-2465± 70 BP (SHUI Tao, 1998, p. 166). The Ji'ertzankale funerary sites has been placed to around 600-400 BC on the basis of sixteen carbon dating results, obtained for bone samples taken from ten graves. Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 2014, pp. 27-28; WU Xinhua 巫新华, 2014, p. 127.

⁹⁷³ Among the most evident changes there were the position of the body, now supine, the disappearance of the vessels next to the deceased's head and the production of a different type of pottery vases.

⁹⁷⁴ The Saka community was one of the tribal groups of the Asian Scythians, who during the ninth-seventh centuries BC settled and developed in the Asian steppes on the basis of the Andronovo tradition. For more detailed information on the Saka community see: YABLONSKY, 1995a. For more information on connections between the local communities in Western Xinjiang and the Saka group see: MEI Jianjun, 2000, pp. 69-71; CHEN Kwang-tzuu, HIEBERT, 1995, pp. 281-283; DEBAINE, 1989, pp. 200-201.

⁹⁷⁵ Mei Jianjun, 2000, p. 20.

That said, while analogies among the Aketala hoards, the later graves at Xiabandi cemetery AII and the funerary site at Ji'ierzankale seem to be limited to the globular shape of the vessels⁹⁷⁶, similarities with the remains at Xiangbaobao cemetery are more numerous, involving burial structures and rites⁹⁷⁷. More specifically, a small group of graves in the cemetery of Xiangbaobao (M13, M17, M40) were characterized by the presence of surface markers (mounds or stone enclosures), wooden logs sealing the graves and the coexistence of cremation and inhumation rituals. In addition, the position of the dead on its left side with bent legs, and a pot placed near the head were occasionally verified. The scant funerary objects contained in the aforementioned burials have not been adequately reported, however from the few illustrations available, it is possible to recognize a round-based, globular container from grave M13, similar to the Akelata and later Xiabandi specimens (Fig. 144). The remaining burials in Xiangbaobao cemetery, despite including analogous globular pottery vessels, showed different burial rites, such as a supine funerary position, and grave goods, consisting of Scythian-type of metal objects and beads⁹⁷⁸. This group of graves was accordingly connected to the Scythian community of Saka, which appeared in Central Asia and in the Pamir region in the first millennium BC⁹⁷⁹. By contrast, remains in graves M13, M17, M40 seem to represent a “transitional phase”, characterized by the decline of the Andronovo influence and the emergence of a new tradition, apparently connected to the eastward migration of Scythian groups.

Judging from pottery evidence, it seems that in the Pamir region a “transition” occurred from an Andronovo-type of tradition, reflected in the remains from the first phase of the Xiabandi cemetery AII, into a Saka-type of tradition, shown by the findings at Xiangbaobao and Ji'ierzankale, through a “intermediate” phase, represented by the deposits at Aketala, the findings from the later stage of Xiabandi cemetery AII and graves M13, M17, M40 at the Xiangbaobao funerary site. Accordingly, while the cemetery AII at Xiabandi probably represents two stages, both assigned to the Bronze Age, the attribution of the Aketala hoards to the Neolithic period is problematic, since evidence suggests that

⁹⁷⁶ In Ji'ierzankale cemetery, not only the graves had two concentric circles of stone enclosures marking the surface (and no mounds), but also a corridor at the entrance. Additionally, the tradition of multiple burials prevailed, and the bodies were generally placed supine and extended (Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 [Institute of Archeology, Xinjiang Academy of Social Sciences], 2014). These features paralleled those of the later graves at Wutulan and Kuokesuxi in the Ili-Tacheng region, dating to the first millennium BC, (XIAb, 2014a; XIA, 2014d; XIA, 2012a), but similar structures were unknown in Xiabandi cemetery AII. It should be noticed that the aforementioned graves in the Ili-Tacheng region shared similarities with those at the Qiongkeke cemetery, in the same area, which contained painted pottery and some iron, thus assigned to a later period (XIA, 2002b).

⁹⁷⁷ WU Yong 吴勇, 2012, pp. 38-40.

⁹⁷⁸ Among others, refined metal objects, such as knives and daggers, and elongated hard stone beads were found.

⁹⁷⁹ Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981, p. 212; WANG Binghua 王炳华, 1985b, pp. 55-56.

it should be assigned to the Bronze Age, and perhaps to its late stage. This attribution is supported by the similarities of pottery items from the Aketala hoards with containers recovered from Bronze Age sites in Central Asia, such as at the settlements of Shortugai (Afghanistan)⁹⁸⁰ and Tashguzor (Tajikistan)⁹⁸¹ and specimens assigned to the Chust or the late Bishkent cultural groups (ca. 1300-800 BC) in the Fergana Valley⁹⁸². This further suggests that, while the remains in the Aketala hoards have been correctly placed to around 1000 BC, they should be assigned to the Bronze Age, rather than the Neolithic period⁹⁸³.

Other materials

Very few bone and stone tools were found in the Xiabandi cemetery AII. As regards bone items, only entire or broken sheep bones were recovered from ten graves, while no horse remains were found⁹⁸⁴. Sheep heads and bones were sometimes buried with the dead⁹⁸⁵, while other remains were found inside pottery and wooden containers, which were placed inside the tombs and most likely were food offers (Fig. 145). These discoveries suggest, not only that sheep breeding was a significant component of the regional economy, but also that animal sacrifices were involved in the funerary rites.

While no stone items were recovered from Xiabandi cemetery AII, numerous stone implements, including eleven curved knives, six curved sickles, fourteen mills, six pestles, three grinding stones, one arrowhead, four spinning wheels and two rings, were found in the Aketala hoards (Fig. 146). Knives and sickles with a curved shape were specific farming tools, and their discovery suggests that the local community was, at least partially, devoted to agriculture (Figs. 146.1-5, 8). Because of the very aspect of these utensils, scholars believe that some form of connection between the Aketala

⁹⁸⁰ The settlement represents the last stage of the Shortugai site (period IV). It has been carbon dated to 2281-2322 BC by Posshel in the mid-1990s (POSSEHL, 1997-1998, pp. 58-59), however its chronological position has been revisited in the light of new discoveries, especially those related to the Harappan period. Now there is general agreement over the dating 2600-2000 BC for the Shortugai site, and as a consequence, the dating of later occupation of the settlement has been postponed to Bishkent period (late second-early first millennium BC). For further details on the site and its controversial cultural attribution to the Harappa or the Bishkent communities see: FRANCFORT, 1989, 1979, pp. 101-202; DUPREE, 1981; PRABHAKAR, 2017.

⁹⁸¹ The site was assigned to the Bishkent community (late second-early first millennium BC), however a quantity of Andronovo material was found, suggesting a previous occupation of Tashguzor by the Andronovans. KUZ'MINA, MALLORY, 2007, pp. 275-276; P'YANKOVA П'ЯНKOBA, 1999.

⁹⁸² ASKAROV, 1992, p. 441, fig. 5; KUZ'MINA, MALLORY, 2007, pp. 275-276, 287-288, 705, fig. 91

⁹⁸³ Although no bronzes were found at Aketala, two main factors should be taken into account: first, the remains were found on the surface, and second, bronze objects were rather valuable in ancient times. The combination of this two factors leaves room for speculating that the bronze material may have been stolen in time, or taken by the owners when the site was abandoned.

⁹⁸⁴ Horse remains were not found among the Bronze Age remains at Xiabandi cemetery AII, and they neither were in other Bronze Age sites in the Pamir region. They occasionally featured later graves, dating to the Han dynasty period (206 BC-221 AD), such as grave M13 at Xiabandi cemetery AII, which contained a horse skeleton.

⁹⁸⁵ Only in grave M34 one complete sheep skeleton was found.

community and the Chust cultural group (settled in the Fergana Valley and dating to around 1300-800 BC) had been already established at the end of the second millennium BC⁹⁸⁶ (Fig. 147). As a matter of fact, several hundreds curved sickles and knives were found in the Fergana Valley and its close territories, and most of them were unearthed from sites dating from the second half of the second millennium BC to the first millennium BC. Some of these objects have been indeed assigned to the Chust community, such as those found at Sary-Bulun, on the Issyk-Kul Lake⁹⁸⁷ (Fig. 148.1), while those discovered at Koktepe, near Tashkent⁹⁸⁸, and in Southern Uzbekistan (at the Mirshadi oasis, in the settlement of Kyzylcha 6⁹⁸⁹, in Kyzyl-Tepe⁹⁹⁰ and in Bujrachi-Tepe 2⁹⁹¹) have been attributed to the Burguljuk cultural group⁹⁹². Back in the fourth millennium BC, semilunar knives and sickles were rather common in Neolithic farming societies, but they were also found in hunters and gatherers' communities in Europe⁹⁹³, Central Asia⁹⁹⁴, India⁹⁹⁵, Tibet⁹⁹⁶, China and even Korea⁹⁹⁷ (Fig. 149). In particular, in China, in addition to the specimens discovered in Xinjiang Province, crescent moon-shaped knives were found in the Karuo County in Tibet, among the cultural remains of the Karuo community (ca. 3200-2000 BC)⁹⁹⁸ and in present Gansu, in Jianjiaping site (Yongdeng County), attributed to the Machang cultural group (2650-2000 BC)⁹⁹⁹ (Figs. 149.2, 5). Other sickles were recovered from Inner Mongolia, in Xiaoheishigou site (Ningcheng County), assigned to the Upper

⁹⁸⁶ MEI Jianjun, 2000, p. 9.

⁹⁸⁷ KUZ'MINA, MALLORY, 2007, p. 439.

⁹⁸⁸ Johanna LHUILLIER, 2007, p. 4.

⁹⁸⁹ SAGDULLAYEV САГДУЛЛАЕВ, 1987, p. 31.

⁹⁹⁰ SAGDULLAYEV САГДУЛЛАЕВ, 1978, p. 7.

⁹⁹¹ SAGDULLAYEV САГДУЛЛАЕВ 1978, pp. 30-36.

⁹⁹² The dating 1500-1000 BC for the Burguljuk cultural group was tentatively established by typological examination of the remains and based on stratigraphy. For further information on the Burguljuk community see: BEDENZU-SARMIENTO, LHUILLIER, 2009.

⁹⁹³ In Northern Europe the Late Neolithic period (3000-2300 BC) and the Bronze Age (1800-1000 BC) were characterized by the presence of such tools. CHILDE, 1925, p. 220.

⁹⁹⁴ Especially in the cultural sites around the Fergana Valley, in Uzbekistan and Kyrgyzstan. For more information see: KOROBKOVA, 1981, chapter 15.

⁹⁹⁵ Curved stone and copper sickles and knives were found in some areas of the Kashmir region, such as in the Burzahom site B (2850-2550 BC) (see fig. 149.1). According to recent studies, communities in Northern India were in contact with the Kouro cultural group in Tibet (ca. 3200- 2000 BC), and with that of Majiayao in Sichuan (ca. 3300-2050 BC). HAN Jianye, 2012, p. 31. For more information on the prehistory of these regions and possible contacts see: MUGHAL, HALIM, 1972; DIKSHIT, 1982; HUO Wei 霍巍 1991; Chengdu shi Wenwu Kaogu Yanjiusuo 成都文物考古研究所 (Chengdu Institute of Cultural Relics and Archaeology), Abazangzu Qiangzu Zizhizhou Wenguan Suo 阿坝藏族羌族自治州文管所 (Ngawa Tibetan and Qiang Autonomous Prefecture), Mao xian Bowuguan 茂县博物馆 (Mao County Museum), 2002.

⁹⁹⁶ Curved stone knives and sickles presenting, however, a perforation next to the straight side were recovered from the Karuo site in Changdu (Tibet), dating back to middle-late Neolithic period (ca. 3300-2000 BC). BELLEZZA, 2015 fig. 25; HAN Jianye, 2012, p. 33; for detailed information on the site see Xizang Zizhiqu Wenwu Guanli Weiyuanhui 西藏自治区文物管理委员会 (Tibet Autonomous Region Heritage Management Committee), Sichuan Daxue Lishixi 四川大学历史系 (Sichuan University, History Department), 1985.

⁹⁹⁷ Multiple holes were applied on crescent moon-shaped knives found in the Mumun site (Korea), dating back to the second-first millennium BC. NELSON, 1993, p. 125.

⁹⁹⁸ HAN Jianye, 2012, p. 32 fig. 5; dating for the Karuo remains has been established by carbon dating, IAC, 1991, pp. 243-250.

⁹⁹⁹ The recovered specimen was made of copper. SUN Shuyun 孙叔云, HAN Ruben 韩汝芬, 1997, p. 76.

Xiajiadian tradition (first millennium BC)¹⁰⁰⁰ and in Henan, among the cultural remains of the Erlitou community (ca. 1600-1300 BC) in Meishan cemetery (Ruzhou County)¹⁰⁰¹ (Figs. 149.3, 4). As regards western types, according to some senior scholars, Bronze Age communities in the Fergana Valley had developed their own distinctive variety of semilunar sickles¹⁰⁰². On the contrary, Kuz'mina has argued that these tools emerged within the Timber Grave (ca. 1900-1200 BC) and Andronovo (ca. 1900-1200 BC) communities and became popular during the late Bronze Age in the eastern Andronovo territory, especially Semirech'e, Fergana and the Tashkent oasis¹⁰⁰³. The Timber Grave sickles featured a very upward pointed end, while Andronovo specimens were perforated, slightly curved on one side (Fig. 116). Some similarities can be observed between Andronovo metal sickles and some stone specimens from Fergana and South-western Xinjiang (such as those in fig. 147), however, they differ greatly from the semilunar sickles in figs. 146. 1, 3, 5, 8 and some of those in fig. 148, with respect to shape and material. Therefore Kuz'mina's theory needs more archaeological evidence to be demonstrated. A differently oriented investigation has found in Xinjiang the origin of semilunar sickles and knives, which then spread to the Issyk-Kul Lake region (where the community of Chust grew from the second half of the second millennium BC), and then to the whole Fergana territory, and to a smaller extent, to Semirach'e¹⁰⁰⁴. However, on the basis of archaeological discoveries known at present, the few semilunar knives and sickles featuring in Xinjiang, and specifically in the Pamir region, the Tianshan Valleys, the Turfan Basin and along the southern rim of the Taklamakan Desert, have mostly been placed around 1000 BC or later¹⁰⁰⁵. Since this is a rather late dating, the theory according to which curved sickles and knives originated in Xinjiang, lacks of solid chronological and archaeological foundations. Given their simplicity, and independent "invention" of these semilunar tools by different communities at different times is also to be considered. Nevertheless, the fact that by the end of the second millennium BC, in addition to curved knives and sickles, the Chust assemblage in the Fergana

¹⁰⁰⁰ XIANG Chunsong 项春松, LI Yi 李义, 1995, p. 15, fig. 18.

¹⁰⁰¹ Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo Henan Er Dui 中国社会科学院考古研究所河南二队 (Second Archeological Team of Henan of the Chinese Academy of Social Science), 1982, pp. 465, 471.

¹⁰⁰² ZADNEPROVSKII, ZADNEIPIROVSKIIY, 1962, p. 36, fig. 12; SEMENOV SEMENOV, SHIRINOV SHIRINOV, 1976, pp. 73-76; KOROBKOVA, 1981, p. 88.

¹⁰⁰³ KUZ'MINA KUZ'MINA, 1966, pp. 44-45, tabs. IX, X. The author also classified sickles unearthed from the Andronovo territory into four groups, and stated that they shared a common genesis with tools of the Timber Grave community. KUZ'MINA, MALLORY, 2007, 141-143.

¹⁰⁰⁴ KUZ'MINA, MALLORY, 2007, p. 439.

¹⁰⁰⁵ They were found in the sites of Haladun (Sache County), Halahezhuo (Turfan City) and Niya Beifang (Minfeng County), and were collected in the Akesu Prefecture and Luntai County. Some of these sites were carbon dated to around 1000 BC, while others were placed to around the end of the second-beginning of the first millennium BC by typological examinations. All these remains were assigned to the Late Bronze Age and to the early Iron Age (MEI Jianjun, 2000, pp. 9-10; Xinjiang Wenwu Bowuguan 新疆文物博物馆 (Xinjiang Cultural Relics Museum), 1991; YUE Feng 岳峰, YU Zhiyong 于志勇 1999). Earlier sickles from Tianshan Beilu cemetery in Eastern Xinjiang (ca. 2000-1400 BC) and the Ili-Tacheng region were of the Andronovo type. Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 94. See also figs. 116, 83.6.

Valley included bridle-shaped stone mills and stone “rings”, which were also present in the Aketala deposits, suggests that some connections actually existed between the Aketala and the Chust communities¹⁰⁰⁶ (Figs. 146, 148).

Few wooden items were found in a number of graves in Xiabandi cemetery AII, and they consisted of fifteen *pen* plates, three handled *bei* cups, two *bo* bowls, one *shao* spoon and some unidentified items (Figs. 150.1, 2). In addition, the discovery of numerous wooden lids for covering pottery containers, in which broken sheep and goats bones were found, suggests the existence of a funerary ritual that involved food offers (Fig. 150.3).

3.2.4 Metallurgy

While in the Aketala hoards only a broken copper knife was found (Fig. 151), in Xiabandi cemetery AII metal objects were more numerous¹⁰⁰⁷, though only consisting of ornaments: in fact, no metal tools and no weapons were recovered. Personal ornaments were usually placed in adult female burials¹⁰⁰⁸, recalling the tradition typical of the steppe¹⁰⁰⁹. Eight earrings were recovered from the cemetery: a pair was found in graves M4, M32 and M42, while a single specimen, placed on the right side of the deceased’s head, was discovered in burials M5 and M39 (Fig. 152). These earrings were circles with a trumpet-shaped ending: the typical Andronovo shape. As mentioned in the previous section of this chapter¹⁰¹⁰, penannular earrings were more common in the eastern Andronovo communities, throughout the territories of present-day Kazakhstan¹⁰¹¹, Uzbekistan¹⁰¹² and Western Siberia¹⁰¹³ (Figs. 112.5-7). Further east, they featured in North-western and North-eastern China (Gansu, Inner Mongolia, Hebei, Tianjin and Beijing), where local groups had apparently established some form of contact with the steppe communities¹⁰¹⁴ (Figs. 112.9-11). As in the Ili-Tacheng region, in South-western Xinjiang, no other types of earrings have been found in association with Bronze Age remains,

¹⁰⁰⁶ Remains assigned to the Chust cultural group, including curved sickles, bridle-shaped mills and stone rings, are currently exhibited in the State Museum of History in Tashkent (Uzbekistan).

¹⁰⁰⁷ They featured in graves including both inhumated and cremated human remains: the specimen recovered from grave M27, in which a cremation ritual was performed, was partially melt.

¹⁰⁰⁸ Only one broken earring and a button were found in children’s graves, M5 and M19 respectively.

¹⁰⁰⁹ Especially some Andronovo-related tribes. KUZ’MINA, MALLORY, 2007, p. 195.

¹⁰¹⁰ See the previous section of this chapter “The Ili-Tacheng region” and the first chapter “The Altay region”.

¹⁰¹¹ Among others they were found in the Borovoe, Sanguyur and Tautari cemeteries, and in the Tash-Tyube, Tasty Butak and Targimensai sites. KUZ’MINA, MALLORY, 2007, pp. 264-267; KUZ’MINA, MAIR, 2008, p. 201, fig. 57.

¹⁰¹² Among others, they were found in the Dzarkutan site. KANIUTH, 2007, p. 29.

¹⁰¹³ They were found in the Malyi cemetery, close to Tomsk. GIMBUTAS, 1965, p. 101, fig. 61.

¹⁰¹⁴ BUNKER, 1993, pp. 30-32; BUNKER, 1998, p. 611. See also the previous section of this chapter “The Ili-Tacheng region”.

thus suggesting that early communities in the whole western Xinjiang region were strongly influenced by the Andronovo metallurgical production. In this regard, the discovery of one pair of silver specimens in grave M32 at Xiabandi cemetery AII (Figs. 152.5, 6), provides further links to the Andronovo community. In fact, the Andronovans, not only were able to extract silver, as demonstrated by the discovery of stone mining tools of the Andronovo type around the Kansay mines in present Uzbekistan, but also to manufacture objects, as shown by the production of silver ornaments in the Semirech'e region, at Tash-Tyube¹⁰¹⁵.

In addition to penannular earrings, the set of personal ornaments of the Xiabandi community, included anklets and bracelets. A single anklet, made of bronze beads was recovered from graves M42 and M62, while in grave M32 two specimens were found (Fig. 153). In addition, five flat and, sometimes, slightly twisted bracelets were distributed in three graves (M4, M32 and M42) all associated with female bodies (Fig. 154). As well as the earrings, when singularly found, these bracelets were placed on the right side of the dead. In spite of the simplicity of these objects, their production can be traced back “only” to the early third millennium BC, when they featured among the remains assigned to the Sofievka cultural group (ca. 2950-2740 BC), in the Krasny Khutur cemetery in the middle Dnieper region¹⁰¹⁶, and further east, in the Volga-Kama region, in correspondence to the cultural sites of the Abashevo community (ca. 2500-1900 BC)¹⁰¹⁷. In the second millennium BC flat bracelets were fairly diffused in the Andronovo territory: they were discovered, for example, in Ataken-sai and Khabarnoe I (Southern Urals), in Altyn-su (Kazakhstan)¹⁰¹⁸, in Tash-Tyube (Kyrgyzstan)¹⁰¹⁹ and in several sites in Western Siberia¹⁰²⁰ (Fig. 155). That said, they were more often unearthed from sites characterised by mixed materials, such as the Tahirbai settlement in Eastern Turkmenistan¹⁰²¹, which although attributed to the Bishkent cultural group¹⁰²², contained numerous objects related to the Andronovo tradition¹⁰²³ (Fig. 156.1). Bracelets

¹⁰¹⁵ KUZ'MINA, MALLORY, p. 90. For more information on the use of silver by the Andronovans see the second chapter of this research “Eastern Xinjiang”.

¹⁰¹⁶ Chernykh regarded the remains of Sofievka as a representative of an independent cultural community, while other scholars believe that they represented the ‘Sofievka-type of the Tripolye cultural group’. CHERNYKH, 1992, p. 94; VIDEIKO, 1995. For the chronology of this community see KADROW, 1995.

¹⁰¹⁷ CHERNYKH, 1992, p. 195.

¹⁰¹⁸ CHERNYKH, 1992, p. 199, fig 71.

¹⁰¹⁹ KUZ'MINA, MAIR, 2008, p. 172.

¹⁰²⁰ UMERENKOVA УМЕРЕНКОВА, 2015.

¹⁰²¹ KUZ'MINA, MAIR, 2008, p. 182.

¹⁰²² Some scholars, such as Litvinsky, regarded the Bishkent community as a single group, while others, such as Kuz'mina, associated it with the Vashkh cultural group, regarding the two as a single culture. Its dating remains also controversial: while Baumer placed the Bishkent community to around 1100-900 BC, Adams put forward a earlier dating, corresponding to around 1700-1500 BC. For further discussion on the topic see LITVINSKY ЛИТВІНСКИЙ, 1964; KUZ'MINA, MALLORY, 2007, p. 7; KUZ'MINA, MAIR, 2008, p. 84; BAUMER, 2012, p. 115; ADAMS, 1997, p. 68.

¹⁰²³ KUZ'MINA, MAIR, 2008, p. 84.

found in the Kumsay cemetery, by the piedmont of the Hissar Range (Tajikistan), were accompanied by handmade, mostly undecorated ceramics, similar to those found in the Xiabandi cemetery AII¹⁰²⁴ (Fig. 156.2). The Kumsay funerary site was placed to around the middle of the second millennium BC, however, its cultural attribution is still problematic, since most of the graves contained an admixture of Andronovo (ca. 1900-1200 BC) and Sapalli (ca. 1700-1300 BC) material¹⁰²⁵. Of the same mixed character were other sites, such as the cemetery of Siab, in the Zaravshan Valley¹⁰²⁶, the settlement of Dzharkutan IV¹⁰²⁷, the Dzham hoard¹⁰²⁸ and the funerary site of Bustan VI¹⁰²⁹ in Southern Uzbekistan¹⁰³⁰ where flat bracelets were found: while these sites have been attributed to the Sapalli cultural group, bracelets, and other metal objects have been considered products of the connections with the Andronovo community (Figs. 156.3-5)¹⁰³¹. This suggests that, although a mixture of different populations coexisted in Central Asia, metallurgy of these early communities was strongly influenced by the Andronovo's. That said, these flat bracelets may have not been "real Andronovo" objects: in fact, not only the evident Andronovo's preference for other, more distinctive types of bracelets, such as the spiral-ended type (which outnumbered the flat specimens)¹⁰³², but also the recurring presence of these objects in mixed contexts, leave room for speculating that flat bracelets from the aforementioned Bronze Age sites may have been simplified copies or a local adaptations of the Andronovo type, rather than one of the diagnostic objects of this tradition.

In Xinjiang territory, in addition to the specimens found in the Pamir region, flat bracelets were discovered in the Tianshan Valleys, in the cemetery at Sa'ensa'yi village (Changji County)¹⁰³³, while in present-day Gansu Province they featured in small quantities in diverse sites assigned to the Siba

¹⁰²⁴ KUTIMOV КУТИМОВ, 2013.

¹⁰²⁵ KUTIMOV КУТИМОВ, 2013; VINOGRADOVA ВИНОГРАДОВА 2000; for further information on the Sapalli cultural group and its dating see: ASKAROV, АСКАРОВ, 1977; GÖRS DORF, HUFF, 2001.

¹⁰²⁶ KUZ'MINA, MALLORY, p. 241, 699, fig. 85.

¹⁰²⁷ Dating for this site was initially established to ca. 1700-1300 BC by Askarov and Abdullaev on the basis of uncalibrated carbon dating, while later Askarov accepted a earlier date for the site, 2034-1684 Cal. BC. Görsdorf, and Huff put forward a chronological range, corresponding to 1880-1690 Cal. BC. For further discussion see ASKAROV АСКАРОВ, ABDULLAYEV АБДУЛЛАЕВ, 1983; ASKAROV, АСКАРОВ 1977, p. 132; GÖRS DORF, HUFF, 2001.

¹⁰²⁸ KUZ'MINA, MALLORY, 2007, p. 241, 698, fig. 84.

¹⁰²⁹ Dating for this site was established by stratigraphy to ca. 1300-900 BC (Akhmadali A. ASKAROV, Ахмадали А. АСКАРОВ, Temir Shirinov Темір ШИРИНОВ, 1993), while carbon dating revealed that Bustan VI was earlier (first half of the second millennium BC). КИРЧО КИРЧО, РОРОВ, ПОПОВ, 1999, p. 360.

¹⁰³⁰ For further information on the sites see HUFF, 2000; HUFF, PIDAEV, CHAYDOULLAEV, 2001; for additional pictures see KUZ'MINA, MALLORY, 2007, p. 683.

¹⁰³¹ ASKAROV АСКАРОВ, SHIRINOV ШИРИНОВ, 1993; ASKAROV, АСКАРОВ, 1977, p. 101; KANIUTH, 2007, see in particular p. 29 fig. 4; KUZ'MINA, MALLORY, 2007, pp. 226-227, 233, 268-270.

¹⁰³² KOVTUN КОВТУН, 1999.

¹⁰³³ See, for example, the specimen found in grave M84. XIA, 2013a, fig. 55.5.

cultural group, such as that of Siwashan (Lintao County)¹⁰³⁴ and Jiuzhan (Heshui County)¹⁰³⁵ (Fig. 157). In these eastern sites, the significantly low number of flat bracelets, and their wide chronological distribution (while the Siba community was placed within the range ca. 1900-1500 BC, the cemetery at Sa'ensa'yi has been carbon dated to the first millennium BC) suggest that most likely they were not local products. On the contrary, they seem to reflect the process of undirected, though continuous, interactions between the communities in North-western China and the steppe cultural groups.

Two types of rings featured in Xiabandi cemetery AII, and specifically in burials M18 and M39 respectively. As usual, they were associated with adult female bodies. The ring found in burial M18 had a spiral-shape and was found close to the deceased's hand (Fig. 158.1), while that recovered from grave M39 was only slightly twisted and was located in the vicinity of the dead's head (Fig. 158.2). Spiral rings were common findings in the steppes communities, and they were found in the Bronze Age cemeteries assigned to the Catacomb cultural group (ca. 2600-2000 BC) in Northern Caucasus¹⁰³⁶, and the Abashevo community (ca. 2500-1900 BC) in the Urals region¹⁰³⁷ (Figs. 159. 1, 2). In later periods, they featured not only in the Timber Grave cultural sites (ca. 1900 -1200 BC) in the Don Basin¹⁰³⁸, but also in some contexts assigned to Seima Turbino-related communities (around 1500 BC), such as that in Shaitanskoye Ozer II¹⁰³⁹ (Fig. 159.3). In the 1990s Chernykh correctly observed that spiral rings were more common in the Urals region than in Kazakhstan and Eastern Eurasia¹⁰⁴⁰, however they sometimes featured among the adornments of the Afanasevo community (ca. 3500-2500 BC)¹⁰⁴¹, and were sometimes recovered from Adronovo (ca. 1900-1200 BC)¹⁰⁴² and Karasuk cultural sites (ca. 1200-800 BC)¹⁰⁴³ (Figs. 159.4-6). A number of spiral finger rings was found further east, in North-western and North-eastern China, in present-day Qinghai and Gansu Provinces, in the sites of Zongri (Tongde County)¹⁰⁴⁴ and Huoshaogou (Yumen City)¹⁰⁴⁵, assigned to the Zongri (ca. 3600-2050 BC) and Siba (ca. 1900-1500 BC) communities respectively (Figs. 159.7, 8). Other specimens were

¹⁰³⁴ ANDERSON, 1943, p. 251, fig. 62

¹⁰³⁵ WANG Zhankui 王占奎, SHUI Tao 水涛, 1997, p. 437.

¹⁰³⁶ CHERNYKH, 1992, pp. 127-128.

¹⁰³⁷ CHERNYKH, 1992, p. 196.

¹⁰³⁸ CHERNYKH, 1992, p. 195, 198.

¹⁰³⁹ KOROCHKOVA, KUZMINYKH, SERIKOV, STEFANOV, 2010, p. 493.

¹⁰⁴⁰ CHERNYKH, 1992, p. 199.

¹⁰⁴¹ GRYAZNOV ГРЯЗНОВ, 1999, p. 109.

¹⁰⁴² KUZ'MINA, MALLORY, 2007, p. 653, fig. 41

¹⁰⁴³ LEGRAND, 2006, pp. 852-853.

¹⁰⁴⁴ Qinghai Sheng Wenwu Guanli chu 青海省文物管理处 (Administration of Cultural Relics of Qinghai Province), Hainan Zhou Minzu Bowuguan 海南州民族博物馆 (Hainan Museum of Nationalities), 1998, pp. 1-14, 35, in particular see figs. 35-36.

¹⁰⁴⁵ BAI Yunxiang 白云翔, 2002, pp. 27, 29, 31.

recovered among the remains of the Lower Xiajiadian cultural group (ca. 2200-1600 BC) on the Liuli River (Beijing)¹⁰⁴⁶, and in association with Datuotou cultural findings (1900-1400 BC) in Lijiandian County (Hebei)¹⁰⁴⁷. Although the frequent discovery of spiral-shaped rings in combination with pennanular earrings, suggests a connection between the Andronovans and their production, the wide spatial and chronological diffusion of these ornaments makes difficult, not only the establishment of their cultural attribution, but also their actual significance in the funerary rituals. In fact, the spiral symbol was extremely diffused since the Neolithic period¹⁰⁴⁸, and often connected to the Sun and the fertility¹⁰⁴⁹. Nevertheless, when the spiral involved the shape, instead of the decoration, it may have not had these ritual significances but, on the contrary, a precise utilitarian function. In this regard, by analysing spiral rings and bracelets recovered from several Copper Age graves assigned to the Tiszapolgar community in the Hungarian Plain (ca. 3300-3100 BC), Derevenski has suggested that these objects were manipulated as the size of the finger or wrist changed throughout life¹⁰⁵⁰. Therefore, although, wearing a ring most likely had a ritual significance in the funerary ceremonies, the spiral shape of the ring found in cemetery AII at Xiabandi may have had practical function, rather than a ritual significance.

The ring found in grave M39 was a bronze circle with a slightly twisted end and, despite having been found close to the deceased's head, it was recorded as a finger-ring in the excavation report (Fig. 158.2). As the aforementioned spiral specimen, the simple shape of this object makes difficult the establishment of its original cultural attribution, since similar ornaments were very much spread in the steppe territory. In fact, from the end of the third millennium BC, they featured in sites assigned to diverse cultural groups, such as the Abashevo (ca. 2500-1900 BC), in the Don Basin, Upper Volga and Western Urals, and the Timber Grave (ca. 1900-1200 BC), in the Volga-Urals territory¹⁰⁵¹ (Figs. 160.1, 2). They were also found among the cultural remains of the Andronovo (ca. 1900-1200 BC) and Seima Turbino-related communities (around 1500 BC)¹⁰⁵² (Figs. 160.3, 4). Despite the wide spatial and chronological distribution throughout Eurasia, it seems that the number of finger-rings was relatively low in the Bronze Age¹⁰⁵³. A research by Jettmar has revealed that at the end of the second millennium

¹⁰⁴⁶ Liuli he Kaogu Gongzuo Dui 琉璃河考古工作队 (Liuli River Archaeological Team) 1976.

¹⁰⁴⁷ JIN Junli, 2009, p. 421.

¹⁰⁴⁸ ZHUSHCHIKHOVSKAYA, DANILOVA, 2008.

¹⁰⁴⁹ MCFARLAND, SCHLABEN, 1995.

¹⁰⁵⁰ DEREVENSKY, 2000, pp. 398-400.

¹⁰⁵¹ CHERNYKH, 1992, pp. 195-196.

¹⁰⁵² Among others, they were found in Shaitanskoye Ozero. KOROCHKOVA, KUZMINYKH, SERIKOV, STEFANOV, 2010, p. 493.

¹⁰⁵³ A relatively diffused type of ring was the spiral-ended of the Andronovans.

BC finger-rings were used only in a small area, roughly correspondent to the Minusinsk Basin¹⁰⁵⁴, suggesting that the use of finger-rings, apparently already modest during the course of the millennium, was even more limited in later periods¹⁰⁵⁵. They were indeed outnumbered by other ornaments having similar shapes, such as the temple rings, which were more spread in South-Western Siberia, Altay and Kazakhstan¹⁰⁵⁶. Considering the wider diffusion of temple rings in Eurasia and given that the specimen from Xiabandi was found close to the dead's head, it seems more plausible that it was indeed a temple ring, rather than a finger ornament.

In the Xiabandi cemetery AII two decorative round-shaped, double-holed “buttons” were found in graves M19 and M52 (Figs. 161.1, 2). Contrarily to other metal items recovered from the funerary site, they were not associated with adult females (they were, indeed, found in two children graves) and were not placed on the right side of the deceased. Although similar buttons were discovered in some Andronovo cultural sites in Eastern Kazakhstan (such as that at Maly Koytas)¹⁰⁵⁷ (Fig. 161.3), a higher number and different variants of these objects were found in Northern China: double-holed buttons, like those unearthed from the graves at the Xiabandi cemetery, were discovered, in Eastern and Southern Xinjiang, in the cemeteries of Tianshan Beilu (ca. 2000-1400 BC)¹⁰⁵⁸ and Liushui (around 1000 BC)¹⁰⁵⁹ respectively (Fig. 161.4, 5), and further east, in Gansu, in the sites of Xinzhuangping (Jishishan County)¹⁰⁶⁰ and Jiuzhan (Heshui County)¹⁰⁶¹, assigned to the Qijia (ca. 2300-1700 BC) and Siba (ca. 1900-1500 BC) communities respectively (Fig. 161.6, 7). Additionally, some specimens were discovered in the Yaozi cemetery (Liangchengguo County) in Inner Mongolia¹⁰⁶², assigned to the Maoqinggou cultural group (first millennium BC), while others, though more refined, featured in some Scythians contexts, placed around the first millennium BC¹⁰⁶³. Sometimes these buttons have been regarded as proper clothes fasteners, however, the specimens recovered from the Xiabandi cemetery AII were placed close to the head, therefore they may have been parts of some head decorations.

¹⁰⁵⁴ Karl JETTMAR, 1950, p. 93.

¹⁰⁵⁵ The limited use of finger-rings during the Karasuk period is also mentioned in Legrand's research. LEGRAND, 2006, pp. 853-854.

¹⁰⁵⁶ Karl JETTMAR, 1950, pp. 93-94; in South-western Siberia temple rings became more common during the last phase of the Fedorovo period, from 1200 BC. KUZ'MINA, MALLORY, 2007, p. 24.

¹⁰⁵⁷ KUZ'MINA, MALLORY, 2007, p. 653.

¹⁰⁵⁸ Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 40.

¹⁰⁵⁹ Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Archaeological Team, Institute of Archaeology, Chinese Academy of Social Science), 2006, p. 36, fig. 3.1.

¹⁰⁶⁰ Gansu sheng Bowuguan 甘肃省博物馆 (Gansu Provincial Museum), 1996, p. 51.

¹⁰⁶¹ WANG Zhankui 王占奎, SHUI Tao 水涛, 1997, p. 438.

¹⁰⁶² Neimenggu Zizhiqu Wenwu Kaogu Yanjiusuo 内蒙古自治区文物考古研究所 (Inner Mongolia Autonomous Region Institute of Cultural Relics and Archeology), 1989, p. 66.

¹⁰⁶³ YABLONSKY, 1995a.

3.2.4.1 Remarks on metallurgical examinations

Few metallurgical studies have been conducted on metal objects discovered in the Pamir region, and no tests have been carried out on the ornaments from Xiabandi cemetery AII. On the contrary, elemental analyses were performed in the 1970s on the broken knife recovered from Aketala hoards, and they revealed that it was made of copper, with an additional tin content of 1.2%¹⁰⁶⁴. Other examinations on a fragment and a stripe from Suletangba'e site (Wupa'er County) were conducted by Mei Jianjun in 2000¹⁰⁶⁵. Unfortunately, the chronological position as well as the cultural attribution of this site are unclear: in fact, the two specimens were placed to "1000 BC or earlier"¹⁰⁶⁶. Of the two samples, that taken from the fragment resulted to be made of pure copper, while the stripe was made of a tin-copper alloy, with a copper content of around 70%¹⁰⁶⁷. As mentioned in the introduction of this dissertation¹⁰⁶⁸, tin bronze, which appeared in South-western Asia as early as at fourth millennium BC, reached Central and Eastern Asia in the following millennia via the steppe, and its spread has been associated with the expansion of the Andronovo community¹⁰⁶⁹. Chernykh argued that 90-100% of Andronovo bronze objects contained a percentage of tin within a range of 2% to 10%¹⁰⁷⁰: according to the results of Mei's examinations, the content of tin in the bronze stripe from Suletangba'e (2.24% and 8.15%) fell precisely into this range. The two samples from the site of Suletangba'e were subjected to additional metallographic tests, however, their conditions were too poor to allow for a conclusive result: in fact, while the corrosion had completely deleted the metal structure of the copper specimen, the stripe presented only small traces of a dendritic structure, which Mei interpreted as evidence of casting.

The existence of a local metallurgical activity is indicated by the discovery of ingot moulds and crucibles in several graves in Xiabandi cemetery AII (for example in graves M45, M89, M62), and is further suggested by the availability of copper and tin sources in the Pamir region. Several deposits have been identified in the Kezileisu and Kashgar Prefectures and more specifically, copper sources

¹⁰⁶⁴ Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977, p. 109; CHEN Ge 陈戈, 1990, p. 367.

¹⁰⁶⁵ MEI Jianjun, 2000, p. 44.

¹⁰⁶⁶ MEI Jianjun, 2000, p. 44.

¹⁰⁶⁷ Two separated examinations were conducted on samples taken from the stripe and both revealed that it was made of a tin-copper alloy, with a tin content of 2.24% and 8.15% respectively

¹⁰⁶⁸ See the paragraph "Metallurgy" in the introduction of this dissertation.

¹⁰⁶⁹ BOROFFKA, CIERNY, LUTZ, PARZINGER, PERNICKA, WEISGERBER, 2002; POTTS, 2012, p. 116.

¹⁰⁷⁰ CHERNYKH, 1992, p. 213

have been found in the villages of Shazigou, Kalama, Tegelimansu (Aketao County), in Huayuan (Wuqia County), A'erbaliieke (Shache County)¹⁰⁷¹. Furthermore, deposits of cassiterite are located in Uzbekistan, Tajikistan and Afghanistan. Some scholars believe that these ores may have been known already in the second millennium BC¹⁰⁷², though too few studies on the subject have been conducted for establishing their possible exploitation in prehistory. Nevertheless, the presence of such numerous copper and tin sources, in association with archaeological discoveries of metalworking-related objects, indicates the existence of a local metallurgy in the Pamir region during the Bronze Age.

3.2.5 Summary

Judging from Bronze Age evidence, the area around the Xiabandi cemetery AII was inhabited by a single and consistent local community, which practised pastoralism, as shown by the numerous sheep and goats remains found in the graves. In fact, several sheep bones were buried with the dead, such as in graves M48 and M31. In addition, sheep and goat meat was offered as funerary sacrifice, as suggested by the food remains found in pottery and wooden vessels, often covered by wooden lids and placed inside the tombs. The pastoralist economy complied with the environmental ecology, consisting of wide meadows that were used as pasturages for sheep herding. Agriculture was also practised: although no farming tools were discovered in Xiabandi cemetery AII, recent analyses of human bones have revealed that sheep meat, wheat and millet were part of the community's diet¹⁰⁷³. The existence of some form of agriculture is also documented by the remains in the slightly later hoards at Aketala, mostly consisting of knives, sickles and other utensils related to farming. The environment of Aketala is that of the desert oasis, which, as shown in other Xinjiang regions (such as in the Hami oasis and along the southern rim of the Tarim Basin¹⁰⁷⁴), was preferred by prehistoric communities for a mixed agro-pastoralist economy. The Xiabandi community was socially organized, as suggested by the discovery of several mounds covering multiple graves: more specifically, the custom of burying children and adults or couples of adults (female-male) under the same mound, indicates that the community arrangement was most likely family-based. On the contrary, the absence of tools does not provide evidence of labour division in this community. Objects related to metalworking, recovered from some graves (such as M45, M89 and M62) in Xiabandi cemetery AII, suggest that a part of the

¹⁰⁷¹ MEI Jianjun, 2000, p. 51, tab. 5.1.

¹⁰⁷² CIERNY, WEISGERBER, 2003, p. 28.

¹⁰⁷³ ZHANG Xinyu 张昕煜, WEI Dong 魏东, WU Yong 吴勇, NIE Ying 聂颖, HU Yaowu 胡耀武, 2016.

¹⁰⁷⁴ See the second and fourth chapter of this dissertation respectively.

population was devoted to metallurgical activity, however whether metallurgists constituted a recognized group in this society is still questionable, as most of the ingots moulds and crucibles were found in burials containing children bodies (M89) or void of human remains (M62). The existence of some form of social stratification is suggested by the discovery of burials M4, M32 and M42, which stand out for their quantities of metal objects. These graves were single and included one female body each. In addition, some metal ornaments, although in smaller quantities, were discovered in other female graves, specifically in M5, M19, M18, M39. This scenario suggests that some women held some sort of social power over the community, since the use of precious materials, such as bronze and silver, for adorning female bodies can be considered a marker of the relevant role played by these women in their society.

The lack of metal tools makes difficult the general understanding of the role of metallurgy, not only in this community, but also in the Pamir region. Archaeological evidence suggests that metal, perhaps from the close copper and tin ores in the territories of the present-day Kezileisu and Kashgar Prefectures, was smelted and cast locally. That said, it is not known if and to what extent metal artefacts were used in everyday-life activities, as no metal tools were found in Xiabandi cemetery AII. Looking closely to the archaeological sites in the Pamir region, one can notice the absence not only of bronze utensils, but also of stone and wooden implements: this suggests a specific choice of the Xiabandi community of excluding utensils from the set of grave goods at Xiabandi. The scarcity of metal tools, in contrast with an abundance of ornaments, has also been observed in the later Xiangbaobao funerary site, dating to the first millennium BC. A copper knife and several stone utensils from the Aketala deposits (ca. 1000 BC) seem to confirm that tools could be placed in hoards, but not in cemeteries. However, this theory is challenged by the specific typology metal ornaments recovered, of the Andronovo-type, which could have been easily acquired from elsewhere, specifically from Semirech'e, where the Andronovans settled. In addition, the discovery of ingot moulds, and the lack of artefact moulds, suggest that metal was not consumed locally. The still insufficient archaeological evidence for the Pamir region, limited to only one site (i.e. Xiabandi), and specifically the lack of investigations of settlements and hoards, leave the questions about the role of metallurgy open.

Grave structure, burial rituals and pottery indicates that the Bronze Age cultural groups in the Pamir region were in contact with the Andronovo community, but, at the same time, evidence shows the existence of strong local features. More specifically:

1. People in the Pamir region were mainly seasonal pastoralists herding sheep and goats. This community practised a little agriculture as well, and most likely grew wheat and millet, as shown by the study on the paleodiet of the Bronze Age Xiabandi population. Andronovans had a similar agro-pastoralist economy, based on sheep, goats and, in some cases, cattle breeding and little farming. The Andronovo community grew wheat, as demonstrated, not only by the recovery of farming tools, but also by the remains of burned grains found in some pits in the Tobol River region¹⁰⁷⁵ and in the Begash site¹⁰⁷⁶. Millet, was cultivated as well: palaeobotanical studies identified millet remains in settlements of the Fedorovo type, while traces of millet grains were found in several Andronovo sites in Kazakhstan¹⁰⁷⁷. Millet has traditionally been considered original of China, and in fact, its cultivation was verified as early as 8000 BC in the north-eastern part of the country¹⁰⁷⁸, while abundant evidence for domesticated millet was discovered throughout the Yellow River Valley, in correspondence to Neolithic remains, dating to around 6000 BC¹⁰⁷⁹. At the same time, it seems that several Neolithic communities in Western and Central Europe grew millet as well, before 5000 BC¹⁰⁸⁰. By the late third millennium BC millet cultivation was documented in Central Asia, where carbonized grains were found, for example, in Begash (ca. 2200 BC) in Kazakhstan¹⁰⁸¹ and in Ojakly (ca. 1600 BC) in Southern Turkmenistan¹⁰⁸², while millet remains of the second millennium BC were discovered by Andronovo-related cultural sites in Kazakhstan. Considering the chronological and geographical position of the remains at Xiabandi, it is likely that the local cultivation of millet was the result of interactions occurred between the communities in the Pamir region and those settled in present Kazakhstan, which had perhaps imported it from China through a northern route¹⁰⁸³. Results of the isotopic analysis on human remains from the Minusinsk Basin and the Semirech'e region indicate that there was an increasing consumption and a wider diffusion of millet in the early-middle second millennium BC¹⁰⁸⁴. The same trend has been

¹⁰⁷⁵ OKLADINOV, 1959, pp. 23-24.

¹⁰⁷⁶ FRANCHETTI, SPENGLER, FRITZ, MAR'YASHEV, 2010.

¹⁰⁷⁷ KUZ'MINA, MALLORY, 2007, p. 141.

¹⁰⁷⁸ LU Houyuan, ZHANG Jianping, LIU Kanbi, WU Naiqin, LI Yumei, ZHOU Kunshu, YE Maolin, ZHANG Tianyu, ZHANG Haijiang, YANG Xiaoyan, SHEN Licheng, XUA Deke, LI Quan, 2009; 2009; CRAWFORD, 2009.

¹⁰⁷⁹ ZHAO Zhijun, 2005; LIU Xinyi, HUNT, JONES, 2009.

¹⁰⁸⁰ LISITSINA, 1984, pp. 285-292.

¹⁰⁸¹ FRANCHETTI, SPENGLER, FRITZ, MAR'YASHEV, 2010.

¹⁰⁸² ROUSE, CERASETTI, 2014.

¹⁰⁸³ The hypothesis that sees China at the origin of millet cultivation in Central Asia is based on recent theories supporting the existence of the so-called "Fur Route" or "Steppe Road", which connected the steppe communities with the region of Gansu-Qinghai and North-eastern China, perhaps earlier than the Silk Road. See: BUNKER, 2012, p. 16; MEI Jianjun, 2003a, pp. 37-39.

¹⁰⁸⁴ SVYATKO, SCHULTINGS, MALLORY, MURPHY, REIMER, KHARTANOVICH, CHISTOV, SABLIN, 2013;

verified in South-western Xinjiang¹⁰⁸⁵: this not only demonstrates that the Xiabandi community was in contact with western cultural groups, most likely of the Andronovo type, but also suggests that an actual eastward migration of Andronovo-related agro-pastoralists (from Central Asia to the Pamir region) may have happened in the first half of the second millennium BC.

2. Bronze Age communities in the Pamir region were socially organized on a family/clan basis, as were the Andronovans¹⁰⁸⁶.
3. The Xiabandi population usually grouped a number of graves under the same mound. On the contrary, the Andronovo communities, especially in the eastern territories, used to fence multiple burials into a single enclosure¹⁰⁸⁷, thus revealing a different burial approach. The combination of mounds and stone enclosures related to the same grave has been rather rarely found in the Eurasian territory, however it was verified in a number of sites assigned to the later phase of the Andronovo community (ca. 1900-1200 BC) in Kazakhstan¹⁰⁸⁸. Other similar mixed structures were found in present-day Tajikistan, in correspondence to the remains of the Bishkent-Vaksh cultural group (dating to the end of the second millennium BC-beginning of the first millennium BC)¹⁰⁸⁹, which was strongly influenced by the Andronovo tradition¹⁰⁹⁰. In the Xiabandi cemetery wooden structures were employed to support or to close the graves: according to several studies, the Andronovans had apparently selected pine and cedar as construction materials for their houses and graves, and, in fact, wooden structures were abundantly found in archaeological sites assigned to this community, including those located in the Ili-Tacheng region¹⁰⁹¹.
4. As the Andronovans, the Xiabandi community practised cremation and inhumation. In the latter case, the dead was placed on one side with bent legs, and generally one, more rarely two vessels were located close to its head. This posture resembled the Andronovo funerary position, though in Xiabandi cemetery AII several bodies were found almost crunched on one side and the

MATUZEVICIUTE, LIGHTFOOT, O'CONNELL, VOYAKIN, LIU Xinyi, SVYATKO [et al.], 2015.

¹⁰⁸⁵ According to the presently available evidence millet was unknown in the earlier sites in the Pamir region, while it was found in the Xiabandi cemetery AII.

¹⁰⁸⁶ GRYAZNOV, 1969, p. 68.

¹⁰⁸⁷ Stone enclosure surrounding multiple graves were found for example at Bylkyldak, Taldy I, Aishrak (Kazakhstan), in Semirech'e and in the Ili-Tacheng regions. Few damaged soil mounds, covering more than one grave, are known for the Andronovo tribe of Alakul (and they were recovered for example from the site of Uvak in the southern Urals region), however they seem not to have constituted the traditional Andronovo funerary practice. KUZ'MINA, MALLORY, 2007, p. 670; for specific references on mounds found in the Andronovo territory see: GRYAZNOV, 1969, p. 68; KUZ'MINA, MALLORY, 2007, p. 26.

¹⁰⁸⁸ FRACHETTI, 2008, p. 32.

¹⁰⁸⁹ P'YANKOVA, 1981, chapter 13.

¹⁰⁹⁰ For more information on the relationship between communities in Tajikistan and the Andronovans see KUZ'MINA, MALLORY, 2007, pp. 275-278.

¹⁰⁹¹ KUZ'MINA КУЗЬМИНА, 1973; KUZ'MINA, MALLORY, 2007, p. 42. For more detailed information on the remains in the Ili-Tacheng region see the previous section of this chapter "The Ili-Tacheng region".

vessels were often made of wood, instead of pottery, while Andronovans always employed earthenware. The lower number of paired tombs and the male-female burial pattern verified in the Xiabandi cemetery AII are in line with the funerary traditions of the Andronovo community, whose graves containing couples of adults (male and female) represented only the 2% of the total¹⁰⁹². However, as regards these paired graves, the mutual position of the deceased in the Pamir region, facing the same direction, differs from that observed in the Andronovo burials, where couples usually faced each other¹⁰⁹³.

5. No horse remains were recovered from Bronze Age sites in the Pamir region. While lacks of horses were also observed in the Andronovo community in North-western Xinjiang, on the contrary, large quantities of these animals' skeletons were found in other regions of the Andronovo territory¹⁰⁹⁴. Specifically, it seems that the Andronovans developed three breeds: small horses from Kirgizia, midium-size horses, similar to those used by the Sintasha community, and tall horses; while the small ones were used for transport and food, the latter were employed for funerary sacrifices¹⁰⁹⁵. The Xiabandi community used to sacrifice animals during the burial rituals, however, in the Pamir region only sheep and goats were offered.
6. The overwhelming majority of the vessels found at Xiabandi cemetery AII were *guan* pots with a flat or solid base, and high and wide shoulders, showing clear analogies with the Andronovo examples. The absence of decorations on the vessels from the Pamir region suggests the existence of close connections between the local community and the cultural groups in the Semirech'e region, where unadorned Andronovo-type pottery containers were widely produced. On the contrary, vessels found in graves M18, M107 and M109, were round-based and globular-shaped with handles, differing evidently from most of the items found in the cemetery on one side, and from those recovered from the Andronovo cultural sites, on the other. These globular containers showed more analogies with vessels found among the remains of the Chust community in the Fergana Valley and in the Aketala hoards in the Pamir region. The latter included a number of pottery fragments decorated with textiles impressions, suggesting the existence of some form of contact with the Bronze Age farming community in Central Asia,

¹⁰⁹² KUZ'MINA, MALLORY, 2007, p. 194.

¹⁰⁹³ KUZ'MINA, MALLORY, 2007, p. 194; P'YANKOVA, 1981, chapter 13.

¹⁰⁹⁴ KUZ'MINA, MALLORY, 2007, p. 149; TSALKIN ЦАЛКИН, 1972.

¹⁰⁹⁵ TSALKIN ЦАЛКИН, 1972; KUZ'MINA, MAIR, 2008, pp. 60-61.

including the region of Semirech'e¹⁰⁹⁶. Shape and decoration of the vessels discovered in the Pamir region suggest the occurrence of an "evolution" from an Andronovo-type of cultural tradition, evident from the containers unearthed from the earliest graves at Xiabandi, to a new post-Andronovo tradition, represented by the later graves at the Xiabandi cemetery AII, the remains at Aketala and, perhaps, the early phase graves at the Xiangbaobao funerary site. Specifically, remains related to this later stage are characterized by clear similarities with those of the farming communities in the Fergana Valley and its neighbouring regions, and, at the same time, by the preservation of some Andronovo features. By the first millennium BC, the diffusion of a Saka-type tradition is shown by the remains in the cemeteries at Xiangbaobao and Ji' erzankale.

7. The development of this new tradition, more similar to that of the agricultural communities in Central Asia is further reflected in the shapes and types of stone objects discovered in the Aketala hoards: stone balls, bridle-shaped mills and semilunar sickles have parallels with the stone remains found in the Chust cultural sites, while differ from the Andronovo's.
8. Metal objects recovered from Xiabandi cemetery AII were ornaments of the Andronovo type and were usually associated with female graves, while male burials only included a pottery vessel. The internment of metal ornaments with female bodies has been verified in numerous Andronovo cemeteries, where the practice of burying male with few grave goods (often limited to pottery) has also been observed¹⁰⁹⁷. This suggests the existence funerary ritual shared by the community of Xiabandi and the Andronovans. As mentioned above, the reason behind the absence of metal utensils and weapons in Xiabandi cemetery AII, including those distinctive of the Andronovo cultural group, remains an open question, but whether metal objects were produced locally or brought from elsewhere, it seems that the local community was linked to the Andronovans.

On the basis of the available material, it is possible to infer that during the Bronze Age the Pamir region was inhabited by a Andronovo-type population, probably migrated from Central Asia, Semirech'e and the Fergana Valley (as shown by the marked local features, distinctive of the eastern tribes of the Andronovo community), perhaps in response to climatic changes occurred in the second

¹⁰⁹⁶ According to recent examinations results, textile-impressed decorations on vessels found in Semirech'e show similarities with the Petrovka-Sintasha (end of the third millennium-beginning of the second millennium BC) and the Andronovo (ca. 1900-1200 BC) specimens, suggesting the existence of common weaving traditions. DOUMANI, FRANCHETTI, 2012, no. 86, pp. 375.

¹⁰⁹⁷ Most of the bronze tools came from settlements. FRANCHETTI, 2008, p. 32.

millennium BC. These cultural groups may have brought their metallurgy to the Pamir region, even though this theory is only supported by the discovery of some Andronovo-type of personal ornaments from female graves at Xiabandi AII, and most certainly needs more solid archaeological evidence. In particular it needs to be demonstrated the local use of metal for producing objects: given the small number of artefacts, the presence of ingot moulds, and the lack of artefacts moulds, the hypothesis that metal was not locally consumed should be considered. Some similarities between the Bronze Age remains in the Ili-Tacheng region and those from Xiabandi, especially with respects to burial structures, pottery and metal ornaments, leaves room for speculating that the two communities had some sort of relationships. In the first millennium BC, new funerary customs and a new type of pottery production spread in the Pamir region, showing analogies with materials of non-Andronovo farming cultural groups in Central Asia. In spite of this, since these agricultural communities were strongly influenced by the Andronovo traditions, some traces of the past Andronovo occupation, such as the funerary posture and the waving methods, were preserved in Central Asia as well as in South-western Xinjiang. In summary, evidence shows that a cultural group of the Andronovo-type, most likely from the Semirech'e region, occupied the Pamir region, forming, perhaps, the south-westernmost periphery of the Andronovo territory, during the first half of the second millennium BC. By the end of the millennium, evidence shows a decline of the Andronovo practices, and the rise of a different tradition. This "transitional phase" is represented by the remains in the deposits at Aketala and the findings from the later stage of cemetery AII at Xiabandi, which, despite having clear parallels with the farming communities in Central Asia, were still partially influenced by the Andronovo traditions. The consistent similarities between cultural remains in the Pamir region with those from Central Asia, throughout the centuries suggest that there were continuous interactions between the communities inhabiting the two areas. By the first millennium BC a Saka-type tradition was already spread in South-western Xinjiang, as shown by the remains at Xiangbaobao and Ji'erzankale.

4. THE SOUTHERN RIM OF THE TARIM BASIN

4.1 Introduction

The oases on the southern rim of the Tarim Basin formed over the course of prehistory on the highlands and lowlands along the rivers that crossed the desert. It appears that the highest places were inhabited earlier than their lower counterparts due to better water provision, natural protection and more suitable environments for human activities such as hunting, gathering and, later, pastoralism. In Southern Xinjiang, the highlands have been inhabited since 8000 BC, as demonstrated by the remains discovered in the valleys contained in the Kunlun Mountains¹⁰⁹⁸. Mesolithic and Neolithic findings were recovered from high-altitude sites, such as those of Ashenkule and Xiaopulu on the upper course of the Keriya River and in the valleys of the Kala Tashen Mountains¹⁰⁹⁹, while other remains were found in the villages of Ka'erdun and Yeniuquan, on the A'erjin Mountains¹¹⁰⁰. In later periods, it seems that larger areas were occupied and, in fact, traces of human activity during the Metal Ages were found in both regions, in the highlands and lower sites along rivers, deep into the desert. The existence of Bronze Age societies in Southern Xinjiang have puzzled archaeologists, since prehistoric remains from the Neolithic period onward had long been associated with later periods, specifically to the Iron Age and thereafter¹¹⁰¹. However, this issue was resolved in 1993, when the earlier phase of the Niya Beifang site was identified¹¹⁰² and, a few years later, not only were the settlement of Keriya Beifang¹¹⁰³ and the cemetery of Liushui found and excavated, but the earlier phase of the cemetery at Zagunluke was also recognized and attributed to the Late Bronze Age (Fig. 162). The Beifang site consists of two main areas excavated in 1993 and 1996 respectively¹¹⁰⁴. In 1996, a considerably damaged settlement was

¹⁰⁹⁸ HUANG Xiaohong 黄小红, WU Zhou 吴州, 1997.

¹⁰⁹⁹ HUANG Xiaohong 黄小红, WU Zhou 吴州, 1997.

¹¹⁰⁰ WANG Binghua 王炳华, XIAO Xiaoyong 肖小勇, LIU Wensuo 刘文锁, LIU Yusheng 刘玉生, 1990.

¹¹⁰¹ In 1929 Huang Wenbi identified the Karadong site, on the Keriya River, while in 1959 the site of Niya was investigated. Both were placed from the Han dynasty (206 BC-220 AD) to the Jin dynasty (265-420) period. QI Xiaoshan 祁小山, WANG Bo 王博, 2008, pp. 50-55, 61.

¹¹⁰² The site was discovered in 1989, however it was only in 1993 and 1996 that the remains were excavated and examined.

¹¹⁰³ In the lower reaches of the Keriya River a damaged cemetery, called "the Northern Cemetery" was also found, however its excavation was never officially approved. Therefore only few information are available and they have been included in two brief introductory articles (ZHANG Yingchun 张迎春, 2009; CHEN Yiming 陈一鸣, ZHANG Yingchun 张迎春, 2008). Professor Mair, who recently visited the sites, has reported that the cemetery is so badly damaged that nearly nothing remains of it, and according to archaeologists it will never be excavated. MAIR, CHENG Fangyi, 2013.

¹¹⁰⁴ Zhongri Rizhong Gongtong Niya Yiji Xueshu Kaocha Dui 中日日中共同尼雅遗迹学术考察队 (Sino-Japanese Academic Expedition Team at the Niya Ruins), 1996, pp. 35-39, 73-79; YUE Feng 岳峰, YU Zhiyong 于志勇, 1999.

found and although only a few ruined walls and wooden poles had been preserved on the western side, some pottery and relevant metal objects were uncovered. Other material was collected from the area around the settlement and from the section already excavated in 1993, including stone tools, pottery vessels, metal weapon-tools, bones, beads and a jade object, interpreted as a sceptre head. The discovery of the remains at Niya Beifang has been of crucial importance, since it was the first site archaeologists believed to fully represent the Bronze Age in Southern Xinjiang. However, despite its importance, the early phase has been only partially or briefly described in preliminary and final reports.¹¹⁰⁵ In addition, a lack of carbon dating has led to the site being placed around 1000 BC on the basis of typological studies¹¹⁰⁶. The same chronology has been established for the wooden residential site of Keriya Beifang, found close to the lower reaches of the Keriya River by the Sino-French investigation team at the beginning of the 2000s. Numerous objects made of pottery, stone, bronze and jade were recovered from the settlement¹¹⁰⁷. Real breakthroughs in the understanding of the Bronze Age period in Southern Xinjiang were the discovery of the Liushui cemetery in Yutian County and the identification of earlier phases at the Zagunluke cemetery. The former is a large cemetery consisting of sixty-five tombs in the village of Liushui (A'qiang township, in Yutian County) on the upper reaches of the Keriya River, excavated between 2003 and 2005¹¹⁰⁸. It can be fairly certainly placed around 1000 BC thanks to carbon dating and typological examinations¹¹⁰⁹, and has been assigned to the Late Bronze Age by archeologists. Remains at the Zagunluke village (also known as Zahongluke¹¹¹⁰, in Qiemo County), located on a tableland on the outskirts of the desert, were initially investigated in 1985. However, only during the following decade were two funerary complexes identified, named respectively cemetery no. 1 and no. 2. Cemetery no. 2, besides being very damaged, has been dated rather late (206 BC-8 AD), therefore it has not been included in the present research¹¹¹¹. On the contrary, cemetery no. 1, despite presenting multiple phases, has been carbon dated to an earlier period,

¹¹⁰⁵ YUE Feng 岳峰, YU Zhiyong 于志勇, 1999, pp. 11-17; Zhongri Rizhong Gongtong Niya Yiji Xueshu Kaocha Dui 中日日中共同尼雅遗迹学术考察队 (Sino-Japanese Academic Expedition Team at the Niya Ruins), 1996, 35-39, 73-79.

¹¹⁰⁶ There are some mentions of absolute and uncalibrated dating (3500-2500 BP or 3100-2900 BP) for these remains in TANG Zihua, MU Guijin Mu, WU Xinhua (2009), however no actual data are available.

¹¹⁰⁷ QI Xiaoshan 祁小山, WANG Bo 王博, 2015, pp. 30-31; DEBAINE, IDRIS, 2001.

¹¹⁰⁸ Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Archaeological Team, Institute of Archaeology, Chinese Academy of Social Science), 2006.

¹¹⁰⁹ Twelve carbon dating examinations have been successfully carried out on material from Liushui, and they have placed the site to around 1000 BC. WAGNER, WU Xinhua, TARASOV, AISHA, RAMSEY, SCHULTZ, SCHMIDT-SCHULTZ, GRESKY, 2011, p. 15736.

¹¹¹⁰ MEI Jianjun, 2000, p. 23.

¹¹¹¹ The smaller cemetery no. 2, officially discovered in 1996, had been severely damaged not only by ancients, but also 20th-century explorers. Its late dating to 206 BC-8AD was established by typological comparison and several carbon dating examinations (HAN Jianye 韩建业, 2005, p. 73). At present only the report of two graves is available. Xinjiang Bowuguan Kaogubu 新疆博物馆考古部 (Department of Archaeology of the Xinjiang Museum), 2002.

with its earliest stages assigned to the Bronze Age¹¹¹². It was first excavated in 1985¹¹¹³, when five graves were found and then in 1989¹¹¹⁴ and 1996¹¹¹⁵, when two and one-hundred-and-two burials were recovered respectively. The cemetery is large, so it has been divided into two parts, namely the northern and southern districts: the former covers a small area and presents scattered burials, while the latter, much larger, has been further divided into eastern and western districts. The eastern district consists of a few, small graves, while its western counterpart includes large single graves, some set in corridors. The latter of these districts has been studied more closely. Cemetery no. 1 was apparently used for a long period. Archaeologists divided the site into three phases according to the characteristics of the remains and on the basis of data acquired through carbon dating, which was carried out successfully on seven graves¹¹¹⁶. The first phase, dated around 1500 BC, included only one grave, M61, which was rectangular in shape with round corners and oblique walls (Fig. 163.1). The human remains here discovered were rather confused, yet archaeologists were able to identify the single body of an adult female, in a supine position, although it is not clear how the legs were placed. Grave goods unearthed in burial M61 comprised pottery and wooden items. Specifically, the pottery included one undecorated round-based *hu* vessel, with an elongated body and high neck, while made of wood were a needle and a sewing tool comprising a wheel and a stick, similar to those widely found in the valleys of the Tianshan Mountains, in the cemeteries at Chawugugou¹¹¹⁷ and in Eastern Xinjiang at Yanbulake¹¹¹⁸ and Wupu¹¹¹⁹ (Fig. 163.2). No metal objects were found in grave M61. Metal objects were uncovered, however, in the burials assigned to the middle stage of cemetery no. 1, which was dated using carbon dating to around 800 to 200 BC (slightly later than the Liushui site) and included ninety burials, divided by archaeologists into three groups based on their structure. Besides the four above-mentioned sites, other remains have been found scattered throughout Southern Xinjiang, and they were briefly

¹¹¹² Xinjiang Weiwu'er Zizhiqu Bowuguan, 新疆维吾尔自治区博物馆 (Museum of the Xinjiang Uygur Autonomous Region), Bayingeleng Menggu Zizhizhou Wenguan Suo 巴音格楞蒙古自治州文管所 (Institute of Cultural Relics of the Bayingolin Mongol Autonomous Prefecture), 2003, pp. 131-133.

¹¹¹³ REXITI Ahemanti 阿合曼提 热西提, 1995, chapter 12.

¹¹¹⁴ Bayingeleng Menggu Zizhizhou Wenguan Suo 巴音郭楞蒙古自治州文管所 (Institute of Cultural Relics of the Bayingolin Mongol Autonomous Prefecture), 1992.

¹¹¹⁵ Xinjiang Weiwu'er Zizhiqu Bowuguan, 新疆维吾尔自治区博物馆 (Museum of the Xinjiang Uygur Autonomous Region), Bayingeleng Menggu Zizhizhou Wenguan Suo 巴音格楞蒙古自治州文管所 (Institute of Cultural Relics of the Bayingolin Mongol Autonomous Prefecture), 2003.

¹¹¹⁶ Xinjiang Weiwu'er Zizhiqu Bowuguan, 新疆维吾尔自治区博物馆 (Museum of the Xinjiang Uygur Autonomous Region), Bayingeleng Menggu Zizhizhou Wenguan Suo 巴音格楞蒙古自治州文管所 (Institute of Cultural Relics of the Bayingolin Mongol Autonomous Prefecture), 2003, pp. 131-133.

¹¹¹⁷ XIA, 1987a, p. 7; XIA, 1992, p. 59.

¹¹¹⁸ Xinjiang Weiwu'er Zizhiqu Wenhua Ting Wenwu chu 新疆维吾尔自治区文化厅文物处 (Xinjiang Uygur Autonomous Region Department of Cultural Relics Office), Xinjiang Daxue Lishixi Wenbo yu bu Zhuanxiu ban 新疆大学历史系文博干部专修班 (Department of History, Xinjiang University), 1989, p. 349.

¹¹¹⁹ Hami Bowuguan 哈密博物馆 (Hami Museum), p. 130.

described in the summary published in 1990 by the Institute of Archaeology in the Chinese journal *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics)¹¹²⁰. However information is too limited to allow for a proper analysis.

4.2 Geographical setting

The region on the southern rim of the Tarim Basin spans the northern highlands of the Kunlun Mountains, from which rivers and brooks flow down to the desert and form oases on their deltas. Considering the absence of artificial irrigation systems, in the Bronze Age areas suitable for human life must have been limited to these two ecological regions that are the highlands and the desert oases. Indeed, remains of past human activities have been found in these environments, the former being suitable for pasturing and the latter for agro-pastoralist economy. What is interesting is that several ancient sites have been recovered deep in the desert, in locations that are now too dry to be inhabited. This indicates that in the past there was some sort of water provision in these lands and, in fact, it is now widely accepted that Xinjiang particularly suffered from the phenomenon described as the “desiccation of Asia”, which was one of the attributing factors that led to the decrease of water supply in the area¹¹²¹. Studies conducted on the ancient rivers along the southern rim of the Tarim Basin have revealed that rivers previously carried a larger amount of water¹¹²². Additionally, archaeological discoveries of crop cultivation and animal grazing on the lower reaches of the Keriya River at the Keriya Beifang site, dating as early as the end of the first millennium BC¹¹²³, indicates the previous existence of larger green areas where there is now only desert, suggesting that originally the desert may not have been as large as it is today¹¹²⁴. Another convincing theory is that the rivers originating on the northern slope of the Kunlun Mountains have slowly changed their course, gradually forming their present shape¹¹²⁵. Scholars have observed that, during flood seasons, water transports large quantities of sediments, which erode riverbanks and are then deposited on the riverbed, so the continuous process of erosion and deposition must have caused the collapse of riverbanks and overflowing on both sides, creating new channels¹¹²⁶. If wider rivers flowing in different directions did exist at one time, and the

¹¹²⁰ Takelamagan Shamo Zong Kaogu Duizu 塔克拉玛干沙漠综考古队组 (Taklimakan Desert Archaeological Team), 1990.

¹¹²¹ HUNTINGTON, 1906.

¹¹²² YANG Xiaoping, WHITE [et. al.], 2006, pp. 385, 391.

¹¹²³ Zhong Fa Lianhe Keliya he Kaogu Dui 中法联合克里雅河考古队 (Sino-French Expedition Team), 1997, p. 11

¹¹²⁴ This consideration was supported by Prof. Yuan Qiurong and Prof. Liu Wensuo during a meeting in Xinjiang in 2016.

¹¹²⁵ YANG Xiaoping, WHITE [et. al.], 2006, p. 391.

¹¹²⁶ ZU Ruiping, GAO Qianzhao, QU Jianjun, QIANG Mingrui, 2003.

desert was significantly smaller than today, there might have been a direct communication between the southern and northern rims of the Taklimakan Desert. This theory is supported not only by the aforementioned studies on ancient rivers, but also by research on the formation of dunes. Considering that large desert dunes, reaching heights of one hundred meters, act as powerful barriers, evidence that in the past the dunes in the Taklimakan Desert were much smaller favours the hypothesis of an easier north-south link¹¹²⁷. Finally, archaeological evidence and slightly later literary sources all support this thesis¹¹²⁸. That said, the theory cannot be proven until serious paleoenvironmental studies have been systematically carried out in the area.

The southern rim of the Tarim Basin experiences an arid climate and a small amount of precipitation that decreases from the mountains to the desert. Besides the rainfalls, a major supply of water comes from the Kunlun Mountain glaciers, whose melt water generates forty-three rivers flowing down to the lower lands. As already mentioned in the previous chapters, despite the arid climate, which has characterized Xinjiang since the Tertiary period (66-2,6 millions years ago), until the second millennium BC the humidity level was relatively high and only since then has the region become significantly more arid with minor wet oscillations¹¹²⁹. In the specific case of Southern Xinjiang, studies published at the beginning of the year 2000 (based on magnetic susceptibility geochemical, carbonate isotope and pollen analysis of carbon-dated lacustrine deposits close to the city of Niya) have showed that the area underwent several alterations of wet and dry phases¹¹³⁰. Specifically, during the periods corresponding to ca. 2000-1400 BC, 500 BC-100 AD and 600-1000 AD, the southern rim of the Tarim Basin seems to have enjoyed a humid climate while, on the contrary, from ca. 1400 to 500 BC and 100 to 600 AD the area was subjected to more arid conditions, as it is today. Considering all the examined time periods, of particular interest for this study were those from 2000 to 1400 BC and from 1400 to 500 BC. The former was characterized by a high A/C range and a great presence of aquatic plants, indicating humid conditions¹¹³¹. Climatic oscillations and especially the high humidity level during the second millennium BC in Niya corresponds to the markedly wet conditions detected in

¹¹²⁷ YANG Xiaoping, WHITE [et. al.], 2006, p. 385.

¹¹²⁸ YIN Qing 殷晴, 1990.

¹¹²⁹ JIANG Fengqing 姜逢清, HU Ruji 胡汝骥, MA Hong 马虹, 1998.

¹¹³⁰ ZHONG Wei, XIONG Heigang, TASHPOLAT Tiyip, SHU Qiang, 2001, pp. 144-149; ZHONG Wei, XIONG Heigang, TASHPOLAT Tiyip, HIROKI Takmura, SHU Qiang, 2001.

¹¹³¹ *Artemisia* and *Chenopodiaceae* are often the dominant taxa in arid regions lacking forest vegetation. When their total percentages cover at least 50%, the *Artemisia/Chenopodiaceae* (A/C) ratios can be used for differentiating between desert and steppe conditions. More specifically, A/C ratios of <0.5, between 0.5 and 1, and >1 indicate desert, desert-steppe and steppe conditions respectively. Ann EL-MOSLINMANY, 1990.

the Wulungu¹¹³² and Barkol¹¹³³ Lakes, as well as in other regions in Xinjiang¹¹³⁴. The period ca. 1400-500 BC was marked by arid conditions, and this is confirmed by a study conducted on the size of grains transported by the wind, which revealed that the climate was arid along the desert boundary. Curiously, an opposite characteristic has been observed in the highlands: results of palynological analysis performed on a section of Liushui County has revealed that during the period ca. 1200-600 BC the highlands experienced wet conditions¹¹³⁵. These studies have shown the existence of a moisture pattern in this specific area of Xinjiang, where humid periods on the highlands correspond to arid phases in the desert oases and vice versa.

4.3 Archaeological context

Of the two aforementioned residential sites, the settlement found on the lower reaches of the Keriya River is better preserved than its counterpart at Niya Beifang. The Keriya residential site consisted of several buildings, in close confinement, whose walls had been built using poplar poles placed in lines. Some traces of fires were found inside the rooms. The roof of the buildings had been made with reeds and sheep excreta, attesting that the community kept sheep. Some form of agriculture was practiced and various grains, such as barley, have been recovered around the settlement (Fig. 164).

More information on the Bronze Age communities on the southern rim of the Tarim Basin can be acquired from the cemeteries. In the Liushui cemetery all the preserved graves had surface markers and, more specifically, thirteen burials were covered by an oval or round pebble mound, sometimes hollow on the top (Fig. 165.2), while the remaining graves were fenced by a round stone enclosure (Fig. 165.1)¹¹³⁶. Half of the stone-fenced graves included a smaller stone enclosure on the eastern side, inside which traces of fire were found, suggesting the performance of sacrificial rites. Only in grave M24 was the small enclosure on the western side (Fig. 166). Mounds covered some of the burials in Zaganluke cemetery, but no fenced tombs were recovered there, and some graves had no marker on the surface. According to archaeologists, the graves in the Liushui cemetery resemble those found in Northern Pakistan and this consideration could be extended to the mounded graves in the Zaganluke site. However, mounded and fenced pit graves were rather common throughout Eurasia, and both

¹¹³² LIU Xingqi, HERZSHUH, SHEN Ji, JIANG Qingfen, XIAO Xiayun, 2008.

¹¹³³ XUE Jibin, ZHONG Wei, 2011.

¹¹³⁴ ZHANG Yun, KONG Zhaochen, NI Jian, YAN Shun, YANG Zhenjing 2007.

¹¹³⁵ TANG Zihua, CHEN Dongmei, WU Xinhua, MU Guijin, 2013, pp. 38-40.

¹¹³⁶ There are some very damaged burials, such as M29, M48 and M14. Their surface markers, if present, are impossible to recognize.

structures coexisted in the same cemetery in the Andronovo territory, in Semirech'e, in the Ili-Tacheng region and Eastern Kazakhstan (1900-1200 BC)¹¹³⁷. Mounds were also typical of Scythian cemeteries, whose burials have been widely recovered throughout the whole Eurasian territory in the first millennium BC. Pit graves in the cemeteries of Liushui and Zagunluke were mostly rectangular with rounded corners, and only a few square and oval-shaped burials were discovered. In Liushui they were often pointed towards the east at an angle of 10°-20° and filled with sand, stones and bones, while traces of burned wood, sheep bones and pottery were recovered outside and inside the burials. Some graves contained wooden structures, the most common being wooden beds found in graves at Liushui and Zagunluke, while some burials at Zagunluke additionally included poles and funerary beds made of dog leather (Fig. 167). In the same cemetery, many burials had a passage marked by reeds, grass and herbs, while a group labelled the "catacomb type" comprised entrances and corridors, suggesting a more advanced architectural knowledge and a later date for these graves¹¹³⁸. The majority of the graves contained multiple bodies but, while in the cemetery at Liushui this majority is overwhelming¹¹³⁹, in Zagunluke they make up a little more than half of the total number of burials (Fig. 168)¹¹⁴⁰. In Liushui cemetery bodies were commonly unearthed on different levels, which indicates that the practice of secondary burials was widespread and, according to archaeologists, also "regulated". In fact, they noted that in the first burials bodies were placed on the eastern side, while secondary burial remains of fragmented and indefinable bones were found on the western side¹¹⁴¹.

Despite its relatively recent excavation, Liushui cemetery has already been the subject of a number of anthropological studies, which have provided some information on the prehistoric population in Southern Xinjiang. Eighteen skulls from the graveyard were examined and compared to specimens from western and eastern regions (specifically the Volga region and Anyang) revealing a prevalence of western components in the craniofacial features¹¹⁴². Examinations on dental non-metric traits revealed an affinity of the Liushui people to western populations, especially those from South-western Siberia

¹¹³⁷ KUZ'MINA, MALLORY, 2007, pp. 20-23, 242-243; FRANCHETTI, 2008, p. 32.

¹¹³⁸ Xinjiang Weiwu'er Zizhiqu Bowuguan, 新疆维吾尔自治区博物馆 (Museum of the Xinjiang Uygur Autonomous Region), Bayingeleng Menggu Zizhizhou Wenguansuo 巴音格楞蒙古自治州文管所 (Institute of Cultural Relics of the Bayingolin Mongol Autonomous Prefecture), 2003, p. 127.

¹¹³⁹ There were only eight single burials. Among the multiple graves six were double, while the remaining burials included more than two bodies.

¹¹⁴⁰ More than half of the graves were multiple (55%), while a lower number of them were single (36,2%).

¹¹⁴¹ Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Archaeological Team, Institute of Archaeology, Chinese Academy of Social Science), 2006, p. 33.

¹¹⁴² An analysis of the metric traits of the same skulls was also performed, leading to an opposite conclusion. However, as the authors themselves declare in the paper, the methodology used to evaluate the metric traits is new and the necessary genetic evidence is yet to be acquired. TAN Jingze, LI Liming, ZHANG Jianbo, FU Wenqing, GUANG Haijuan, AO Xue, WANG Ling'e, WU Xinhua, HAN Kangxin, JIN Li, LI Hui, 2013.

and the Black Sea¹¹⁴³. Regarding other anthropological evidence, such as studies on pathological disorders of teeth and bones, more information has been obtained. In particular, the Liushui people were frequent meat eaters and had a highly active physical life: serious injuries to the lumbar spine and thoracic spine and other traumatic disorders in the skeletons comply with a mobile pastoralist life (Fig. 169)¹¹⁴⁴. Human remains in the Zaganluke cemetery have also been the centre of in-depth research carried out on the well preserved desiccated bodies, among which the most famous was the “Chärchän Man”. The “Chärchän Man” was of Caucasoid descent, with a prominent nose, wide eyes and yellowish-brown hair and he was approximately two meters tall when he was living (Fig. 170)¹¹⁴⁵. The enormous amount of textiles, which accompanied him have preserved their bright colours and show clear analogies with products from Central Europe¹¹⁴⁶. Furthermore, the shape of the hats found in the “Chärchän Man” grave were peaked and of Scythian type, similar to those carved in the small Saka sculptures recovered from the counties of Xinyuan and Gongliu in the Ili-Tacheng region (Fig. 171)¹¹⁴⁷. In both cemeteries all age groups of both sexes, except children, had been buried. In Zaganluke 70% of the burials contained adults, while only a small number of children were recovered, often together with adult bodies (14%). The number of children in the Liushui cemetery was equally low. A simple interpretation of this scarcity of children would be that they were buried separately, perhaps in “infant cemeteries”, which are known for some steppe cultural groups and in particular for some Andronovo tribes (ca. 1900-1200 BC)¹¹⁴⁸. A second interpretation, provided by a group of scholars who researched specifically the cemetery of Liushui, was that, given that the burial site was located on highlands (which may have been used as Summer pastures), children were not taken to these areas and instead stayed elsewhere with part of the family¹¹⁴⁹. That said, it is likely that the communities in these territories practised a semi-nomadic pastoralist activity, which involved only a part of the population. In multiple graves, a pattern of adult-child internment was observed at both the Liushui and Zaganluke cemetery, where no fewer than five graves contained adults and children buried together, supporting the existence of family-based societies in Southern Xinjiang. This has been confirmed by other anthropological evidence, which showed that there were family-based connections among individuals

¹¹⁴³ ZHANG Xu 张旭, ZHU Hong 朱泓, WANG Minghu 王明辉, WU Xinhua 巫新华, 2014.

¹¹⁴⁴ GRESKY, WAGNER, SCHMIDT-SCHULTZ, SCHWARZ, WU Xinhua, AISHA, TARASOV, SCHULTZ, 2016.

¹¹⁴⁵ In the same tomb three women were found together with the “Chärchän Man”, see DOLKUN, 1994, pp. 5-6.

¹¹⁴⁶ BABER, 1999, pp. 23-46.

¹¹⁴⁷ QI Xiaoshan 祁小山, WANG Bo 王博, 2008, pp. 254-255; hats of this type were also discovered further west in Central Italy, where they were modelled on Etruscan mirrors (300 BC), see BABER, 1999, p. 34.

¹¹⁴⁸ KUZ'MINA, MALLORY, 2007, pp. 21, 195.

¹¹⁴⁹ WAGNER, WU Xinhua, TARASOV, AISHA, RAMSEY, SCHULTZ, SCHMIDT-SCHULTZ, GRESKY, 2011, p. 15736.

buried in the same grave in the Liushui cemetery¹¹⁵⁰. A form of hierarchy may also have already been established, as suggested by some evidently richer burials, such as grave M55 in Liushui, which contained a higher quantity and quality of goods. In the two cemeteries the dead were generally placed supine with high, bent legs. However, at the Liushui site, a number of bodies were found lying on one side with bent legs, a practice typical of the Andronovo community (ca. 1900-1200 BC) and inherited by Scythian groups in the first millennium BC, such as the Tuvan¹¹⁵¹. Most heads pointed east, sometimes facing north in the cemetery in Liushui, while at the site of Zaganluke the main direction was north-east. Some heads were found separated from their bodies, indicating decapitation practices, rather widespread among steppe cultures¹¹⁵². Han Jianye's research on flexed burials in ancient China reveals the existence of a "Tibetan sub-group" of the "western burial tradition", which is characterized by supine flexed bodies placed in multiple graves (sometimes because of the coexistence of first and second burials) together with round-based vessels, spouted pots and animal sacrifices¹¹⁵³. According to Han, the "Tibetan sub-group" emerged around 1800 BC and died out around 900 AD. Most of the bodies buried in the cemeteries of Liushui and Zaganluke can be associated with this tradition. As Han has stressed, this tradition came from the west and only rarely featured in China, where supine bodies generally had extended legs¹¹⁵⁴. On the contrary, further west, the supine position with raised legs was extremely widespread. Indeed, since the fourth millennium BC, this burial tradition was linked to the Pit Grave community in Western Asia (ca. 3300-2600 BC)¹¹⁵⁵, the Afanasevo group in the Minusinsk Basin (ca. 3500-2500 BC)¹¹⁵⁶, and was then inherited by a number of Bronze Age cultural groups throughout Eurasia. In particular, this tradition was rather common in South-western Siberia, where graves containing supine bodies with bent legs were found corresponding to the territories of the Okunev (ca. 2500-1700 BC)¹¹⁵⁷, while in Northern Xinjiang they featured in the Qiemu'erqieke (ca. 2500-1800 BC)¹¹⁵⁸ community. Supine bodies with moderately bent legs were found in some pre-Scythian and Scythian sites in Southern Urals and Volga region¹¹⁵⁹, Central Asia¹¹⁶⁰, in the Altay¹¹⁶¹

¹¹⁵⁰ SCHULTZ, SCHMIDT-SCHULTZ, WU Xinhua, 2007.

¹¹⁵¹ HUDIAKOV, SKOBELEV, MITKO, BORISENKO, OROZBEKOVA, 2013.

¹¹⁵² For example decapitation practices were verified in the northern Qiemu'erqieke and Okunev communities. XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archaeology, Xinjiang Academy of Social Science), 1982, pp. 24, 32; GRYAZNOV, 1969, pp. 51-66. See also the first chapter of this dissertation, "The Altay region".

¹¹⁵³ HAN Jianye, 2008, p. 170.

¹¹⁵⁴ HAN Jianye, 2008, p. 170.

¹¹⁵⁵ CHERNYKH, 1992, p. 84.

¹¹⁵⁶ GRYAZNOV, ГРЯЗНОВ, 1999, in particular see pp. 94-95, figs. 8-9.

¹¹⁵⁷ GRYAZNOV, 1969, p. 52.

¹¹⁵⁸ Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981; KOVALEV, ERDENEBAATAR, 2009, pp. 150, 153.

¹¹⁵⁹ DVORNICHENKO, 1995b, pp. 102-103; DVORNICHENKO, 1995a, pp. 105-106.

¹¹⁶⁰ YABLONSKY, 1995b, pp. 209-210.

and the Minusinsk regions¹¹⁶², sometimes in combination with a few flexed remains placed on one side. Cemeteries in Southern Xinjiang were characterized by the interment of animal bones or leather accompanying human inhumation. In numerous cases, bones and sheep, horse, ox and fox skeletons, as well as dog leather, were found inside the burials. This practice has been archaeologically verified at a number of sites from Kazakhstan and Mongolia to North-east China¹¹⁶³, and was a common practice during the Andronovo (ca. 1900-1200 BC)¹¹⁶⁴, Karasuk (ca. 1200-800 BC)¹¹⁶⁵ and Scythian (first millennium BC)¹¹⁶⁶ cultural eras.

4.3.1 Grave goods

Pottery

On the southern rim of the Tarim Basin, pottery production was fairly uniform in terms of materials used. Ceramics found in the cemetery at Liushui and the settlements at Niya Beifang and Keriya Beifang were mostly red and sandy, while only a few items were made of coarse grey pottery, such as the three vessels found in the Liushui cemetery burials M20 and M24, and the few recovered from the Niya Beifang site (Fig. 172.2). Curiously, the shapes of most grey pottery specimens clearly resemble those made of stone and grey pottery recovered in the cemeteries of Qiemu'erqieke (ca. 2500-1800 BC) (Figs. 176.3, 4) while the red pottery vessels differed, showing globular shapes and, sometimes, handles. Judging by the quality and varying colours of the vessels, especially in the cemetery of Liushui and at the site on the Keriya River, pottery items must have been fired at low temperatures.

Types of vessels mostly consisted of *guan* containers, *bei* cups and *bo* bowls, while a few *hu* vases and *guanliu guan* pitchers were recovered from the Zaganluke cemetery alone. Only a few kinds of *guan* vessels were produced, but they did significantly vary in shape (Figs. 172-174). An equal number of flat and round based *guan* pots were found, yet they were not evenly distributed: of the objects recovered from the Niya Beifang site, only one specimen had a round base while the others were flat based. On the contrary, of the forty-six *guan* pots unearthed in the Liushui cemetery, only three items,

¹¹⁶¹ YABLONSKY, 1995a.

¹¹⁶² BOKOVENKO, 2006, pp. 864.

¹¹⁶³ WAGNER, WU Xinhua, TARASOV, AISHA, RAMSEY, SCHULTZ, SCHMIDT-SCHULTZ, GRESKY, 2011, p. 15735.

¹¹⁶⁴ FRANCHETTI, 2008, pp. 32-33.

¹¹⁶⁵ LEGRAND, 2006, pp. 852.

¹¹⁶⁶ YABLONSKY, 1995b, p. 229; BOKOVENKO, 2006, p. 866.

in burials M19, M20 and M32 respectively, had a flat base, whereas the majority had a globular shape with a round base (Fig. 173). In the residential site on the ancient Keriya River, round-based pots prevailed, as in the Zagunluke cemetery, where nine of the eleven *guan* vessels had a round base (some in fig. 174). Additionally, some of the *guan* vessels had large shoulders and a high neck, while others bore a large mouth and short neck. A number of pots also had handles, some of which were small, while others were large. In particular, in the Liushui cemetery, some of the recovered *guan* containers bore one or two small handles, and only one specimen, collected on the surface, had an extraordinarily large handle (Fig. 173.6). There were also specimens characterized by a flat base and straight high walls. Despite the varying shapes of the *guan* containers, no single type prevailed, showing the existence of a rather consistent and coherent pottery production in the whole region on the southern rim of the Tarim Basin. This production has parallels with that of neighbouring cultural groups, proving the existence of some form of connections between communities throughout Xinjiang and beyond. Archaeologists suggested that double-handled *guan* pots resembled those of the Chust cultural group (ca. 1300-800 BC) (Fig. 175.3), however, they are also similar to those found in some sites in the valleys on the northern slope of the Tianshan Mountains, in cemetery no. 1 at Chawuhugou (1000-400 BC)¹¹⁶⁷ and in the Sidaogou cemetery (1036-300 BC)¹¹⁶⁸ (Fig. 175.4). This particular type of pot shares further similarities with some specimens found in the western region of Xinjiang, in burial M18 in the Xiabandi cemetery (900-700 BC) in the Pamir region (Fig. 138.1)¹¹⁶⁹. Additionally, archaeologists have established connections between the communities at Liushui and Qugong in Lhasa (Tibet), dating to 1050-200 BC¹¹⁷⁰, on the basis of similarities of single-handled *guan* pots recovered from both sites¹¹⁷¹. Globular-shaped *guan* from Zagunluke cemetery, and the flat-based pot with a slightly reversed mouth from Nina Beifang had parallels with specimens of the northern steppe cultures and were specifically similar to the stone and pottery containers found in the cemetery of Qiemu'erqieke (Fig. 176). The type of *guan* with a flat base and straight walls, recovered from the Liushui cemetery and the Niya Beifang site (Figs. 177.1, 2) was typical of the early Neolithic communities in North-eastern China, such as the Xinglongwa in Inner Mongolia (ca. 6000-4800 BC)¹¹⁷² (Fig. 177.3), but during the Bronze Age it was common further west, where similar cylindrical vessels were collected

¹¹⁶⁷ XIA, Hejing Bowuguan (Hejing Museum), 1992, pp. 43-44.

¹¹⁶⁸ Xinjiang Weiwu'er Zizhiqu Wenguanhui 新疆维吾尔自治区文管会 (Cultural Relicts Office Xinjiang Autonomous Region), 1982, p. 116.

¹¹⁶⁹ XIA, 2012c, pp. 35-37.

¹¹⁷⁰ The dating was based on typological features of the pottery. HUO Wei 霍巍, 1995.

¹¹⁷¹ Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Archaeological Team, Institute of Archaeology, Chinese Academy of Social Science), 2006, p. 37.

¹¹⁷² SHELACH, 2000, p. 389, see also p. 391, fig. 10.

from the Bactria-Margiana Archaeological Complex (ca. 2200-1700 BC)¹¹⁷³, the Chust cultural site of Delverzin¹¹⁷⁴ in Fergana (ca. 1300-800 BC) and were also occasionally found in sites assigned to the Vakhsh community in Tajikistan (second half of the second millennium BC)¹¹⁷⁵ (Fig. 177.4). Decorations on the vessels bear similarities to steppe specimens. Indeed, most of the *guan* pots recovered from the settlements of Niya Beifang, Keriya Beifang and Liushui cemetery, in addition to nearly half the vessels found in Zaganluke, were carved on the upper part or on the whole body with simple triangles and lines (Fig. 178.1). These geometric patterns resembled decorations on the Karasuk vessels (ca. 1200-800 BC)¹¹⁷⁶ and, later, the Tagar pots (ca. 800-200 BC) found in the Minusinsk Basin and in the Altay region (Fig. 178.2)¹¹⁷⁷. Similar to the Karasuk types (ca. 1200-800 BC)¹¹⁷⁸ are also some vessels recovered from Keriya Beifang, featuring a row of bosses around the neck surrounding a lower decoration with lines and punched patterns (Figs. 178.5, 6). Decorations with a bossed pattern around the neck of two specimens from the Niya Beifang site also featured on some steppe vessels such as those from the Qiemu'erqieke cemeteries¹¹⁷⁹ (Figs. 178.3, 4).

Besides the *guan* pots, *bei* cups were also extensively recovered. Some had a flat base, straight high walls and were engraved on the upper part with triangles and lines patterns. Archaeologists who uncovered these *bei* containers in the sites of Niya Beifang and Liushui have associated them with the Chust community (ca. 1300-800 BC), yet their distribution was as widespread as the aforementioned straight-walled *guan* pots. Other cups, also flat-based, had a globular body and were sometimes engraved on the upper part. In Zaganluke cemetery, as many as nineteen handled *bei* cups were found, mostly made of grey pottery. The shape of these receptacles varied, though they all had handles. Round and flat-based specimens were also discovered (Fig. 179). While their bodies were sometimes characterized by more evident shoulders, as in the case of the *bei* cup found in grave M62 (Fig. 179.3), other items, such as that in burial M74, were bucket-like in shape (Figs. 179.5). Analogies can be drawn between these globular specimens and items found in the Turfan Depression, in Shuinichang

¹¹⁷³ At Togolok. SARIANIDI, 1986, p. 9, fig. 13.

¹¹⁷⁴ ASKAROV, 1992, pp. 439-441.

¹¹⁷⁵ The Vakhsh community, occupied the Vakhsh valley, in present-day Tajikistan and it seems that originated from the northward movement of one part of the tribes from Southern Bactria. LITVINSKY, 1992, p. 377. For further information on the Vakhsh pottery see P'YANKOVA, 1981, chapter 13, in particular see fig. 4.

¹¹⁷⁶ LEGRAND, 2006, pp. 853-855.

¹¹⁷⁷ BOKOVENKO, 1995c, pp. 305, 314, in particular fig. 14; BOKOVENKO, 1995b, p. 292.

¹¹⁷⁸ This specimen is specifically similar to that found in M1, enclosure 463, at Sukhoe Ozero II. LEGRAND, 2006, p. 856, fig. 13B.

¹¹⁷⁹ XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 1981; QI Xiaoshan, WANG Bo, 2008, p. 322.

cemetery (1000-700 BC)¹¹⁸⁰ (Fig. 179.7)

Despite the relatively high number of *bei* cups found in the Zagunluke cemetery, the prevalent artefact typology in this funerary site was the *bo* bowl. As many as fifty-one specimens, mostly made of grey pottery, were recovered from the cemetery (Figs. 180.2, 4), while a relatively large quantity of *bo* bowls was also found in the Liushui funerary site: specifically twenty-seven globular-shaped, round-based specimens (Fig. 180.1). The bowls in Liushui cemetery were rather uniform in shape, but the same cannot be said of the items found in the Zagunluke site, which were more varied. In fact, despite being all round-based, some bowls were globular with no distinction between the body and the neck, such as the two specimens found in grave M65 (Fig. 180.4). In contrast, the bowls unearthed from burial M38 were characterized by clear shoulders and concave walls (Fig. 180.2). Both types resemble some of the items recovered from the Dalverzin site, assigned to the Chust cultural group (ca. 1300-800 BC)¹¹⁸¹ (Figs. 180.3, 5). Bowls from Liushui were often carved with simple net designs, while in Zagunluke, these containers were not decorated at all.

The array of pottery types found at the Zagunluke cemetery also included *hu* vases and some *guanliu guan* pitchers. Of the three elongated *hu* vessels, two had a round base and no decorations (Fig. 181.2), while a flat-based vase had been carved with triangle patterns (Fig. 181.1). The six pitchers differed in size and of particular interest were the smaller specimens: the pitcher from grave M92 was only thirteen centimetres high and had a mouth-diameter of less than nine centimetres, indicating that it must have been relatively useless for daily activities. The other specimens were bigger and clearly more suitable for everyday use, so the production of such a small object suggests that it was used for rituals.

Of the six *guanliu guan* pitchers, five were made of black pottery and had a round base (Figs. 182.2, 3). The one exception was made of red pottery, had a flat base and was slightly carved on the shoulders, though the decoration pattern is unclear (Fig. 182.3).

It is evident that pottery found in the four sites of Niya Beifang, Keriya Beifang, Liushui and Zagunluke share strong characteristics, suggesting that in the Bronze Age a consistent cultural group had formed in Southern Xinjiang (Fig. 183). However, from the examination of the aforementioned

¹¹⁸⁰ XIA, Shehezi Bowuguan 石河子博物馆 (Shihezi Museum), 1994, pp. 12-14, 18.

¹¹⁸¹ SHAO Huiqun 邵会秋, 2008, p. 179.

evidence, it seems that the local pottery production in Southern Xinjiang was largely influenced by traditions of diverse neighbouring communities inhabiting South-western Siberia – the Karasuk (ca. 1200-800 BC) and the Tagar (ca. 800-200 BC) – whose pottery production may have spread throughout the Tianshan Valleys and the oases on the northern rim of the Taklamakan Desert before reaching Southern Xinjiang. It is also clear that the western farming societies of the Bactria-Margiana Archaeological Complex (ca. 2200-1700 BC), the Chust (ca. 1300-800 BC) and the Vashk (second half of the second millennium BC- first millennium BC) communities had a significant impact. It seems that, around the first millennium BC, a new form of pottery production expanded throughout numerous areas of Xinjiang¹¹⁸²: the use of grey pottery died out, as did the traditional steppe shapes that were common of the Okunev (ca. 2500-1700 BC), Qiemu'erqieke (ca. 2500-1800 BC) and Andronovo (ca. 1900-1200 BC) cultural groups¹¹⁸³. During this period, red and brown pottery began to dominate, along with new shapes of vessels. The shape of vessels also changed: earlier types of *guan* with flat bases and large shoulders, as some of those found in Niya Beifang site (Figs. 172.2, 3, 5, 6) slowly disappeared, while globular containers, sometimes with elongated necks, and one or two handles became more numerous¹¹⁸⁴.

Other materials

Several stone objects were recovered from Southern Xinjiang. Among them semi-lunar stone knives and sickles were collected from the Niya Beifang site and they share characteristics with those from the region of Fergana and the Aketala hoards in the Pamir region (Fig. 146). In the third chapter, features and origins of curved knives and sickles have been analysed¹¹⁸⁵. Hundreds of these objects, recovered from Central Asia, have been attributed to the Chust and Burguljuk cultural groups (ca. 1300-800 BC, ca. 1500-1000 BC respectively)¹¹⁸⁶ and they have often been found together with bridle-shaped stone mills and stone “rings”, which were among the findings at the sites of Niya Beifang and Keriya Beifang¹¹⁸⁷ (Figs. 148, 184). Curved sickles and knives also featured in Xinjiang, where, besides the

¹¹⁸² The same pattern has been observed in the Pamir region and in the area of Ili-Tacheng.

¹¹⁸³ Especially olive-shaped pots and specimens with flat bases, wide mouth and no handles.

¹¹⁸⁴ As shown in the previous chapters, with the only exception of the Hami oasis, pottery production in Xinjiang in the second millennium BC was generally black, handmade, with large mouth and no handles.

¹¹⁸⁵ See the second section of the third chapter “The Pamir region”.

¹¹⁸⁶ See the second section of the third chapter “The Pamir region”, in particular see fig. 148.

¹¹⁸⁷ For additional information see the second section of the third chapter “The Pamir region”.

southern rim of the Tarim Basin, they were found at Aketala¹¹⁸⁸, Haladun, Halahezhuo, Akesu¹¹⁸⁹ and Luntai¹¹⁹⁰, all dating around 1000 BC. The Bronze Age stone assemblage in Southern Xinjiang also included whetstones, often matched with knives as they were in the Liushui cemetery.

Wooden objects, including containers, combs, sewing tools, agricultural utensils (such as shovels), but also tools connected to horse domestication (such as heel ropes and bridle tips), and bows were recovered from Southern Xinjiang, where the arid climate had helped to preserve them (Fig. 185.1). They were especially numerous in Zagunluke cemetery, where the containers were mostly cups, bowls and dishes (Fig. 185.1). The formers had a single handle, sometimes ringed and were globular in shape with a rounded base, while only a few specimens were flat-based, such as the *bei* cup found in grave M44 (Figs. 185.1a-c). These items were rather popular among Scythian communities in South-western Siberia, in Tuva and the Minusinsk Basin¹¹⁹¹. One particular specimen consisted of two *bei* cups attached together (Fig. 185.1e), forming an object similar to the stone artefact found in the Qiemu'erqieke grave M3 (Fig. 24). However, the intricate spiral carvings, which stand out for their complexity, put into question the Zagunluke specimen's attribution to the cemetery's second phase and suggest a later dating. Several round or oval *pen* dishes were made of wood and, in some cases, had four small feet, similar to the other containers uncovered from the sites of the Tagar and Tuvan communities (Fig. 185.1d). A high number of combs were recovered from Zagunluke cemetery and these have since been identified as originating from the two production traditions, mentioned in the second chapter, namely the "steppe" and "southern" (or tropical) traditions¹¹⁹² (Fig. 185.2). The "steppe" combs were made of several pieces of wood enclosed in a frame, into which wooden sticks were inserted (Figs. 185.2b, c), while the combs pertaining to the "southern" tradition consisted of a hollow piece of wood, into which sticks were inserted and secured with woollen laces (Fig. 182.2a). Other examples of combs which may have derived from the "southern" tradition can be found in the Xiaohe cemetery (ca. 1800 BC)¹¹⁹³, although this cemetery has been assigned to a community, which may have come from the steppe¹¹⁹⁴, suggesting that both comb-making traditions, the "steppe" and the

¹¹⁸⁸ Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uygur Autonomous Region Museum), 1977, p. 107. the second section of the third chapter "The Pamir region".

¹¹⁸⁹ MEI Jianjun, 2000, pp. 9-10.

¹¹⁹⁰ Xinjiang Wenwu Bowuguan 新疆文物博物馆 (Cultural Relics Museum of Xinjiang), 1991, p. 3.

¹¹⁹¹ BOKOVENKO, 1995c, p. 309, fig. 15; BOKOVENKO, 1995a, pp. 279-280, see in particular fig. 33.

¹¹⁹² ZHENG Juxin 郑巨欣, 2008, chapter 3.

¹¹⁹³ MAIR 2006, p. 290, fig. 5.1.

¹¹⁹⁴ Some connections have been made by Han Kangxin, who, by analysing some of the skulls from Gumugou cemetery I, found similarities with those from Afanasevo cemeteries. Therefore he speculated that the Gumugou people were migrants from the highlands. Archaeological evidence also hints at some form of connection between the two areas. HAN Kangxin, 1986.

“southern”, may have had the same “steppe origin” and only later diversely developed into two traditions. Two wooden, Scythian-type bows were found in the Zaganluke cemetery (Fig. 185.4). According to experts, Scythian bows were short and had curved tips, a setback centre section and thick limbs¹¹⁹⁵. The specimen found in grave M64 was made of a combination of bone, wood and sinew, was short (a little over one meter) and had a distinctive double-curved body. Other than in the Scythian regions in the north and west, similar bows were discovered in the Turfan Basin, at the sites of Subeixi¹¹⁹⁶, Yanghai¹¹⁹⁷ and Shengjindian¹¹⁹⁸ (all dating to the first millennium BC by carbon dating and typological analysis), while there is little evidence in other areas of Xinjiang¹¹⁹⁹. Given that the complex shape of these bows was unlikely to have been accidental, it can be suggested that the know-how for producing these objects came from the northern Scythian region, in South-western Siberia, and reached Southern Xinjiang across the Turfan Basin. It is indeed probable that the transmission mechanism of Scythian bows was likely to have been the transfer of expertise rather than the simple movement of physical objects. In fact, it has been shown that the specimens found in Subeixi were larger than traditional Scythian bows, suiting the larger size of people that inhabited the Turfan Basin, while the specimens from Xinjiang showed evidence of some local traditions, such as the use of certain bones and the application of lacquers. The latter indicates connections with Chinese technology¹²⁰⁰. Wooden musical instruments were recovered from Zaganluke cemetery: in particular, the discovery of two “steppe konghous” (Fig. 185.3) provide evidence of early connections between the communities in Southern Xinjiang with late Bronze Age and Iron Age cultural groups in the Pamir region (more specifically the Ji’erzankale cemetery)¹²⁰¹ and also the Turfan Basin, where some specimens were recovered from Yanghai¹²⁰², and the Hami oasis (especially the Aisikexia’er cemetery)¹²⁰³. Equally as important, the instruments link the Xinjiang communities to the west. Research on these instruments is still at an early stage, however it seems that horizontal angular harps originated in Mesopotamia around 1900 BC and spread eastward during the Neo-Assyrian Empire around 900 BC via the Scythian

¹¹⁹⁵ DWYER, 2003, pp. 76-78.

¹¹⁹⁶ A bow with its leather quiver were found in M4. Tulufan diqu Bowuguan 吐鲁番博物馆 (Turfan Museum), 2002, pp. 50-51

¹¹⁹⁷ Several double-curved Scythian bows were recovered, in association with regular ones. XIA, Tulufan diqu Wenwu ju 吐鲁番地区文物局 (Turfan Regional Cultural Relics Bureau), 2004, pp. 5-7; Tulufan diqu Wenwu ju 吐鲁番地区文物局 (Office for Cultural Relics of Turfan, 2011, pp. 126, 138, 141.

¹¹⁹⁸ Two bows were found in grave M2. LI Xiao, WAGNER, WU Xiaohong, TRASOV, ZHANG Yongbin, SCHMIDT, GOSLAR, GRESKY, 2013, p. 338.

¹¹⁹⁹ The diffusion of these weapons may have been wider, however the preservation of wood and other organic materials was mostly common in arid regions, such as the southern rim of the Tarim Basin.

¹²⁰⁰ DWYER, 2003, p. 72.

¹²⁰¹ Xinjiang Shehui Xueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), 2014, pp. 24-25.

¹²⁰² QI Xiaoshan 祁小山, WANG Bo 王博, 2008, p. 105.

¹²⁰³ Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 151.

mercenaries¹²⁰⁴. Besides the Xinjiang specimens, “konghous” have been uncovered in only three locations at the edge of the vast Eurasian steppe zone, in Pazyryk, Bashdar and Olbia, on the Black Sea¹²⁰⁵. In spite of this, since the instrument was small and portable, it was likely to have been commonly used by the mobile population of Eurasia.

A number of bone and horn objects were found in Southern Xinjiang. Besides some non-decorated polished bone combs varying in shape (some had one bump on each side of the handle, while others were simply perforated)¹²⁰⁶ (Figs. 186.3, 4), a group of drinking horns was recovered from Zagunluke cemetery (Figs. 186.1, 2). The latter, specifically made from ox horn and open at both ends, were used for ritual ceremonies and libations, and at the same time were symbols of supremacy – both military and social – among Scytho-Sarmatian communities¹²⁰⁷. Drinking horns of this type were rather common in early societies and especially those of Iranian origin developed these objects beautifully, creating zoomorphic specimens, decorated with precious materials, which took the name “rhythà”¹²⁰⁸ (Fig. 187). Of all the communities who used drinking horns, however, the Scytho-Sarmatians stand out for their rich and homogeneous assemblages, clearly showing that these people did not adopt the “rhythà”, but instead retained a marked preference for simple drinking horns¹²⁰⁹, such as those found in the Zagunluke cemetery.

Some glass beads were recovered from the Liushui and Zagunluke cemeteries (Fig. 188). The beads from Liushui are simple tube-shaped stones of a single colour, while those found at the Zagunluke site are globular in shape and some multicoloured, such as the light-blue-and-white specimen from grave M14. Some studies have been conducted on glass objects in Xinjiang but none analysed those from Bronze Age sites. Little research has been conducted on later glass remains from Zagunluke dating the first-sixth century AD¹²¹⁰, while more studies have been published on artefacts found at the Iron Age

¹²⁰⁴ WU Guo, 2009, 110-112.

¹²⁰⁵ BO Lawergren, 2003, pp. 89-91.

¹²⁰⁶ For a discussion on combs found in cemetery no. 1 at Zagunluke see LU Lipeng 鲁礼鹏, MA Jine 马金娥, 2017.

¹²⁰⁷ MANASSERO, 2007; similar horns occasionally featured in the Afanasevo cultural sites, however their function is unclear. GRYAZNOV, ГРЯЗНОВ, 1999, p. 92, fig. 6.

¹²⁰⁸ Some of the most exquisite examples of these artistic objects were found in Nisa (Turkemenistan), see, MASSON, PUGACHENKOVA, 1982.

¹²⁰⁹ JACOBSON-TEPFER, 1995, p. 217.

¹²¹⁰ CHENG Qian, GUO Jinlong, WANG Bo, CUI Jianfeng, 2012; glass beads were also found in grave M115, at Xiabandi AII, assigned to Han dynasty period (206 BC-220 AD) and in grave 1M27 at Qunbake, dating to the first half of the second millennium BC. XIA, 2012c, pp. 121-122; Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Team of the Institute of Archeology, Chinese Academy of Social Sciences), Xinjiang Bayinguoleng Menggu Zizhizhou Wenguan Suo 新疆巴音郭楞蒙古自治州文管所 (Institute of Cultural Relics of the Xinjiang Bayingolin Mongolian Autonomous Prefecture), 1991, p. 694.

sites of Kezi'er (Kiziltur) in Baicheng County (ca. 1000-600 BC) and Wenquan in Emin County (ca. 700-500 BC)¹²¹¹. These studies have revealed that glass was most likely introduced in Xinjiang as early as the Iron Age, and that its production was closely linked to the Saka population (first millennium BC)¹²¹². Specifically, most of the glass objects discovered in Xinjiang dating to the tenth-sixth century BC (i.e. Kezi'er and Wenquan glasses) most likely were Saka products, adopted from early societies in Western Asia, Eastern Mediterranean regions and Egypt¹²¹³. It has been noted that the chemical composition of glass beads in Xinjiang was close to that of Western Asians glass, though not identical because of the inclusion of local raw materials. From these findings, glass scientists and archaeologists have hypothesized that Saka and Saka-related people, who locally produced glass items, employed their own technique and, at the same time, used local raw materials¹²¹⁴. It must be noted that single-colour beads at Kezi'er were dated around the tenth-eighth century BC¹²¹⁵, which roughly corresponds to the date of Liushui and Zaganluke cemeteries and from the latter appear similar to those found in the contemporaneous cemeteries in Western Xinjiang with regard to shape and colour. In the Central Plain glass was also produced, as well as in other Chinese regions, with unique local features. However, considering the available analysis, Chinese glass objects appeared much later than those found in Xinjiang, roughly around the fifth century BC¹²¹⁶. In addition, the composition of glass beads dating between the first and sixth centuries A.D. found in the Zaganluke cemetery indicates that even in later periods glass was of the western type¹²¹⁷. For these reasons the hypothesis that Xinjiang glass is of Chinese origin has been put aside and, instead, the discovery of glass artefacts similar to those found in Xinjiang in graves assigned to the Spring and Autumn (771-476 BC) period in Henan Province¹²¹⁸ suggests the existence of a trade route for transporting glass from Xinjiang to the Central Plain.

At the Liushui cemetery numerous shells were recovered from no less than eight graves (M1, M12, M17, M18, M21, M30, M32 and M55) and, among them a number of cowries were identified (Fig.

¹²¹¹ LI Qinghui, LIU Song, ZHAO Hongxia, GAN Fuxin, ZHANG Ping, 2013.

¹²¹² This statement is preliminary, since a broad survey and analysis of glass dating earlier than the fifth century BC from Xinjiang is yet to be undertaken.

¹²¹³ LI Qinghui, LIU Song, ZHAO Hongxia, GAN Fuxin, ZHANG Ping, 2013, p. 19; GAN Fuxi, CHENG Huansheng and LI Qinghui, 2006, pp. 710-711.

¹²¹⁴ GAN Fuxi, CHENG Huansheng, LI Qinghui, 2006, p. 710.

¹²¹⁵ XIA, 2002a, p. 26.

¹²¹⁶ GAN Fuxi, CHENG Huansheng, LI Qinghui, 2006, p. 712.

¹²¹⁷ CHENG Qian, GUO Jinlong, WANG Bo, CUI Jianfeng, 2012, pp. 1955-1960.

¹²¹⁸ For example those found in burial M1, of Gushigou, dating (Henan sheng Wenwu Yanjiusuo 河南省文物研究所 [Henan Institute of Cultural Relics], 1991) have a similar chemical composition to that of glass beads from Kezi'er. GAN Fuxi, CHENG Huansheng and LI Qinghui, 2006, p. 711.

189). In the second chapter origins and function of these shells have been discussed more in detail¹²¹⁹. Despite the questions still surrounding cowries and shells, their discovery at the Liushui cemetery confirms the site as a key point in the system of cultural east-west exchanges throughout Eurasia.

A few pieces of nephrite have been recovered from Liushui cemetery and the sites at Niya Beifang and Keriya Beifang. While most of them constitute globular, polished white beads and, in a single case, a sceptre head (Fig. 190.2), the jade axe found in the Keriya Beifang settlement was cut and made of green nephrite (Fig. 190.1). In-depth studies are yet to be carried out on these objects, however some research has been conducted on the nephrite deposits along the southern rim of the Taklamakan Desert¹²²⁰, where the raw material for these items most likely originated. The deposits consist of both ores and alluvial boulders and, while mines have only been worked since the first millennium AD¹²²¹, alluvial deposits were probably exploited at much earlier times. Jade from the Southern Xinjiang deposits was green, yellow, red and dark, however a particular type, white in colour, which had been used to make the objects uncovered at the archaeological sites, was collected from the Baiyu River (or White Jade River) in Hetian County and was among the most valuable finds¹²²². It has now been established that trading activities between the Central Plain, Xinjiang and Central Asia took place as early as the establishment of the Silk Road (second century BC), yet there is evidence to suggest that trading of Hetian jade can be traced back to the Neolithic period or the Bronze Age¹²²³. It has been indeed proposed that a “Jade Road” connecting Xinjiang to the Central Plain preceded the more famous Silk Road¹²²⁴. This is by no means unreasonable, since recent analyses on some jade objects found in Qijia contexts in the Gansu province (ca. 2300-1700 BC) have proven that the jade was from Hetian¹²²⁵. Jade discovered by the Liao River, dating from the Xinglongwa to the Hongshan occupation (ca. 7000-2500 BC)¹²²⁶ have not been examined yet, however, as no jade sources exist in that region, they may have come from Xinjiang. In spite of the possible existence of the “Jade Road”, evidence proving the existence of a real, regular route via which jade was transported and traded is still insufficient and further studies are required on this subject. Indications of future research have been made by Gan Fuxi and Yongmin Shan, whose studies on ancient jades suggest not only that a “Jade

¹²¹⁹ See the second chapter of this dissertation “The Eastern Xinjiang region”.

¹²²⁰ LIU Yan, DENG Jun, SHI Guanghai, LU Taijin, HE Huaiyu, NG Yi-Nok, SHEN Chonghui, YANG Liqiang, WANG Qingfei, 2010; LIU Yan, DENG Jun, SHI Guanghai, TZEN Fuyui, ZHANG Guibing, ABUDUWAYITI Maituohuti, YANG Liqiang, SUN Xiang, 2011.

¹²²¹ KEVERNE, 1991, pp. 24-26.

¹²²² ZHANG Minghua, 2004, p. 4.

¹²²³ SHAN Yongming 单永明, 2011, p. 156.

¹²²⁴ HU Jia 胡笏, ZHONG Xizheng 钟习政, 2007, p. 135; see also ZANG Zhen 臧振, 1994, no. 2, pp. 36-64; GAN Fuxi 干福熹, 2009.

¹²²⁵ GU Fang, 2008, paragraph. 3.

¹²²⁶ CHANG Kwang-Chih, 2006, p. 48.

Road” must have existed earlier than the Silk Road, but also that it may have reached the Mediterranean region¹²²⁷. With regard to the white jade objects found in Liushui and Niya Beifang sites, the hypothesis that they were made locally using local material is tempting. However, some questions arise, due to the evident small quantity of items recovered, as this contrasts with the presence of a local industry, and only further research will provide answers to these questions.

4.4 Metallurgy

Various types of metal objects were recovered from the region and have been classified into three categories: personal ornaments, horse-related objects and weapon-tools.

4.4.1 Personal ornaments

Bronze ornaments including earrings, rings, bracelets and a mirror were found together with other ornaments made of gold. With regard to bronze objects, a ring was recovered from the Keriya Beifang settlement and, considering the size of the item, it might have been either a bracelet or part of another decorative object, perhaps a temple ring (Fig. 191.1). Uncertainty surrounds the bronze hook that was discovered at the Niya Beifang site in terms of its function. Similar specimens were found in association with remains of the Abashevo (ca. 2500-1900 BC), Sintashta (ca. 2100-1500 BC), Andronovo (ca. 1900-1200 BC) and Seima-Turbino (around 1500 BC) steppe cultural groups¹²²⁸ and, in some cases, these hooks have been defined as “fishing hooks” to stress their function¹²²⁹. The proximity of the Niya Beifang site to the Niya River would suggest that the artefact may indeed have been a fishing tool, yet the shape of this object and, especially, the fact that its end is tightly wrapped indicate it would have been useless for fishing and, instead, may have been part of a decorative object, such as a temple ring (Fig. 191.2). In addition to these findings, a mirror was recovered from Liushui cemetery. Its image has been published in the excavation report, however the quality of the picture is low and it is not provided with a description. The mirror is round in shape with a central handle, of the type described in detail in the second chapter and recovered from Tianshan Beilu¹²³⁰. The Liushui specimen was decorated, though the pattern is unclear.

¹²²⁷ GAN Fuxi 干福熹, 2009; SHAN Yongming 单永明, 2011, no. 3, p. 156.

¹²²⁸ CHERNYKH, 1992, 195, 220, 225, 199.

¹²²⁹ ZHANG Liangren, 2009, p. 24.

¹²³⁰ See the second chapter of this dissertation “Eastern Xinjiang”.

In addition to bronze objects, golden specimens were found in Liushui cemetery. Besides a gold-foil pectoral (echoing the Scythian world¹²³¹) (Fig. 192) and some beads, four gold-cast earrings were recovered from grave M10 (Fig. 193.1). They were characterized by a circle with a biconical end: a style that may have originated from Scythian cultural groups¹²³². Earrings of this kind have frequently been discovered along the Amu Darya, in the Uigarak cemetery, at the site on the Sakar Choge hills and in the region of Tuva, in Arzhan cemetery¹²³³ (Fig. 193.2). The four gold earrings in Liushui cemetery were found in a male grave, a custom that is close to that of the Scythians (particularly the Saka group), though each Scythian male body was usually matched with only one single earring¹²³⁴. These items were rather widespread throughout the Altay region, including the south-western slope of the range, where they were recovered from Suke'erte (Fuyun County) and Dongtaleide (Habahe County), both dating back to after the eighth century BC¹²³⁵ (Figs. 193.3, 4). Interesting earrings found in the cemetery at Yanbulake, in Eastern Xinjiang¹²³⁶, were circular in shape with a biconical end, which was created by the interlacing of two wires (Fig. 193.6). Although the resulting design of the earring is close to those from the Liushui cemetery, the latter show a much more advanced technology and refined manufacturing process. Similar, but more elegant specimens were recovered from the Iron Age stage of the Chaiwopu site (around 1000 BC)¹²³⁷ and a slightly later phase at Wulapo (second half of the first millennium BC)¹²³⁸ (Fig. 193.5). In Liushui and Zaganluke cemeteries some iron remains were unearthed and, specifically in Liushui graves M1, M4, M34 and M28, some fragments were found, while the assemblage at Zaganluke consisted of a ring and a very damaged object, which originally might have been a sword.

¹²³¹ The most famous example, although later, is the pectoral from Tolstaya Mogila, found in the Ukrainian steppe. The eastward expansion of the Scythian objects is demonstrated by the discovery of gold foil pectorals in the Xiongqian cemetery (Hualong County, Qinghai) and in the cemetery at Jundushan, near Beijing, both dating to the first millennium century BC. VIDALE, 2007, p. 255, fig. 1.; WANG Guodao 王古道, 2003, p. 47, figs. 5-6; Beijing Shi Wenwu Yanjiusuo, 北京市文物研究所 (Beijing Institute of Cultural Relics), 2007.

¹²³² YABLONSKY 1995b, pp. 218, 230; BOKOVENKO, 1995b, pp. 287-288.

¹²³³ ARMBRUSTER, 2009, pp. 187-193.

¹²³⁴ YABLONSKY, 1995b, p. 218.

¹²³⁵ XIA, 2015a, p. 378.

¹²³⁶ Xinjiang Weiwu'er Zizhiqu Wenhuating Wenwu chu 新疆维吾尔自治区文化厅文物处 (Xinjiang Uygur Autonomous Region Department of Cultural Relics Office), Xinjiang Daxue Lishixi Wenbo yu bu Zhuanxiu ban 新疆大学历史系文博干部专修班 (Department of History, Xinjiang University), 1989, pp. 346, fig. 24.21.

¹²³⁷ XIA 1998, p. 23, fig. 11.11.

¹²³⁸ WU Yong 吴勇, 1999, p. 90, fig. 1.

4.4.2 Horse-related objects

Regarding horse-related objects, of particular interest are the horse bridles found in Liushui cemetery, which represent one of the earliest pieces of evidence of horse domestication in Southern Xinjiang (Fig. 194.1). The bridles had a stirrup-shaped end and, according to Bokovenko, it was precisely this type of bridle that in the ninth-eighth century BC replaced bone or horn cheekpieces in Central Asia¹²³⁹. Similar assertions have been made by Vishnevskaya, who, by using the holes at the end of the mouth-pieces as a criterion, established that bridles with a stirrup-shaped end appeared from the eighth century BC¹²⁴⁰. Additional studies by Russian scholars have revealed that after spreading throughout the Eurasian territory for two centuries, the stirrup-ended bridles were replaced by a new single-holed bridle in the sixth century BC¹²⁴¹. That said, the kind of bridles discovered in Liushui cemetery were commonly found in Scythian sites in Central Kazakhstan where the Tasmola sub-group of the Saka settled¹²⁴², in Tuva, in the Arzhan cemetery¹²⁴³, and also in the Minusinsk Basin in correspondence to sites assigned to the Tagar cultural group¹²⁴⁴ (Figs. 194.2-4). In Xinjiang, such bridles were uncovered in contexts, which have been dated to the first millennium BC, on the southern slope of the Tianshan Mountains, in cemetery no. 1 at Chawuhugou¹²⁴⁵ and Sa'ensa'yi¹²⁴⁶, and in the Turfan Depression at Yanghai¹²⁴⁷ (Figs. 194.5-7).

4.4.3 Tools

In Southern Xinjiang metal tools consist of knives, daggers, arrowheads and socketed spades. In Liushui, Niya Beifang and Zagunluke sites, a large quantity of knives were discovered. These knives can be divided into two groups: straight and curved blade. The first incorporates single-blade knives with no demarcation between handle and blade (Fig. 195). Of these knives, some of those found in Liushui and Niya Beifang were longer and their blade was slightly larger than the handle (Fig. 195.1), resembling those unearthed in cemetery no. 4 at Chawuhugou on the southern slope of the Tianshan

¹²³⁹ BOKOVENKO 1995c, p. 305.

¹²⁴⁰ VISHNEVSKAYA ВИШНЕВСКАЯ, 1992.

¹²⁴¹ CHLENOVA ЧЛЕНОВА, 1992, p. 215.

¹²⁴² YABLONSKY, 1995b, p. 204.

¹²⁴³ BOKOVENKO, 1995a, pp. 269-271.

¹²⁴⁴ BOKOVENKO, 1995c, pp. 305, 307-308.

¹²⁴⁵ A specimen was discovered in grave M1, XIA, Hejing xian Bowuguan 和静县博物馆 (Hejing Museum), 1992, p. 91, fig. 14.7.

¹²⁴⁶ They were recovered from several graves, namely M6, M22, M31, M101, M106, M113, M115. XIA, 2013a, pl. 7 fig. 3, pl. 20 fig. 3, pl. 25 fig. 5, pl. 67 fig. 3, pl. 72 fig. 4, pl. 75 fig. 9, pl. 77 fig. 7.

¹²⁴⁷ They were found, for example, in graves M5 and M14. Tulufan diqu Wenwu ju 吐鲁番地区文物局 (Office for Cultural Relics of Turfan), 2011, pl. 11 fig. 3, pl. 4 fig. 5.

Mountains¹²⁴⁸, but also in the Burgulyuk settlement in Tashkent (tenth-eighth century BC)¹²⁴⁹ (Figs. 195.2, 3). This kind of knife was also recovered from the Andronovo territory (ca. 1900-1200 BC), including Semirech'e and the Ili-Tacheng region¹²⁵⁰ (Fig. 195.4). Other knives, from Liushui and Zagunluke cemeteries had a straight blade and, in most cases, a perforated handle (maybe for something to be inserted), making these objects perfect portable tools (Fig. 196.1). Indeed, they were rather widespread among the Eurasian steppe mobile communities. These knives, recovered from Northern and Eastern Xinjiang, and have been described in detail in the first and second chapters¹²⁵¹. Most of the specimens appeared in Xinjiang from 1000 BC onwards¹²⁵²: in the Tianshan Valleys, for example, numerous knives were unearthed in cemeteries nos. 1 and 4 at Chawuhugou (ca. 1000-380 BC)¹²⁵³, while that from Qiemu'erqieke in the Altay region (Fig. 196.2), despite having long been attributed to the early Bronze Age, has recently been assigned to a later phase of the cemetery (ca. 1200-800 BC)¹²⁵⁴. In the first millennium BC, straight blades with a perforated handle were widely recovered from Tagar cultural sites in the Minusinsk Basin (Fig. 196.3). The second group of knives in Southern Xinjiang comprises specimens with a curved blade. Most knives of this kind were found in Liushui cemetery and consisted of curved items with a demarcation between handle and blade. One longer knife had a decorated handle with a ring-shaped end, reminiscent of specimens from the Seima-Turbino community (around 1500 BC) (Fig. 197.1). However, the knives at Liushui and those of the Seima-Turbino community present significant differences with regard to technical and stylistic evolution, since the later specimens in Southern Xinjiang show a rougher manufacturing process and do not have zoomorphic pommels. The knives of the Karasuk cultural group (ca. 1200-800 BC), whose metallurgy was most likely connected to that of the Seima-Turbino community¹²⁵⁵, are closer to those from Liushui (Fig. 197.2). In fact, if the Karasuk people initially produced very curved knives, in the later phase of the tradition they adopted a shape similar to that of the specimens found in Southern Xinjiang¹²⁵⁶. It was precisely this shape that was later inherited by following Scythian sub-groups, such as the Tagar¹²⁵⁷ and the Tuvan¹²⁵⁸ in the first millennium BC (Fig. 197.3, 4). Curved knives with

¹²⁴⁸ XIA, 1987a, pp. 7-8.

¹²⁴⁹ KUZ'MINA, MALLORY, 2007, p. 442.

¹²⁵⁰ SHAO Huiqiu 邵会秋, 2009, fig. 3

¹²⁵¹ See the second chapter of this dissertation.

¹²⁵² Early specimens were found in Tianshan Beilu and Eastern Xinjiang. See the second chapter of this dissertation.

¹²⁵³ XIA, Hejing Bowuguan 和静县博物馆 (Hejing Museum), 1992, pp. 51-53; XIA, 1987a, pp. 7-8.

¹²⁵⁴ Taken from a personal conversation with Professor Kovalev in Saint Petersburg in August 2016. For more information see the first chapter, "The Altay region".

¹²⁵⁵ CHERNYKH, 2008, p. 50.

¹²⁵⁶ See the Karasuk knives evolution in JETTMAR 1950, pl. 4.

¹²⁵⁷ See the Tagar knives evolution in JETTMAR 1950, pl. 4.

¹²⁵⁸ BOKOVENKO, 1995a, p. 271.

decorated and ringed handles also featured in Northern China, though most scholars agree that they must have come from the steppe¹²⁵⁹. In Xinjiang they were found in the eastern region, in the Bronze Age cemetery of Tianshan Beilu and these specimens have been described in the second chapter (Figs. 87, 197.5). Curved knives in Eastern Xinjiang were also recovered from the Iron Age funerary site of Baiqi'er (eighth-third century BC)¹²⁶⁰. They also featured in the Tianshan Valleys, in the Sa'ensa'yi site (first millennium BC)¹²⁶¹. Further east, some well manufactured curved knives were recovered from the Yanshi Erlitou cultural site, which has been dated as early as the second millennium BC¹²⁶², while other specimens were uncovered in Yanqing, near Beijing¹²⁶³ (eighth-third century BC). In Anyang, appreciation for this shape has been demonstrated by the discovery not only of bronze items, but also of jade pendants shaped precisely like these knives¹²⁶⁴ (Fig. 197.6). Smaller curved knives featured at the Liushui cemetery and show parallels with findings from the Tianshan Valleys, in the Nu'erjia cemetery in Changji¹²⁶⁵ and the Chawuhugou¹²⁶⁶ cemetery, all dated to the first millennium BC. Knives unearthed from Southern Xinjiang were products of the steppe and were inherited by different cultural groups, allowing for their diffusion throughout Eurasia. Given the background of these objects and the larger quantity found at Karasuk and Scythian cultural sites, especially in the regions of Tuva (Tuvan type), Minusinsk (Tagar sub-group), Fergana, and Eastern Kazakhstan (Saka), it can be suggested that these knives came from the north and the west and, via the Tianshan valleys, reached the southern region of the Tarim Basin. It seems that these knives diffused during the first millennium BC, in the transitional period between the late Bronze Age and early Iron Age, maybe as a result of migrations of new mobile communities, which settled in Xinjiang or somehow came into contact with local populations in the region.

A dagger, with a ringed-handle and a rhomboid blade, was recovered from the Keriya Beifang settlement (Fig. 198.1). This artefact is similar to those found in Tagar cultural sites (Fig. 198.2), regarded as an evolution of the daggers produced by the Karasuk population, which in turn had evolved from the (few) Andronovo types¹²⁶⁷. Besides the Minusinsk Basin, where the Tagar community settled,

¹²⁵⁹ LINDUFF, 1998, pp. 627-629, in particular see fig. 3.

¹²⁶⁰ Hami Bowuguan 哈密博物馆 (Hami Museum), 2013, p. 159.

¹²⁶¹ See for example curved bronze knives from graves M89 and M101. XIA, 2013a, pl. 60 fig. 2, pl. 67 fig. 4,

¹²⁶² LINDUFF, 1998, pp. 627-629, in particular see fig. 3.

¹²⁶³ Beijing shi Wenwu Yanjiusuo Shanrong Wenhua Kaogu Dui, 北京市文物研究所山戎文化考古队 (Shanrong Culture Archaeological Team of the Beijing Institute of Cultural Relics), 1989, p. 29.

¹²⁶⁴ Jade specimens are known to specifically belong to the Shang and Zhou dynasty contexts. BAUMER, 2012, p. 152.

¹²⁶⁵ XIA, 2013c, p. 35, fig. 40.

¹²⁶⁶ XIA, 1995, p. 294.

¹²⁶⁷ See the evolution of the daggers in JETTMAR, 1950, pl. 6; see also BOKOVENKO, 2006, pp. 870-871.

these daggers were widely distributed throughout Scythian territories, especially in the region of Tuva¹²⁶⁸ as well as in the Altay¹²⁶⁹ and Mongolia¹²⁷⁰ (Figs. 198.3-5). They were also discovered in Central Asia, in correspondence to the territories occupied by Saka communities during the first millennium BC in Kazakhstan and in Uzbekistan, on the Aral Sea¹²⁷¹, but also in the Western Pamir region¹²⁷² (Figs. 198.6-7).

In relation to arrowheads, the specimens found in the Liushui cemetery and in Keriya Beifang settlement, with a shaft socket and a side hook (Figs. 200.1, 2), are the most interesting as they are analogous to the arrowheads featuring in the Scythian communities throughout Eurasia: they were recovered from Northern Caucasus, the Volga River and southern Urals regions¹²⁷³, in addition to territories further east, in Central and Eastern Kazakhstan and South-western Siberia, where they were found in correspondence to Tagar cultural sites (ca. 800-200 BC)¹²⁷⁴ (Figs. 200.3, 4). An early use of hooked items can be tentatively traced back as early as the third-second millennium BC, since a hooked spearhead was found at Shenna, in Qinghai, assigned to the Qijia community (ca. 2300-1700 BC)¹²⁷⁵ (Fig. 199.2). This specimen is believed to have been the product of still unclear contacts between groups in North-western China and the steppe tribes, especially the Seima-Turbino (Fig. 199.1)¹²⁷⁶. However, the hooks on these weapons were facing upwards, theoretically upside down compared to the arrowheads found in Southern Xinjiang. Around the first millennium BC in Xinjiang, hooked arrowheads, identical to the Liushui specimens, albeit made of wood, appeared in the Subeixi site¹²⁷⁷ (Fig. 200.5), while bronze items featured in the Tianshan Valleys at the cemeteries of Nu'erjia and Sangongxiang, in Changji Prefecture¹²⁷⁸ and Sa'ensa'yi near Urumqi¹²⁷⁹ (Figs. 200.6, 7).

¹²⁶⁸ BOKOVENKO, 1995a, pp. 268-269, 274-277.

¹²⁶⁹ BOKOVENKO, 1995b, p. 287.

¹²⁷⁰ VOLKOV, 1995, pp. 321-322.

¹²⁷¹ MEI Jianjun, 2000, p. 171.

¹²⁷² In Western Pamir daggers of this type were recovered from Tamdinsky cemetery (eighth-sixth century BC). YABLONSKY, 1995b, pp. 235-236.

¹²⁷³ PETRENKO, 1995, pp. 14-15; DVORNICHENKO, 1995a, p. 107.

¹²⁷⁴ BOKOVENKO, 2006, pp. 870-871; BOKOVENKO, 1995c, p. 303.

¹²⁷⁵ MEI Jianjun, 2003a, pp. 7, 10-11.

¹²⁷⁶ Hooked spearheads were found in the Rostovka cemetery. For a discussion see MEI Jianjun, 2003a, pp. 7, 10-11.

¹²⁷⁷ Tulufan diqu Bowuguan 吐鲁番博物馆 (Turfan Museum), 2002, p. 55.

¹²⁷⁸ XIA, 2013c, pp. 33-35; XIA, 2015f, pl. 58 fig. 1, pl. 70 fig. 1.

¹²⁷⁹ They were found, for example, in graves M19 and M34. XIA, 2013a, pl. 17 fig. 4, pl. 27 fig. 4.

Bronze socketed spades with two lateral loop-holes were found in the settlement at Niya Beifang and in Liushui cemetery¹²⁸⁰ (Figs. 201.1, 2). They have an identical shape and are only distinguished by the geometric decoration on the base of the spade from the Liushui site. The early production of these objects can be traced back to the Timber Grave community (ca. 1900-1200 BC)¹²⁸¹ (Fig. 201.3); they were later unearthed in the Seima cemetery of the Seima-Turbino cultural group (around 1500 BC)¹²⁸² (Fig. 201.4) and, as a result of still unclear interactions between the two communities, a specimen was found at Qijiaping and assigned to the Qijia cultural group (ca. 2300-1700 BC)¹²⁸³ (Fig. 201.5). One spade of this type, now exhibited at the Hermitage Museum, has been discovered in an Andronovo context (ca. 1900-1200 BC), even though it does not seem to have been part of the set of weapons of this tradition (Fig. 86.4). On the contrary, this kind of spade was more common in the Minusinsk Basin during the Karasuk occupation (ca. 1200-800 BC)¹²⁸⁴, and centuries later was still used by the Scythian community of Tagar (ca. 800-200 BC)¹²⁸⁵ (Figs. 201.6, 7).

4.4.4 Remarks on metallurgical examinations

According to the results of metallurgical analysis conducted by Mei, bronze objects from Liushui cemetery were exclusively made of a tin-copper alloy¹²⁸⁶. In Southern Xinjiang copper ores are located in Qimantage in Ruoqiang County and in Tula in Qiemo County. The former may contain some tin, while no traces of arsenic have been detected¹²⁸⁷. It is still unknown whether these deposits were exploited in prehistory, however their very presence suggests that the existence of a local metallurgy in Southern Xinjiang should be considered. As mentioned in the introduction of this dissertation, tin bronze, appeared in South-western Asia as early as the fourth millennium BC, was predominant during the Late Bronze Age throughout the Andronovo territory (ca. 1900-1200 BC). The Andronovans, who supposedly exploited tin deposits in Kazakhstan in the Kalba-Naryn Mountains and Uzbekistan in the Zeravshan valley¹²⁸⁸, have indeed been associated with the expansion of tin bronze¹²⁸⁹. The Karasuk community, which seamlessly replaced the Andronovo around the thirteenth or twelfth century BC, did

¹²⁸⁰ These tools were recovered from Tianshan Beilu, therefore they have been analysed in detail in the second chapter of this dissertation “Eastern Xinjiang”.

¹²⁸¹ A specimen is exhibited at the Hermitage Museum.

¹²⁸² CHERNYKH, 1992, p. 218-219.

¹²⁸³ For further information on these contacts see FITZGERALD-HUBER, 1995, 43-52; MEI Jianjun, 2003b.

¹²⁸⁴ GRYAZNOV, 1969, fig. 18.

¹²⁸⁵ BOKOVENKO, 1995c, pp. 303, 307.

¹²⁸⁶ This observation is based on the analysis of twenty-six samples. MEI Jianjun, 2008.

¹²⁸⁷ MEI Jianjun, 2000, p. 51, tab. 5.1.

¹²⁸⁸ GARNER, 2013.

¹²⁸⁹ GARNER, 2011. For additional information on the development of the tin bronze technology see the introduction of this dissertation.

not use tin bronze. On the contrary, according to Chernykh, Karasuk metalwork was characterized by the employment of arsenical bronze as the principal alloy, making up at least 85%-90% of the total¹²⁹⁰. The community probably exploited the copper-arsenic deposits in Tuva, in the Minusinsk Basin, and in the Sayano-Altay region, while the raw material for the few tin-copper specimens may have come from polymetallic mines in Mongolia and on the Upper Amur River. The latter were probably also exploited by the Tagar group, which had a tin-copper alloy based metallurgy¹²⁹¹. The presence of golden jewellery at Liushui is an important indicator for connecting this population to the pastoralist tribes of the steppe regions, who were able to cast gold objects in significant quantities, by exploiting the large ores in Central Asia. As mentioned in the previous chapters, large deposits were located in the Ural region, Kazakhstan and Fergana¹²⁹², while high quantities of gold can also be found in the Zeravshan, Vakhsh and Kafirnigan Rivers¹²⁹³. Numerous discoveries of cultural objects in the vicinity of the deposits have revealed that gold ores and placers were exploited by the Andronovans¹²⁹⁴ and that, some centuries later, Karasuk and Karasuk-related people inhabiting South-western Siberia and North-eastern Kazakhstan were still using gold. In fact, archaeological remains assigned to the Karasuk included gold clips used to join cracks in vessels¹²⁹⁵ (a custom maybe inherited by the Afanasevo culture¹²⁹⁶) and also elegant pieces of foil-covered and cast jewellery, such as those found in the Munshunkur burial in Eastern Kazakhstan¹²⁹⁷. The true masters of gold production were, however, the Scythians, whose skills and expertise are evident in the high quality decorative cast objects found in Turkestan, Fergana, Kazakhstan, the region of Pamir, on the Altay and in South-western Siberia, from the first millennium BC. An outstanding example of Scythian gold production is the assemblage found in Arzhan cemetery in Tuva dating to the eighth-seventh century BC, which contained refined locally produced pieces of jewellery and exquisite decorative objects produced using a highly creative and technical level of expertise¹²⁹⁸. The discovery of the golden earrings in Liushui cemetery, similar to the Arzhan specimens, suggests that the local population was in contact with pastoralist communities,

¹²⁹⁰ CHERNYKH, 1992, p. 270.

¹²⁹¹ For further information see HSU Yiukang, BRAY, HOMMEL, POLLARD, 2016, pp. 357-375; MINIAEV, 2016.

¹²⁹² In Bashkiria, it was extracted from the Kuseevskiy mine; in Northern Kazakhstan ores were available in Borovoe, in Stepnyak areas, in Bayanaul (Altyn-Kazgan, Altyntas) and Karaganda districts (Zhosaly, Kushoku, Kenshoku), while in Central Kazakhstan, ores are known in Karkaraly district (Altynsu, Alabuga, Kyzyl-Espe, Akchagyl, Akzhal, Murza-Shoku) and on the Ulutau Mountains (Akshoku, Sorkuduk, Koskol, Obaly); in Eastern Kazakhstan gold was mined in the vicinity of Lake Balkhash (Sayak) and Kazanchunkur on the Irtysh River. SAL'NIKOV, САЛЬНИКОВ, 1967, pp. 278-279; KUZ'MINA, MALLORY, 2007, pp. 89-90; CHUKHROV ЧУРОВ, 1950, pp. 4, 54.

¹²⁹³ KUZ'MINA, MALLORY, 2007, p. 89.

¹²⁹⁴ GRYAZNOV, ГРЯЗНОВ, 1935, pp. 192-193; CHERNIKOV ЧЕРНИКОВ, 1960, pp. 118-119.

¹²⁹⁵ OKLADINOV, 1990, p. 86.

¹²⁹⁶ BORODOVSKY, 2013, pp. 119-122.

¹²⁹⁷ KUZ'MINA, MAIR, 2008, p. 161.

¹²⁹⁸ ARMBRUSTER, 2009, pp. 187-193.

while the shape of these objects indicates that interactions had been specifically established with the Scythian groups in the northern and western territories.

4.5 Summary

The homogeneity of the findings in the four sites indicates the existence of a consistent single cultural group, which occupied the whole area of Southern Xinjiang in the Bronze Age, from the end of the second millennium BC to the first millennium BC. This community used to build settlements in the low lands, while its funerary sites were located in high-altitude places, as was custom of the early Iron Age groups in Mongolia, Altay and South-western Siberia¹²⁹⁹. Remains on the southern rim of the Tarim Basin are very few in number, however this analysis has shown that the region was occupied by semi-nomadic communities, who practised seasonal pastoralism. Specifically, information on climate and environment indicates that the highlands were particularly rich in pasturages during the Summer, suggesting that they were inhabited during the hot season and abandoned when Winter came. With the arrival of the cold season these semi-nomadic populations moved to the lower lands, where settlements, such as those of Niya Beifang and Keriya Beifang, were located. Anthropological evidence also points to a mobile or semi-mobile pastoralist lifestyle for the communities of Liushui and Zaganluke: most of the adults showed traces on their bones indicating long walks on mountain slopes and their teeth displayed typical features of meat eaters. Judging by the evidence, a double economy existed within these communities: while in the desert oases (where settlements were located) the discovery of various grains and several agricultural tools indicates that some form of farming was practised, the evidence from the cemeteries in the highlands demonstrates that sheep breeding was the main occupation of these communities¹³⁰⁰. In fact, sheep bones have been widely discovered in graves accompanying the dead, while traces of their burnt remains have also been identified in tomb fillings and in mounds. Some sheep were probably sacrificed in the smaller stone enclosure found on the eastern side of some graves in the Liushui cemetery and these funerary rituals likely involved libations, as suggested by the discovery of drinking horns in Zaganluke cemetery. Horses had definitely been domesticated, as demonstrated by the recovery of Scythian-type bronze bridles and horn-made cheek peeks. Whole horses and sheep or parts of them were sometimes buried with the dead, a fairly widespread practice

¹²⁹⁹ Some examples of these high-altitude funerary and sacrificial sites can be found in LIU Wensuo, 2014.

¹³⁰⁰ Agriculture on the highlands was rarely practised, if at all, so it is unsurprising that only a few tools that may have in some way been connected with agricultural activities were found in the Liushui cemetery. In Zaganluke cemetery, also built in a high-altitude location, farming tools were rare.

among early steppe groups from Europe to Siberia.

Communities in Southern Xinjiang were socially organized, most likely on a family-basis, as suggested by family connections existing between people buried in the same grave. A form of a hierarchy is evident from the discovery of wealthier graves. Among the buried bodies, a lack of children has been observed and may indicate a specific community preference not to bring children to the summer pasturages. It is also possible that children were buried elsewhere, separated from the adults, in the “infant cemeteries”, as was sometimes the case among steppe cultures. If signs of the existence of some form of social organization can be found by examining the archaeological remains, there is no evidence of labour divisions and, specifically, no indication of the existence of metallurgist clans. No tools for metal production were recovered from the graves and neither were the so-called “founder hoards”¹³⁰¹. This is relevant, in so far as there is no clear evidence of a local metal production, although it is rather the case, given the quantity of metal objects and their peculiar features, in addition to the availability of raw material in the area. Metal objects found in the examined sites on the southern rim of the Tarim Basin, including personal ornaments, horse-related objects and tools, were among the first evidence of metallurgical production in the area and were of the steppe variety. The specific similarities with Scythian specimens in South-western Siberia suggest that they were products of close connections between the communities living in the two regions.

Evidence shows that the communities in Southern Xinjiang were closely in contact with Scythian-related cultural groups, such as the Tagar, who inhabited the Minusinsk Basin in the first millennium BC. More specifically:

1. Bronze items were of the Scythian type and, more specifically, very similar to those produced by the Tagar sub-group, which occupied the Minusinsk Basin. Some of the tools displayed constant similarities with specimens from the cultural sites of Qijia, Seima Turbino, Karasuk and Tagar. It is known that at one point Seima Turbino-related populations came into contact with the Qijia community¹³⁰² and it is clear from the metallurgical evidence that they also had a great impact on the metallurgy of the Karasuk and, later, Tagar cultural groups. Therefore, putting aside the debate on the connection between the Qijia and Seima Turbino communities (which, for chronological reasons, could not have directly influenced the societies in Southern

¹³⁰¹ KUZ'MINA, MALLORY, 2007, p. 97.

¹³⁰² FITZGERALD-HUBER, 1995, 43-52; MEI Jianjun, 2003b.

Xinjiang) it can be concluded that from the end of the second millennium BC to the first millennium BC two cultural groups produced types of metal objects extraordinarily similar to those found on the southern rim of the Tarim Basin and they were precisely the Karasuk (ca. 1200-800 BC) and, even more, the Tagar (ca. 800-1200 BC) in the Minusinsk Basin. However, dissimilarities have been recognized in the use of diverse alloys in the Karasuk and the Southern Xinjiang communities, which were arsenic-copper and tin-copper respectively. On the contrary, the groups on the southern rim of the Tarim Basin and the Tagar had the same tin-bronze based metallurgy. That said, no evidence of metallurgical practices, dating earlier than that at the examined sites, has yet been discovered in Southern Xinjiang. The sudden appearance of refined bronze and golden objects is very likely to have been the result of contacts with metal-using groups and, given that a large quantity of metal artefacts can hardly represent a form of gift-exchange practice with northern groups, it is convincing enough that these items were made locally under the guidance of experts. As mentioned in the introduction of this dissertation, a successful transfer of metallurgical knowledge requires verbal instructions and practical demonstrations by experts¹³⁰³. Therefore, it seems reasonable to speculate that among the Tagar groups that occupied the Minusinsk Basin around the ninth century BC, some moved south and reached the southern rim of the Tarim Basin, where they settled and began to locally produce metal objects.

2. Many pottery remains resemble those of the late Karasuk and early Tagar cultural groups.
3. Anthropological evidence indicates that the population of Liushui had affinities with people from South-western Siberia and the Black Sea¹³⁰⁴. In this regard, it has been recently suggested that the Scythians may have originated from the Timber Grave population in the northern region of the Black Sea¹³⁰⁵. If so, the most reasonable hypothesis is that the Tagar group of the Scythian, who had already mixed with the local Siberian population moved south and, via the Tianshan Valleys and, to some extent, Eastern Xinjiang, reached the southern region of the Taklamakan Desert. That people in Southern Xinjiang were Scythian has been also suggested by Francfort who, having seen the remains at the site of Keriya Beifang realized that the skulls were not mongoloid (on the contrary, they were more similar to western specimens) and, considering the features of the archaeological findings, proposed an affiliation with the

¹³⁰³ For more information on the transmission of the “metallurgical package” see the paragraph “Metallurgy” in the introduction on this dissertation.

¹³⁰⁴ ZHANG Xu 张旭, ZHU Hong 朱泓, WANG Minghu 王明辉, WU Xinhua 巫新华, 2014.

¹³⁰⁵ JURAS, KRZEWINSKA, NIKITIN, EHLER, CHYLENSKI, LUKASIK, KRENZ-NIEDBALA, SINIKA, PIONTEK, IVANOVA, DABERT, GOTHERSTROM, 2017.

Scythians of South-western Siberia and Kazakhstan¹³⁰⁶.

4. Glass production was apparently introduced by the Scythian communities, who worked materials locally, supporting the theory of a southward movement of these populations.

Despite the aforementioned similarities with the Tagar community, some differences have also been noted between the two populations, for example regarding the burials, which were cists in the Scythian world, in contrast to the simple pits in Liushui cemetery. Connections with other Scythian groups, such as the Saka and the Tuvan, have been demonstrated, for example, by the discovery of gold specimens, similar to those from the cemetery of Arzhan in Tuva. In addition, the remains in Southern Xinjiang show some analogies with Eastern Xinjiang communities, indicating that unclear connections between groups living in these regions had already been established. In this regard, of major interest is the round mirror recovered from Liushui cemetery, which is of the type typically found in Eastern Xinjiang and, further east in Gansu and Qinghai (Fig. 82). Additional influences came from the Chust community, especially concerning some pottery vessels and stone tools (Figs. 145, 175, 177). However, the number of objects involved in these alleged interactions is low and, consequently, it is safe to affirm that only weak connections were established with these cultural groups. On the contrary, affinities with the late Karasuk and, even more, the Tagar cultural objects are much more numerous, especially with respect to metallurgy, and it is precisely the mechanism of metal technology transmission which suggests the actual presence of northern groups in Southern Xinjiang. However, in spite of scholarly efforts over the last two decades, numerous questions still remain: for example how and to what extent people from South-western Siberia reached the southernmost region of the Tarim Basin is still to be conclusively determined. For now, remains specifically similar to those of the Tagar group and to those found in Southern Xinjiang have been recovered from several Iron Age sites in the Tianshan Valleys and in Eastern Xinjiang, suggesting that, from the north, a group of Scythians (which most likely included metallurgists) moved to the valleys of the Tianshan Mountains and in the oases in Eastern Xinjiang before arriving in Liushui, Beifang and Zaganluke via the Pamir region or, possibly, through the desert following the course of rivers that have now run dry.

A possible association with Scythian-related populations has raised questions on the assignment of the four examined sites to the Bronze Age. Especially problematic are the cemeteries of Zaganluke and

¹³⁰⁶ RODERICK, 2002.

Liushui. The presence of “catacomb-like” graves in the former, the strong similarities with Iron Age communities, such as the Tagar, and the recovery, not only of glass beads and artefacts, but also of several broken iron knives in both sites, make their attribution to the Bronze Age very much questionable. Findings at Niya Beifang and Keriya Beifang settlements, despite sharing similarities with the Tagar culture with respect to metallurgy, suggest that they may have been slightly earlier than the cemeteries and, in fact, no iron was recovered there. Numerous questions remain unanswered and correctly assigning these sites as well as acquiring a proper understanding of the early societies on the southern rim of the Tarim Basin pose future challenges for archaeological research in the region.

CONCLUSION

In the preceding chapters archaeological evidence from four bordering areas of present-day Xinjiang Province (Altay region, Western and Eastern Xinjiang and the southern rim of the Tarim Basin) has been examined in detail in order to throw new light on Bronze Age communities in the region and their metallurgy (research question no. 1). Special attention has been paid to local developments and external contributions to the emergence and growth of Xinjiang early metallurgical knowledge (research question no. 2). An other issue, which has been at the centre of this research is the understanding of the role of Bronze Age communities in Xinjiang in the system of interactions during the second millennium BC and, more specifically, in the process of technological transmission (research question no. 3). The conclusive chapter is articulated into three parts, each dedicated to answering one of the three research questions. In addition, those issues that remain unresolved will be highlighted, as they maybe of some relevance for future research.

1. When, where, and how the first metal-using societies settled in Xinjiang.

Archeological evidence shows that the first metal-using society in Xinjiang was the Qiemu'erqieke, who settled in the Altay region during the third millennium BC. According to the geographical distribution of this community's archaeological remains, it spread across the highlands on the southern slope of the Altay Range in Xinjiang, in the territory corresponding to the Bayan Ulgi and Khovd provinces in Western Mongolia and the mountainous region of North-eastern Kazakhstan. The Qiemu'erqieke people were hunters and combined this activity with some pastoralism, while there is no evidence of agricultural practice. Stone was widely employed for making vessels as well as ritual objects, while metallurgical activity was still in its early stages: only a few small artefacts, such as rings, wires and undecorated flat plaques for fixing vessels were found (Figs. 36.1,2). If we apply the criteria adopted by Gryaznov to date Siberian sites¹³⁰⁷ the Qiemu'erqieke must be attributed to the Copper Age, as its metallurgy is characterized by a basic production of a few simple tools for perforating, cutting and repairing vessels, combined with improvements in stone manufacturing. These people had a well-established ritual system, as indicated by the number of phalli, anthropomorphic figurines and steles recovered from the sites, and this was apparently shared with different

¹³⁰⁷ GRYAZNOV, 1969, p. 45.

communities, such as the Okunev in the Minusinsk Basin (Figs. 27, 28). The Qiemu'erqieke people were Europoid, so they must have moved to the Altay region from the west. A few theories on the possible origin of the Qiemu'erqieke have thus far been proposed, with one of the most recent put forward by Russian scholars, who suggest that this group hailed from Southern Europe¹³⁰⁸. Although there are some similarities between the stone remains in Southern France and the Altay region, as of yet there is no archaeological evidence proving such a long-distance movement of these people. A more recent hypothesis by Lin Meicun, who sees the expansion of the Seima Turbino community at the origin of the Qiemu'erqieke, is not fully convincing due to the chronological discrepancy between the two groups¹³⁰⁹ and the peculiarity of the Qiemu'erqieke cultural aspects, which have been discussed in the first chapter. The Qiemu'erqieke tradition seems to have spread to the south, where anthropomorphic steles were found in the Turfan Basin and Hami (Fig. 18). Evidence of the Qiemu'erqieke cultural expansion can also be found in the funerary remains in Lop Nur and in the lower reaches of the Keriya River, while some traits typical of this community were observed in the pottery assemblages from Hami and Gansu (Figs. 31, 28).

In the second millennium BC the first bronze-using societies emerged in Eastern and Western Xinjiang and they occupied the highlands and the lower lands. In Eastern Xinjiang early evidence of metal use can be placed to around 2000 BC and, judging by the remains, the Bronze Age lasted until the end of the second millennium BC. The geographical distribution of the findings reveals that while Neolithic communities mostly occupied the highlands contained in the eastern spur of the Tianshan Range, during the Bronze Age people moved to the lower lands, to Hami and some areas of the present-day Yiwu Prefecture. Only some groups remained in high-altitude places in the Barkol region. Bronze Age settlers in Eastern Xinjiang were mostly farmers and sedentary and, although some pastoralism was practiced, it seems to have held a secondary position within the local economy. The communities of Eastern Xinjiang produced painted pottery and were advanced in metallurgical production. They were well organized socially and had an established belief system, which included fertility cults shared by neighboring groups in the Lop Nur region and on the upper reaches of the Keriya River. Other rituals, such as those linked to bow-shaped pendants (Fig. 77) and designs (Fig. 70), were most likely local. The population of Eastern Xinjiang was characterized by an admixture of eastern and western

¹³⁰⁸ KOVALEV, 2011.

¹³⁰⁹ Dating for Qiemu'erqieke has been established around 2500-1800 BC, while dating for the Seima Turbino remains is still uncertain, ranging from 1500 BC, 2000 BC or even earlier. KOVALEV, ERDENEBAATAR, 2009, pp. 150, 153; CHERNYKH, 1992, p. 215-234; FITZGERALD-HUBER 1995, pp. 49-50; LIN Meicun 林梅村, 2015, p. 52.

individuals, and the multi-origin of these communities is evident in their archaeological remains, which show features of western groups in Central Asia and South-western Siberia and eastern societies in present-day Gansu and Qinghai. The closest relations seem to have been with the east, namely the Qijia and Siba communities. Specifically metal objects and painted pottery are major indicators of these strong ties. The presence of painted pottery is especially relevant as the pottery discovered in Eastern Xinjiang represents the earliest evidence of this type of decoration in Xinjiang. It seems that painted pottery remained unique to the communities in the Hami region until the end of the second-beginning of the first millennium BC, corresponding to the final Bronze Age and the beginning of the Iron Age, when it spread westward throughout the Tianshan Valleys¹³¹⁰.

In Western Xinjiang archaeological evidence of Bronze Age communities dating to the second millennium BC, was discovered in two main regions, the Ili-Tacheng and Pamir. In North-western Xinjiang, the higher and lower lands were populated from the earliest occupation of the region, and during the Bronze Age these areas were inhabited by Europoid people of the Andronovo type. Their settlements were built in flatter territories, though sometimes at a rather high altitude (the Adunqiaolu settlement was located at more than 2000 m above the sea level) and close to water sources. Next to the settlement a cemetery has usually been found¹³¹¹. Other funerary sites and places of worship were discovered alone¹³¹², suggesting the existence of some sort of sacred places separated from the residential sites, where specific sacrificial rituals would be performed. Space arrangement in the residential and funerary sites shows that the local people were socially organized. Communities in North-western Xinjiang were seasonal pastoralists, who took livestock to the highlands in the Summer, before moving to the settlements in the lower valleys during the Winter. Farming tools, frequently recovered from hoards in Aga'ersen, Zeketai and Xiakalangu'er, are evidence that some agriculture was practiced. Metal tools, ornaments and pottery items were of the Andronovo-type: the striking similarities of the archaeological remains, in addition to the anthropological evidence, indicates that an Andronovo tribe, most likely from Central Asia, settled in North-western Xinjiang and formed the

¹³¹⁰ See, for example, Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队(Xinjiang Team of the Institute of Archeology, Chinese Academy of Social Sciences), *Xinjiang Bayinguoleng Menggu Zizhizhou Wenguansuo 新疆巴音郭楞蒙古自治州文管所* (Institute of Cultural Relics of the Xinjiang Bayingolin Mongolian Autonomous Prefecture), 1987, p. 991, fig. 9; Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队(Xinjiang Team of the Institute of Archeology, Chinese Academy of Social Sciences), *Xinjiang Bayinguoleng Menggu Zizhizhou Wenguansuo 新疆巴音郭楞蒙古自治州文管所* (Institute of Cultural Relics of the Xinjiang Bayingolin Mongolian Autonomous Prefecture), 1991, p. 691 fig. 13, p. 700, fig. 23; XIA, 1987a, p. 5, fig. 5.

¹³¹¹ Such as in Adun Qiaolu and Weixiao sites. See the second section of the third chapter of this dissertation "The Ili-Tacheng region".

¹³¹² For example in Wutulan village. See the second section of the third chapter of this dissertation "The Ili-Tacheng region"

easternmost periphery of the Andronovo territory. Bronze Age communities in South-western Xinjiang, (known as the “Pamir region”), developed from the very beginning of the second millennium BC. According to archaeological evidence, the highlands were the first to be inhabited, while during the final Neolithic the lower lands began to be slowly occupied, so that by the Bronze Age both the highlands and the lower areas were populated. Little is known of the Bronze Age communities in the Pamir region due to the scant remains thus far discovered. Indeed, archaeological sites in this area consist of one sole cemetery, Xiabandi AII, in Tashenku’ergan County, and the four Aketala deposits in Shufu County. That said, it has been deduced that the local economy likely revolved around agro-pastoralism, as numerous sheep and goats’ bones were unearthed from cemetery AII at Xiabandi¹³¹³, located on the highlands, while farming tools were recovered from Aketala in the desert oasis of Kashgar (Figs. 145, 146). This suggests an efficient exploitation of the environmental resources: lower lands for farming and highlands for pastoralism. The neighboring Andronovo community, who judging by evidence of pottery and metal evidence had a strong influence on the Pamir region, was also agro-pastoralist¹³¹⁴. Nevertheless, questions surrounding the economy in South-western Xinjiang during the Bronze Age still remain, due, in particular, to the absence of tools in the Xiabandi cemetery. Further questions about the race and culture of the Bronze Age population in the Pamir region derive from a lack of analyses and excavations. Although remains from the Xiabandi cemetery suggest that the area was influenced by the Andronovans, it is premature to consider such findings as conclusive evidence as it would be presumptuous to evaluate the Pamir region bases on one single site.

At the turn of the first millennium BC, metal-using communities appeared in Southern Xinjiang. Considering the available evidence it seems that, while during the Neolithic period only the highlands were inhabited, in the Bronze Age the region was more widely occupied by one consistent community, who spread all along the southern rim of the Tarim Basin, in the highlands and the desert oases. At the same time, the first millennium BC witnessed a more efficient exploitation of the surrounding environment: farming constituted the main economy in the desert oases, while pastoralism was practiced on the highlands. Communities in Southern Xinjiang engaged in seasonal pastoralism, as goats and sheep were taken to the highlands in the Summer and moved to the desert oasis in the Winter. Horses had been already domesticated as working animals, as shown by the bronze bridles from

¹³¹³ In addition, recent analyses of human bones, revealing that wheat and millet were part of the community’s diet, further support the existence of an agro-pastoralist economy in the Pamir region. ZHANG Xinyu 张昕煜, WEI Dong 魏东, WU Yong 吴勇, NIE Ying 聂颖, HU Yaowu 胡耀武, 2016.

¹³¹⁴ GRYAZNOV, 1969, p. 91; KUZ’MINA, MALLORY, 2007, pp. 141-156.

Liushui. Bronze Age communities on the Southern rim of the Tarim Basin built their settlements in the desert oases, along rivers that had once crossed the desert, while cemeteries were usually located on highlands and in the foothills of the Kunlun Range. Local groups were socially organized (most likely in a hierarchical system), pottery was widely produced and metallurgy was very developed, including iron and gold objects of the Tagar type. Evidence that this Scythian group inhabited the southern rim of the Tarim Basin during the first millennium BC has been found in the human remains: people in Southern Xinjiang were western, showing traits of population from Southern-Siberia and the Black Sea¹³¹⁵, thus it is probable that this community, or a part of it, consisted of Tagar individuals¹³¹⁶. The discovery of iron, glass, and Scythian-type ornaments and horse bridles indicates that remains in Southern Xinjiang belong to the transitional period between the end of the Bronze Age and the beginning of the Iron Age¹³¹⁷.

Based on the above, it is possible to conclude that Bronze Age communities in Xinjiang developed from around 2000-1000 BC and they occupied the highlands and the lower lands of the bordering regions of present-day Xinjiang Province. In earlier periods it seems that populations were smaller, more scattered and mainly occupied high-altitude areas. In fact, not only have Paleolithic and Neolithic remains usually been recovered from the highlands, but also the Copper Age cultural group of Qiemu'erqieke in the third millennium BC settled in the higher valleys located in the Altay Range. During the Bronze Age communities spread more widely and were able to exploit the environmental resources of both the highlands and the desert oases, for pasturing and farming respectively. The wider expansion, the agro-pastoralist economy, the remarkable development of pottery (which was rather rare or absent in earlier periods) and the emergence of bronze technology are the main characteristics of the Bronze Age communities in Xinjiang. The first millennium BC witnessed the end of the Bronze Age: the discovery of iron, glass, horse-related and Scythian-type objects in sites dating to this period are evidence of the beginning of the Iron Age.

¹³¹⁵ ZHANG Xu 张旭, ZHU Hong 朱泓, WANG Minghu 王明辉, WU Xinhua 巫新华, 2014.

¹³¹⁶ It has recently been suggested that some Scythian communities may have originated from the Timber Grave population in the northern region of the Black Sea. If this is corrects, the Tagar group of the Scythian could have mixed with local the Siberian population in the Minusinsk Basin and moved south reaching the southern region of the Taklamakan Desert. JURAS, KRZEWINSKA, NIKITIN, EHLER, CHYLENSKI, ŁUKASIK, KRENZ-NIEDBALA, SINIKA, PIONTEK, IVANOVA, DABERT, GOTHERSTROM, 2017.

¹³¹⁷ Bridles with a stirrup-shaped end seem to have spread in the ninth-eighth century BC, when they replaced bone or horn cheekpieces in Central Asia. BOKOVENKO 1995c, p. 305; VISHNEVSKAYA, ВИШНЕВСКАЯ, 1992. Most of the glass objects discovered in Xinjiang date to the tenth-sixth century BC (i.e. Kezi'er, Wenquan, Liushui and Zagunluke glasses) and seem to have been linked to Saka and Saka-related people, who locally produced glass items by employing their own technique and using local raw materials. GAN Fuxi, CHENG Huansheng, LI Qinghui, 2006, p. 710.

2. How metallurgy developed in Xinjiang Bronze Age communities: contributions from local innovations and outside impetus to the emergence and development of the regional early metallurgical knowledge.

The first metal-using community in Xinjiang is the Qiemu'erqieke, which I have assigned to the Copper Age, as it produced simple copper and lead items, for example rings, fasteners and undecorated plaques. This metallurgy was based on pure copper and lead. Some objects were made of an alloy of the two metals, however, this combination was most likely unintentional, as the elementary level of the Qiemu'erqieke metallurgy indicates that the community had not yet developed the knowledge and expertise required to produce metal alloys. Copper ores containing lead impurities were also located in the vicinity of the sites at the Rudno Altay and on the Chinese Altay, therefore it is very probable that they were exploited by the Qiemu'erqieke community, once these people had settled in the Altay region and South-western Siberia in the third millennium BC. At this early stage of metallurgical development, it is difficult to determine whether metal production by the Qiemu'erqieke was stimulated by contacts with other groups. Some impulses may have come from the Afanasevo community (ca. 3500-2500 BC), who had a similar basic metallurgical knowledge and most likely exploited the copper ores in the same region. However, information available indicates that the Qiemu'erqieke community satisfied most of the requirements for developing their own independent metallurgical production: they lived close to the deposits (therefore the raw material was easy to obtain) and fuel provision was ensured by large forests of spruces, larches and pines covering the Altay area. Furthermore, the community was socially organized, thus able to support metallurgists in the collective part of the process (ore extraction and selection and fuel provision), while the hierarchical arrangement of their society provided the basis for a possible internal market for these objects. As previously stated, the small amount of simple metal objects recovered and the lack of research on the topic makes it difficult to form a theory on the origin of this early metal production. That said, until further information becomes available, the hypothesis that independent metallurgy emerged in the Altay region and South-western Siberia should be considered. Although the Qiemu'erqieke community was the first to commence elementary copper-based metallurgical practice in Xinjiang, it seems that it did not play a relevant role in the development of bronze technology in the region, which occurred in the second millennium BC. From the beginning of the millennium, the appearance of bronze objects in Eastern and Western Xinjiang seems to have been related to the expansion of neighbouring metal-using cultural groups, or the result of strong relationships with them.

In Eastern Xinjiang, large quantities of bronze objects, including tools, personal ornaments and ritual objects were found. They were made of arsenic-copper and tin-copper alloys. Some copper deposits, identified in Hami and Yiwu, may have been mined at some point in history, yet whether they were exploited during the Bronze Age has not yet been investigated. Their possible arsenic content is also unknown. Sources of raw material for metal production in Eastern Xinjiang may have been the arsenic-rich copper oxide ores located in the Hexi Corridor, which were exploited by prehistoric populations as early as the beginning of the second millennium BC¹³¹⁸. Tin bronze was also used, and although it is possible that local communities utilized the deposit at Shanchakou in Hami, no investigation has yet been conducted on this ore. Fuel supply could easily have been collected on the Tianshan Range, just north of Hami, as this area was home of a significant amount of trees. It is known that Eastern Xinjiang is abundant with mineral coal, however, to date, no research has been carried out to determine a possible early exploitation of this material. Communities in Eastern Xinjiang were well organized from a social standpoint and thus able to arrange the collective works required for the metallurgical production. All these factors point toward the existence of a local metallurgy in Eastern Xinjiang, though the initial stimulus was most likely connected to contacts with neighbouring communities, especially the Siba in the Gansu-Qinghai region. Indeed, not only did the use of arsenic-copper alloy and the wide range of techniques (including casting, forging, annealing and cold working) employed by populations in Eastern Xinjiang share parallels with Siba metallurgy¹³¹⁹, but also numerous artefacts (such as knives and decorative objects) recovered from Bronze Age sites in the Hami region were of the Siba type. Contributions to the development of Eastern Xinjiang people's culture seem to have come from earlier communities in the Gansu-Qinghai region, Qijia (ca. 2300-1700 BC) and Machang (ca. 2300-2000 BC), suggesting the existence of an established "tradition" of cultural contacts between Eastern Xinjiang communities and their eastern neighbours. These connections were most likely facilitated by geographical factors, as the Hexi corridor provided an easy access to present-day Gansu. Concerning tin bronze technology, in the second millennium BC, knowledge on this field was spread throughout Central Asia and employed by steppe communities, who exploited the resources along the

¹³¹⁸ Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Beijing Keji Daxue Yejin yu Cailiaoshi Yanjiusuo 北京科技大学冶金与材料史研究所 (Institute of Metallurgy and Materials History of the Beijing University of Science and Technology), Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo 中国社会科学院考古研究所 (Institute of Archaeology of the Chinese Academy of Social Sciences), Xibe Daxue Wenhua Yichan Xueyuan 西北大学文化遗产学院 (Cultural Heritage Institute of the North-western University), 2014; CHEN Guoke 陈国科, LI Yanxiang 李延祥, QIAN Wei 潜伟, WANG Hui 王辉, 2015.

¹³¹⁹ MEI Jianjun, 2000, pp. 63-64.

“tin belt”¹³²⁰. It is possible that connections with these people may have led to a transfer of technological knowledge to Eastern Xinjiang, though interactions with tin-bronze using communities, such as the Andronovo (ca. 1900-1200 BC), have not yet been proven by archaeological evidence. Of particular interest is the relationship with the BMAC (around 2000 BC), which has been proposed by senior scholars¹³²¹ and, to some extent, suggested by archaeological evidence¹³²². If the existence of such interactions is to be conclusively demonstrated, it could perhaps be useful in explaining the spread of tin bronze in Eastern Xinjiang.

In Western Xinjiang, the Andronovo community greatly contributed to the emergence of bronze metallurgy. Bronze Age metal objects found in the Ili-Tacheng region were of the Andronovo type, both typologically and chemically. In particular, bronze tools, including socketed axes with a decorated butt, socketed spades, chisels, slightly curved and perforated sickles, single blades, and earrings with a trumpet-shaped end were distinctive Andronovo artefacts. The composition of these items, made of tin bronze with a tin content averaging between 2% and 10%, can also be associated with the Andronovo metallurgical tradition¹³²³. The local production of these Andronovo artefacts by casting¹³²⁴ is attested by the discovery of several moulds, intended to cast mirrors and tools, while ingot moulds unearthed in Wutulan, Jirentaigoukou and Adun Qiaolu (Fig. 111) suggest that part of the smelted metal may have not been locally consumed. In the Ili-Tacheng region metalworking was facilitated by the vicinity of copper resources (located in the counties of Takesi, Nileke and Yumin), the availability of fuel supply on the nearby highlands, in addition to a well-organized society. Tin resources have been discovered in Bole County (Bo’ertala Prefecture), though their exploitation during the second millennium BC is still unclear. Tin was also available in larger quantities in the deposits along the “tin belt” in Central Asia, and these latter deposits were widely exploited by the Andronovo community in the Bronze Age. An advanced metal technology, characterized by tin bronze objects containing a rather specific quantity of tin and different metalworking techniques, seems to have appeared in the Ili-Tacheng region rather suddenly in the second millennium BC, therefore it is probable that it was brought by Andronovo tribes, who occupied in the region, as part of a cultural package. The Andronovans also seem to have

¹³²⁰ Tin deposits are located in a narrow belt stretching from Europe to South-eastern Asia.

¹³²¹ SARIANIDI, 1998, p. 157; Mallory has hypothesized that the origin of the Yanbulake community may have been connected to the migration of tribes from the BMAC area. MALLORY, MAIR, 2000, p. 269.

¹³²² Radial ornaments found in Tianshan Beilu are similar to BMAC’s objects, while the anthropomorphic decoration on one of the mirrors from Eastern Xinjiang can be interpreted as a legendary character, Kersaspa, popular in Bactria and Margiana. See Figs. 76, 82.

¹³²³ CHERNYKH, 1992, p. 213.

¹³²⁴ According to metallographic examinations on Bronze Age samples, forging and annealing were also employed. MEI Jianjun, 2000, pp. 41-42.

influenced South-western Xinjiang: metal objects, pottery and burial structures recovered from the Bronze Age cemetery AII at Xiabandi are of the Andronovo-type (and specifically the Semirech'e subtype). A pre-Andronovo metal production in the Pamir region was traced back to the end of the third millennium BC, when the community in Suletangba'e was apparently capable of manufacturing copper objects. However, dating for this site is questionable, as it is based on similarities of stone and pottery with artefacts pertaining to the Neolithic Kaltemina'er community (Uzbekistan, (second-first millennium BC), though no data on the actual objects has been provided¹³²⁵. In addition, the relation between the Sulentangba'e site and the seventeen copper items found there has recently been put into doubt, and currently remains unclear¹³²⁶. As no further and more detailed information is available, it is impossible to properly evaluate these findings and establish an internal evolutionary process of metallurgy based on these remains. More reliable evidence has been unearthed at cemetery AII at Xiabandi, dating from the beginning to the middle of the second millennium BC¹³²⁷, and consisting of Andronovo-type personal ornaments (trumpet-shaped earrings and bracelets)¹³²⁸. The existence of a local metallurgical activity is supported by the discovery of metalworking-related objects (i.e. ingot moulds and crucibles), the availability of copper and fuel sources in the Pamir region and a well-organized society, which could have supported the collective parts of the process. In spite of this, the lack of bronze utensils poses questions about the role of metal in the economy of the Pamir region communities in the Bronze Age: although these people were able to smelt and cast metal into ingots and were socially organized, it seems that they did not create a basic, internal consumption market. In fact, the very types of metal objects recovered (personal ornaments, usually placed in female's graves¹³²⁹), suggest that they were personal belongings of the dead, which could have been introduced from elsewhere, for example from the neighbouring Andronovo territory, more specifically from Semirech'e, because of the relationship between the two regions. Looking closely to the archaeological sites in the region, one can notice the lack not only of bronze tools, but also of stone and wooden implements, and this can be explained by the specific choice of excluding utensils from the set of grave goods at Xiabandi. This tendency can be also observed in some Andronovo funerary sites, and in the later cemetery of Xiangbaobao (900-400 BC), where in thirty-nine graves, only five weapon-tools were found (two iron knives and three bronze arrowheads). A copper knife and several stone utensils found at the Aketala deposit (ca. 1000 BC) seem to confirm that tools could be placed in hoards, but not in

¹³²⁵ WANG Bo 王博, 1995, p. 27; GONG Guoqiang 龚国强, 1997, p. 7.

¹³²⁶ MEI Jianjun, 2000, p. 9.

¹³²⁷ The first phase of the cemetery has been carbon dated to 1900-1500 BC, while the second to 900-770 BC. XIA, 2012c, pp. 144-145.

¹³²⁸ A few buttons were also recovered, and their cultural attribution is unclear.

¹³²⁹ Only in two children's burials (M5, M19) were metal ornaments exceptionally found.

cemeteries. As of yet neither settlements, nor other hoards have been investigated, the questions remain unsolved. It seems that the main issue that hampers a deeper knowledge of metallurgy in the Pamir region as well as its relation with that of the Andronovo, is the scarcity of excavated sites. Although Xiabandi has been widely excavated and well-reported, and is the source of precious information on the Bronze Age in the Pamir region, it is premature to draw conclusions on the basis of one site.

In the first millennium BC metallurgy appeared in Southern Xinjiang, most likely stimulated by contacts with northern communities settled in the Minusinsk Basin. Metal objects recovered from Bronze Age sites along the southern rim of the Tarim Basin (including spades with side loops, daggers, arrowheads with a side hook, knives and horse bridles) resemble those of the Tagar community, who occupied the Minusinsk Basin at the beginning of the first millennium BC. Evidence currently available shows that in Southern Xinjiang metallurgy was rather advanced and characterized by cast objects made of tin-bronze. The raw material may have come from local deposits: copper resources are located in the counties of Ruqiang and Qiemo, though no research on their possible early exploitation has yet been conducted. There is little evidence of the existence of tin resources in Southern Xinjiang. Tin deposits are located in the areas of Hami and Changji (Urumqi), and they may have been known and exploited throughout prehistory. In particular, in Changji, archaeological remains dating to the first millennium BC share remarkable traits with the material in Southern Xinjiang (Figs. 194, 200), suggesting the existence of close connections between the northern and the southern rims of the Taklamakan desert. These contacts may have involved some form of two-way exchange process or even trading: it is possible that tin was transported to the south, while white jade from Hetian spread northwards, as it was found in Sa'ensa'yi cemetery in Changji¹³³⁰. Fuel supply may have come from the *populus* forest, which grew in desert conditions along the southern rim of the Tarim Basin and, according to archaeological evidence, was widely used by the Liushui population¹³³¹. Communities in Southern Xinjiang were socially organized and a form of hierarchy had been established, as suggested by the recovery of richer graves. These considerations point to the existence of a local bronze metallurgy on the southern rim of the Tarim Basin in the first millennium BC. At the same time, as the earliest bronze objects were of the Tagar-type and their appearance in Southern Xinjiang was rather sudden, it is probable that metal technology was brought to the region by this northern community. However, Southern Xinjiang was not occupied by the Tagar in the way that the Ili-Tacheng region was

¹³³⁰ See, for for example, the bead found in grave M49. XIA, 2013c, pl. 43, fig. 4.

¹³³¹ Remains were found in the cemetery, inside and outside the graves.

perhaps occupied by the Andronovans. It is more likely that a group of Tagar people, including metallurgists, moved to the southern rim of the Tarim Basin introducing metallurgy into the region. In fact, evidence shows that Southern Xinjiang was occupied by a single cultural group, who had distinctive and consistent features, such as Tagar-type bronze artefacts, local productions (such as jade), and pottery and stone items resembling specimens from Central Asia. The route taken by the Tagar group probably crossed the Zungarian Basin, reaching the Tianshan Range, where numerous Tagar-type objects were found. Their influence may have spread throughout Eastern Xinjiang during the first millennium BC, as shown by archaeological remains assigned to the Iron Age, including knives from Baqi'er, horse bridles from Yanghai and golden earrings from Yanbulake. The route from the Tianshan Range to Southern Xinjiang probably crossed the desert, following the course of rivers, such as the Keriya River, which have now dried out.

It seems that during the third millennium BC metallurgy in Xinjiang was at an elementary stage. The focus was the Altay region, occupied by the Qiemu'erqieke community. Despite the possible spread of the Qiemu'erqieke influence to the south, to Lop Nur, the lower Keriya River, Hami and Turfan, it does not seem to have contributed to the emergence of bronze metallurgy in Xinjiang. In the second millennium BC bronze metallurgy appeared as a result of influences from eastern and western communities, through regional occupation (of Western Xinjiang) and cultural contacts (in Eastern Xinjiang). In the first millennium BC, key migrations occurred in a north-south direction, resulting in the transfer of metal technology to Southern Xinjiang via the Tianshan Valleys and the Taklamakan Desert. It seems that external contributions were essential in the emergence of bronze metallurgy in Xinjiang in the second millennium BC, while evidence of internal developments and local contributions are scarce. This is probably the result of an insufficient knowledge of prehistoric Xinjiang, as the lack of excavations and research on Copper Age sites still prevents a complete understanding of the evolution of metallurgy in the region.

3. The role of Xinjiang Bronze Age communities in the prehistoric system of east-west interactions: was Xinjiang a crossroad of cultural connections during the Bronze Age? If so, which areas of Xinjiang were involved in these early interactions?

In recent decades Xinjiang has increasingly come to be recognized as a prehistoric hub, connecting China to the western communities in Central Asia. Its strategic position, in the heart of Eurasia, was of

pivotal importance in helping the region become a significant player in early Eurasian interactions. Although this assumption has undeniable foundations, the very position of Xinjiang, in addition to its peculiar geographical features, harsh environment and severe climatic conditions, seem to have long isolated large areas of the region from the neighbouring societies.

According to available evidence, in the third millennium BC, human occupation of Xinjiang was poor and scattered. Only one group is known to have consistently settled in this period: the Qiemu'erqieke (who, despite having spread more widely in Mongolia, also inhabited the Altay region). These people established some form of cultural connections with the neighbouring Afanasevo and Okunev groups. Discoveries of round-based pottery vessels with carved decorations and stone figurines in the Qijia sites of Dahezhuang and Qijiaping (Gansu Province), basket-shaped pottery containers at Tianshan Beilu, and Qiemu'erqieke steles in Turfan point to the existence of some interactions between the Qiemu'erqieke and these southern regions. Since some Okunev remains (awls, stone figurines and rings) were recovered from Qijia sites in Qijiaping and Zongzhai, the geographical position of the Qiemu'erqieke community suggests that it may have been the link between Gansu-Qinghai and the Minusinsk Basin. This hypothesis is plausible geographically, chronologically and, to some extent, archaeologically¹³³². However, there are still questions, which remain unanswered, especially concerning the nature of the Qiemu'erqieke-Okunev relations: although the existence of contacts between the two communities seems to be very likely, they never involved metallurgy. Metal technology of the Qiemu'erqieke was rather basic and can be only compared to the initial phase of the Okunev. On the contrary, Okunev metal evidence from Gansu is associated with a more advanced Okunev phase¹³³³, and was absent from Qiemu'erqieke cultural sites. Unfortunately, there is still a large gap in the knowledge on the Altay populations during the course of the second millennium BC, and only scant information is currently available on Bronze Age communities in Mongolia: this area is crucial for understanding early relations between the steppe and North-western China. Fortunately, this region has recently attracted increasing archaeological interest and numerous excavations are currently being carried out, therefore more data is likely to come available in the near future.

According to the present research, during the Bronze Age (ca. 2000-1000 BC) Xinjiang was still a

¹³³² As described in the first chapter, some Okunev objects were found in Qiemu'erqieke and Qijia contexts, and Qiemu'erqieke stone and pottery items were also recovered from Gansu (Fig. 31). This suggests not only the existence of contact between Qiemu'erqieke and Qijia communities, but also that Qiemu'erqieke people may have been an intermediary between the Okunev group and population of Gansu.

¹³³³ GRYAZNOV, 1969, pp. 51-66.

rather peripheral region, which played a marginal role in the system of exchange between prehistoric communities until the end of the second millennium BC. From the beginning of the Bronze Age, it seems that two “blocks” of metal-using societies emerged in Xinjiang. In Hami and the surrounding areas, a group of communities developed under the influence of the eastern Siba group, while in Western Xinjiang, Andronovo-related populations occupied the Ili-Tacheng region and, to a still unclear extent, the Pamir area, forming the easternmost periphery of the Andronovo territory. Little connection seems to have existed between the two and, if any connection did exist, it was most likely indirect. Andronovo materials, including metal objects, dominated in Western Xinjiang, though they were remarkably scarcer throughout the rest of the Province, suggesting that the expansion of the Andronovans in Xinjiang was limited to the Ili-Tacheng region and perhaps the Pamir area¹³³⁴. In the Altay, Andronovo objects were occasionally discovered (such as the axe found on the surface in Fuyun County, (Fig. 51) or dated rather late (such as the trumpet-ended earring unearthed from Suke’erte cemetery dating to thirteenth-ninth century BC, (Fig. 48). In the Tianshan Valleys, the axe from Jianxin and the spade from Banfanggou (both around Urumqi) are stray finds, and thus impossible to collocate into a cultural framework¹³³⁵. Findings in Eastern Xinjiang are equally scarce, consisting of one slightly curved and perforated sickle from Tianshan Beilu, in addition to some stray finds, such as the double-winged arrowhead from Ke’ersang (Kuisu County)¹³³⁶. The Andronovans have been considered major players in the spread of tin bronze throughout Eastern Eurasia and this alloy was also used in Eastern Xinjiang, however the existence of direct relations between the Andronovans settled in Western Xinjiang and the eastern communities in Hami and its surroundings remains very uncertain. As Bunker has observed, Andronovo objects (mostly personal ornaments) dating from the early second millennium BC and found in Gansu-Qinghai and North-eastern China (Beijing, Hebei and Liaoning) were probably products of long-distance contacts with the Andronovo, through northern routes linking the steppe with these eastern regions¹³³⁷. Results of the present research support Bunker’s view, as it is shown that the role of Xinjiang communities in the system of interactions during the second millennium BC was very marginal. While Western Xinjiang seems to have been an established periphery of the Andronovo territory, characterized by limited interactions with the east, evidence

¹³³⁴ As stated in the second section of the conclusive chapter, the nature of the relationship between the Andronovans and the communities in the Pamir region is still unclear due to the scarcity of excavations in South-western Xinjiang.

¹³³⁵ Mei Jianjun, 2000, p. 67.

¹³³⁶ One wooden solid wheel, dating to second half of the second millennium BC, was found in Wupu, however, as Mei pointed out, given the chronology and type of this single wheel its contribution to the understanding of early contact is questionable. MEI Jianjun, 2003a, p. 32.

¹³³⁷ BUNKER 1993, p. 31. A similar theory has been formulate by Mei Jianjun, though he has postponed the “opening” of the “Steppe Route” to the second half of the second millennium BC. MEI Jianjun, 2003a, pp. 28-32.

shows that Eastern Xinjiang was strongly influenced by eastern communities (particularly the Siba), and at the same, initiated some form of relation with western and northern groups. Similarities with Siba materials involved painted pottery¹³³⁸ and metal technology, leading to speculation that Eastern Xinjiang was a western Siba periphery¹³³⁹. However, this conclusion seems premature since the Siba community has not yet been fully understood¹³⁴⁰ and reports of significant sites in Eastern Xinjiang are either unpublished (Tianshan Beilu) or contain limited information (Wupu). The existence of a very close relationship with eastern communities is further supported by similarities with Kayue cultural artefacts recovered from Qinghai, such as knives, bells and radial ornaments. According to some scholars, this group directly influenced Eastern Xinjiang, especially the community of Yanbulake¹³⁴¹, though the impact of Kayue can be observed in Tianshan Beilu as well. Considering archaeological evidence, Mei's theory on the existence of two-way relation between the Kayue and Eastern Xinjiang groups finds support¹³⁴²: while painted pottery possibly spread westward, metal artefacts, such as the radial and the bow-shaped ornaments, could have diffused in a eastward direction. There is little doubt surrounding the existence of close relationships between Eastern Xinjiang and Gansu-Qinghai, however the limited archaeological evidence thus far available still impedes a complete understanding of the extent and nature of connections between the two regions. In addition to eastern influences, it seems that numerous cultural aspects of communities in Eastern Xinjiang were shaped as a result of contributions from different western traditions, whose extent should not be underestimated. Features of some remains, such as the radial decorations and patterns on mirrors, point to some form of contact with the BMAC. These interactions have been put at the basis of the origin of the Yanbulake community by some scholars¹³⁴³, though this theory is not yet supported by sufficient archaeological foundations. As of yet, little evidence of the BMAC has been found in Western and Central Xinjiang, therefore, if these contacts existed, they most likely did not involve other Xinjiang communities in the second millennium BC. The existence of relations with nomadic and semi-nomadic steppe populations is suggested by the discovery of curved knives, looped spades and awls with calendric handles, however these interactions are not yet completely understood. As mentioned above, the question

¹³³⁸ According to Mei there are some differences between pottery production of the two regions, with respect to the shape of some vessels and the decoration patterns. In spite of this, the peculiarity of the vessels' types and the painted decoration leave little doubt on the eastern origin of pottery production in Eastern Xinjiang. MEI Jianjun, 2000, p. 64

¹³³⁹ Liu Guorui and Debaine believe that communities in Eastern Xinjiang were Siba. MEI Jianjun, 2000, p. 64, footnote 22.

¹³⁴⁰ There are questions about the origin of the arsenic-bronze-based metallurgy of Siba and its painted pottery technology, while relationships with the Qijia and the steppe communities are still unclear. See: LI Shuicheng, 1993; SUN Shuyun 孙叔云, 1998; SHUI Tao 水涛, 1993.

¹³⁴¹ SHUI Tao 水涛, 1993.

¹³⁴² MEI Jianjun, 2000, p. 65.

¹³⁴³ SARIANIDI, 1998, p. 157; Mallory has hypothesized that the origin of the Yanbulake community may have been connected to the migration of tribes from the BMAC area. MALLORY, MAIR, 2000, p. 269.

regarding contacts between Eastern Xinjiang and the Andronovans remains unanswered, though this research tends to exclude Western Xinjiang communities as possible players in these interactions. Some form of cultural exchange between other steppe groups (such as Seima-Turbino-related and Okunev communities) and Gansu-Qinghai communities seems to have existed earlier than the first Bronze Age people settled in Eastern Xinjiang: An and Fitzgerald's theorized the existence of connections between the Qijia community and the steppe¹³⁴⁴ and, if this hypothesis is correct, this research shows that the involvement of Eastern Xinjiang populations in the early stage of these contacts is questionable. Steppe artefacts, such as double-looped spades, side-hooked spearheads and curved knives reached Gansu and Qinghai during the Qijia occupation (ca. 2300-1700 BC). In Eastern Xinjiang the earliest curved knives appeared in the first half of the second millennium BC in Tianshan Beilu, while the first looped-spade, recovered from the same cemetery, is more similar to the specimen found in Gansu rather than those from the steppe. Steppe hooked spearheads were recovered from Gansu, Shaanxi and further east in Henan and Liaoning¹³⁴⁵, however they were not found in Eastern Xinjiang. Recent research by Lin Meicun has revealed a possible eastward transmission of these steppe items across the northern slope of the Altay Range to Inner Mongolia and further east along the Liao River¹³⁴⁶. Therefore, it seems that Xinjiang was not involved in the eastward movement of these objects. This further supports the existence of preferential routes for cultural and technological transmission connecting the steppe to China, which did not involve Xinjiang communities in the second millennium BC. The afore-mentioned Okunev-type awls found among the Qijia remains is most likely earlier than the Xinjiang specimens, as the earliest was recovered from Wupu, dating to 1400-1000 BC. Evidence shows that connections between the northern steppe and Gansu-Qinghai had been established prior to the emergence of the Bronze Age Eastern Xinjiang communities. Given that some items, such as the looped-spade from Tianshan Beilu, show more analogies with the Gansu specimens, it is even possible that initial Eastern Xinjiang relationships with the steppe were indirect, and occurred through the mediation of Gansu cultural groups. In this early stage, the role of Eastern Xinjiang communities in the diffusion of cultural elements from the east toward the west was apparently also not particularly relevant, until the end of the second millennium BC: almost all the Bronze Age painted pottery, adopted from Gansu-Qinghai communities, was confined to Eastern Xinjiang, while carved decoration, of probable steppe origin, still prevailed throughout the rest of the region. Only at the end

¹³⁴⁴ AN Zhimin, 1993; FITZGERLD-HUBER, 1995, pp. 43-52.

¹³⁴⁵ LIN Meicun 林梅村, 2015.10, pp. 58-59.

¹³⁴⁶ According to Lin, in the second millennium BC Seima Turbino-related metallurgy was relatively spread also in Xinjiang, in the Altay region, Tacheng and on the northern slope of the Tianshan Range, however there is great uncertainty on dating and cultural attribution of Xinjiang specimens. LIN Meicun 林梅村, 2016.

of the millennium, at the beginning of the Iron Age did painted pottery begin to spread across the Tianshan Valleys, suggesting that it was at this point that Eastern Xinjiang started to establish itself as a hub of cultural exchanges.

In the second half of the second millennium BC, the regional climate shifted toward more arid conditions and this new situation seems to have reshaped early communities in Xinjiang. By the end of the millennium larger areas in the Tianshan Valleys and Southern Xinjiang were occupied by socially-organized communities, which created a network of interconnected centres¹³⁴⁷. In Southern Xinjiang the consistency of archaeological remains, suggests that one community spread along the southern rim of the Tarim Basin. This group established interactions with western and northern groups, such as the Chust and the Tagar respectively, but also with populations in the Tianshan Valleys. Some form of trading may have existed, as in Fergana¹³⁴⁸, the Changji¹³⁴⁹ area, Gansu and, even further east, in Henan, white jade was found (most probably originating from Hetian)¹³⁵⁰, while tin and horses may have come from the Tianshan Valleys and the steppe respectively.

According to the results of the present research, during the Bronze Age the Xinjiang territory was still mostly peripheral and interactions between local populations and the neighboring communities were at an early stage. The second millennium BC witnessed a gradual occupation of Xinjiang by two metal-using groups in the west and in the east, as a result of influences from their neighbors, the Andronovo and the Siba. These two “blocks” did not establish direct mutual connections. However, while Western Xinjiang seems to have been an Andronovo periphery, characterized by limited interactions with the east, communities in Eastern Xinjiang, deeply influenced by their eastern neighbors, had most likely established some form of basic and perhaps indirect connections with northern and western steppe groups and the BMAC paving the way to establish itself as a hub of cultural exchanges. By the end of the second millennium BC new climatic conditions led to a more intense occupation of the Xinjiang territory, prompting the establishment of actual routes connecting different populations, which developed in the first millennium BC, at the beginning of the Iron Age.

¹³⁴⁷ MEI Jianjun, 2000, pp. 23-24.

¹³⁴⁸ Jade was found among the Chust remains in Fergana and connections with Xinjiang have been made by KOHL, GARDIN, FRANCFORT, 1984, p. 191.

¹³⁴⁹ XIA, 2013a, pl. 43, fig. 4.

¹³⁵⁰ Nephrite artefacts from the Liao River (dating from the Xinglongwa to the Hongshan occupation, 7000-2500 BC), Gansu, Henan (Fu Hao tomb, Anyang, Henan Province, ca. 1250-1192 BC) and Nanjing (Beiyinyangying site, 4000-3000 BC) are believed to be from Hetian. CHANG Kwang-Chih, 2006, p. 48; GU Fang, 2008, paragraph. 3; ZANG Zhen 臧振, 1994, p. 36; ZHANG Yunde 张运德 2009, p. 108.

BIBLIOGRAPHY

Abbreviations:

IAC: Institute of Archaeology, Chinese Academy of Social Science (Shehui Xueyuan Kaogu Yanjiusuo 社会学院考古研究所)

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“Russian Collections, Russian Explorations in Chinese Central Asia”, in *International Dunhuang Project*, http://idp.bl.uk/pages/collections_ru.a4d, 16/02/2016.

ADAMS Q. Douglas, *Encyclopedia of Indo-European culture*, London and Chicago: Fitzroy Dearborn, 1997.

AKINER Shirin, “Conceptual geographies of Central Asia”, in AKINER Shirin, HAY Jon, TIDEMAR Sander (eds.), *Sustainable Development in Central Asia*, New York: St. Martin’s Press, 1998, pp. 3-62.

ALBENDA Pauline, “Mirrors in the ancient Near East”, in *Notes on the History of Science*, 1985, no. 4, pp. 2-9.

ALEKSEYENKO A. Yevgeny АЛЕКСЕЕВКО А. Евгений, “Kul'tyri u ketov Культы у кетов” (Ket cults), in VDOVIN S. Innokentij ВДОВИИ S. Иннокентий (ed.) *Pamyatniki kul'tury narodov Sibiri i Severa Памятники культуры народов Сибири и Севера* (Cultural monuments of the peoples of Siberia and the North), Leningrad: Nauka, 1977, pp. 29-65.

ALLAN Sarah, “Erlitou and the formation of Chinese civilization: toward a new paradigm”, in *The Journal of Asian Studies*, 2007, vol. 66, no. 2, pp. 461-496.

AMMERMAN J. Albert, CAVALLI-SFORZA L. Luigi, “Measuring the rate of spread of early farming in Europe”, in *Man*, 1971, vol. 6, no. 4, pp. 674-688.

AN Zhimin, “Neolithic communities in eastern parts of Central Asia”, in DANI H. Ahmad, MASSON M. Vadim (eds.), *History of Civilizations of Central Asia vol. 1. The dawn of civilization: earliest times to 700 B.C.*, Paris: Unesco, 1992, pp. 148-162.

AN Zhimin, “The Bronze Age in eastern parts of Central Asia”, in DANI H. Ahmad, MASSON M. Vadim (eds.), *History of Civilizations of Central Asia vol. 1. The dawn of civilization: earliest times to 700 B.C.*, Paris: Unesco, 1992, pp. 308-325.

AN Zhimin 安志敏, “Shilun Zhongguo de zaoqi tongqi 试论中国的早期铜器” (On the ancient copper

and bronze objects in China), in *Kaogu* 考古 (Archaeology), 1993.12, pp. 1110-1119.

AN Zhimin, “Cultural complexes of the Bronze Age in the Tarim Basin and surrounding areas”, in MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 2, Washington: Institute for the Study of Man, 1998, pp. 45-62.

AN Zhimin, “On early copper and bronze objects in ancient China”, in LINDUFF M. Katheryn, HAN Rubin, SUN Shuyun (eds.), *The beginnings of metallurgy in China*, Lewiston, Queenston and Lampeter: Edwin Mellen Press, 2000, pp. 29-46.

ANDERSON G. John, *An early Chinese culture*, Beijing: Ministry of Agriculture and Commerce, the Geological Survey of China, 1923.

ANDERSSON G. John, “Preliminary report on archaeological research in Kansu”, in *Memoirs of the geological survey of China* (serie A), 1925, no. 5, pp. 1-51.

ANDERSON G. John, “Researches into the prehistory of the Chinese”, in *Bulletin of the Museum of Far Eastern Antiquities*, 1943, no. 15, pp. 1-304.

ANTHONY W. David, “Settlements and cemeteries of the Bronze Age of the Urals: the potential for reconstructing early social dynamics”, in HANKS K. Bryan, LINDUFF M. Katheryn (eds.), *Social complexity in prehistoric Eurasia: monuments, metals, and mobility*. Cambridge, New York: Cambridge University Press, 2009.

ANTHONY W. David, *The horse, the wheel, and language: how Bronze-Age riders from the Eurasian steppes shaped the Modern World*, New Jersey: Princeton University Press, 2010.

ANUCHIN I. Vasiliy, АНУЧИН И. Василий “Oчерk shamanstva u yeniseyskikh ostyakov Очерк шаманства у енисейских остяков” (Shamanism in the Yenisey Ostyak), in *МАЕ*, 1914, vol. 2, no. 2, pp. 1-90.

ARMBRUSTER Barbara, “Gold technology of the ancient Scythians – gold from the kurgan Arzhan 2, Tuva”, in *ArcheoSciences*, 2009, no. 33, pp. 187-193.

ASKAROV A. Akhmadali АСКАРОВ А. Ахмадали, *Drevnezemledel'cheskaya kul'tura èpokhi bronzy yuga Uzbekistana* Древние Земледел Ческая культура эпохи бронзы юга Узбекистана (Ancient farming Bronze Age cultures in Southern Uzbekistan), Tashkent: Fan, 1977.

ASKAROV A. Akhmadali, “The beginning of the Iron Age in Transoxiania”, in DANI H. Ahmad, MASSON M. Vadim (eds.), *History of Civilizations of Central Asia vol. 1. The dawn of civilization: earliest times to 700 B.C.*, Paris: Unesco, 1992, pp. 439-442.

ASKAROV A. Akhmadali АСКАРОВ А. Ахмадали, ABDULLAYEV N. Buribay АБДУЛЛАЕВ Н. Бурибай, *Dzharkutan* Джаркутан (Dzharkutan), Tashkent: Fan 1983.

ASKAROV A. Akhmadali АСКАРОВ А. Ахмадали, SHIRINOV Temir ШИРИНОВ Темир, *Rannaja gorodskaja kul'tura èpokhi bronzy Juga Srednej Azii* Ранняя городская культура эпохи бронзы юга Средней Азии (The early urban culture of the Bronze Age in Southern and

Central Asia), Samarkand: IA of the Academy of Sciences of Uzbekistan, 1993.

BAI Yunxiang 白云翔, “Zhongguo de zaoqi tongqi yu qingtongqi de qiyuan 中国的早期铜器与青铜器的起源” (Early bronze objects and the origin of bronze in China), in *Dongnan Wenhua* 东南文化 (South-Eastern Cultures), 2002.7, pp. 25-37.

BAI Yunxiang, “A Discussion on early metals and the origins of bronze casting in China”, in *Chinese Archaeology*, 2003, vol. 3, no. 1, pp. 157-165.

BAR-YOSEF Ofer, ZILHAO Joao, “Towards a definition of the Aurignacian”, in *Trabalhos de Arqueologia* (Works on Archaeology), 2006, no. 45, pp. 11-18.

BARBER W. Elizabeth, “A Weaver's-eye view of the second millennium Tarim Basin finds”, in *Journal of Indo-European Studies*, 1995, vol. 23, nos. 3-4, pp. 347-357.

BARBER W. Elizabeth, “Bronze Age cloth and clothing of the Tarim Basin: the Kroran (Lulan) and Qumul (Hami)”, in MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 2, Washington: Institute for the Study of Man, 1998, pp. 647-655.

BARBER W. Elizabeth, *The mummies of Urumqi*, London and New York: Norton and Company, 1999.

BAUMER Christopher, *The history of Central Asia: the age of the steppe warriors*, London and New York: I. B.Tauris, 2012.

BAYELY Justine, REHREN Thilo, “Toward a functional and typological classification of crucibles”, in LA NIECE Susan, HOOK Duncan, CRADDOCK Paul (eds.), *Metals and mines: studies in archaeometallurgy*, London: Archetype, 2007, pp. 46-55.

Bayingeleng Menggu Zizhizhou Wenguansuo 巴音郭楞蒙古自治州文管所 (Institute of Cultural Relics of the Bayingolin Mongol Autonomous Prefecture), “Qiemu Zhagunluke gumudi 1989 nian qingli jianbao 且末扎滚鲁克古墓地 1989 年清理简报” (Preliminary report on the excavation in 1989 of the Zhagunluke cemetery in Qiemu County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1992.2, pp. 1-14. BEDENZU-SARMIENTO

BEDENZU-SARMIENTO Julio, LHUILLIER Johanna, “Entre nomadisme et sédentarité: l'étude des cultures de l'âge du Fer ancien du Chach. Peut-on parler d'une influence du Khorezm” (Between nomadism and sedentarity: the study of the cultures of the old iron age of the Chach. Can we speak of an influence of Khorezm), in ALIMOVA A. Dilorm АЛИМОВА А. Дилором, PIDAEV R. Shokir ПИДЕВ П. Шакир (eds.), *Uzbekiston pojtahiti Toškent 2200 ёшда: Toškent šahrining 2200 jillik ûbilejiga bagişlangan halkaro ilmiy konferenciâ materiallari* Узбекистон пойтахти Тошкент 2200 ёшда: Тошкент шаҳрининг 2200 йиллик юбилейига бағишланган халқаро илмий конференция материаллари (2200th Anniversary of Tashkent, the capital of Uzbekistan: Materials of the International Scientific Conference devoted to the 2200th Anniversary of the City of Tashkent), Tashkent: FAN, 2009, pp. 40-45.

Beijing Keji Daxue Yejin yu Cailiaoshi Yanjiusuo 北京科技大学冶金与材料史研究所 (Institute of

Metallurgy and Materials, Beijing University of Science and Technology), XIA, Hami diqu Wenwu Guanlisuo 哈密地区文物管理所 (Hami Cultural Relics Management Office), “Xinjiang Hami Tianshan Beilu mudi chutu tongqi de chubu yanjiu 新疆哈密天山北路墓地出土铜器的初步研究” (A preliminary study on the bronzes unearthed from Tianshan Beilu cemetery in Hami, Xinjiang), in *Wenwu* 文物 (Cultural Relics), 2001.6, pp. 79-89.

Beijing shi Wenwu Yanjiusuo Shanrong Wenhua Kaogu Dui, 北京市文物研究所山戎文化考古队 (Shanrong Culture Archaeological Team of the Beijing Institute of Cultural Relics) “Beijing yanqing Jundushan Dong Zhou Shanrong buluo mudi fejue ji lue 北京延庆军都山东周山戎部落墓地发掘纪略” (Summary of the exploration of the cemetery of the Shanrong tribe, in Yanqing County, on the Jundu Mountains, Beijing, dating to the later Zhou dynasty period.), in *Wenwu* 文物 (Cultural Relics), 1989.8, pp. 17-43.

Beijing shi Wenwu Yanjiusuo, 北京市文物研究所 (Beijing Institute of Cultural Relics), *Jundushan mudi* 军都山墓地 (Jundushan Cemetery), Beijing: Wenwu chubanshe, 2007.

Beijing shi Wenwu Guanli chu 北京市文物管理处 (Beijing Municipal Cultural Relics Administration Office), “Beijing diqu de you yi zhongyao kaogu faxian 北京地区的又一重要考古收获” (Another important archaeological discovery in Beijing), in *Kaogu* 考古 (Archaeology), 1976.4, pp. 246-262.

BELLEZZA V. John, “The Prehistoric collection of the Tibet Museum in Lhasa”, in *Flight of the Khyung*. Available at <http://www.tibetarchaeology.com/february-2015/16-01-2017>.

BERDNIKOV Ivan, SOKOLOVA Natalia, “Cultural dynamics of southern part Middle Siberia in the Neolithic based on the pottery study”, in *Quaestiti, The 2nd Virtual Multidisciplinary Conference*, 2014, vol. 2, no. 1, pp. 343-346. Available at <http://quaesti.com/archive/?vid=1&aid=3&kid=160201-14&q=f6>, 08-06-2017.

BEREZANSKAYA S. Sofia БЕРЕЗАНСЬКА С. Софія, TSVEK V. Olena ЦВЕК В. Олена, KLOCHKO I. Viktor КЛОЧКО І. Віктор, LYASHKO M. Svetlana ЛЯШКО М. Світлана, *Remeslo epokhi eneolita-bronzy na Ukraine* Ремесло епохи енеолита - бронза на Україні (Handicraft of the Chalcolithic and Bronze Age in Ukraine), Kiev: Naukova Dumka, 1994.

BERGMANN Folke, *Archaeological research in Sinkiang*, Stockholm: Thule, 1939.

BERTRAND Arnaud, “The hydraulic systems in Turfan (Xinjiang)”, in *The Silk Road*, 2010, no. 8, pp. 27-41.

BETTS V. G. Alison, JIA W. M. Peter, DODSON John, “The origins of wheat in China and potential pathways for its introduction: a review”, in *Quaternary International*, 2014, no. 348, pp. 158-168.

BIN Yang, “The rise and fall of cowry shells: the Asian story”, in *Journal of World History*, 2001, vol. 22, no. 1, pp. 1-25.

- BO Lawergren, “Western influences on the early Chinese Qin Zither”, in *Bulletin of the Museum of Far Eastern Antiquities*, 2003, no. 75, pp. 79-109.
- BOKOVENKO A. Nikolai, “Tuva during the Scythian period”, in DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY T. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, New Haven and Conn: Zinat Press, 1995, pp. 265-284. (a)
- BOKOVENKO A. Nikolay, “Scythian Culture in the Altai Mountains”, in DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY T. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, New Haven and Conn: Zinat Press, 1995, pp. 285-298. (b)
- BOKOVENKO A. Nikolay, “The Tagar culture in the Minusinsk Basin”, in DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY T. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, New Haven and Conn: Zinat Press, 1995, pp. 299-314. (c)
- BOKOVENKO A. Nikolay, “The emergence of the Tagar culture”, in *Antiquity*, 2006, vol. 80, no. 310, pp. 860-879.
- BOND Gerard, KROMER Bernd, BEER Juerg, MUSCHELER Raimund, EVANS N. Michael, SHOWERS William, HOFFMANN Sharon, LOTTI-BOND Rusty, HAJDAS Irka, BONANI Georges, “Persistent solar influence on North Atlantic climate during the Holocene”, in *Science*, 2001, no. 294, pp. 2310-2316.
- BONORA Gian Luca, “Recipienti zoomorfi a carattere rituale” (Ritual zoomorphic containers), in BONORA Gian Luca, MARZATICO Franco (eds.), *Ori dei cavalieri delle steppe, Collezioni dei musei dell’Ukraina* (Gold of the steppe riders, collections of the Ukrainian Museums), Milan: Silvana Editore, 2007, pp. 232-235.
- BORODOVSKY P. Andrey, “Prestigious Afanasyevo wooden metal-bound ware from Sayan-Altai”, in *Archaeology Ethnology and Anthropology of Eurasia*, 2013, vol. 41, no. 4, pp. 119-122.
- BOROFFKA Nikolaus, CIERNY Jan, LUTZ Joachim, PARZINGER Hermann, PERNICKA Ernst, WEISGERBER Gerd, “Bronze Age tin from Central Asia: preliminary notes”, in BOYLE Katie, RENFREW A. Colin, LEVINE A. Marsha (eds.), *Ancient Interactions: East and West in Eurasia*, Cambridge: McDonald Institute, 2002, pp. 135-159.
- BOYD E. William, CHANG Nigel, “Integrating social and environmental change in prehistory: a discussion of the role of landscape as a heuristic in defining prehistoric possibilities in Northeast Thailand”, in HABERLE Simon, STEVENSON Janelle, PREBBLE Matthew (eds.), *Terra Australis 21: Altered ecologies-fire climate and human influence on terrestrial landscapes*, 2010, p. 273-297.
- BUNKER C. Emma, “Gold in ancient China: a cultural puzzle”, in *Artibus Asiae*, 1993, vol. 53, nos. 1-2, pp. 27-50.
- BUNKER C. Emma, “The metallurgy of personal ornaments”, in WHITE Julia, BUNKER C. Emma (eds.), *Adornments for eternity: status and rank in Chinese ornaments*, Denver and Hong Kong: Denver Art Museum and Woods Publishing, 1994, pp. 31-54.

- BUNKER C. Emma, “Cultural diversity in the Tarim Basin vicinity and its impact on ancient Chinese culture”, in MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 1, Washington: Institute for the Study of Man, 1998, pp. 604-618.
- BUNKER C. Emma, “Artefacts: regional styles and methods of production” in BUNKER C. Emma, WATT James, SUN Zhixin (eds.), *Nomadic art of the Eastern Eurasian steppes: the Eugene V. Thaw and other New York collections*, New York: Metropolitan Museum of Art, 2012, pp. 15-36.
- CAVALLI-SFORZA L. Luigi, “Genes and peoples, and Languages”, in *PNAS*, 2000, vol. 94, no. 15, pp. 7719-7724.
- CHANG Kwang-chih, *The archaeology of ancient China*, New Haven and London: Yale University Press, 1963.
- CHANG Kwang-chih “Archaeology and Chinese histography”, in *World Archaeology*, 1981, no. 13, pp. 156-169.
- CHANG Kwang-Chih, “China on the eve of the historical period”, in LOEWE Michael, SHAUGHNESSY L. Edward, *The Cambridge history of ancient China*, New York: Cambridge University Press, 2006, pp. 37-44.
- CHANG Xi'en 常喜恩, “Balikun Nanwan mudi 66 hao mu qingli jianbao 巴里坤南湾墓地 66 号墓清理简报” (Preliminary report of the excavation of grave no. 66 at the Nanwan cemetery, in Balikun County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1985.1, pp. 4-16.
- CHAPMAN John, “The impact of modern invasions and migrations on archaeological explanation”, in CHAPMAN John, HAMEROW Helena, (eds.), *Migrations and invasions in archaeological explanation*, Oxford: Archeopress, 1997, p. 1-21.
- CHARLES A. James, “Early arsenical bronze: a metallurgical view”, in *American Journal of Archaeology*, 1967, vol. 71, no. 1, pp. 21-26.
- CHARLES A. James, “From copper to iron: the origin of metallic materials”, in *Journal of Metals*, 1979, vol. 31, no. 7, pp. 8-13.
- CHARLES A. James, “The coming of copper and copper-base alloys and iron: a metallurgical sequence”, in WERTIME A. Theodore, MUHLY D. James (eds.), *The coming of the Age of Iron*, New Haven: Yale University Press, 1980, pp. 151-181.
- CHEN Fuyou 陈福友, LI Feng 李锋, WANG Huimin 王惠民, PEI Shuwen 裴树文, FENG Xingwu 冯兴无, ZHANG Shuangquan 张双权, ZHANG Le 张乐, LIU Decheng 刘德成, ZHANG Xiaoling 张晓凌, GUAN Ying 关莹, GAO Xing 高星, “Ningxia Shuidonggou yizhi di er didian fajue baogao 宁夏水洞沟遗址第 2 地点发掘报告” (Investigation report of site no. 2 at Shuidonggou in Ningxia Province), in *Renleixue Xuebao* 人类学学报 (Acta Anthropologica Sinica), 2012.4, pp. 317-334.

- CHEN Ge 陈戈, "Lüelun Xinjiang de caitao 略论新疆的彩陶" (On the painted potteries of Xinjiang) in *Xinjiang shehui kexue* 新疆社会科学 (Xinjiang Social Sciences), 1982.2, pp. 77-103.
- CHEN Ge 陈戈, "Guanyu Xinjiang yuangu wenhua de jige wenti 关于新疆远古文化的几个问题" (Several problems on the ancient cultures in Xinjiang), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1985.1, pp. 27-38.
- CHEN Ge 陈戈, "Guanyu Xinjiang xinshiqi shidai wenhua de xin renshi 关于新疆新石器时代文化的新认识" (New view on the Neolithic cultures in Xinjiang), in *Kaogu* 考古 (Archaeology), 1987.4, pp. 343-351.
- CHEN Ge 陈戈, "Guanyu Xinjiang diqu de qingtong shidai he zaoqi tieqi shidai wenhua 关于新疆地区的青铜时代和早期铁器时代文化" (On the Bronze Age and early Iron Age cultures of Xinjiang), in *Kaogu* 考古 (Archaeology), 1990.4, pp. 366-374.
- CHEN Ge 陈戈, "Xinjiang shiqian wenhua 新疆史前文化" (Prehistoric cultures in Xinjiang), in *Xibei Minzu Yanjiu* 西北民族研究 (Ethnic Studies on the North-west), 1994.2, pp. 101-111.
- CHEN Ge 陈戈 "Xinjiang yuangu wenhua chulun 新疆远古文化初论" (Preliminary discussion on Xinjiang ancient cultures), in *Zhongyuan Xuekan* 中亚学刊 (Journal of Central Asia), 1995.4, pp. 5-72.
- CHEN Ge 陈戈, "Xinjiang kaogu shulun 新疆考古述论" (Discussion on Xinjiang archaeology), in *Tulufan xue Yanjiu* 吐鲁番学研究 (Turfan Studies), 2002.1, pp. 16-30.
- CHEN Guoke 陈国科, LI Yanxiang 李延祥, QIAN Wei 潜伟, WANG Hui 王辉, "Zhangye Xichengyi yizhi chutu tongqi de chubu yanjiu" 张掖西城驿遗址出土铜器的初步研究 (Preliminary research on metal remains from Xichangyi, Zhagye City), in *Kaogu yu Wenwu* 考古与文物 (Archaeology and Cultural Relics), 2015.2, pp. 119-128.
- CHEN Kunlong, LIU Siran, Li Yanxiang [et al.], "Evidence of arsenical copper smelting in Bronze Age China: A study of metallurgical slag from the Laoniupo site, Central Shaanxi", in *Journal of Archaeological Science*, 2017, no. 82, pp. 31-39.
- CHEN Kwang-tzuu, Fredrik T. HIEBERT, "The late prehistory of Xinjiang in relation to its neighbors", in *Journal of World Prehistory*, 1995, vol. 9, no. 2, pp. 243-300.
- CHEN Xiaosan 陈小三, *Hexi zoulang ji qi linjin diqu zaoqi qingtong shidai yicun yanjiu* 河西走廊及其邻近地区早期青铜时代遗存研究 (Study on early Bronze Age remains in the Hexi Corridor and its adjacent areas) Doctoral Dissertation. Jilin University, 2012. Available on <http://www.cnki.net/kcms/detail/detail.aspx?filename=1013117936.nh&dbname=cdfdtotal&v=MDAwNDYyQ1VSTDJmWXVkc0ZpM2hWcnpBVkYyNkhiSzVHZGpQcVpFYlBJUjhDM3RNdmdhCaW1FMTdUMzJXMmhvOUY=>. 23.07.2017.
- CHENG Qian, GUO Jinlong, WANG Bo, CUI Jianfeng, "Characteristics of chemical composition of

glass finds from the Qiemo tomb sites on the Silk Road”, in *Spectroscopy and Spectral Analysis*, 2012, no. 7, pp. 1955-1960.

Chengdu shi Wenwu Kaogu Yanjiusuo 成都文物考古研究所 (Chengdu Institute of Cultural Relics and Archaeology), Abazangzu Qiangzu Zizhizhou Wenguansuo 阿坝藏族羌族自治州文管所 (Ngawa Tibetan and Qiang Autonomous Prefecture), Mao xian Bowuguan 茂县博物馆 (Mao County Museum), “Sichuan Mao xian Yingpanshan yizhi shijue baogao 四川茂县营盘山遗址试掘报告” (Report on the excavation at the Yingpanshan site in Mao County, Sichuan), in Chengdu shi Wenwu Kaogu Yanjiusuo 成都文物考古研究所 (Chengdu Institute of Cultural Relics and Archeology) (ed.), *Chengdukaogu faxian (2000) 成都考古发现 (2000)* (Archaeological discoveries in Chengdu [2000]), Beijing: Kexue chubanshe, 2002, pp. 1-77.

CHERNAI L. Igor ЧЕРНЫЙ Л. Игорь, “Vyrobotka tekstilya u plemen d'yakovskoy kul'tury (po materialam Seletskogo gorodishcha) Выработка текстиля у племен дьяковской культуры (по материалам Селецкого городища)” (Textile production by the tribes of the Diakovo culture [based on the materials from the Selets fortress]), in *Sovetskaya arkheologiya Советская археология* (Soviet Archaeology), 1981, no. 4, pp. 70-86.

CHERNIKOV S. Sergey ЧЕРНИКОВ С. Сергей, *Vostochny Kazakhstan v èpokhu bronzy Восточный Казахстан в эпоху бронзы* (East Kazakhstan in the Bronze Age), Moscow: Nauka, 1960.

CHERNYKH N. Evgenil, *Ancient metallurgy in the USSR: the early Metal Age*, Cambridge: Cambridge University Press, 1992.

CHERNYKH N. Evgenil, “Formation of the Eurasian “Steppe Belt” of stockbreeding cultures: viewed through the prism of archaeometallurgy and radiocarbon dating”, in *Archaeology, Ethnology and Anthropology of Eurasia*, 2008, vol. 35, no. 3, pp. 36-53.

CHILDE V. Gordon, *The dawn of European civilization*, New York: Knopf, 1925.

CHILDE V. Gordon, *The Danube in Prehistory*, Oxford: Oxford University press, 1929.

CHILDE V. Gordon, *The Bronze Age*, Cambridge: Cambridge University Press, 1930.

CHILDE V. Gordon, *Man Makes Himself*, London: Watts & Co., 1936.

CHILDE V. Gordon, *What happened in History*, New York: Penguin Books, 1954.

Chinese Archaeology, “Archaeology Forum 2005 in Beijing”, Preview of the discoveries presented in the fifth annual “Archaeology Forum” sponsored by CASS, 10th of January 2006. Available on http://www.kaogu.net.cn/en/backup_new/new/2013/1026/42291.html 21-07-2017;

CHLENOVA L. Natalia, ЧЛЕНОВА Л. Наталья, “Tagarskaya kul'tura Тагарская культура” (The Tagar culture), in MOSHKOVA G. Marina, МОШКОВА Г. Марина (ed.), *Stepi Aziatskoichasti S.S.S.R. Skifo-Sarmatskoe Vremya Степная полоса Азиатской части СССР в скифо-сарматское время* (Steppes of the Asian Part of the USSR in Scytho-Sarmatian Times), Moscow: Archaeology of the USSR, 1992, pp. 206-223.

- CHRISTIAN David, “Inner Eurasia as a unit of world history”, in *Journal of World History*, 1994, vol. 5, no. 2, pp. 173-211.
- CHUKHROV V. Fedor ЧУРОВ В. Федор, *Zona okisleniya sulfidnykh mestorozhdeniy stepnoy chasti Kazakhstana* Зона окисления сульфидных месторождений степной части Казахстана (The zone of oxidated sulfide deposits of the Kazakhstan steppe), Moscow: USSR Academy of Sciences, 1950.
- CIERNY Jan, WEISGERBER Gerd, “The Bronze Age tin mines in Central Asia”, in GIUMLIA-MAIR Alessandra, LO SCHIAVO Fulvia (eds.), *The problem of early tin*, Oxford: Archaeopress, 2003.
- CLARK Grahame, “The invasion hypothesis in British archaeology”, in *Antiquity*, 1966, vol 40, no. 159, pp.172-189.
- COSTANTINI Lorenzo, “I legni lavorati rinvenuti a Shahr-I Sokhta” (Woods from Shahr-I Sokhta), Rome: Il Museo, 1987.
- CRAWFORD W. Gary, “Agricultural origins in North China pushed back to the Pleistocene-Holocene boundary”, in *Proceedings of the National Academy of Sciences of the United States of America*, 2009, no. 106, pp. 7271-7272.
- CUNLIFFE Barry, *Iron Age communities in Britain: an account of England, Scotland and Wales from the seventh century BC until the Roman conquest*, London: Routledge, 2005.
- D’ANNA André, *Les statues-menhirs et stèles anthropomorphes du midi Méditerranéen* (The statues-menhirs and anthropomorphic steles of the central Mediterranean region), Paris: Editions du CNRS, 1977.
- DANI H. Ahmad, MASSON M. Vadim, *History of civilizations of Central Asia, volume 1*, Paris: Unesco Press, 1992.
- DANI H. Ahmad, TAPHAR Bal Kristen, “The Indus civilization”, in DANI H. Ahmad, MASSON M. Vadim (eds.), *History of civilizations of Central Asia vol. 1. The dawn of civilization: earliest times to 700 B.C.*, Paris: Unesco, 1992, pp. 271-307.
- DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY A. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, Berkley: Zinat Press, 1995.
- DEBAINE Corinne, “Archéologie du Xijiang des origines aux Han. Première partie” (Archaeology of Xinjiang from the origin to the Han dynasty. First part), in *Paléorient*, 1988, vol. 14, no. 1, pp. 5-29.
- DEBAINE Corinne, “Archéologie du Xijiang des origines aux Han. Deuxième partie” (Archaeology of Xinjiang from the origin to the Han dynasty. Second part), in *Paléorient*, 1989, vol. 15, no. 1, pp. 183-213.
- DEBAINE Corinne, *From Neolithic to the Bronze Age in North-western China: the Qijia culture and its connections*, Paris: Editions Recherche sur les Civilisations, 1995.

- DEBAINE Corinne, IDRIS Abdouressul, *Keriya mémoires d'un fleuve: archéologie et civilisation des oasis du Taklamakan Mission archéologique franco-chinoise au Xinjiang* (Keriya memories of a river: archaeology and civilization of the oases of the Taklamakan. Franco-Chinese archaeological mission in Xinjiang), Paris: Findakly, 2001.
- DEMOULE Jean-Paul, GILIGNY François, LEHOERFF Anne, SCHNAPP Alain, *Guide des méthodes de l'archéologie* (Guide to the archaeological methods), Paris: La Découverte, 2005.
- DENG Ying 邓莹, "Loulan yanjiu zongshu yu sikao 楼兰研究综述与思考" (Review and thoughts on Loulan research), in *Minzu Diyu Wenhua Yanjiu 楼兰研究综述与思考* (Ethnic Regional Culture Studies), 2003.4, pp. 71-76.
- DEREVENSKY S. Joanna, "Rings of life: the role of early metalwork in mediating the gendered life course", in *World Archaeology*, 2000, vol. 31, no. 3, pp. 389-406.
- DEREVIANKO P. Anatoly, "Human occupation of nearby regions and the role of population movements in the Palaeolithic of Siberia", in DEREVIANKO P. Anatoly, SHIMKIN B. Demitri, POWERS W. Roger (eds.), *The Palaeolithic of Siberia, new discoveries and interpretations*, Chicago: University of Illinois Press, 1998, pp. 336-351.
- DEREVIANKO P. Anatoly [et. al], "Neolithic tribes in northern parts of Central Asia", in DANI H. Ahmad, MASSON M. Vadim (eds.), *History of civilizations of Central Asia vol. 1. The dawn of civilization: earliest times to 700 B.C.*, Paris: Unesco 1992, pp. 163-183.
- DEREVIANKO P. Anatoly, PETRIN T. Valeri, TAIMAGAMBETOV J. Zhaken, "The phenomenon of micro-industrial complexes in Eurasia", in *Archaeology, Ethnology and Anthropology of Eurasia*, 2000, vol. 4, no. 4, pp. 2-16.
- DEREVIANKO P. Anatoly, ZENIN N. Vasily, RYBIN P. Evely, GLADYSHEV A. Sergey, TSYBANKOV Alexander, OLSEN W. John, TSEVEENDORJ Damdinsurenjin, GUNCHINSUREN Byambaa, "The technology of Early Palaeolithic lithic reduction in Northern Mongolia: The Tolbor-4 site", in *Archaeology, Ethnology and Anthropology of Eurasia*, 2007, vol. 1, no. 29, pp. 16-38.
- DEREVIANKO P. Anatoly ДЕРЕВЯНКО П. Анатолю, KANDYBA V. Alexander КАНДЫБА В. Александр, PETRIN T. Valeriy ПЕТРИН Т. Валерыу, *Paleolit Orkhona Палеолит Орхона* (Palaeolithic of the Orkhon Valley), Novosibirsk: IAE SO RAN, 2010.
- DEREVIANKO P. Anatoly, GAO Xing, OLSEN W. John, RIBYN P. Evely, "The Paleolithic of Dzungaria (Xinjiang, North-western China) based on materials from the Luotuoshi Site", in *Archaeology Ethnology and Anthropology of Eurasia*, 2012, vol. 40, no. 4, pp. 2-18.
- DI COSMO Nicola, *Ancient China and its enemies: the rise of nomadic power in East Asian history*, Cambridge: Cambridge University Press, 2004.
- DIKSHIT N. Kashinath, "The Neolithic cultural frontiers of Kashmir", in *Man and Environment*, 1982, no. 6, pp. 30-36.

- DODSON R. John, LI Xiaoqiang, ZHOU Xinying, ZHAO Keliang, SUN Nan, ATAHAN Pia, “Origin and spread of wheat in China”, in *Quaternary Science Reviews*, 2013, no. 72, pp. 108-111.
- DOLKUN Kamberi, “The Three Thousand Year Old Charcharn Man Preserved at Zaghunluq: Abstract Account of a Tomb Excavation in Charchan County of Uyghuristan”, in *Sino-Platonic Papers*, 1994, no. 44.
- DOUMANI N. Paula, FRANCHETTI D. Michael, “Bronze Age textile evidence in ceramic impressions: weaving and pottery technology among mobile pastoralists of Central Eurasia”, in *Antiquity*, 2012, vol. 86, no. 332, pp. 368-382.
- DREMOV A. Vladimir ДРЕМОВ А. Владимир, *Naselenie Verhnego Priob'ja v jepohu bronzy* (Население Верхнего Приобья в эпоху бронзы (Population of the Upper Ob in the Bronze Age), Tomsk: Publishing house of Tomsk State University, 1997.
- DUPREE Luis, “Notes on Shortugai: A Harappan site in Northern Afghanistan”, in DANI H. Ahmad (ed.), *Indus civilisation, new perspectives*, Islamabad, Pakistan: Centre for the Study of the Civilization of Central Asia, Quaid-i-Azam University, 1981, pp. 103-115.
- DVORNICHENKO V. Vladimir, “Sauromatian Culture”, in DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY T. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, New Haven and Conn: Zinat Press, 1995, p. 105-120. (a)
- DVORNICHENKO V. Vladimir, “Sauromatians and Sarmatians of the Eurasian Steppe: the transitional period from the Bronze Age”, in DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY T. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, New Haven and Conn: Zinat Press, 1995, pp. 101-104. (b)
- DWYER Bede, “Scythian style bows discovered in Xinjiang, from the photographs and drawings of Stephen Selby”, in *Journal of the Society of Archer-Antiquaries*, 2003, pp. 71-82.
- EATON R. Ethel, MCKERRE Hugh, “Near Eastern alloying and some textual evidence for the early use of arsenical copper”, in *World Archaeology*, 1976, vol. 8, no. 2, pp. 169-191.
- EL-MOSLINMANY Ann, “The Ecological significance of common nonarboreal pollen: example from dryland of the Middle East”, in *Review of Palaeobotany and Palynology*, 1990, no. 64, pp. 343-350.
- ENOCH M. Jay, “History of mirrors dating back 8000 years”, in *Optometry and Vision Science*, 2006, vol. 83, no. 10, pp. 777-781.
- ESIN N. Yuri, “Stone stele bearing a “Sun-Headed” deity on the Tuim River, Khakassia (In commemoration of the Finnish Antiquarian Society Expedition to the Yenisei headed by J.R. Aspelin 120 Years Previously)”, in *Archaeology, Ethnology and Anthropology of Eurasia*, 2009, vol. 37, no. 3, pp. 84-94.
- ESIN N. Yuri, *Ulug Khurtu Tas, the cultic stone of Khakassia with the history of four thousands years*, Abakas: Ankhakovsky Museum, 2011.

- FENG Zhaodong, WANG Weiguo, NARANTSETSEG Tserendash, JULL A. J. Timothy [et al.], “Lacustrine and eolian records of Holocene climate changes in the Mongolian Plateau: preliminary results”, in *Quaternary International*, 2005, no. 136, pp. 25-32.
- FITZGERALD-HUBER Louisa, “Qijia and Erlitou: the question of contacts with distant cultures”, in *Early China*, 1995, vol. 20, pp. 17-67.
- FITZGERALD-HUBER Louisa, “The Qijia culture: path east and west”, in *Bulletin of the Museum of the far Eastern Antiquities*, 2003, no. 75, pp. 55-78.
- FORT Joaquim, “Demic and cultural diffusion propagated the Neolithic transition across different regions of Europe”, in *Journal of the Royal Society Interface*, 2015, vol. 12, no. 106, pp. 1-8.
- FORT Joaquim, “Synthesis between demic and cultural diffusion in the Neolithic transition in Europe”, in *Proceedings of the National Academy of Sciences of the United States of America*, 2012, vol. 109, no. 46, pp. 18669-18673.
- FOWELL J. Sara, HANSEN C. S. Barbara, PECK A. John, GANBOLD Enebish [et al.], “Mid to late Holocene climate evolution of the lake Telmen Basin, North and Central Mongolia, based on palynological data”, in *Quaternary Research*, 2003, no. 59, pp. 353-363.
- FRANCALACCI Paolo, “DNA analysis of ancient desiccated corpses from Xinjiang”, in *Journal of Indo-European Studies*, 1995, vol. 23, nos. 3-4, pp. 385-415.
- FRANCALACCI Paolo, “DNA analysis on ancient desiccated corpses from Xinjiang (China): further results”, in MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 2, Washington: Institute for the Study of Man, 1998, pp. 537-547.
- FRANCFORT Henri-Paul, “The late periods of Shortugai and the problem of the Bishkent culture (Middle and Late Bronze Age in Bactria)”, in TADDEI Maurizio, *South Asian archaeology 1977: papers from the fourth International Conference of the Association of South Asian Archaeologists in Western Europe held in the Istituto Universitario Orientale, Naples*, Naples: Istituto Universitario Orientale, 1979, pp. 191–202.
- FRANCFORT Henri-Paul, *Fouilles de Shortugai: recherches sur l'Asie Centrale protohistorique* (Excavations at Shortugai: research on Central Asia protohistory), Paris: Diffusion De Boccard, 1989, vols. 1-2.
- FRANCFORT Henri-Paul, “The cultures with painted ceramics of south Central Asia and their relations with the north-eastern steppe zone (late 2nd- early 1st millenium BC)”, in EICHMANN Ricard, PARZINGER Hermann (eds.), *Migration und Kulturtransfer. Der Wandel vorder und zentralasiatischer Kulturen im Umbruch vom 2. zum 1. vorchristlichen Jahrtausend* (Migration and cultural transfer. Changes in Central Asian cultures during the transition from the second to the first millennium BC), Berlin: Abelt, 2001, pp. 221-235.
- FRANCHETTI D. Micheal, *Pastoralist Landscapes and Social Interaction in Bronze Age Eurasia*, Berkley, Los Angeles and London: University of California Press, 2008.

- FRANCHETTI D. Michael, SPENGLER N. Robert, FRITZ Gayle, MAR'YASHEV N. Alexei, "Earliest direct evidence for broomcorn millet and wheat in the central Eurasian steppe region", in *Antiquity*, 2010, vol. 84, no 326, pp. 993-1010.
- FRANCHETTI D. Michael, "Migration concepts in Central Eurasian archaeology", in *Annual Review on Anthropology*, 2011, vol. 40, pp. 195-212.
- FU Sinian 傅斯年, "Kaoguxue de xin fangfa 考古学的新方法" (New methods in archaeology), in YUE Yuxi 岳玉玺, LI Quan 李泉, MA Liangkuan 马亮宽 (eds.), *Fu Sinian Xuanji* 傅斯年选集 (A selection of Fu Sinian works), Tianjin: Tianjin Renmin chubanshe, 1996, pp. 184-191.
- GAN Fuxi 干福熹, "Boli he yushi zhi lu 玻璃和玉石之路 (The Glass and Jade Roads)", in *Guangxi Minzu Daxue Xuebao (Ziran Kexueban)* 广西民族大学学报 (自然科学版) (Journal of the Guangxi University For Nationalities [Natural Science Edition]), 2009, no. 4, pp. 6-17.
- GAN Fuxi, CHENG Huansheng, LI Qinghui, "Origin of Chinese ancient glasses: study on the earliest Chinese ancient glasses", in *Science in China Series E: Technological Sciences*, 2006, vol. 49, no. 6, pp. 701-713.
- Gansu sheng Bowuguan 甘肃省博物馆 (Gansu Provincial Museum), "Gansu Jishishan xian Xinzhuangping Qijia wenhua yizhi diaocha 甘肃积石山县新庄坪齐家文化遗址调查" (Survey of the Qijia cultural site at Xinzhuangping, Jishishan County in Gansu Province), in *Kaogu* 考古 (Archaeology), 1996.11, pp. 46-53.
- Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu institute of Archaeology and Cultural Relics), *Yongchang Xigang Chaiwangang Shajing wenhua Muzang fajue baogao* 永昌西岗柴湾岗沙井文化墓葬发掘报告 (Report of the excavation of the Shajing cultural site of Chaiwangang, Yongchang Xigang), Lanzhou: Gansu Renmin chubanshe, 2001.
- Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics) *Qin'an Dadiwan-Xinshiqi shidai yizhi fajue baogao* 秦安大地湾—新石器时代遗址发掘报告 (Qin'an Dadiwan-Report on the excavations of a Neolithic site), Beijing: Wenwu chubanshe, 2006.
- Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), "Gansu Zhangye shi Xichengye yizhi 2010 nian fajue jianbao 甘肃张掖市西城驿遗址2010年发掘简报" (2010 Excavation of the Xichengye site, at Xicheng City, Gansu Province), in *Wenwu* 文物 (Cultural Relics), 2015.10, pp. 66-84.
- Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Jilin Daxue Beifang Kaogu Yanjiushi 吉林大学北方考古研究室 (Laboratory of Northern Archaeology of the Jilin University), *Minle Donghuishan kaogu: Siba wenhua mudi de jieshi yu yanjiu* 民乐东灰山考古: 四坝文化墓地的揭示与研究 (Archaeology of the Donghuishan site in Minle County: revealing and researching the Siba cemetery), Beijing:

Kexue chubanshe, 1998.

- Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Xibei Daxue Wenhua Yichan yu Kaoguxue Yanjiu Zhongxin 西北大学文化遗产与考古学研究中心 (Northwest University Cultural Heritage and Archaeology Research Center), “Gansu Lintanmogou Qijia wenhua mudi fajue jianbao 甘肃临潭磨沟齐家文化墓地发掘简报”(A Brief Report on the excavation of the Qijia cemetery in Lintanmogou, Gansu), in *Wenwu* 文物 (Cultural Relics), 2009.10, pp. 4-24.
- Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Beijing Keji Daxue Yejin yu Cailiaoshi Yanjiusuo 北京科技大学冶金与材料史研究所 (Institute of Metallurgy and Materials History of the Beijing University of Science and Technology), Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo 中国社会科学院考古研究所 (Institute of Archaeology of the Chinese Academy of Social Sciences), Xibei Daxue Wenhua Yichan Xueyuan 西北大学文化遗产学院 (Cultural Heritage Institute of the North-western University), “Gansu Zhangyeshi Xichengyi yizhi” 甘肃张掖市西城驿遗址 (Remains at Xichengyi, Zhangye City, Gansu), in *Kaogu* 考古 (Archaeology), 2014.7, pp. 3-17.
- Gansu sheng Wenwu Kaogu Yanjiusuo 甘肃省文物考古研究所 (Gansu Institute of Archaeology and Cultural Relics), Xibei Daxue Sichou zhi Lu Wenhua Yichan Baohu yu Kaoguxue Yanjiu Zhongxin 西北大学丝绸之路文化遗产保护与考古学研究中心 (Center for Cultural Heritage Protection and Archaeology of the Silk Road, Northwest University), “Gansu Lintanmogou mudi Qijia wenhua muzang 2009 nian fajue jianbao 甘肃临潭磨沟墓地齐家文化墓葬2009年发掘简报”(A Brief Report on the excavation in 2009 of the Qijia cemetery in Lintanmogou, Gansu), in *Wenwu* 文物 (Cultural Relics), 2014.6, pp. 4-23.
- GAO Shizhu 高诗珠, *Zhongguo Xibei diqu san ge gudai renqun de xianliti DNA yanjiu* 中国西北地区三个古代人群的线粒体 DNA 研究 (The mitochondrial DNA of three ancient populations in Northwest China), Doctoral Dissertation, Jilin University, 2009.
- GARNER Jennifer, “Zum Forschungsstand der bronzezeitlichen Rohstoff- gewinnung in Kasachstan (On the research on the Bronze Age extraction of raw materials in Kazakhstan)”, in STOLLNER Thomas, SAMASEV Zajnolla (eds.), *Unbekanntes Kasachstan - Archäologie im Herzen Asiens. Band I. Katalog der Ausstellung des Deutschen Bergbau-Museums Bochum vom 26. Januar bis zum 30. Juni 2013* (Unknown Kazaksthan, archeology at the heart of Asia vol. 1, Catalogue of the exhibition in the Deutschen Bergbau-Museums in Bochum from Jenuary the 26th to June the 30th), Bochum: Deutsches Bergbau-Museum, 2013, pp. 345-356.
- GARNER Jennifer, “Bronze Age tin mines in Central Asia”, in HAUPTMANN Andreas, MODERESSI-TEHRANI Diana (eds.), *Archaeometallurgy in Europe III. Proceedings of the 3rd International Conference Deutsches Bergbau-Museum, Bochum 2011*, Bochum: Deutsches Bergbau-Museum, 2015, pp. 135-144.
- GIMBUTAS Marija, “Borodino, Seima and their contemporaries”, in *Proceeding of Prehistoric Society*, 1957, no. 22, pp. 143-172.

- GIMBUTAS Marija, “Timber Grave in Southern Russia” in *Expedition*, 1961, vol. 3, no. 3, pp. 14-22.
- GIMBUTAS Marija, *Bronze Age cultures in Central and Eastern Europe*, The Hague and London: Mouton, 1965.
- GIMBUTAS Marija, *The Civilization of the Goddess: the world of Old Europe*, San Francisco: Harper Collins, 1991.
- GINZBURG V. Vulf, “Enstehung der mittelasiatischen zwischenstromtypus” (Formation of the two types of the Middle Asian race), in *Homo*, 1966, vol. 17, pp. 172-190.
- GLEIRSCHER Paul, “Invasioni o influssi culturali: Cimmeri e Sciiti in Europa Centrale?” (Invasions or cultural influences: Cimmerians and Scythians in Central Europe?), in BONORA Gian Luca, MARZATICO Franco (eds.), *Ori dei cavalieri delle steppe, collezioni dei Musei dell’Ucraina* (Gold of the steppe riders, collections of the Ukrainian Museums), Milan: Silvana Editore, 2007, pp. 118-339.
- GONG Guoqiang 龚国强, “Xinjiang diqu zaoqi tongqi luelun 新疆地区早期铜器略论” (On the early bronzes in Xinjiang), in *Kaogu* 考古 (Archaeology), 1997.9, pp. 7-20.
- GOOD Irene, “Notes on a Bronze Age textile fragment from Hami, Xinjiang with comments on the significance of twill”, in *Journal of Indo-European Studies*, 1995, vol. 23, nos. 3-4, pp. 319-347.
- GONG Lelang, 公乐浪 “A’erzan mudi 阿尔赞墓地” (The Arzhan Cemetery), available at <http://www.kaogu.net.cn/cn/kaoguyuandi/kaogusuibi/2015/0806/51057.html> 3-07-2017.
- GOOD Irene, ZHANG Xian, LAURSEN Richard, “Characterization of dyestuffs in ancient textiles from Xinjiang”, in *Journal of Archaeological Science*, 2007, no. 20, pp. 1-9.
- GORELIK F. Alexander ГОРЕЛИК Ф. Александр, “Kamennaya antropomorfная statuetka epokhi bronzy iz Vostochnogo Kazakhstana (oz. Zaysan) Каменная антропоморфная статуэтка эпохи бронзы из Восточного Казахстана (оз. Зайсан)” (Bronze Age stone anthropomorphic figurines from Eastern Kazakhstan [Lake Zaisan]), in *Rossiyskaya arkheologiya* Российская археология (Russian Archaeology), 2011, no. 1, pp. 126-133.
- GÖRSDORF Jochen, HUFF Dietrich, “14C-Datierungen von Materialien aus der Grabung Dzarkutan, Uzbekistan” (14C dating of materials from the excavation Dzarkutan), in *Archäologische Mitteilungen aus Iran und Turan* (Archaeological news from Iran and Turan), 2001, no. 33, pp. 75-87.
- GORYACHEV A. Alexander ГОРЯЧЕВ А. Александр, MARYASHEV N. Alexei МАРЬЯШЕВ Н. Алексей, “Novyi mogilnik epokhi bronzy Semirechya - Kulsay-1 Новый могильник эпохи бронзы Семиречья Кульсай-1” (A new cemetery of the Bronze Age in Semirech’e - Kulsai-1), in *Arkheologicheskie pamyatniki na Velikom Shelkovom puti, Muzhuzovskiy nauchnyy sbornik* Археологические памятники на Великом Шелковом пути, Мужвзовский научный сборник (Archaeological monuments on the Great Silk Road, Muzhuzovsky scientific collection), 1993, pp. 19-27.

- GORYACHEV A. Alexander, MARYASHEV N. Alexei, “Nouveaux sites du Bronze récent au Semirech'e (Kazakhstan) ” (New sites of the Late Bronze in Semirech'e [Kazakhstan]), in *Paléorient*, 1998, vol. 24, no. 1, pp. 71-80.
- GREGORIEV Stanislav, *Metallurgical production in Northern Eurasia in the Bronze Age*, Oxford: Archeopress, 2015.
- GRESKY Julia, WAGNER Mayke, SCHMIDT-SCHULTZ H. Tyede, SCHWARZ Laura, WU Xinhua, AISHA Ailijiang, TARASOV E. Pavel, SCHULTZ Michael, “‘You must keep going’ musculoskeletal system stress indicators of prehistoric mobile pastoralists in Western China”, in *Quaternary International*, 2016, no. 405, pp. 186-199.
- GRUNWEDEL Albert, *Altbuddhistische Kultstätten in Chinesisch-Turkistan. Bericht über archaologische Arbeiten von 1906 bis 1907 bei Kuca, Qarasahr und in der Oase Turfan* (Ancient Buddhist worship in Chinese Turkistan. Report on archaeological research in 1906-1907 at Kucha, Qarasahr and the oasis of Turfan), Berlin: Druck und Verlag von Georg Reimer, 1912.
- GRUNWEDEL Albert, *Bericht über Archäologische Arbeiten in Idikutschari und Umgebung im Winter 1902-1903* (Report on archaeological research in Idikutshari and the surrounding areas in the winter 1902-1903), München: Verlag der K. Akademie der Wissenschaften, 1906.
- GRUSHIN P. Sergei ГРУШИН П. Сергей [et al.], “Zakhoroneniye s antropomorfnoi skulpturoi v Srednem Prichumyshie Захоронение с антропоморфной скульптурой в Среднем Причумышь” (Burial with anthropomorphic sculpture in the Middle Chumysh River region), in KIROUSHIN F. Yuri КИРЮШИН Ф. Юрий (ed.) *Aridnaya zona yuga Zapadnoy Sibiri v epokhu bronzy* Аридная зона юга Западной Сибири в эпоху бронзы (Arid zone at the south of Western Siberia in the Bronze Age), Barnaul: Altai University Press, 2004, pp. 35-48.
- GRYAZNOV P. Mikhail, ГРЯЗНОВ П. Михаил, “Zoloto Vostochnogo Kazakhstana i Altaya Золото Восточного Казахстана и Алтая” (Gold of East Kazakhstan and Altai), in *Arkheologicheskiye raboty Akademii nauk na novostroykakh v 1932–1933* Археологические работы Академии наук на новостройках в 1932–1933 (New archaeological works by the Academy of Sciences in 1932-1933), Moscow: IGAMIK, 1935, vol. 110, pp. 192-193.
- GRYAZNOV P. Mikhail, *The ancient civilization of Southern Siberia (Ancient civilizations)*, New York: Cowles Book Co. 1969.
- GRYAZNOV P. Mikhail, ГРЯЗНОВ П. Михаил, *Afanas'yevskaya kul'tura na Yeniseye* Афанасьевская культура на Енисее (The Afanasevo culture on the Yenisei), Saint Petersburg: Dimitri Bulanin, 1999.
- GU Fang, *Jade cong and bi of the Qijia culture, jade of the Qijia and related north-western cultures of early China*, New York: Throckmorton Fine Art, 2008.
- GULYAMOV G. Yahya, ГУЛЯМОВ Г. Яхья, “Gidrografiya i usloviya vozniknoveniya orosheniya Гидрография и способы возведения орошения” (Hydrography and methods of irrigation), in Yahya G. Gulyamov Yahya G. GULYAMOV Яхья Г. ГУЛЯМОВ, Utkur I. Islamov Уцкур И.

Исламов, Akhmadali A. ASKAROV Ахмадали А. АСКАРОВ (eds.), *Pervobîtnaya kul'tura v nizov'yakh Zarafshana* Первобытная культура в низовьях Зарафшана (Primitive cultures in the lower reaches of Zarafshan), 1966, Tashkent: Fan, pp. 9-26.

GUO Wu 郭物, *Xinjiang shiqian wanqi shehui de kaoguxue yanjiu* 新疆史前晚期社会的考古学研究 (Archaeological research on late prehistoric societies in Xinjiang), Shanghai: Guji chubanshe, 2012.

HADINGHAM Evan, “The mummies of Xinjiang”, in *Discover Magazine*, April 1994. Available on <http://discovermagazine.com/1994/apr/themummiesofxinj359>, 26-06-2017.

HAKENBECK Susanne, “Migration in archaeology: are we nearly there yet?”, in *Archaeological Review from Cambridge*, 2008, vol. 23, no. 2, pp. 9-26.

Hami Bowuguan 哈密博物馆 (Hami Museum), *Hami wenwu jingcui* 哈密文物精粹 (Essence of Hami Cultural Relics), Beijing: Wenwu chubanshe, 2013.

HAN Jianye 韩建业 “Xinjiang qingtong shidai-zaoqi tieqi shidai wenhua de fenqi he puxi 新疆青铜时代—早期铁器时代文化的分期和谱系” (Traditional features and chronological frameworks of the Bronze Age and early Iron Age cultures in Xinjiang), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2005.3, pp. 57-99.

HAN Jianye, “Different traditions of flexed burials in ancient China”, in *Chinese Archaeology*, 2008 vol. 8, pp. 168-171.

HAN Jianye, “‘The Painted Pottery Road’ and Early Sino-Western Cultural Exchanges”, in *Anabasis*, 2012, no. 3, pp. 25-42.

HAN Kangxin 韩康信, “Xinjiang Kongque he Gumugou mudi rengu yanjiu 新疆孔雀河古墓沟墓地人骨研究” (A study on the human bones of the ancient tombs on the Peacock River), in *Kaogu Xuebao* 考古学报 (Acta Archaeologica Sinica), 1986.3, pp. 361-384.

HAN Kangxin 韩康信, “Tajike xian Xiangbaobao gumu chu shi ren tougou 塔吉克县香宝宝古墓出十人头狗” (Ten crania from Xiangbaobao cemetery, Tajik County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1987.1, pp. 32-35.

HAN Kangxin 韩康信, “Xinjiang Hami Yanbulake gumu rengu zhong xicheng fen yanjiu 新疆哈密焉不拉克古墓人骨种系成分研究” (A study of racial elements of bones from Yanbulake site in Hami, Xinjiang), in *Kaogu Xuebao* 考古学报 (Acta Archaeologica Sinica), 1990.3, pp. 371-390.

HAN Kangxin, “The study of ancient human skeletons from Xinjiang, China” in *Sino-Platonic Papers*, 1994, no. 51.

HAN Kangxin, “The physical anthropology of ancient populations of the Tarim Basin and surrounding areas”, in MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*,

Monograph 26, vol. 2, Washington: Institute for the Study of Man, 1998, pp. 558-570.

HAN Kangxin 韩康信, PAN Qifeng 潘其风, “Xinjiang Zhaosu Tudun guren leixue cailiao de yanjiu 新疆昭苏土墩古人类学材料的研究” (Studies on ancient anthropological material found in Tudun, Zhaosu County), in *Kaogu Xuebao* 考古学报 (*Acta Archeologica Sinica*), 1987.4, pp. 503-523.

HANKS K. Bryan, LINDUFF M. Katheryn (eds.), *Social complexity in prehistoric Eurasia monuments, metals and mobility*, Cambridge: Cambridge University Press, 2009.

HANSEN Svend, “Modelli di case e sculture antropomorfe della cultura di Cucuteni (Romania) e di Tripol’je (Ucraina)” (Houses and anthropomorphic sculptures in the Cucuteni (Romania) and Tripol’je (Ucraina) cultures), in BONORA Gian Luca, Franco MARZATICO (eds.) *Ori dei cavalieri delle steppe, Collezioni dei Musei dell’Ucraina* (Gold of the steppe riders, collections of the Ukrainian Museums), Milan: Silvana Editore, 2007, pp. 66-69.

HARRIS R. David, *The Archaeology of V. Gordon Childe: contemporary perspectives*, Chicago: University of Chicago Press, 1994.

HAUPTMANN Andreas, STOLLNER Thomas, “The Gold Mine of Sakdrissi: Results and analyses and a calculation of the prehistoric gold exploitation”, 2013. Available at <http://www.archeologia.be/georgia2.pdf>, 5-08-2017.

HE Banji, *The Cradle of the East: an inquiry of the indigenous origin of techniques and ideas of Neolithic and early historic China 5000-1000 BCE*, Hong Kong: Chinese University of Hong Kong and University of Chicago Press, 1975.

Hebei sheng Wenwu Yanjiusuo 河北省文物研究所 (Hebei Institute of Cultural Relics), “Hebei Laishui Jianxin cun yizhi fajue baogao 河北涞水渐新村遗址发掘报告” (Excavation at the Jianxin village, Laishui, Hebei), in *Wenwu Chunqiu* 文物春秋 (Cultural Relics Chronicles), 1992, supplement no. 1, pp. 220-228.

HEDIN A. Sven, *History of the expedition in Asia, 1927-1935*, Stockholm: Statens Etnografiska Museum, 1944.

HEDIN A. Sven, BERGMAN N. Folke, *History of the Expedition in Asia, 1927-1935*, Stockholm: Statens Etnografiska Museum, 1945.

HEDIN A. Sven, *Sven Hedin Central Asia Atlas: Memoir on Maps*, Stockholm: Etnografiska Museum, 1966.

HEIMANN James, “Small change and ballast: cowry trade and usage as an example of Indian Ocean economic history”, in *South Asia: Journal of South Asian Studies*, 1980, vol. 3, no. 1, pp. 48-69.

HEIN Anke, “The problem of typology in Chinese archaeology”, in *Early Archaeology*, 2016, vol. 39, pp. 21-52.

HEINSCH MaryFran, VANDIVER Pamela, “Recent xeroradiographic analysis of Kura-Araxes

ceramics”, in PETERSON L. David, POPOVA M. Laura, SMITH T. Adam (eds.), *Beyond the steppe and sown: proceedings of the 2002 University of Chicago Conference on Eurasian Archaeology*, Leiden: Brill, 2006, pp. 382-394.

HEMPHILL E. Brian, MALLORY P. James, “Horse-mounted invaders From the Russo-Kazakh steppe or agricultural colonists from Western Central Asia? A craniometric investigation of the Bronze Age settlement of Xinjiang”, in *American Journal of Physical Anthropology*, 2004, no. 124, pp. 199-222.

Henan sheng Wenwu Yanjiusuo 河南省文物研究所 (Henan Institute of Cultural Relics), “Xichuan Xiasi chungiu chu mu 淅川下寺春秋楚墓” (Ancient tombs of the Spring and Autumn period at Xiasi, in Xichuan), Beijing: Wenwu chubanshe, 1991.

HENKEY Gyula, HORVATH Izabella, “Physical anthropological field report and comparative research results on the Kazaks and Kirghiz from the peoples of Republic of China”, in *International Journal of Central Asian Studies*, 1998, vol. 3, pp. 170-192.

HERZSCHUH Ulrike, WINTER Katja, WUNNEMANN Bernd, LI Shijie, “A general cooling trend on the central Tibetan Plateau throughout the Holocene recorded by the Lake Zigetang pollen spectra”, in *Quaternary International*, 2006, nos. 154-155, pp. 113-121.

HERZSCHUH Ulrike, ZHANG Chengjun, MISCHKEB Steffen, HERZSCHUH Rainer, MOHAMMADI Farhid, MINGRAME Birgit, KQRSCHNER Harald, RIEDEL Frank, “A late Quaternary lake record from the Qilian Mountains (NW China), part 2: history of the primary production reconstructed from macrofossil, pollen, biomarker and isotope data”, in *Global and Planetary Change*, 2005, no. 46, pp. 361-379.

HIEBERT T. Fredrik, “Pazyryk chronology and early horse nomads reconsidered”, in *Bulletin of the Asia Institute*, 1992, vol. 6, pp. 117-130.

HIEBERT T. Fredrik, *Origin of the Bronze Age oasis civilization in Central Asia*, New Haven: Peabody Museum Press, 1994.

HILL E. John, *Through the Jade Gate to Rome: a study of the Silk Routes during the Later Han dynasty, 1st to 2nd centuries CE*. Charleston: BookSurge, 2009.

HORNER G. Nils, CHEN C. Parker, “Alternating lakes. Some river changes and lake displacements in Central Asia”, in *Geographiska Annaler* (Geographical Chronicles), 1935, vol. 17, Supplement: Hyllningskrift Tillagnad Sven Hedin, pp. 145-166.

HOU Can 侯灿, “Loulan yanjiu xiyi 楼兰研究析疑” (Questions on Loulan research), in *Dunhuang Yanjiu* 敦煌研究 (Dunhuang Studies), 2002.1, pp. 66-72.

HSU J. Kenneth, “Did the Xinjiang Indo-Europeans leave their home because of Global cooling?”, in MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 2, Washington: Institute for the Study of Man, 1998, pp. 683-696.

- HSU Yiukang, BRAY J. Peter, HOMMEL Peter, POLLARD A. Mark, “Tracing the flows of copper and copper alloys in the early Iron Age societies of the eastern Eurasian steppe”, in *Antiquity*, 2016, vol. 90, no. 350, pp. 357-375.
- HU Jia 胡笳, ZHONG Xizheng 钟习政, *Xinjiang mima* 新疆密码 (Secrets of Xinjiang), Beijing: Wuzhou Chuanbo chubanshe, 2007.
- HUANG Xiaohong 黄小红, WU Zhou 吴州, “Keliya he shangyou diqu xin faxian de liang chu shiqi didian 克里雅河上游地区新发现的两处石器地点” (Discovery of two groups of stones remains on the upper reaches of the Keriya River), in XIA, Xinjiang Weiwu'er Zizhiqu Bowuguan 新疆维吾尔自治区博物馆 (Museum of Archaeology of the Xinjiang Uygur Autonomous Region), *Xinjiang wenwu kaogu xin shouhuo 1990-1996* 新疆文物考古新收获 1990-1996 (New Archaeological Achievements in Xinjiang), Urumqi: Xinjiang Meishu Sheying chubanshe, 1997, pp. 44-56.
- HUDIAKOV S. Yuli, SKOBELEV G. Sergei, MITKO A. Oleg, BORISENKO Y. Alisa, OROZBEKOVA Zhazgul, “The burial rite of the early Scythian nomads of Tuva (based on the Bai-Dag I cemetery)”, in *Archaeology Ethnology and Anthropology of Eurasia*, 2013, vol. 41, no. 1, pp. 104-113.
- HUFF Dietrich, “Tempel oder Palast? Dscharkutan — Monumentalbauten und Siedlung im bronzezeitlichen Baktrien” (Temple or palace? Dzharkutan - Monumental buildings and settlements in the Bronze Age Bactria), in KYRIELEIS Helmut (ed.), *Archäologische Entdeckungen. Die Forschungen des Deutschen Archäologischen Instituts im 20. Jahrhundert* (Archaeological discoveries. Research of the German Archaeological Institute in the 20th century), Mainz: Zabern, 2000, pp. 115-118.
- HUFF Dietrich, PIDAEF R. Shokir, CHAYDOULLAEV Chapulat, “Uzbek-German archaeological researches in the Surkhan Darya region”, in LERICHE Pierre, FOURNIAU Vincent (eds.), *La Bactriane au carrefour des routes et des civilisations de l'Asie Centrale. Termez et les villes de Bactriane-Tokharestan* (Bactria at the crossroads of roads and civilizations in Central Asia: Termez and the city of Tokharistan in Bactria: proceedings of the Symposium in Termez in 1997), Paris: Maisonneuve & Larose 2001, pp. 219-233.
- SHEN Hui, WU Xinhua, TANG Zihua, ZHOU Xinying, SUN Nan, LI Xiaoqiang, “Wood Usage and Fire Veneration in the Pamir, Xinjiang, 2500 yr BP”, in *Plos One*, 2015, vol. 10, no. 8, pp. 1-13.
- HUNGTINGTON Ellsworth, “The rivers of Chinese Turkestan and the desiccation of Asia”, in *The Geographical Journal*, 1906, vol. 28, no. 4, pp. 352-367.
- HUNTINGTON Ellsworth, “The Depression of Turfan in Central Asia”, in *Geographical Journal*, 1907, vol. 30, no. 3, pp. 254-273.
- HUO Wei 霍巍, “Ximalayashan nanlu yu Lancangjiang liuyu de xinshiqi shidai nongye cunluo: jianlun Keshimi'er Buluzhahuomu yizhi yu woguo xinan diqu xinshiqi shidai nongye wenhua de lianxi 喜马拉雅山南麓与澜沧江流域的新石器时代农业村落—兼论克什米尔布鲁扎霍姆遗址与我国西南地区新石器时代农业文化的联系” (Neolithic agricultural villages in the southern Himalaya and Lancang Valleys: on the connections between the Burzahom culture in Kashmir

and the Neolithic agricultural communities of South-western China), in *Nongye kaogu* 农业考古 (Agricultural Archaeology), 1991.2, pp. 101-107.

HUO Wei 霍巍, “Xizang gaoyuan gudai muzang de chubu yanjiu 西藏高原古代墓葬的初步研究” (A preliminary study on ancient tombs on the Tibetan Plateau), in *Wenwu* 文物 (Cultural Relics), 1995.1, pp. 44-58.

HYLAND C. David, ZHUSHCHIKHOVSKAYA S. Irina, MEDVEDEV E. Vitaly, DEREVIANKO P. Anatoly, TABAREV V. Andrei, “Pleistocene textiles in the Russian Far East: impressions from some of the world’s oldest pottery”, in *Anthropologie* (Anthropology), 2002, no. 40, pp. 1-10.

IAC, “Xinjiang Wenquan xian Adun Qiaolu yizhi yu mudi 新疆温泉县阿墩乔鲁遗址与墓地” (The settlement and the cemetery in Adun Qiaolu village, Wenquan County, Xinjiang), in *Kaogu* 考古 (Archaeology), 2013.7, pp. 25-33.

IAC, *Zhongguo kaoguxue zhong tanshisi niandai shuju ji (1965-1991)* 中国考古学中碳十四年代数据集 (1965-1991) (Carbon dates in Chinese archeology [1965-1991]), Beijing: Wenwu chubanshe, 1991.

IDRISS Abduressul 伊弟利斯·阿布都热苏勒, ZHANG Chuan 张川, HAS Yet 阿斯叶提, “E’erqisi hepan de shiqi yizhicun ji qi leixing yanjiu 额尔齐斯河畔的石器遗址存及其器类型研究” (Stone artifacts found in the Irtysh Valley and study on their typology), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1998.3, pp. 45-53.

ISAKOV Abdullo, “Excavations of the Bronze Age settlement of Sarazm”, in KOHL L. Philip (ed.), *The Bronze Age civilization of Central Asia: recent Soviet discoveries*, New York: Routledge, 1981, chapter 12.

ISAKOV Abdullo ИСАКОВ Абдулло, “Sarazm - poselenie epokhi paleometalla v doline Zarafshana Саразм - поселение эпохи палеометалла в долине Зарафшана” (Sarazm - a settlement of the Paleometal Age in the Zarafshan Valley), in MUNCHAIEV M. Rauf МУНЧАЕВ М. Рауф (ed.), *Arkheologiya Srednei Aziie i Blizhnego Vostoka. II Sovetko-Amerikanskii simpozium, Samarkand, 6–12 sent. 1983. Tezisy Dokladov Археология Среднеазиатского и Ближнего Востока. Советский-Американский симпозиум. симпоз, Самарканд, 6–12 сент. 1983. Тезисы Докладов* (Reports of the Soviet-American Symposium of Archeology of Central Asian and Middle East in Samarcanda, 6-12 Sept. 1983), Tashkent: Fan, 1983, pp. 54-57.

IVANOV S. Sergey S. ИВАНОВ С. Сергей, “Novyye nakhodki ornamentirovannykh visloobushnykh toporov epokhi bronzy iz Kyrgyzstana Новые находки орнаментированных вислообушных топоров эпохи бронзы из Кыргызстана” (New finds of Bronze Age ornamental shaft-hole axes from Kyrgyzstan), in *Teoriya i praktika arkheologicheskikh issledovaniy* Теория и практика археологических исследований (Theory and practice of the archaeological research), 2014, vol. 9, no. 2, pp. 91-100.

JACOBSON-TEPFER Esther, *The deer goddess, a study in the ecology of belief*, Leiden: Brill, 1993.

- JACOBSON-TEPFER Esther, *The art of the Scythians, the interpretation of cultures at the edge of the Hellenistic world*, Leiden, New York and Koln: Brill 1995.
- JACOBSON-TEPFER Esther, *The Hunter, the stag, and the mother of animals. Image, monument, and landscape in ancient North Asia*, Oxford: Oxford University Press, 2015.
- JETTMAR Karl, “The Karasuk culture and its south-eastern affinities”, in *Bulletin of the Museum of Far Eastern Antiquities*, 1950, no. 22, pp. 83-126.
- JIA W. M. Peter, BETTS V. G. Alison, “A re-analysis of the Qiemu'erqieke (Shamirshak) cemeteries, Xinjiang, China”, in *Journal of Indo-European Studies*, 2010, vol. 38, nos. 3-4, pp. 275-317.
- JIA W. M. Peter, BETTS V. G. Alison, WU Xinhua, “Prehistoric archaeology in the Zhunge'er (Junggar) Basin, Xinjiang, China”, in *Eurasian Prehistory*, 2009, vol. 6, nos. 1-2, pp. 167-198.
- JIA W. M. Peter, BETTS V. G. Alison, CONG Dexin, JIA Xiaobing Jia, DUPUY D. Paula, “Adun Qiaolu: new evidence for the Andronovo in Xinjiang, China”, in *Antiquity*, 2017, vol. 91, no. 357, pp. 621-639.
- JIANG Aili, “The Liushui cemetery of 3000 years ago in the region of Xinjiang”, in *Chinese Archaeology*, 2013. Available at http://www.kaogu.cn/en/backup_new/new/2013/1026/42232.html 9-08-2017.
- JIANG Fengqing 姜逢清, HU Ruji 胡汝骥, MA Hong 马虹, “Xinjiang qihou yu huanjing de guoqu, xianzai ji weilai qingjing 新疆气候与环境的过去、现在及未来情景” (The past, present and future climate and environment in Xinjiang), in *Ganhan Qu Dili 干旱区地理 (Arid Lands Geography)*, 1998, vol. 21, no. 1, pp. 1-9.
- JIANG Qingfeng, JI Junfeng, SHEN Ji, MATSUMOTO Ryo, TONG Guobang, QIAN Peng, REN Xuemei YAN Dezhi, “Holocene vegetational and climatic variation in westerly-dominated areas of Central Asia inferred from the Sayram Lake in Northern Xinjiang, China”, in *Science China Earth Science*, 2013, vol. 56, no. 3, pp. 339-353.
- JIANG Qingfen 蒋庆丰, LIU Xingqi 刘兴起 [et al.], “Wulungu hu chenji wulidu tezheng ji qi gu qihou huanjing yi 乌伦古湖沉积物粒度特征及其古气候环境意” (High resolution sporopollen record and environmental change since Holocene in the Wulungu Lake, Xinjiang), in *Chenji Xuebao 沉积学报 (Acta Micropalaeontologica Sinica)*, 2006, vol. 23, no. 1, pp. 77-86.
- JIN Junli, *Chronological and cultural framework of bronzes in northern China during the 4th to the 3rd millennia B. P.*, Doctoral Dissertation, 2009, Faculty of Cultural Studies, The Eberhard-Karls-Universität Tübingen. Available at <https://publikationen.uni-tuebingen.de/xmlui/handle/10900/46323?show=full> 09-09-2017.
- JIAO Tianlong, “Gender studies in Chinese Neolithic”, in ARNOLD Bettina, WICKER N. Nancy (eds.), Gender and Archaeology of Death, Walnut Creek, Lanham, New York, Oxford: Altamira Press, 2001, pp. 51-62.

- JORDAN Peter, ZVELEBIL Marek, “Ceramics before farming: the dispersal of pottery among prehistoric Eurasian hunter-gatherers”, Walnut Creek: Left Coast Press, 2009.
- JURAS Anna, KRZEWINSKA Maja, NIKITIN G. Alexey, EHLER Edvard, CHYLENSKI Maciej, LUKASIK Sylwia, KRENZ-NIEDBALA Marta, SINIKA Vitaly, PIONTEK Janusz, IVANOVA Svetlana, DABERT Mirosława, GOTHERSTROM Anders, “Diverse origin of mitochondrial lineages in Iron Age Black Sea Scythians”, in *Scientific Reports*, 2017, no. 7, pp. 1-10.
- KADROW Slamwomir, “Absolute Chronology of the Soviefka type in the light of ‘Wiggle matching’ analysis”, in *Baltic Pontic Studies*, 1995, vol. 3, pp. 141-147.
- KANIUTH Kai, “The metallurgy of the late Bronze Age Sapalli culture (Southern Uzbekistan) and its implications for the ‘tin-question’”, in *Iranica Antiqua*, 2007, vol. 42, pp. 23-40.
- KANKAINEN Tuovi, “Pitfalls in the calibration of radiocarbon ages”, in *Journal of Nordic Archaeological Science*, 2002, LA6, pp. 7-10.
- KE Peng, ZHU Yanshi, “New research on the origin of cowries in Ancient China”, in *Sino-Platonic Papers*, 1995, no. 68.
- KEITH Arthur, “Human skulls from ancient cemeteries in the Tarim Basin”, in *Journal of the Royal Anthropological Institute*, 1929, no. 59, pp. 149-180.
- KEVERNE Roger, *Jade*, New York: Springer Science + Business Media, 1991.
- KHODZHAYNOV K. Tel'man ХОДОЖАЙНОВ К. Тельман, Antropologicheskii sostav naseleniia epokhi bronzy Sapalitera Антропологический состав населения эпохи бронзы Сапалитепа, (Anthropological composition of the Bronze Age population at Sapalli-tepe), Tashkent: Fan, 1977.
- KILLICK David, FENN Thomas, “Archaeometallurgy: the study of preindustrial mining and metallurgy”, in *Annual Review of Anthropology*, 2012, no. 41, pp. 559-575.
- KIRCHO B. Lyubov КИРЧО Б. Любовь, POPOV G. Sergei ПОПОВ Г. Сергеи, “K voprosu o radiouglerodnoy khronologii drevneyshikh tsivilizatsiy Sredney Azii K voprosu o radiouglerodnoy khronologii drevneyshikh tsivilizatsiy Sredney Azii” (On radiocarbon chronology of the ancient civilizations of Central Asia), in *Stratum Plus*, 1999, no. 2, pp. 350-361
- KIROUSHIN F. Yuri КИРЮШИН Ф. Юрий, “Kamennaya skulptura epokhi bronzy s Altaya Каменная скульптура эпохи бронзы с Алтая” (Stone sculpture of the Bronze Age from the Altay), in *Izvestiya SO AN SSSR. Ser. Istoriya, filologiya i filosofiya Известия СО АН СССР. Сер. История, филология и философия* (Journal of the Siberian Branch of the USSR Academy of Sciences. Series History, Philology and Philosophy), 1991, vol. 2, pp. 66-70.
- KIROUSHIN F. YORI КИРЮШИН Ф. Юрий, *Eneolit i ranniaia bronza iuga Zapadnoi Sibiri Энеолит и ранняя бронза юга Западной Сибири* (Eneolithic and early bronze in South-western Siberia), Barnaul: Altay State University, 2002.

- KIROUSHIN F. Yuri, GRUSHIN P. Sergei, “Early and middle Bronze Age portable art pieces from the forest-steppe zone of the Ob-Irtysh region”, in *Archaeology Ethnology and Anthropology of Eurasia*, 2009, vol. 37, no. 4, pp. 67-75.
- KIROUSHIN F. Yuri КИРЮШИИ Ф. Юрий, GRUSHIN P. Sergei ТРУШИИ П. Сергей, TISHKIN A. Alexei ТИШКИИ А. Алексей, *Pogrebal'nyu obryad naseleniya epokhi ranney bronzy Verkhnego Priob'ya (po materialam gruntovogo mogil'nika Teleytskiy Vzvoz- I)* Погребальный обряд населения эпохи ранней бронзы Верхнего Приобья (по материалам грунтового могильника Телейтский Взвоз- I (The burial ritual of the people inhabiting the Upper pre-Ob territory in the Early Bronze [based on the materials of the subsoil burial ground Teleutskiy Vzvoz-I]), Barnaul: Altai State University Press, 2003.
- KIROUSHIN F. Yuri КИРЮШИИ Ф. Юрий, GRUSHIN P. Sergei ТРУШИИ П. Сергей, TISHKIN A. Alexei ТИШКИИ А. Алексей, “Eluninskaya kultura bronzovogo veka v Ob-Irtyshskom mezhdurechye Елунинская культура бронзового века в Обь-Иртышском междуречье” (The Bronze Age Cultures of Elunino in the Ob-Irtysh interfluve), in SARIANIDI I. Viktor САРИАНИДИ И. Виктор, KOZHIN M. Pavel КОЖИИ М. Павел, KOSAREV F. Mikhail КОСАРЕВ Ф. Михаил (eds.), *Na puti otkrytiya tsivilizatsii: sbornik statey k 80-letiyu V.I. Sarianidi* На пути открытия цивилизации: сборник статей к 80-летию В.И. Сариниди (Toward the discovery of civilization: a collection of articles for the 80th anniversary of V. I. Sarianidi), St. Petersburg: Aletya, 2010, pp. 552-566.
- KIROUSHIN F. Yuri КИРЮШИИ Ф. Юрий, PAPIN V. Demitri ПАПИИ В. Дмитрий, FEDORIK S. Alexander ФЕДОРЫК С. Александр, SHAMSHIN B. Alexander ШАМШИИ Б. Александр, “Issledovania v Vostochnoi Kulunde Исследования в Восточной Кулунде” (Research in East Kulunda), in *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii: Materialy Godovoi itogovoi sessii Instituta arkheologii i etnogra i SO RAN* Проблемы археологии, этнографии, антропологии Сибири и сопредельных территорий. Материалы Годовой сессии Института археологии и этнографии СО РАН (Problems of archaeology, ethnography, anthropology of Siberia and adjacent territories. Materials of the Annual Session of the Institute of Archaeology and Ethnography of the SB RAS), 2005, vol. 11, pp. 329-332.
- KISER Elke, “Plastered skulls of the Catacomb culture in the Northern Pontic region”, in BONOGOFKY Michelle (ed.), *Skull collection, modification and decoration*, Oxford: Archaeopress, 2006, pp. 45-58.
- KISLENKO Aleksandr, TATARINTSEVA Natalya, “The Eastern Ural steppe at the end of the Stone Age”, (Trans. by WRIGHT Sara), in LEVINE A. Marsha, RASSAMAKIN Yuri, KISLENKO Aleksandr, TATARINTSEVA Natalya, *Late prehistoric exploitation of the Eurasian steppe*, Cambridge: McDonald Institute for Archaeological Research, 1999, pp. 183-216.
- KLEMENTZ A. Dmitri КЛЕМЕНТЦ А. Дмитрий, OLDENBURG F. Sergei ОЛЬДЕНБУРГ Ф. Сергей, *Zapisky o neobkhodimosti arkheologicheskogo obsledovaniya turfana* Записки о необходимости археологического обследования турфана (Note on the organization of an expedition to the Tarim Basin for Archaeological Purposes), S. Petersburg: POBRAS, vol. 13, no. 1, 1901.
- KOHL L. Philip, GARDIN Jean-Claude, FRANCFORT Henry-Paul, *Central Asia, Palaeolithic*

beginnings to the Iron Age, Paris: Editions Recherche sur les Civilisations, 1984.

KOHL L. Philip, *The Bronze Age civilization of Central Asia: recent Soviet discoveries*, New York: M. E. Sharp, 1981.

KOHL L. Philip, *The Making of Bronze Age Eurasia*, Cambridge: Cambridge University Press, 2007.

KOROBKOVA F. Galina, “Ancient reaping tools and their productivity in the light of experimental tacewear analysis”, in KOHL L. Philip (ed.), *The Bronze Age civilization of Central Asia: recent Soviet discoveries*, New York: SHARPE M. E., 1981, chapter 15.

KOROCHKOVA N. Olga, KUZMINYKH V. Sergey, SERIKOV B. Yuri, STEFANOV I. Vladimir, “Metals from the ritual site of Shaitanskoye Ozero II (Sverdlovsk Oblast, Russia)”, in *Trabajos de Prehistoria* (Works on Prehistory), 2010, vol. 67, no. 2, pp. 489-499.

KOROLKOVA Elena, “Ritual vessels of the nomads”, in Andrei ALEKSEEV (ed.), *The Golden Deer of Eurasia: Scythian and Sarmatian Treasures from the Russian Steppes*, New York: Yale University Press, 2000, pp. 61-64.

KOSSINNA Gustav, “Die vorgeschichtliche Ausbreitung der Germanen in Deutschland” (The prehistoric spread of Germanic tribes in Germany), in *Zeitschrift des Vereins für Volkskunde* (Journal of the Folklore Society), 1896, no. 6, pp. 1-14.

KOVALEV A. Alexei, “Die ältesten Stelen am Ertrix. Das Kulturphänomen Xemirxek (The ancient stele along the Irthysh. The Chemurchek phenomenon)”, in *Eurasia Antiqua*, 1999, vol. 5, pp. 135-178.

KOVALEV A. Alexei, “The great migration of Chemurchek people from France to the Altai in the early III millennium BCE”, in *International Journal of Eurasian Studies*, 2011, no. 1, pp. 1-55.

KOVALEV A. Alexei КОБАЛЕВ А. Алексей, *Drevneyshiye statui chemurcheka iprilegayushikh territoriy* древнейшие статуи чемурчека и прилегающих территорий (The most ancient statues of Chemurchek and the surrounding territories), Saint Petersburg: LDprint, 2012.

KOVALEV A. Alexei КОБАЛЕВ А. Алексей, *Drevneyshiye yevropeytsy v serdtse azii: Chemurchekskiy kul'turnyy fenomen, tom 1* Древнейшие европейцы в сердце азии: Чемурчекский культурный феномен, том 1 (The most ancient Europeans in the heart of Asia: the Chemurchek cultural phenomenon, vol. 1), Saint Petersburg: Book Antiqua, 2014.

KOVALEV A. Alexei КОБАЛЕВ А. Алексей, *Drevneyshiye yevropeytsy v serdtse azii: Chemurchekskiy kul'turnyy fenomen, tom 2* Древнейшие европейцы в сердце азии: Чемурчекский культурный феномен, том 2 (The most ancient Europeans in the heart of Asia: the Chemurchek cultural phenomenon, vol. 2), Saint Petersburg: Book Antiqua, 2015.

KOVALEV A. Alexei, ERDENEBAATAR Diimaazhav, “Menggu qingtong shidai wenhua de xin faxian 蒙古青铜时代文化的新发” (New discoveries of Bronze Age cultural remains in Mongolia), in *Bianjiang kaogu yanjiu* 边疆考古研究 (Archaeological Research at the Frontiers), 2008, vol. 9, pp. 246-279.

- KOVALEV A. Alexei, ERDENEBAATAR Diimaazhav, “Discovery of new cultures of the Bronze Age in Mongolia (According to the data obtained by the International Central Asiatic Archaeological Expedition)”, in BEMMAN Jan, PARZINGER Hermann, POHL Ernst, TSEVEENDORZH Damdinsüren (eds.), *Current Archaeological research in Mongolia*, Bonn: Rheinische Friedrich-Wilhelms-Universität, 2009, pp. 149-170.
- KOVTUN V. Igor V. КОБТУН В. Игорь, “Khronologiya andronovskikh brasletov s konusovidnymi spiralyami Хронология андроновских браслетов с конусовидными спиральями” (Chronology of the Andronovo bracelets with cone-shaped spiral ends), in *Arkheologiya, etnografiya i muzeynoye delo* Археология, этнография и музейное дело (Archaeology, Ethnography and Museology), 1999, no. 19, pp. 25-30.
- KOVTUN V. Igor КОБТУН В. Игор, *Andronovskiy ornament (morfologiya i mifologiya)* Андроновский орнамент (морфология и мифология) (Andronovo ornaments [morphology and mythology]), Kazan: Kazanskaya Nedvizhimost, 2016.
- KOZHOMBERDIEV K. Isman КОЖОМБЕРДИЕВ К. Исман, KUZ'MINA E. Elena КУЗЬМИНА Е. Елена, “Shamshinskiy klad èpokhi pozdney bronzy v Kirgizii Шамшинский клад эпохи поздней бронзы в Киргизии” (Treasures of the Bronze Age site of Shamshi, Kyrgyzstan), in *Sovetskaya arkheologiya* Советская археология (Soviet Archaeology), 1980, no. 4, pp. 140-153.
- KOZINTSEV G. Alexander, “The ‘Mediterraneans’ of Southern Siberia and Kazakhstan, Indo-European migrations and the origin of the Scythians: a multivariate craniometrical analysis”, in *Archaeology Ethnology and Anthropology of Eurasia*, 2008, vol. 36, no. 4, pp. 140-144.
- KUBAREV D. Vladimir, “Two Bronze Age steles in Gorny Altai”, in *Archaeology, Ethnology and Anthropology of Eurasia*, 2009, vol. 37, no. 1, pp. 34-38.
- KUNGUROV L. Artur КУНГУРОБ Л. Артур, GORBUNOV B. Vadim ГОРБУНОВ В. Вадим, “Sluchainye arkheologicheskie nakhodki s verkhnego Chumysha (po materialam muzeia s. Pobedy) Случайные археологические находки с Верхнего Чумыша (по материалам музея с. Победа)” (Accidental archaeological finds from the Upper Chumysh River [based on the materials of the museum of the village of Pobedy]), in KIROUSHIN F. Yuri КИРЮШИН Ф. Юрий, TISHKIN A. Alexei ТИШКИН А. Алексей (eds.), *Problemy izucheniya drevnei i srednevekovoi istorii* Проблемы изучения древней и средневековой истории (The problems of studying ancient and medieval history), Barnaul: Altay State University Press, 2001.
- KUNGUROVA Y. Natalya, “Archaeological materials from Solontsy-5: ethnic-cultural relationships within the Kuznetsk-Altai culture”, in *Archaeology, Ethnology and Anthropology of Eurasia*, 2003, vol. 2, no. 14, pp. 30-39.
- KUPYANOVA B. Elena КУПИЯНОВА В. Елена, “K voprosu o prichinakh detskikh kollektivnykh zakhoroneniy v nekropol'yakh bronzovogo veka Yuzhnogo Zaural'ya К вопросу о причинах детских коллективных захоронений в некрополях бронзового века Южного Зауралья” (On the causes of children’s collective graves in the Bronze Age necropolies in the southern Trans-Urals region), in Chelyabinsk State University, Institute for Humanitarian Problems, Chelyabinsk Scientific Center (eds.), *Etnicheskiye vzaimodeystviya na yuzhnom Urale, materialy II Regional'naya nauchno-prakticheskaya konferentsiya*, Этнические

взаимодействня на южном урале, материалы II Региональная научно-практическая конференция (Ethnic interaction in the southern Ural region, materials of the Second Regional Scientific and Practical Conference), Chelyabinsk: Rifev, 2004, pp. 82-84.

KURKOV A. Andrei, "Is there a problem of desiccation of Asia?", in *Soviet Geography*, 1968, vol. 9, no. 1, pp. 47-54.

KUTIMOV G. Yuri КУТИМОВ Г. Юрий, "Novye issledovaniya mogil'nika epokhi pozdney bronzy Kumsay (Tadzhikistan) Новые исследования могильника эпохи поздней бронзы Кумсай (Таджикистан)" (New research on the late Bronze Age Kumsay cemetery [Tajikistan]), in *Arkheologicheskiye vesti* Археологические вести (Archaeological News), 2013, no. 19, pp. 75-89.

KUZ'MINA E. Elena КУЗЬМИНА Е. Елена, *Metallicheskie izdelija jeneolita i bronzovogo veka Srednej Azii* Металлические изделия энеолита и бронзового века Средней Азии (Copper Age and Bronze Age metallurgical production in Central Asia), Moscow: Nauka, 1966.

KUZ'MINA E. Elena КУЗЬМИНА Е. Елена, *Mogil'nik Tuktubayevo i vopros o khronologii pamyatnikov fedorovskogo tipa na Urale* Могильник Туктубаево и вопрос о хронологии памятников федоровского типа на Урале (Burials of Tuktubaevo and the question of the chronology of monuments of the Fedorov type in the Urals region), Vinogradov: PAUS, 1973.

KUZ'MINA E. Elena, "Cultural connections of the Tarim Basin people and the pastoralists of the Asian steppes in the Bronze Age", in MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 1, Washington: Institute for the Study of Man, 1998, pp. 63-85.

KUZ'MINA E. Elena and MALLORY P. James, *The origin of the Indo-Iranians*, Leiden: Brill, 2007.

KUZ'MINA E. Elena, MAIR H. Victor, *The prehistory of the Silk Road*, Philadelphia: University of Pennsylvania Press, 2008.

LAVENTO Mika Тапио ЛАВЕНТО Мика Тапио, PATRUCHEV S. Valery S. ПАТРУШЕВ С. Валерий, "Razvitiye i khronologiya tekstil'noy keramiki na Sredney i Verkhney Volge: kriticheskiy vzglyad vozmozhnostey khronologii po ^{14}C -, AMS i tipologicheskomu metodom, Развитие и хронология текстильной керамики на Средней и Верхней Волге: критический взгляд возможностей хронологии по ^{14}C -, АМС и типологическому методам" (Development and chronology of textile-impressed ceramics in the Middle and Upper Volga: a critical view of chronology possibilities for ^{14}C , AMS and typological methods), in *Povolzhskaya Arkheologiya* Поволжская Археология (The Volga River Region Archaeology), 2015, no. 2 pp. 160-188.

LECHTMANN Heather, "Arsenic bronze: dirty copper or chosen alloy? A view from the Americas", in *Journal of Field Archaeology*, 1996, vol. 23, no. 4, pp. 477-514.

LEVINE A. Marsha, "Botai and the Origins of Horse Domestication", in *Journal of Anthropological Archaeology*, 1999, no. 18, pp. 29-78.

LEGRAND Sophie, "The emergence of the Karasuk culture", in *Antiquity* 2006, vol. 80, no. 310, pp.

843-859.

- LEMMEN Carsten, GRONENBORG Detlef, WIRTZ W. Kai, “A simulation of the Neolithic transition in Western Eurasia”, in *Journal of Archaeological Science*, 2011, vol. 38, no. 12, pp. 3459-3470.
- LHUILIER Johanna, “Les relations des cultures à céramique modelée peinte d’Ouzbékistan avec le Xinjiang – 2e moitié du IIe millénaire av. JC.” (Relations between the cultures with handmade painted ceramics of Uzbekistan and Xinjiang – second half of the second millennium BC), Paper of the Third Asia Network Congress - IMASIE, Sep 2007 Paris, France. Available at <https://halshs.archives-ouvertes.fr/halshs-01111876/document>, 12-05-2017.
- LI Ji 李济, “Gudai Zhongguo Wenming 古代中国文明” (Ancient Chinese civilization), in *Kaogu* 考古 (Archaeology), 1996.8, pp. 57-60.
- LI Qinghui, LIU Song, ZHAO Hongxia, GAN Fuxin, ZHANG Ping, “Characterization of some ancient glass beads unearthed from the Kizil reservoir and Wenquan cemeteries in Xinjiang, China”, in *Archaeometry*, 2013, vol. 56, no. 4, pp. 1-24.
- LI Shuicheng 李水城, “Siba wenhua yanjiu 四坝文化研究” (Research on the Siba culture), in SU Bingqi 苏秉琦 (ed.), *Kaoguxue wenhua lunji* 考古学文化论集 (Collection of studies on archaeological cultures), Beijing: Wenwu chubanshe 1993, pp. 80-121.
- LI Shuicheng 李水城, “Cong kaogu faxian gongyuan qian erqian nian dongxi wenhua de pengzhuang he jiaoliu 从考古发现公元前二千年东西文化的碰撞和交流” (Encounter and exchange between east and west during the second millennium BC, from an archaeological perspective), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1999.1, pp. 53-65.
- LI Shuicheng 李水城, SHUI Tao 水涛, “Siba wenhua tongqi yanjiu 四坝文化铜器研究”, in *Wenwu* 文物 (Cultural Relics), 2000.2, pp. 36-44.
- LI Shuicheng 李水城, “Hexi diqu xinjian Majiayao wenhua yicun ji xiangguan wenti 河西地区新见马家窑文化遗存及相关问题” (Remains of the Majiayao cultures newly seen in the Hexi region and related questions), in SU Bingqi 苏秉琦 (ed.), *Su Bingqi yu dangdai zhongguo kaoguxue* 苏秉琦与当代中国考古学 (Su Bingqi and archaeology in contemporary China), Beijing: Kexue chubanshe, 2001.
- LI Shuicheng, “The regional characteristics and interactions between the early bronze metallurgies of the North-west and Central Plains”, in *Chinese Archaeology*, 2006, vol. 6, no. 1, pp. 132-139.
- LI Suyuan 李溯源, “Xinjiang Xinyuan xian chutu yizu qingtongqi 新疆新源县出土一组青铜器” (A group of bronzes discovered in the Xinyuan County), in *Zhongguo Wenwubao* 中国文物报 (Chinese Journal of Cultural Relics), 2005.21. Available at <http://www.kaogu.cn/cn/xueshuyanjiu/yanjiuxinlun/bianjiangjizhongwai/2013/1025/33477.htm>, 6-07-2017.
- LI Suyuan 李溯源, “Yilihe Aga’ersen leixing qingtongqi 伊犁河谷阿尕尔森类型青铜器”

(Typological study on bronze objects found in Aga'ersen, Ili River Valley), in *Bianjiang Kaogu Yanjiu* 边疆考古研究 (Archaeological Studies on the Frontiers), 2014.2, pp. 99-110.

LI Xiao 李肖, "Xinjiang Tacheng shi kaogu de xin faxian 新疆塔城市考古的新发现" (New archaeological discoveries in Tacheng City, Xinjiang), in *Xiyu Yanjiu* 西域研究 (Western Regions Studies), 1991.1, p. 104.

LI Xiao 李肖, DANG Tong 党彤, "Zhunga'er pendi zhouyuan diqu chutu de tongqi chutan 准噶尔盆地周缘地区出土的铜器初探" (On bronze wares unearthed from the surroundings of Junggar Basin), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1995.2, pp. 40-51.

LI Xiao, WAGNER Mayke, WU Xiaohong, TRASOV Pavel, ZHANG Yongbin, SCHMIDT Arno, GOSLAR Tomasz, GRESKY Julia, "Archaeological and palaeopathological study on the third/second century BC grave from Turfan, China: individual health history and regional implications", in *Quaternary International*, 2013, nos. 290-291, pp. 335-343.

LI Xueqin, "Liangzhu culture and the Shang dynasty taotie motif" in WHITFIELD Roderick (ed.), *The problem of meaning in early Chinese ritual bronzes*, London: University of London, School of Oriental and African Studies, 1993, pp. 56-66.

LI Zongshan 李宗山, YIN Xiaoyan 尹小燕, "Hebei sheng Qian'an xian chutu liang jian Shangdai tongqi 河北省迁安县出土两件商代铜器" (Two bronzes of the Shang period from Qian'an County, Hebei Province), in *Wenwu* 文物 (Cultural Relics), 1995.6, pp. 88-89.

Liaoning sheng Wenwu Kaogu Yanjiusuo 辽宁省文物考古研究所 (Liaoning Provincial Institute of Cultural Relics and Archaeology), Jilin Daxue Kaoguxue 吉林大学考古学 (Department of Archeology, Jilin University), "Liaoning Fuxin Pingdingshan shichengzhi fajue baogao 辽宁阜新平顶山石城址发掘报告" (Excavation report of the Pingdingshan Stone Site in Fuxin, Liaoning), in *Kaogu* 考古 (Archaeology), 1992.5, pp. 399-418.

LIESOWSKA Anna, "Modern science to unlock the secrets of couples holding each other in loving embrace for 3,500 years", in *The Siberian Times*, December 27th, 2013. Available at <http://siberiantimes.com/science/casestudy/features/modern-science-to-unlock-the-secrets-of-couples-holding-each-other-in-loving-embrace-for-3500-years/> 19-06-2017.

LILYQUIST Christine, *Ancient Egyptian mirrors: from the earliest times through the Middle Kingdom (Münchner Ägyptologische Studien)*, Berlin: Deutscher Kunstverlag, 1979.

LIN Meicun 林梅村, "Tuhuoluoren de qiyuan yu qianxi 吐火罗人的起源与迁徙" (Origins and migrations of the Tocharians), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2002, nos. 3-4, pp. 69-80.

LIN Meicun 林梅村, "Saiyima—Tu'erbin'nuo wenhua yu shiqian sichou zhilu 塞伊玛—图尔宾诺文化与史前丝绸之路" (The Seima - Turbino culture and the prehistoric Silk Road), in *Wenwu* 文物 (Cultural Relics), 2015.10, pp. 49-63.

- LIN Meicun 林梅村, “Saiyima—Tu’erbin’nuo wenhua zai Zhongguo 塞伊玛—图尔宾诺文化在中” (The Seima Turbino culture in China), in *Kaogu yu Wenwu* 考古与文物 (Archaeology and Cultural Relics), 2016.2, pp. 94-101.
- LIN Yun, “A re-examination of the relationship between bronzes of the Shang culture and of the Northern Zone”, in CHANG Kwang-chih (ed.), *Studies of Shang Archaeology*, New Haven and Conn: Yale University Press, 1986, pp. 237-273.
- LIN Yun 林沅, “Guanyu Xinjiang beibu Qie’ermuqieke leixing yicun de ji ge wenti—cong Bu’erjin xian chutu de taoqi shuoqi 关于新疆北部切尔木切克类型遗存的几个问题——从布尔津县出土的陶器说起” (Some issues on Qie'ermuqieke remains found in Northern Xinjiang - based on the pottery found at Buerjin County), in LIN Yun 林沅 (ed.), *Lin Yun xueshu wenji* 林沅学术文集 (Lin Yun collected works), Beijing: Science Press 2008, pp. 143-161.
- LINDUFF M. Katheryn, “Zhukaigou, steppe culture and the rise of Chinese civilization”, in *Antiquity*, 1995, vol. 69, no. 262, pp. 133-145.
- LINDUFF M. Katheryn, “Here today and gone tomorrow: the emergence and demise of bronze producing culture outside the Central Plain”, in ZANG Zhenhua (ed.), *Integrated Studies of Chinese Archaeology and Historiography*, Taipei: Institute of History and Philology, Academia Sinica, 1997, pp. 393-428.
- LINDUFF M. Katheryn, “The emergence and demise of bronze-using cultures outside the Central Plain in ancient China”, in MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 2, Washington: Institute for the Study of Man, 1998, pp. 619-646.
- LINDUFF M. Katheryn, HAN Rubin, SUN Shuyun (eds.), *The Beginnings of Metallurgy in China*, Lewiston, Queenston and Lampeter: Edwin Mellen Press, 2000.
- LINDUFF M. Katheryn, “A walk on the wild side: late Shang appropriation of horses in China”, in LEVINE A. Marsha, RENFREW A. Colin, BOYLE Katie (eds.), *Prehistoric steppe adaptation and the horse*, Oxford: Oxbow, 2003, pp. 139-162.
- LINDUFF M. Katheryn, MEI Jianjun, “Metallurgy in Ancient Eastern Asia: How is it Studied? Where is the Field Headed?”, Paper presented at the conference Modeling Early Metallurgy: Old and New World Perspectives SAA: Vancouver, 2008. Available at <https://www.britishmuseum.org/pdf/Linduff%20Mei%20China.pdf>
- LISITSINA N. Gorislava, “The Caucasus: a centre of ancient farming in Eurasia”, in VAN ZEIST Willem, CASPARIE A. Willem (eds.), *Plants and ancient man: studies in palaeoethnobotany*, Rotterdam: Balkema, 1984, pp. 285-292.
- LITVINSKY A. Boris ЛИТВИНСКИЙ А. Борис, “Tadzhikistan i Indiya (primery drevnikh svyazey i kontaktov) Таджикистан и Индия (примеры древних связей и контактов)” (Tajikistan and India [examples of ancient ties and contacts]), in BONGARD-LEVINA Grigory БОНГАРД-ЛЕВИНА М. Григорий, STRUVE V. Vasily СТРУВЕ В. Василий (eds.), *Indiya v drevnosti* Индия в древности (Ancient India), Moscow: Vinauka, 1964, pp. 143-165.

- LITVINSKY A. Boris, P'YANKOVA T. Ludmila, "Pastoral tribes of the Bronze Age in the Oxus Valley", in DANI H. Ahmad, MASSON M. Vadim (eds.), *History of civilizations of Central Asia vol. 1. The dawn of civilization: earliest times to 700 B.C.*, Paris: Unesco, 1992, pp. 371-386.
- LIU Baoshan 刘宝山, DOU Xuyao 窦旭耀, "Qinghai Hualong xian Xiabanzhuwa Kayue wenhua mudi di erci fajue jianbao 青海化隆县下半主洼卡约文化墓地第二次发掘简报" (The second excavation of the Xiabanzhuwa cemetery, Huilong County, Qinghai Province), in *Kaogu yu Wenwu* 考古与文物 (Archaeology and Cultural Relics), 1998.4, pp. 1-8, 67.
- LIU Li, CHEN Xingcan, *The Archaeology of China, from the late Palaeolithic to the early Bronze Age*, New York: Cambridge University Press, 2012.
- LIU Wensuo, "Archaeological remains of sacrificial rituals in Eastern Altai Mountains", in YU Tianshan, LI Jinxu, DOAR Bruce (eds.) *Eurasian Studies*, Sidney: Asian Publishing Nexus, 2014, vol. 2, pp. 1-28.
- LIU Xingqi, HERTZSHUH Ulrike, SHEN Ji, JIANG Qingfen, XIAO Xiayun, "Holocene environmental and climatic changes inferred from Wulungu Lake in Northern Xinjiang, China", in *Quaternary Research*, 2008, no. 70, pp. 412-425.
- LIU Xinyi, HUNT V. Harriet, JONES K. Martin, "River valleys and foothills: changing archaeological perceptions of North China's earliest farms", in *Antiquity*, 2009, vol. 83, no. 319, pp. 82-95.
- LIU Xuetao 刘学堂, "Xinjiang diqu zaoqi tongjing ji xiangguan wenti 新疆地区早期铜镜及相关问题" (Ancient mirrors in Xinjiang and related questions), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1993.1, pp. 121-131.
- LIU Xuetao 刘学堂, "Zhongguo zaoqi tongjing qiyuan yanjiu 中国早期铜镜起源研", in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1998.3, pp. 55-72.
- LIU Xuetao 刘学堂, "Yilihe shangyou shiqian kaogu xin faxian jiqi chubu yanjiu 伊犁河上游史前考古新发现及其初步研究" (On the prehistoric discoveries in the Upper Ili Valley), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2011.1, pp. 84-107.
- LIU Xuetao 刘学堂, RUAN Qiurong 阮秋荣, "Xinjiang Nileke Qiongeke taidi dierci kaogu fajue shouhuo fengshuo 新疆尼勒克穷科克台地第二次考古发掘收获丰硕" (Results of the the second archaeological excavation in Qiongeke Plateau, in Nileke County, Xinjiang), in *Zhongguo Wenwubao* 中国文物报 (Chinese Cultural Relics), April 4th, 2003. Available at <http://wenbozaixian.com/portal/DigitPager/paperDetail/publishdate/2003-04-04/paperId/5402/id/37019>, 30-06-2017.
- LIU Yan, DENG Jun, SHI Guanghai, LU Taijin, HE Huaiyu, NG Yi-Nok, SHEN Chonghui, YANG Liqiang, WANG Qingfei, "Chemical Zone of Nephrite in Alamas, Xinjiang, China", in *Resource Geology*, 2010, vol. 60, no. 3, pp. 249-259.

- LIU Yan, DENG Jun, SHI Guanghai, TZEN Fuyui, ZHANG Guibing, ABUDUWAYITI Maituohuti, YANG Liqiang, SUN Xiang, “Geochemistry and petrology of nephrite from Alamas, Xinjiang, NW China”, in *Journal of Asian Earth Science*, 2011, vol. 42, no. 3, pp. 440-451.
- Liuli he Kaogu Gongzuo Dui 琉璃河考古工作队 (Liuli River Archaeological Team), “Beijing Liuli he Xiajiadian xiaceng wenhua muzang 北京琉璃河夏家店下层文化墓葬” (Burials of the Lower Xiajiadian culture on the Liuli River, Beijing), in *Kaogu* 考古 (Archaeology), 1976.1, pp. 59-60.
- LU Houyuan, ZHANG Jianping, LIU Kanbi, WU Naiqin, LI Yumei, ZHOU Kunshu, YE Maolin, ZHANG Tianyu, ZHANG Haijiang, YANG Xiaoyan, SHEN Licheng, XUA Deke, LI Quan, “Earliest domestication of common millet (*Panicum miliaceum*) in East Asia extended to 10,000 years ago”, in *Proceedings of the National Academy of Science of the United States of America*, 2009, no. 106, pp. 7367-7372.
- LU Lipeng 鲁礼鹏, MA Jine 马金娥, “Qiemo Zaganluke yi hao mudi chutu de shuzi 且末扎滚鲁克一号墓地出土的梳子”(A research on the combs from cemetery no.1 of Zaganluke in Qiemo County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2017.1, pp. 77-87.
- LUO Wugan 罗武干, HU Xingjun 胡兴军, ZHANG Jie 张杰, YANG Yimin 杨益民, “Habahe xian Ayituohan yi hao muqun chutu tongqi keji fenxi 哈巴河县阿依托汗一号墓群出土铜器科技分析” (Analysis on the Technology of the bronzes unearthed from the group of graves in Ayituohan, Habahe County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2017.1, pp. 94-100.
- MA Long, WU Jinglu, ABUDUWAILI Jilili, “The climatic and hydrological changes and environmental responses recorded in lake sediments of Xinjiang, China”, in *Journal of Arid Land*, 2011, vol. 3, no. 1, pp. 1-8.
- MAILLARD Monique, “Essai sur la vie matérielle dans l'oasis de Tourfan pendant le Haut Moyen Age” (Essay on materials found in the oasis of Turfan during the Early and Middle Ages), in *Arts Asiatiques*, 1973, vol. 29, no. 1, pp.1-170.
- MAIR H. Victor, “Prehistoric caucasoid corpses of the Tarim Basin”, in *Journal of Indo-European Studies*, 1995, vol. 23, nos. 3-4, pp. 281-307.
- MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 1, Washington: Institute for the Study of Man, 1998.
- MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 2, Washington: Institute for the Study of Man, 1998.
- MAIR H. Victor, “Genes, geography, and glottochronology: the Tarim Basin during late prehistory and history” in *Journal of Indo-European Studies, Monograph Series*, Washington DC: Institute for the Study of Man, 2005, no. 50, pp. 1-47.

- MAIR H. Victor, “The rediscovery and complete excavation of Ördek’s necropolis”, in *The Journal of Indo-European Studies*, 2006, vol. 34, nos. 3-4, pp. 273-318.
- MAIR H. Victor, “The mummies of East Central Asia”, in *Expedition Magazine*, 2010, vol. 52, no. 3, pp. 23-32.
- MAIR H. Victor, CHENG Fangyi, “Kungang: the making of an imaginary archaeological culture”, in *Sino-Platonic Papers*, 2013, no. 237.
- MALLORY P. James, MAIR H. Victor, *The Tarim Mummies: ancient China and the mystery of the earliest peoples from the west*, London: Thames & Hudson, 2000.
- MANASSERO Niccolò, “Libagioni di guerrieri e sovrani: corno potorio dell’ideologia sciita” (Libations of warriors and kings: drinking horns in the Scythian world, in BONORA Gian Luca, MARZATICO Franco (eds.), *Ori dei cavalieri delle steppe, Collezioni dei musei dell’Ukraina* (Gold of the steppe riders, collections of the Ukrainian Museums), Milano: Silvana Editore, 2007, pp. 220-225.
- MARGULAN K. Alkey МАРГУЛАН К. Алькей, “Gornoe delo v Tsentral’nom Kazakhstane v drevnie i srednie veka Горное дело в Центральном Казахстане в древние и средние века” (Mining in Central Kazakhstan during the Ancient and Middle Ages), in KEMAL A. Akishev КЕМАЛЬ А. Акишев (ed.), *Poiski i raskopki v kazakhstane* Поиски и раскопки в Казахстане (Research and excavations in Kazakhstan), Alma Ata: Nauka Press, 1972, pp. 3-30.
- MARGULAN K. Alkey МАРГУЛАН К. Алькей, *Begazy-dandybaevskaya kultura Tsentralnogo Kazahstana* Бегазы-дандыбаевская культура Центрального Казахстана (Begazy-Dandybaevsk culture of Central Kazakhstan), Alma Ata: Nauka, 1979.
- MASSON E. Mikhail, PUGACHENKOVA A. Galina, *The Parthian rhytons of Nisa*, Florence: Monografie di Mesopotamia, 1982.
- MASSON M. Vadim, “The decline of the Bronze Age civilization and movements of the tribes”, in DANI H. Ahmad, MASSON M. Vadim (eds.), *History of civilizations of Central Asia vol. 1. The dawn of civilization: earliest times to 700 B.C.*, Paris: Unesco, 1992, p. 326-345.
- MATUZEVICIUTE M. Giedre, LIGHTFOOT Emma, O’CONNELL C. Tamsin, VOYAKIN Dmitri, LIU Xinyi, SVYATKO V. Svetlana [et al.] “The extent of cereal cultivation among the Bronze Age to Turkic period societies of Kazakhstan determined using stable isotope analysis of bone collagen”, in *Journal of Archaeological Science*, 2015, no. 59, pp. 23-34.
- MCFARLAND Robert, SCHLABEN Will, “Placentas and prehistoric art”, in *The Journal of Psychohistory*, 1995, vol. 23, no. 1, pp. 41-50.
- MEI Jianjun, *Copper and Bronze Metallurgy in Late Prehistoric Xinjiang: Its Cultural Context and Relationship with Neighboring Regions*, BAR International Series 865, Oxford: Archaeopress, 2000.
- MEI Jianjun, “Cultural interaction between China and Central Asia during the Bronze Age”, in *Proceedings of the British Academy 2002 Lectures*, 2003, vol. 121, pp. 1-39. (a)

- MEI Jianjun, “Qijia and Seima-Turbino: the question of early contacts between Northwest China and the Eurasian steppe”, in *Bulletin of the Museum of the far Eastern Antiquities*, 2003, no. 75, pp. 31-54. (b)
- MEI Jianjun, “Metallurgical Analysis of early metal objects from the Liushui cemetery Xinjiang Northwest China”, paper presented at the Fourth Worldwide Conference of the Society for East Asian Archaeology, 2-8 June, Beijing, China, 2008.
- MEI, Jianjun, SHELL Colin, LI Xiao, WANG Bo, “A metallurgical study of early copper and bronze artefacts from Xinjiang, China”, in *Bulletin of Metals Museum*, 1998, no. 30, pp. 1-22.
- MEI Jianjun, SHELL Colin, “The existence of Andronovo cultural influence in Xinjiang during the second millennium BC”, in *Antiquity*, 1999, vol. 73, no. 281, pp. 570-578.
- MEI Jianjun 梅建军, LIU Guorui 刘国瑞, CHANG Xi'en 常喜恩, “Xinjiang dongbu diqu chutu zaoqi tongqi de chubu fenxi 新疆东部地区出土早期铜器的初步分析” (A preliminary study of early copper objects unearthed in Eastern Xinjiang), in *Xiyu Yanjiu 西域研究* (Western Regions Studies), 2002.2, pp. 1-10.
- MEI Jianjun 梅建军, LING Yong 凌勇, CHEN Kunlong 陈坤龙, IDRIS Abduressul 伊弟利斯·阿布都热苏勒, LI Wenyong 李文瑛, HU Xingjun 胡兴军, “Xinjiang Xiaohe mudi chutu bufen jinshuqi de chubu fenxi 新疆小河墓地出土部分金属器的初步分析” (A preliminary analysis of some metal objects unearthed from Xiaohe cemetery, Xinjiang), in *Xiyu Yanjiu 西域研究* (Western Regions Studies), 2013.1, pp. 39-49.
- MELLAART James, “Excavations at Catal Huyuk, 1961: first preliminary report”, in *Anatolian Studies*, 1962, no. 12, pp. 41-65.
- MELLAART James, “Excavations at Catal Huyuk, 1961: second preliminary report”, in *Anatolian Studies*, 1963, no. 13, pp. 43-103.
- MEYER E. Karl, *BRYSAK B. Shareen, Tournament of shadows: the Great Game and the race for empire in Central Asia*, Washington: Basic Books, 1999.
- MILLWARD A. James, *Eurasian crossroads: a history of Xinjiang*, New York: Columbia University Press, 2007.
- MINIAEV S. Sergei, “Production of bronze wares among the Xiongnu”, in *The Silk Road*, 2016, no. 14, pp. 147-165.
- MISCHKE Steffen, FUCHS Dirk, RIEDEL Frank, SCHUDACK E. Michael, “Mid to Late Holocene palaeoenvironment of Lake Eastern Juyan (North-western China) based on ostracods and stable isotopes”, in *Geobios*, 2002, no. 35, pp. 99-110.
- MISCHKE Steffen, RAJABOV Ilhomjon, MUSTAEVA Nailya, ZHANG Chengjun, HERZSCHUH Ulrike, BOOMER Ian, BROWN T. Erik, ANDERSEN Nils, MYRBO Amy, ITO Emi, SCHUDACK E. Michael, “Modern hydrology and late Holocene history of Lake Karakul, Eastern Pamirs (Tajikistan): A reconnaissance study”, in *Palaeogeography, Palaeoclimatology,*

Palaeoecology, 2010, no. 289, pp. 10-24.

- MIYAKE Toshihiko 三宅俊彦, “Kayue wenhua qingtongqi chubu yanjiu 卡约文化青铜器初步研究” (A Preliminary Study on bronze objects of the Kayue culture), in *Kaogu* 考古 (Archaeology), 2005.5, pp. 73-88.
- MOLODIN I. Vyacheslav МОЛОДИН И. Вячеслав, DEREV'ANKO P. Anatoly ДЕРЕВЯНКО П. Анатолий, *Baraba v epokhu bronzy* Бараба в эпоху бронзы (Baraba in the Bronze Age), Novosibirsk: Nauka, 1985.
- MOLODIN I. Vyacheslav МОЛОДИН И. Вячеслав, ALKIN V. Sergey АЛКИН В. Сергей, “Mogil'nik Gumugou (Sin'tszyan) v kontekste afanas'yevskoy problemy Могильник Гумугоу (Синьцзян) в контексте афанасьевской проблемы” (The burial ground of Gumugou (Xinjiang) in the context of the Afanasevo culture), in *Gumanitarnyye issledovaniya: itogi poslednykh let: Tez. dokl. nauch. konf., posvyashch. 35-letiyu gumanitarnogo fakul'teta NGU* Гуманитарные исследования: итоги последних лет: Тез. докл. науч. конф., посвящ. 35-летию гуманитарного факультета НГУ (Humanitarian research: the results of recent years: conference dedicated to the 35th anniversary of the Faculty of Humanities of Novosibirsk State University), Novosibirsk: Novosibirsk State University, 1997, pp. 35-38.
- MOLODIN I. Vyacheslav, МОЛОДИН И. Вячеслав, СЕМЬЯКИНА А. Марина ЧЕМЯКИНА А. Марина, POZDNYAKOVA A. Olga ПОЗДНЯКОВА А. Ольга, “Arkheologo-geofizicheskie issledovaniya pamyatnika Priobrazhenka-6 v Varabinskoj lesostepi Археолого- геофизические исследования памятника преображенка-6 в барабинской лесостепи” (Archaeological and geophysical studies on Preobrazhenka-6 in the Baraba forest-steppe), in *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii: Materialy Godovoi itogovoi sessii Instituta arkheologii i etnogra i SO RAN* Проблемы археологии, этнографии, антропологии Сибири и сопредельных территорий. Материалы Годовой сессии Института археологии и этнографии СО РАН (Problems of archeology, ethnography, anthropology of Siberia and adjacent territories. Materials of the Annual Session of the Institute of Archeology and Ethnography of the SB RAS), 2007, vol. 13, pp. 339-344.
- MOLODIN I. Vyacheslav [et al.], “Early and middle Bronze Age burials at Ordynskoye-1, Western Siberia: a new cultural interpretation”, in *Archaeology, Ethnology and Anthropology of Eurasia*, 2013, vol. 41, no. 4, pp. 84-101.
- MOLODIN I. Viacheslav, MYLNIKOVA N. Ludmila, SELIN V. Dimitri, NESKOROV V. Alexei, “The organization of the mortuary space in the Bronze Age: the Stary Sad burial ground, Baraba forest-steppe, Southern Siberia”, in *Archaeology Ethnology and Anthropology of Eurasia*, 2014, vol. 42, no. 3, pp. 29-45.
- MOLODIN I. Viacheslav, MYLNIKOVA N. Ludmila [et.al] “A Morphological analysis of vessels from middle Bronze Age (early 2nd millennium BC) burials at Vengerovo, in the Irtysh forest-steppe”, in *Archaeology Ethnology and Anthropology of Eurasia*, 2014, vol. 42, no. 2, pp. 44-66.
- MOLODIN I. Viacheslav, MYLNIKOVA N. Ludmila, SELIN V. Dimitri [et. al], “Late Bronze Age burial complexes of the Pakhomovskaya culture, eastern variant (Site of Grishkina

- Zaimka, Baraba)", in *Archaeology, Ethnology & Anthropology*, 2015, vol. 43, no. 1, pp. 47-60.
- MORGUNOVA L. Nina, KHOKHOLOVA S. Olga, "Chronology and Periodization of the Pit-Grave Culture in the area between the Volga and Ural Rivers based on ¹⁴C dating and paleopedological research", in *Radiocarbon*, 2013, no. 55, nos. 2-3, pp. 1286-1296.
- MOSHINSKAYA I. Vanda МОШИНСКАЯ И. Ванда, "О nekotorykh kamennykh skul'pturakh Priirtysh'ya О некоторых каменных скульптурах Прииртышья" (Some stone sculptures along the Irtysh River), in *KSIMK*, 1952, vol. 43, pp. 55-65.
- MUGHAL M. Rafique, HALIM M. Abdul, "The pottery", in *Pakistan Archaeology*, 1972, no. 8, pp. 33-110.
- MUHLY D. James, "The beginnings of metallurgy in the Old World" in MADDIN Robert (ed.), *The Beginning of the Use of Metals and Alloys*, Cambridge: MIT Press, 1988, pp. 2-20.
- NATAPINTU Surapol, "Distribution of Archaeometallurgical Sites from East to West of Thailand", 2012. Available at [http://www.l.u-tokyo.ac.jp/~angisj/Handouts/1350-1415_Natapintu%20_slide_ANGIS2012\(color\).pdf](http://www.l.u-tokyo.ac.jp/~angisj/Handouts/1350-1415_Natapintu%20_slide_ANGIS2012(color).pdf)
- Neimenggu Zizhiqu Wenwu Kaogu Yanjiusuo 内蒙古自治区文物考古研究所 (Inner Mongolia Autonomous Region Institute of Cultural Relics and Archeology), "Liangcheng Guoxianyaozi mudi 凉城崞县窑子墓地" (Guoxianyaozi cemetery at Liangcheng), in *Kaogu Xuebao* 考古学报 (Acta Archaeologica Sinica), 1989.1, pp. 57-81.
- NELSON M. Sarah, *The Archaeology of Korea*, Victoria: Cambridge University Press, 1993.
- NING Chao, GAO Shizhu, DENG Boping, ZHENG Hongxiang, WEI Dong, LU Haoze, LI Hongjie, SONG Li, WU Yong, ZHOU Hui, CUI Yinqiu, "Ancient mitochondrial genome reveals trace of prehistoric migration in the East Pamir by pastoralists", in *Journal of Human Genetics*, 2016, no. 61, pp. 103-108.
- NORIN Erik, *Geologic reconnaissance in the Chinese T'ien-shan*, Stockholm: Thule, 1941.
- NUTTALL Mark, *Encyclopedia of the Arctic*, New York: Routledge, 2005.
- ODELL H. George, *Stone tools: theoretical insights into human prehistory*, New York and London: Plenum, 1996.
- OKLADINOV P. Alexei ОКЛАДИНОВ П. Алексей, *Materialy i issledovaniya po arkheologii SSSR. №18: Neolit i bronzovyy vek Pribaykal'ya. Istoriko-arkheologicheskoye issledovaniye* Материалы и исследования по археологии СССР. №18: Неолит и бронзовый век Прибайкалья. Историко-археологическое исследование (Materials and research on archaeology of the USSR. No. 18: Neolithic and Bronze Age of the Baikal region. Historical and archaeological research), 1950.

- OKLADINOV P. Alexei, *Ancient population of Siberia and its cultures*, Cambridge: Peabody Museum, 1959.
- OKLADINOV P. Alexei, "Inner Asia at the dawn of history", in SENOR Danis (ed.), *The Cambridge history of early Inner Asia, volume 1*, Cambridge: Cambridge University Press, 1990, pp. 41-96.
- OLDENBURG F. Sergei ОЛЬДЕНБУРГ Ф. Сергей, *Russkaia Turkestanskaia Ekspeditsiia 1909-1910* Русская Туркестанская Экспедиция 1909-1910 (Russian Turkestan Expedition of 1909-1910. Concise Preliminary Report), Saint Petersburg: Goda, 1914.
- OLSEN L. Sandra, HARDING G. Deborah, "Women's attire and possible sacred role in the fourth millennium Northern Kazakhstan", in RUBINSON S. Karen, LINDUFF M. Katheryn (eds.) *Are all warriors male? Gender roles on the ancient Eurasian steppe*, Lanham: AltaMira, 2008, pp. 76-92.
- OSBORNE Robin, "Introduction: for tradition as an analytical category", in *World Archaeology*, 2008, vol. 40, no. 3, pp. 281-294.
- OTROSHCHENKO V. Vitaliy, "The Catacomb culture phenomenon", in *Baltic Pontic Studies*, 2013, vol. 18, p. 21-38.
- PATTE Etienne, "Quelques sépultures du Poitou, du Mésolithique au Bronze moyen" (Some sepultures from Poitou, from the Mesolithic to the Middle Bronze), in *Gallia Préhistoire* (Gallia Prehistory), 1971, no. 14, pp. 141-244.
- P'YANKOVA T. Ludmila, "Bronze Age settlements in Southern Tajikistan", in KOHL L. Philip (ed.), *The Bronze Age civilization of Central Asia: recent Soviet discoveries*, New York: M. E Sharpe, 1981, chapter 13.
- P'YANKOVA T. Ludmila П'ЯНКОВА Т. Людмила, "Stepnye komponenty v kompleksakh bronzovogo veka yugo-zapadnogo Tadjikistana Степные компоненты в комплексах бронзового века юго-западного Таджикистана" (The steppe components in the Bronze Age complexes in South-western Tajikistan), in *Stratum Plus*, 1999, no. 2, pp. 286-297.
- PANDEY B. Deena, "Cowries as a monetary token in ancient India", in *Journal of the Numismatic Society of India*, 1996, no. 28, pp. 127-142.
- PARZINGER Hermann, "Zentralasien vom Frühneolithikum bis zur Spätantike" (Central Asia from early Neolithic to late Antiquity), in STOLLNER Thomas, SAMASEV Zajnolla (eds.), *Unbekanntes Kasachstan - Archäologie im Herzen Asiens. Band I. Katalog der Ausstellung des Deutschen Bergbau-Museums Bochum vom 26. Januar bis zum 30. Juni 2013* (Unknown Kazakshan, archeology at the heart of Asia vol. 1, Catalogue of the exhibition in the Deutschen Bergbau-Museums in Bochum from January the 26th to June the 30th), Bochum: Deutsches Bergbau-Museum, 2013, pp. 109-113.
- PECK A. John, FOWELL J. Sara, PEARCE B. Richard, HANSEN C. S. Barbara, SONINKHISHIG Nergui [et al.], "Mid to late Holocene climate change in North-central Mongolia as recorded in the sediments of Lake Telmen", in *Palaeogeography, Palaeoclimatology, Palaeoecology*, 2002, no. 183, pp. 135-153.

- PEI Wenzhong 裴文中, “Xinjiang zhi shiqian kaogu 新疆之史前考古” (Prehistoric archaeology in Xinjiang), in *Zhongyang yaxiya 中央亚细亚 (Central Asia)*, 1942, vol. 1, no.1, pp. 34-39.
- PETRENKO G. Vladimir, “Scythian culture in the North Caucasus”, in DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY T. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, New Haven and Conn: Zinat Press, 1995, p. 11-20.
- PIGOTT C. Vincent, CIARLA Roberto, “On the origin of metallurgy in prehistoric South-East Asia: the view from Thailand”, in LA NIECE Susan, HOOK Ducan, CRADDOCK Paul (eds.), *Metal and mining studies in archaeometallurgy*, London: Archetype, 2007, p. 76-88.
- POPOVA F. Irina, “Sergei. F. Oldenburg’s first Russian Turkestan expedition (1909-1910)”, (transl. by E. S. Petrova), in POPOVA F. Irina (ed.), *Russian Expeditions to Central Asia at the turn of the 20th century*, St. Petersburg: Slavia, 2008, pp. 148-157.
- POSSEHL L. Gregory, “An harappan outpost on the Amu Darya: Shortugai, why was it there?”, in *Indologica Taurinensia*, 1997-1998, nos. 23-24, pp. 57-70.
- POTTS T. Daniel, “Technological transfer and innovation in Ancient Eurasia”, in Jürgen RENN (ed.), *The globalization of knowledge in history*, Berlin: Neopubli GmbH, 2012, pp. 105-123.
- PRABHAKAR V. Nandagopal, *Harappans and their Mesopotamian contacts*, New Delhi: Indian International Centre, 2017, vol. 48, occasional publication.
- PRATT Christina, *An encyclopedia of Shamanism vol. 2*, New York: Rosen Publishing Group, 2007.
- PUETT Michael, “China in early Eurasian history: a brief review of recent scholarships on the issue”, in MAIR H. Victor (ed.), *The Bronze Age and Iron Age people of Eastern Central Asia*, Monograph 26, vol. 2, Washington: Institute for the Study of Man, 1998, pp. 699-715.
- QI Xiaoshan 祁小山, WANG Bo 王博, *Sichou zhi lu caoyuan shiren yanjiu 丝绸之路草原石人研究 (On the anthropomorphic stele in the steppe along the Silk Road)*, Urumqi: Xinjiang Renmin chubanshe, 1996.
- QI Xiaoshan 祁小山, WANG Bo 王博, *Sichou zhi lu Xinjiang gudai wenhua 丝绸之路, 新疆古代文化 (The ancient culture in Xinjiang along the Silk Road)*, Urumqi: Xinjiang Renmin chubanshe, 2008.
- QI Xiaoshan 祁小山, WANG Bo 王博, *Sichou zhi lu Xinjiang gudai wenhua 丝绸之路, 新疆古代文化 (The ancient culture in Xinjiang along the Silk Road)*, Urumqi: Xinjiang Renmin chubanshe, 2015.
- QIAN Wei 潜伟, SUN Shuyun 孙淑云, HAN Rubin 韩汝玢, CHANG Xi’en 常喜恩, YAHE Fujiang 亚合甫江, “Xinjiang Hami Tianshan Beilu mudi chutu tongqi de chubu yanjiu 新疆哈密天山北路墓地出土铜器的初步研究” (A preliminary study of copper and bronze objects excavated at Tianshan Beilu cemetery in Hami, Xinjiang), in *Wenwu 文物 (Cultural Relics)*, 2001.6, pp. 79-89.

- Qinghai sheng Huangyuan xian Bowuguan [et al.] 青海省湟源县博物馆 (Museum of the Hangyuan County, in Qinghai Province), “Qinghai Haungyuan xian Dahuazhongzhuan Kayue wenhua mudi fajue jianbao 青海湟源县大华中庄卡约文化墓地发掘简报” (Preliminary report of the excavation of the Kayue cemetery of Dahuazhongzhuan, Haungyuan County, Qinghai), in *Kaogu yu Wenwu* 考古与文物 (Archaeology and Cultural Relics), 1985.5, pp. 11-34.
- Qinghai sheng Wenwu Kaogu Dui 青海省文物考古队 (Archaeological Team of the Qinghai Province), “Qinghai Huzhutuzu zizhixian Zongzhai Machang, Qijia, Xindian wenhua muzang 青海互助土族自治县总寨马厂齐家辛店文化墓葬” (Machang, Qijia and Xiandian cultural graves in Zhongzhai village, Huzhutu Autonomous County, Qinghai), in *Kaogu* 考古 (Archaeology), 1986.4, pp. 309-317.
- Qinghai sheng Wenwu Guanli chu 青海省文物管理处 (Administration of Cultural Relics of Qinghai Province), Hainan zhou Minzu Bowuguan 海南州民族博物馆 (Hainan Museum of Nationalities), “Qinghai Tongde xian Zongri yizhi fajue jianbao 青海同德县宗日遗址发掘简报” (Excavation of Zongri site in Tongde County, Qinghai Province), in *Kaogu* 考古 (Archaeology), 1998.5, pp. 1-35.
- RAVICH G. Irina, RYNDINA V. Natalia, “Early copper-arsenic alloys and the problems of their use in the Bronze Age of the North Caucasus”, in *Bulletin of the Metals Museum*, 1995, no. 23, pp. 1-18.
- RENFREW A. Colin, “The autonomy of the south-east European Copper Age”, in *Proceedings of the Prehistoric Society*, 1969, vol. 35, pp. 12-47.
- RENFREW A. Colin, *Before civilisation: the radiocarbon revolution and prehistoric Europe*, London: Jonathan Cape, 1973.
- RENFREW A. Colin, “Space, time and polity”, in ROWLANDS J. Michael, FRIEDMAN Jonathan (eds.), *The evolution of social systems, proceedings of a meeting of the Research Seminar in Archaeology and Related Subjects held at the Institute of Archaeology, London University*, London: Duckworth, 1977, pp. 89-114.
- RENFREW A. Colin, “Models of change in language and archaeology”, in *Transactions of the Philological Society*, 1989, vol. 87 no. 2, pp. 103-155.
- RENFREW A. Colin, “Archaeogenetics: towards a population prehistory of Europe”, in RENFREW A. Colin, BOYLE Katie (eds.) *Archaeogenetics: DNA and the population prehistory of Europe*, Cambridge: McDonald Institute for Archaeological Research, 2000, pp. 3-11.
- REXITI Ahemanti 阿合曼提 热西提, “Qiemoxian Zahongluke mudi fajue gaikuang 且末县扎洪鲁克墓地发掘概况” (Excavation of the Zagunluke cemetery in Qiemo County), in MU Shunying 穆舜英, ZHANG Ping 张平, *Loulan wenhua yanjiu lunji* 楼兰文化研究论集 (Collection of Loulan Culture Research), Urumqi: Xinjiang Renmin chubanshe, 1995, chapter 12.
- ROBERTS W. Benjamin, THORTON P. Christopher, PIGOTT C. Vincent, “Development of

- metallurgy in Eurasia”, in *Antiquity*, 2009, vol. 83, no. 322, pp. 1012-1022.
- ROBERTS W. Benjamin, VANDER LINDEN Marc, “What is an archaeological culture? Approaching cultural transmission and variation”, Presentation of the session at the 13th. European Association of Archaeologists meeting in Zadar, Croatia on 18–23 September 2007.
- ROBERTS W. Benjamin, VANDER LINDEN Marc, *Investigating Archaeological Cultures: Material Culture, Variability, and Transmission*, London: Springer Science & Business Media, 2011.
- RODERICK Whitfield, “Keriya, mémoires d'un fleuve. Archéologie et civilisation des oasis du Taklamakan. Mission archéologique franco-chinoise au Xinjiang. Sous la direction de C. Debaine-Francfort et A. Idriss” (Keriya, memories of a river. Archaeology and civilization of the Taklamakan oases. Franco-Chinese archaeological mission in Xinjiang under the direction of C. Debaine-Frankfurt and A. Idriss), in *Arts Asiatiques* (Asian Art), 2002, vol. 57, pp. 232-234.
- ROSEN A. Steven, “The decline and fall of flint,”, in George H. ODELL (ed.), *Stone Tools: Theoretical Insights Into Human Prehistory*, New York and London: Plenum, 1996, pp. 129-178
- ROUSE M. Lynne, CERASETTI Barbara, “Ojakly: a late Bronze Age mobile pastoralist site in the Murghab Region, Turkmenistan”, in *Journal of Field Archaeology*, 2014, no. 39, pp. 32-50.
- RUAN Qiurong, 阮秋荣, “Nileke xian Jilintai yicun fajue de yiyi 尼勒克县吉林台遗存发掘的意义” (The importance of the ancient remains excavated at Jiintai, Nileke County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2004.1, pp. 80-82.
- SAGDULLAYEV S. Anatoly САГДУЛЛАЕВ С. Анатолий, “Drevnezemledel’cheskie poselenija predgorij Bajsuntau Древнеземледельческие поселения предгорий Байсунтау” (Ancient agricultural settlements in the foothills of Baysuntau), in OBELCHENKO Oleg Vladimirovich, ОБЕЛЬЧЕНКО В. Олег, OVEZOV Gian Mamed ОБЕЗОВ Джан Мамед (eds.), *Istorija i arkeologija Srednej Azii* История и археология Средней Азии (History and archeology of Central Asia), Ashkhabad: Ylym, 1978, pp. 30-36.
- SAGDULLAYEV S. Anatoly САГДУЛЛАЕВ С. Анатолий, *Usad’by drevnej Baktrii* Усадьбы древней Бактрии (Settlements in ancient Bactria), Tashkent: FAN, 1987.
- SAID W. Edward, *Orientalism*, London: Penguin, 1995.
- SAL’NIKOV V. Konstantin, САЛЬНИКОВ В. Константин, *Oчерki drevney istorii Yuzhnogo Urala* Очерки древней истории Южного Урала (Essays on the ancient history of Southern Urals), Moscow: Nauka Press, 1967.
- SAMOLIN William, “Ethnographic aspects of the archaeology of the Tarim Basin”, in *Central Asiatic Journal*, 1958, vol. 4, pp. 45-67.
- SARIANIDI I. Viktor, “Le complexe cultuel de Togolok 21 en Margiane” (The Togolok complex no. 21 in Margiana), in *Arts Asiatiques* (Asian Art), 1986, no. 41, pp. 5-21.

- SARIANIDI I. Viktor, *Margiana and proto-zoroastrianism*, Athens: Kapon Editions, 1998.
- SARIANIDI I. Viktor, *Necropolis of Gonur*, Athens: Kapon, 2007.
- SCHMANDT-BESSERAT Denise, “A Stone metaphor of creation”, in *Near Eastern Archaeology*, 1998, vol. 61, no. 2, pp. 109-117.
- SCHULTZ Michael, SCHMIDT-SCHULTZ Tyede, WU Xinhua, “Ergebnisse der paläopathologisch anthropologischen Untersuchung der menschlichen Skelettfunde aus dem Grab 26 von Liushui, Xinjiang (China)” (Results of the paleopathological study of human skeletal finds from tomb no. 26 at Liushui, Xinjiang), in *Eurasia Antiqua*, 2007, no. 13, pp. 181-197.
- SEMENOV A. Sergey СЕМЕНОВ А. Сергей, SHIRINOV Temir ШИРИНОВ Темир, “Kamennye serpy Chustkoï kul'tury Каменные серпы Чустской культуры” (Stone sickles of the Chust culture), in *ONUZ-Obshchestvennyye nauki v Uzbekistane ОНУЗ-Общественные науки в Узбекистане (ONUZ- Social Science in Uzbekistan)*, 1976, no. 10, pp. 73-76.
- SEMENOV A. Vladimir СЕМЁНОВ А. Владимир, “Drevneyshaya migratsiya Indoevropейtsev na vostok (k stoletiyu otkrytiya tokharskikh rukopisey) Древнейшая миграция Индоевропейцев на восток” (к столетию открытия тохарских рукописей) (The oldest migration of Indo-Europeans to the east [centenary of the discovery of Tocharian manuscripts]), in *Peterburgskiy arkheologicheskiiy vestnik Петербургский Археологический Вестник (Petersburg Archaeological Bulletin)*, 1993, no. 8, pp. 25-31.
- SEONG Yeong Bae, OWEN A. Lewis, YI Chaolu, FINKEL C. Robert, “Quaternary glaciation of Muztag Ata and Kongur Shan: evidence for glacier response to rapid climate changes throughout the Late Glacial and Holocene in westernmost Tibet”, in *Geological Society of America Bulletin*, 2009, no. 121, pp. 348-365.
- SERRES Jean-Pierre, “Les statues-menhirs du groupe Rouergat” (The statues-menhirs of the Rouergat group), in D'ANNIE Philippon (ed.), *Découvrez Statues-menhirs - Des énigmes de pierre venues du fond des âges le livre de Annie Philippon sur decitre (Discovering the Statues-menhirs - Stone enigma from the depths of the ages, Annie Philippon's book)*, Rodez: Éditions du Rouergue, 2002.
- SHAFFER G. Jim, TAPHAR Bal Kristen, “Food-producing communities in Pakistan and Northern India”, in DANI H. Ahmad, MASSON M. Vadim (eds.), *History of civilizations of Central Asia vol. 1. The dawn of civilization: earliest times to 700 B.C.*, Paris: Unesco, 1992, pp. 123-147.
- SHAN Yongming 单永明, “Zhuisu qiannian – yushi zhi lu 追溯千年 – 玉石之路” (Thousands years ago: the Jade Road), in *Zhongguo Baoyushi 中国宝玉石 (Chinese Gems and Jades)*, 2011.3, p. 156-157.
- Shanxi Working Team, “The first discovery of a copper artefact at Taosi, Xiangfen, Shanxi” in LINDUFF M. Katheryn, HAN Rubin, SUN Shuyun (eds.), *The Beginnings of Metallurgy in China*, Lewiston, Queenston and Lampeter: Edwin Mellen Press, 2000, pp. 201-208.

- SHAO Huiqiu 邵会秋, "Xinjiang Zagunluke wenhua chulun 新疆扎滚鲁克文化初论" (Preliminary discussion on the Zagunluke culture in Xinjiang", in *Bianjiang kaogu yanjiu* 边疆考古研究 (Archaeological Research on the Frontiers), 2008.7, pp. 170-183.
- SHAO Huiqiu 邵会秋, "Xinjiang diqu Andeluo nuowo wenhua xiangguan yicun tanxi 新疆地区安德罗诺沃文化相关遗存探析" (Discussion on the Andronovo culture in Xinjiang and related remains), in *Bianjiang kaogu yanjiu* 边疆考古研究 (Archaeological Research on the Frontiers), 2009.2, pp. 81-97.
- SHAO Huiqiu 邵会秋, "Shilun Xinjiang Aletai diqu de liang lei qingtong wenhua 试论新疆阿勒泰地区的两类青铜文化" (Discussion on the two Bronze Age cultures on the Altay, Xinjiang), in XIA (ed.), *Xinjiang Aletai diqu kaogu yu lishi wenji* 新疆阿勒泰考古与历史文集 (Collection of archaeological and historical works on the Altai region in Xinjiang), Beijing: Wenwu chubanshe, 2015, pp. 267-273.
- SHELACH Gideon, "The earliest Neolithic cultures of North-east China: recent discoveries and new perspectives on the beginning of agriculture", in *Journal of World Prehistory*, 2000, vol. 14, no. 4, pp. 363-416.
- SHELACH Gideon, *Prehistoric Societies on the Northern Frontiers of China: Archaeological Perspectives on Identity Formation and Economic Change During the First Millennium BCE*, London and New York: Routledge, 2000.
- SHISHLINA I. Natalia, "Decoration of skulls: funerary rituals of the Yamnaya and Catacomb cultures in the Eurasian Bronze Age", in BONOGOFSKY Michelle (ed.), *Skull Collection, Modification and Decoration*, Oxford: Archaeopress, 2006, pp. 59-66.
- SHISHLINA I. Natalia, *Reconstruction of the Bronze Age of the Caspian Steppes - Life styles and life ways of pastoral nomads*. BAR International Series 1876, Oxford: Archaeopress, 2008.
- SHUI Tao 水涛, "Xinjiang qingtong shidai zhu wenhua de bijiao yanjiu 新疆青铜时代诸文化的比较研究" (A comparative study of the Bronze Age cultures in Xinjiang), in *Guoxue Yanjiu* 国学研究 (Studies in Sinology), 1993.1, pp. 447-490.
- SHUI Tao, "On the relationship between the Tarim and Fergana Basins", in MAIR H. Victor (ed.), *The Bronze Age and the Iron Age peoples of Eastern Central Asia, vol. 1*, Washington: Institute for the Study of Man, 1998, pp. 162-168.
- SILVI-TONINI Chiara, BAJPAKOV M. Karl, *Altyn Adam, l'uomo d'oro: la cultura delle steppe del Kazakhstan dall'Età del Bronzo alle grandi migrazioni* (Altyn Adam, the golden man: the Kazakhstan steppe culture from the Bronze Age to the great migrations), Rome: Bagatto, 1999.
- SINOR Denis, *Cambridge history of early Inner Asia*, Cambridge: Cambridge University Press, 1990.
- SINOR Denis, *Inner Asia, history-civilization-languages: a syllabus*, Bloomington: Indiana University Press, 1987.

- SO F. Jenny, BUNKER C. Emma, *Traders and riders on China's Northern frontier*, Seattle and London: Smithsonian Institution in association with the University of Washington Press, 1995.
- SOFFER Olga, ADAVASIO M. James, ILLINGWORTH S. Jeff, AMIRKHANOV A. Hizri, PRASLOV D. Nikolai, STREET Martin, "Palaeolithic perishables made permanent", in *Antiquity*, 2000, vol. 74, no. 286, pp. 812-821.
- SOKOLOVA A. Lyudmila, "Okunev cultural tradition in the stratigraphic aspect", in *Archaeology, Ethnology and Anthropology of Eurasia*, 2007, vol. 2, no. 30, pp. 41-51.
- SOKOLOVA A. Lyudmila, "The Southern Migration of the Sayan archaeological complex", in *Journal of Indo-European Studies*, 2012, vol. 40, nos. 3-4, pp. 438-447.
- SONG Xinchao 宋新潮, "Zhongguo zaoqi tongjing jiqi xiangguan wenti 中国早期铜镜及其相关问题" (Ancient mirrors in China and related questions), in *Kaogu Xuebao 考古学报 (Acta Archaeologica Sinica)*, 1997.2, pp. 147-169.
- SPENGLER Robert, FRANCHETTI D. Michael, DOUMANI Paula, ROUSE Lynne, CESARETTI Barbara, BULLION Elissa, MAR'YASHEV Alexei, "Early agriculture and crop transmission among Bronze Age mobile pastoralists of Central Eurasia", in *Proceedings of the Royal Society Biological Sciences*, 2014, no. 281, pp. 1-7.
- STEIN A. Marc, *Innermost Asia: detailed report of explorations in Central Asia, Kansu and Eastern Iran*, 5 vols., Oxford, Clarendon Press. Reprint: New Delhi: Cosmo Publications, 1981.
- SU Bingqi 苏秉琦, "Guanyu Yangshao wenhua de ruogan wenti 关于仰韶文化的若干问题" (Some problems concerning the Yangshao culture), in *Kaogu xuebao 考古学报 (Acta Archaeologica Sinica)*, 1965.1, pp. 51-82.
- SULIMIRSKI Tadeusz, *Prehistoric Russia*, London: John Baker Humanities Press, 1970.
- SULIMIRSKI Tadeusz, "Scythian antiquities in Western Asia", in *Artibus Asiae*, 1954, vol. 17, nos. 3-4, pp. 282-318.
- SUN Shuyun 孙叔云, "Donghuishan yizhi Siba wenhua tongqi de jiandin ji yanjiu 东灰山遗址四坝文化铜器的鉴定及研究" (Examinations and study of copper objects from the Siba site of Donghuishan), in Gansu sheng Kaogu Yanjiusuo 甘肃省考古研究所 (Gansu Institute of Cultural Relics and Archaeology), Jilin Daxue Beifang Kaogu Yanjiu Shi 吉林大学北方考古研究室 (Research Office of Northern Archaeology of the Jilin University) (eds.), *Minle Donghuishan kaogu - Siba wenhua mudi de jieshi yu yanjiu 民乐东灰山考古-四坝文化墓地的揭示与研究 (Archaeology at Dounghuishan, Minle – Excavation and study on the Siba culture's cemetery)*, Beijing: Kexue chubanshe, 1998, pp. 191-195.
- SUN Shuyun 孙叔云, HAN Rubin 韩汝玢, "Gansu zaoqi de faxian yu yelian zhizao jishu de yanjiu 甘肃早期的发现与冶炼制造技术的研究" (Discovery of early copper and bronze artefacts in

Gansu and studies on their smelting and manufacturing techniques), in *Wenwu* 文物 (Cultural Relics), 1997.7, pp. 75-84.

SUN Xiangjun 孙湘君, DU Naiqiu 杜乃秋, WENG Chengyu 翁成郁, LIN Ruifen 林瑞芬, WEI Keqin 卫克勤, “Xinjiang Manasi hu pen zhouwei jin 14000 nian yilai de gu zhibei gu huanjing 新疆玛纳斯湖盆周围近14000年以来的古植被古环境” (Paeovegetation and paleoenvironment of Manasi Lake, Xinjiang, North-western China during the last 14000 years), in *Di Siji Yanjiu* 第四纪研究 (Quaternary Sciences), 1994.3, pp. 239-248.

SUNCHUGASHEV I. Yakov СУНЧУГАШЕВ И. Яков, *Drevneyshie rudniki i pamyatniki ranney metallurgii v Khakassko-Minusinskoj kotlovine* Древнейшие рудники и памятники ранней металлургии в Хакасско-Минусинской котловине (The oldest mines and early metallurgy in Khakassia and in the Minusinsk Basin), Moscow: Nauka, 1975.

SUNG Yaoliang, *The deified human face petroglyphs of prehistoric China*, New York: Scpg Publishing Corporation, 2015.

SUSLVOV P. Sergei, *Physical geography of Asiatic Russia* (Trans. by GERSHEVSKY D. Noah and ed. by WILLIAMS E. Joseph), San Francisco and London: W. H. Freeman and Co., 1961.

SVYATKO V. Svetlana, MURPHY Eileen, SCHULTING Rick, MALLORY Jim, “Environment, lifestyle and diet of the prehistoric populations from the Minusinsk Basin, Southern Siberia, Russia”, in MAKOHONIENKO Mirosław, MAKOWIECKI Daniel, CZERNIAWSKA Jolanta (eds.), *Eurasian Perspectives on Environmental Archaeology*, Poznan: Bogucki Wydawnictwo Naukowe, 2007, pp. 139-142.

SVYATKO V. Svetlana, SCHULTINGS J. Rick, MALLORY P. James, MURPHM Y. Eileen, REIMER J. Paula, KHARTANOVICH I. Valery, CHISTOV K. Yuri, SABLIN V. Mikhail, “Stable isotope dietary analysis of prehistoric populations from the Minusinsk Basin, Southern Siberia, Russia: A new chronological framework for the introduction of millet to the eastern Eurasian steppe”, in *Journal of Archaeological Science*, 2013, no. 40, pp. 3936-3945.

Takelamagan shamo zong kaogu dui zu 塔克拉玛干沙漠综考古队组 (Taklimakan Desert Archaeological Team), “Takelamagan nanyuan diaocha 塔克拉玛干南缘调查” (Investigation of the southern edge of Taklimakan), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1990.4, pp. 1-53.

TALALALY E. Lauren, *Deities, dolls, and devices: neolithic figurines from Franchthi Cave, Greece*, Bloomington and Indianapolis: Indiana University Press, 1993.

TAN Jingze, LI Liming, ZHANG Jianbo, FU Wenqing, GUANG Haijuan, AO Xue, WANG Ling'e, WU Xinhua, HAN Kangxin, JIN Li, LI Hui, “Cranimetrical evidence for population admixture between eastern and western Eurasians in Bronze Age South-west Xinjiang”, in *Chinese Science Bulletin*, 2013, vol. 58, no. 3, pp. 299-306.

TANG Zihua, CHEN Dongmei, WU Xinhua, MU Guijin, “Redistribution of prehistoric Tarim people in response to climate change”, in *Quaternary International*, 2013, nos. 308-309, pp. 36-41.

- TANG Zihua, MU Guijin Mu, WU Xinhua, “Little effect of environmental changes on prehistorical civilization evolution in Tarim Basin, NW China”, Poster presentation to the third Open Science Meeting: Retrospective views on our planet's future, Corvallis (USA) 8-11 July 2009.
- TANG Zihua, MU Guijin, CHEN Dongmei, “Palaeoenvironment of mid-to late Holocene loess deposit of the southern margin of the Tarim Basin, NW China”, in *Environmental Geology*, 2009, no. 58, pp. 1703-1711.
- TARASOV E. Pavel, DOROFYUK Nadezhda, METEL'TSEVA Elizaveta, “Holocene vegetation and climate changes in Hoton-Nur Basin, North-west Mongolia”, in *Boreas*, 2000, no. 29, pp. 117-126.
- THORP L. Robert, *China in the early Bronze Age: Shang civilization*, Philadelphia: University of Pennsylvania Press, 2006.
- Tianjin shi Lishi Bowuguan Kaogu Dui 天津市历史博物馆考古队 (Team of Archaeology of the Tianjin History Museum), “Tianjian Jixian Zhangjiayuan yizhi di sanci fajue 天津蓟县张家园遗址第三次发掘” (The third excavation at Zhangjiayuan site, Ji County, Tianjin), in *Kaogu* 考古 (Archaeology), 1993.4, pp. 311-324.
- TISHKIN A. Alexei, SEREGIN N. Nikolay, “Metallic mirrors from the Bronze Age sites on the upper stream of the Ob River (Western Siberia)”, in *Life Science Journal*, 2014, no. 11, pp. 63-65.
- TIURINA A. Ekaterina ТЮРИНА А. Екатерина, “Opyt izucheniya oriyentatsionnykh sistem Afanas'yevskoy kul'turno-istoricheskoy obshchnosti (Yuzhnoy Sibiri) Опыт изучения ориентационных систем Афанасьевской культурно-исторической общности (Южной Сибири)” (Research on the orientational systems of the Afanasevo cultural and historical community [Southern Siberia]), in *Teoriya i praktika arkheologicheskikh issledovaniy* Теория и практика археологических исследований (Theory and Practice of the Archaeological Research), 2008, vol. 4, pp. 124-133.
- TOLSTOV P. Sergei ТОЛСТОВ П. Сергей, *Drevniy Khorezm* Древний Хорезм (Ancient Khorezm), Moscow: Nauka, 1948.
- TOSI Maurizio, MALEK SHAHMIRZADI Sadegh, JOYENDA A. Mir, “The Bronze Age in Iran and Afghanistan”, in DANI H. Ahmad, MASSON M. Vadim (eds.), *History of civilizations of Central Asia vol. 1. The dawn of civilization: earliest times to 700 B.C.*, Paris: Unesco Publishing 1992, pp. 184-127.
- TRIGGER G. Bruce, *A history of archaeological thought*, Cambridge: Cambridge University Press, 1997.
- TRIGGER G. Bruce, *Gordon Childe revolutions in archaeology*, London: Thames and Hudson, 1980.
- TROFIMOVA A. Tatyana ТРОФИМОВА А. Татьяна, “Osnovnye itogi paleoantropologicheskogo izucheniya Sredney Azii Основные итоги и задачи палеоантропологического изучения Средней Азии (Preliminary results of paleoanthropological studies in Central Asia), in *Sovetskaya Etnografiya* Советская этнография (Soviet Ethnography), 1960, no. 2, pp. 110-

- TSALKIN I. Veniamin ЦАЛКИН И. Вениамин, “O vremeni i tsestrakh proiskhozhdeniya domashnikh zhivotnykh v svete dannyx sovremennoy arkheologii vremeni i tsentrah proiskhozhdeniya domashnikh zhivotnykh v svete dannyx sovremennoy arkheologii” (Origin and chronology of animals domestication in the light of the data of modern archaeology), in *Izvestiya Akademii nauk SSSR, Seriya geograficheskaya* Известия Академии наук СССР, Серия географическая (Proceedings of the Academy of the Sciences of the USSR, Geographic Series), 1972, no. 1, pp. 12-21.
- TYLECOTE Ronald, *A History of Metallurgy*, London: The Metals Society, 1976.
- Tulufan diqu Bowuguan 吐鲁番博物馆 (Turfan Museum), “Xinjiang Shanshan xian Subeixi yizhi ji mudi 新疆鄯善县苏贝希遗址及墓地” (Remains and cemetery at Subeixi, in Shanshan County, Xinjiang), in *Kaogu* 考古 (Archaeology), 2002.6, pp. 42-57.
- Tulufan diqu Wenwu ju 吐鲁番地区文物局 (Office for Cultural Relics of Turfan), “Xinjiang Shanshan xian Yanghai mudi fajue jianbao 新疆鄯善县墓地发掘简报” (Report on the excavation of Yanghai cemetery in Shanshan County, Xinjiang), in *Kaogu Xuebao* 考古学报 (Acta Archeologia Sinica), 2011.11, pp. 99-166.
- Tulufan diqu Wenguansuo 吐鲁番地区文管所 (Turfan Institute of Cultural Relics), “Xinjiang Shanshan Subashi gu muzang 新疆鄯善苏巴什古墓葬” (The cemetery of Subashi in Shanshan, Xinjiang), in *Kaogu* 考古 (Archaeology), 1984.1, pp. 41-50.
- Tulufan diqu Wenguansuo 吐鲁番地区文管所 (Turfan Institute of Cultural Relics), “Xinjiang Shanshan Subashi gumuqun de xin faxian 新疆鄯善苏巴什古墓群的新发现” (The new discovery of a group of graves in Subashi, Shanshan, Xinjiang), in *Kaogu* 考古 (Archaeology), 1988.6, pp. 502-506.
- TYLECOTE Ronald, *A history of metallurgy*, London: The Metals Society, 1976.
- UMERENKOVA V. Olga УМЕРЕНКОВА В. Ольга, “Syemnyye ukrasheniya epokhi bronzy Zapadnoy Sibiri Съемные украшения эпохи бронзы Западной Сибири” (Detachable decorations in Western Siberian Bronze Age), in *Vestnik Kemerovskogo gosudarstvennogo universiteta* Вестник Кемеровского государственного университета (Bulletin of the Kemerovo State University), 2015, vol. 6, no. 2, pp. 156-166.
- VASIL'EV A. Sergey, SEMENOV A. Vladimir, “Prehistory of the Upper Yenisei Area (Southern Siberia)”, in *Journal of World Prehistory*, 1993, vol. 7, no. 2, pp. 213-242.
- VIDALE Massimo, “Di oro e di spazio, alla ricerca delle relazioni di produzione nel mutare delle oreficerie sciite” (Gold and space, searching for relations in gold production by the Scythian goldsmith's), in BONORA Gian Luca, MARZATICO Franco (eds.), *Ori dei cavalieri delle steppe, Collezioni dei musei dell'Ukraina* (Gold of the steppe riders, collections of the Ukrainian museums), Milan: Silvana Editore, 2007, p. 254-271.

- VIDEIKO Y. Mihailo, “Cemeteries of the Soviefka type. Field research, state of publication of sources and general position in the systematics of the Tripolye culture”, in *Baltic Pontic studies*, 1995, vol. 3, pp. 3-14.
- VINOGRADOVA M. Nataliya ВИНОГРАДОВА М. Наталья, “Issledovaniya kontaktov zemledel'cheskogo i stepnogo naseleniya na yuge Sredney Azii (Yuzhnyy Tadzhikistan) v epokhu pozdney bronzy” (Studies on the interactions between the agricultural and steppe populations in the south of Central Asia [Southern Tajikistan] in the Late Bronze Age, in Valery Sergeevich Olkhovsky), in ODKHOVSKY S. Valery ОЛЬХОВСКИЙ С. Валерий (ed.), *Paleoekologiya i paleodemografiya Yevrazii* палеоэкология и палеодемография Евразии (Paleoecology and paleodemography of Eurasia), Moscow: GEOS, 2000, pp. 89-109.
- VINOGRADOVA M. Natalya ВИНОГРАДОВА М. Наталья, KUZ'MINA E. Elena КУЗМИНА Е. Елена, “Kontakty stepnykh i zemledel'cheskikh plemen Sredney Azii v epokhu bronzy Kontakty степных и земледельческих племен Средней Азии в эпоху бронзы” (Contacts between the steppe and the agricultural tribes in Central Asia during the Bronze Age), in *Vostochnyy Turkestan i Srednyaya Aziya v sisteme kul'tur Drevnego i Srednevekovogo Vostoka* Восточный Туркестан и Средняя Азия в системе культур Древнего и Средневекового Востока (East Turkestan and Central Asia in the system of cultures of the ancient and Medieval East), Moscow: Nauka, 1986, pp. 126-151.
- VISHNEVSKAYA A. Olga ВИШНЕВСКАЯ А. Олга, “Tsentral'nii Kazakhstan Центральный Казахстан” (Central Kazakhstan), in MOSHKOVA G. Marina МОШКОВА Г. Марина (ed.), *Stepi Aziatskoichasti S.S.S.R. Skifo-Sarmatskoe Vremya* Степная полоса Азиатской части СССР в скифо-сарматское время (Steppes of the Asian Part of the USSR in Scytho-Sarmatian Times), Moscow: Archaeology of the USSR, 1992, pp. 130-139.
- VOLKOV V. Vitali, “Early nomads of Mongolia”, in DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY T. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, New Haven and Conn: Zinat Press, 1995, pp. 319-334.
- VON FALKENHAUSEN Lothar, *Suspended Music: Chime-Bells in the Culture of Bronze Age China*, Berkeley and Los Angeles: University of California Press, 1993.
- VON LE COQ Albert, *Auf Hellas Spuren in Ostturkistan. Berichte und Abhandlungen der II und III Deutschen Turfan-Expedition* (On Hell's tracks in East Turkestan. Reports and essays of the II and III German Turfan Expedition), Leipzig: Verlag der J. C. Hinrichs'schen Buchhandlung, 1926.
- WAGNER Mayke, WU Xinhua, TARASOV Pavel, AISHA Ailijiang, RAMSEY B. Christopher, SCHULTZ Michael, SCHMIDT-SCHULTZ Tyede, GRESKY Julia, “Radiocarbon-dated archaeological record of early first millennium B.C. mounted pastoralists in the Kunlun Mountains, China”, in *PNAS*, 2011, vol. 108, no. 38, pp. 15733-15738.
- WANG Binghua 王炳华, “Gumugou ren shehui wenhua shenghuo zhong ji ge wenti 古墓沟人社会文化生活中几个问题” (Questions on the social life of the early Gumugou community), in *Xinjiang Daxue Xuebao* 新疆大学学报 (Journal of Xinjiang University), 1983.2, pp. 86-90. (a)

- WANG Binghua 王炳华, “Kongque he Gumugou fajue ji qi chubu yanjiu 孔雀河古墓沟发掘及其初步研究” (Discovery and preliminary research on the Gumugou site on the Kongque River), in *Xinjiang Shehui Kexue* 新疆社会科学 (Xinjiang Social Sciences), 1983.1, pp. 117-130. (b)
- WANG Binghua 王炳华, “Xinjiang diqu qingtong shidai kaogu wenhua shixi 新疆地区青铜时代考古文化试析” (A preliminary analysis of the archaeological cultures of the Bronze Age in the region of Xinjiang), in *Xinjiang shehui kexue* 新疆社会科学 (Xinjiang Social Studies), 1985.4, pp. 50-61. (a)
- WANG Binghua 王炳华, “Gudai Xinjiang Sairen lishi gouchen 古代新疆塞人历史钩沉” (An historical investigation on the Saka people in ancient Xinjiang), in *Xinjiang Shehui Kexue* 新疆社会科学 (Xinjiang Social Science), 1985.1, pp. 48-58. (b)
- WANG Binghua 王炳华, “Xiaohe kaocha duanxiang 小河考察断想” (Some thoughts on Xiaohe), in *Xiyu Yanjiu* 西域研究 (Western Regions Studies), 2002.2, pp. 50-56.
- WANG Binghua 王炳华, XIAO Xiaoyong 肖小勇, LIU Wensuo 刘文锁, LIU Yusheng 刘玉生, “A'erjin shan xi shiqi 哈斯也提, 阿尔金山细石器” (Microliths at the A'erjin Mountains), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1990.4, pp. 14-19.
- WANG Bo 王博, “Kashen xibu sanhe liuyu gudai yizhi caiji taoqi leixingxue de yanjiu 喀什西部三河流域遗址采集陶器类型学的研究” (Typological study on pottery found along the Three Rivers in the western Kashgar region), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1994.2, pp. 48-59.
- WANG Bo 王博, “Wupa'er xishi qi yizhi diaocha baogao 乌帕尔细石器遗址调查报告” (Investigation report on the remains at Wupa'er), in XIA (ed.), *Xinjiang wenwu kaogu xin shouhuo (1979-1989)* 新疆文物考古新收获 (1979-1989) (New achievements in the cultural relics and archaeological research [1979-1989]), Urumqi: Xinjiang Renmin chubanshe, 1995, pp. 27-40.
- WANG Bo 王博, “Qiemu'erqieke wenhua chutan 切木尔切克文化初探”, in Xibei Daxue Wenbo Xueyuan 西北大学文博学院 (College of Arts and Sciences, Northwest University) (ed.), *Kaogu wenwu yanjiu: jinian Xibei Daxue kaogu zhuan ye chengli shisi zhounian (1956-1996)* 考古文研究: 纪念西北大学考古专业成立十四周年 (1956-1996) (Archaeological Research: Commemoration of the 40th Anniversary of the establishment of the Archaeology courses in Northwest University [1956- 1996]) Xi'an: Santai chubanshe, 1996, pp. 274-285.
- WANG Bo 王博, CHENG Zhengguo 成振国, “Xinjiang Gongliu xian chutu yipi tongqi 新疆巩留县出土一批同期” (A group of bronzes unearthed from Gongliu County, Xinjiang), in *Wenwu* 文物 (Cultural Relics), 1989.8, pp. 95-96.
- WANG Bo 王博, WU Dongjun 乌东军, ZHENG Jie 郑颀, “Aleitai gu mu chutu renlu de zhongzu renleixue yanjiu 阿勒泰古墓出土人颅的种族人类学研究” (A study of racial anthropology on the skull unearthed from the ancient tombs on the Altay), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2005.4, pp. 38-41.

- WANG Guodao 王国道, CUI Zhaonian 崔兆年, “Qinghai Kayue wenhua chutu de jinqi” 青海卡约文化出土的金器 (Gold found in the Kayue cultural sites in Qinghai), in *Gugong Bowuyuan yuankan* 故宫博物院院刊 (Journal of the National Palace Museum), 2003.5, pp. 43-48.
- WANG Mingzhe 王明哲, “Lun Ke’ermuqi wenhua he Ke’ermuqi mudi de shidai 论克尔木齐文化和克尔木齐墓地的时代” (On the chronology of the Ke’ermuqi culture and cemetery), in *Xiyu Yanjiu* 西域研究 (Western Regions Studies), 2013, 2, pp. 69-80.
- WANG Tingting, WEI Dong, CHANG Xi’en, YU Zhiyong, ZHANG Xinyu, ZHANG Changsui, HU Yaowu, FULLER T. Benjamin, “Tianshan Beilu and the isotopic millet road: reviewing the late Neolithic/Bronze Age radiation of human millet consumption from North China to Europe”, in *Natural Science Review*, 2017. Available at <https://academic.oup.com/nsr/article-lookup/doi/10.1093/nsr/nwx015>, 5-09-2017.
- WANG Yongqiang 王永强, RUAN Qiurong 阮秋荣, “2015nian Xinjiang Nileke xian Jirentaigoukou kaogu gongzuo de xin shouhuo 2015 年新疆尼勒克县吉仁台沟口考古工作的新收获” (New results of the excavations in 2015 of the Jirentaigoukou site in Nileke County, Xinjiang), in *Xiyu Yanjiu* 西域研究 (Western Regions Studies), 2016.1, pp. 132-134.
- WANG Yue, DONG Guangrun, “Sand sea history of the Taklimakan for the past 30000 years”, in *Geographiska Annaler* (Geographical Chronicles), 1994, no. 76, pp. 131-141.
- WANG Zhankui 王占奎, SHUI Tao 水涛, “Gansu Heshui Jiuzhan yizhi fajue baogao 甘肃合水九站遗址发掘报告” (Report of excavation at Jiuzhan, Heshui, Gansu), in *Kaoguxue Yanjiu* 考古学研究 (Archaeological Research), 1997.3, pp. 300-460.
- WEBER Andrzej, “The Neolithic and early Bronze Age of the Lake Baikal region: a review of recent research”, in *Journal of World Prehistory*, 1995, vol. 9, no. 1, pp. 99-165.
- WHITE Dustine, BUSH Andrew, “Holocene climate, enviromental change, and neolithic biocultural discontinuity in the Baikal region”, in WEBER Andrzej, KATZENBER M. Anne, SCHURR G. Theodore (eds.), *Prehistoric hunter-gatherers of the Baikal region, Siberia*, Philadelphia: University of Pennsylvania Press, 2010, pp. 1-26.
- WEI Dong 魏东, ZHAO Yongsheng 赵永生, CHANG Xi’en 常喜恩, ZHU Hong 朱泓, “Hami Tianshan Beilu mudi chutu lugu de celiang xingzhuang 哈密天山北路墓地出土颅骨的测量性状” (Cranimetrical variation of ancient skulls from the Hami Tianshan Beilu Cemetery), in *Renleixue Xuebao* 人类学学报 (Acta Anthropologica Sinica), 2012.4, pp. 395-406.
- WERTIME A. Teodore, “Man’s first encounters with metallurgy: man’s discovery of ores and metals helped to shape his sense of science, technology, and history”, in *Science*, 1964, no. 146, pp. 1257-1267.
- WERTIME A. Teodore, “The beginnings of metallurgy: a new look”, in *Science*, 1973, no. 182, pp. 875-887.

- WHITE C. Joyce, HAMILTON G. Elizabeth, "The transmission of early Bronze technology to Thailand: new perspectives", in *Journal of World Prehistory*, 2009, vol. 22, no. 4, pp. 357-397.
- WILLEY R. Gordon, PHILLIPS Phil, *Method and theory in American archaeology*, Chicago: University of Chicago Press, 1958.
- WU En 乌恩, *Beifang caoyuan kaoguxue wenhua yanjiu-qingtongshidai zhi zaoqi tieqi shidai* 北方草原考古学文化研究-青铜时代至早期铁器时代 (Research on archaeological cultures in the northern steppes - from the Bronze Age to the early Iron Age), Beijing: Kexue chubanshe, 2007.
- WU Guo, "From western Asia to the Tianshan Mountains: on the early iron artefacts found in Xinjiang" in MEI Jianjun, REHREN Thilo (eds.), *Metallurgy and civilisation: Eurasia and beyond*, London: Archetype, 2009, pp. 107-115.
- WU Xinhua 巫新华, "2013 nian Xinjiang Tashenku'ergan Ji'erzankale mudi de kaogu fajue 2013年新疆塔什库尔干吉尔赞喀勒墓地的考古发掘" (Archaeological excavation in 2013 of Ji'erzankale cemetery in Tashenku'ergan), in *Xiyu Yanjiu* 西域研究 (Western Regions Studies), 2014.1, pp. 124-127.
- WU Xinhua 巫新华 JIANG Aili 艾力江, "Xinjiang Yutian xian Liushui qingtong shidai mudi, 新疆于田县流水青铜时代墓地" (Bronze age cemetery at Liushui, Yutian County, Xinjiang), in *Bianjiang ji zhongwai jiaoliu yanjiu* 边疆及中外交流研究 (Research on Chinese Borderlands and their Contacts with Foreigners), 2007, available at <http://www.archaeology.net.cn/html/cn/xueshuyanjiu/yanjiuxinlun/bianjiangjizhongwai/2013/1025/33487.html> 9-08-2017.
- WU Yong 吴勇, "Xinjiang diqu zaoqi jin yin qi 试述新疆地区早期金银器" (On the early gold and silver in Xinjiang), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1999.3-4, pp. 87-98.
- WU Yong 吴勇, "Lun Xinjiang Kashen Xiabandi mudi qingtong shidai wenhua 论新疆喀什下坂地墓地青铜时代文化" (On the Bronze Age culture of Xiabandi in Kashen, Xinjiang), in *Xiyu Yanjiu* 西域研究 (Western Regions Studies), 2012.4, pp. 36-44.
- XIA, *Xinjiang gudai minzu yanjiu* 新疆古代民族研究 (Cultural relics of ancient populations in Xinjiang), Urumqi: Guojia Wenwu chubanshe, 1985.
- XIA, "Hejing xian Chawuhugou si hao mudi 1986 niandu faxian jianbao 和静县察吾乎沟四号墓地 1986年度发现简报" (Brief report of the excavation in 1986 of the cemetery IV at Chawuhugou, Hejing County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1987.1, pp. 1-9. (a)
- XIA, "Balikun Nanwan 95 hao mu shijue jianbao 巴里坤南湾墓地 95号墓试掘简报" (Preliminary report on grave M95 at the Nanwan cemetery in Balikun), in *Kaogu yu Wenwu* 考古与文物 (Archaeology and Cultural Relics), 1987.5, pp. 6-8. (b)

- XIA, “Xinjiang Xinyuan Tiemulike gumuqun 新疆新源铁木里克古墓群” (Ancient graves at Tiemulike, Xinyuan County, Xinjiang), in *Wenwu* 文物 (Cultural Relics), 1988.8, pp. 59-66.
- XIA, “Xinjiang Hami Wupu mudi 151, 152 hao muzang 新疆哈密吴堡墓地 151, 152 号墓葬” (Graves no. 151 and 152 in Wupu cemetery, Hami, Xinjiang), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1992.3, pp. 1-11.
- XIA, “Hejing xian Chawuhugou si hao mudi 1987 niandu faxian jianbao 和静县察吾乎沟四号墓地 1986 年度发现简报” (Brief report of the excavation in 1987 of the cemetery IV at Chawuhugou, Hejing County), in XIA (ed.), *Xinjiang wenwu kaogu xin shouhuo* (1979-1989) 新疆文物考古新收获 (1979-1989) (New achievements in the cultural relics and archaeological research [1979-1989]), Urumqi: Xinjiang Renmin chubanshe, 1995, pp. 275-301.
- XIA, “Tuoli xian Sazicun gumuzang 托里县萨子村古墓葬” (Ancient cemetery in Sazi village, Tuoli County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1996.2, pp. 14-22.
- XIA, “Wulumuqi Chaiwupu gu muzang fajue baogao 乌鲁木齐柴窝堡古墓葬发掘报告” (Report on the excavation of the Chaiwupo cemetery in Urumqi), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1998.1, pp. 11-31.
- XIA, “Xinjiang Chabucha’er xian Sudunbulake gu muqun 新疆察布查尔县索墩布拉克古墓群” (Ancient graves in Sudunbulake, Chabucha’er County, Xinjiang), in *Kaogu* 考古 (Archaeology), 1999.8, pp. 17-28. (a)
- XIA, *Xinjiang Chawuhu daxing shizu mudi fajue baogao* 新疆察吾乎大型氏族墓地发掘报告 (Xinjiang Chawuhu: excavation report of large clan-cemeteries) Beijing: Dongfang Press, 1999. (b)
- XIA, “Xinjiang Baichang xian Kezi’ertu’er mudi di yi ci fajue 新疆拜城县克孜尔吐尔墓地第一次发掘” (First exploration of the Kizi’ertu’er cemetery, in Baicheng County, Xinjiang), in *Kaogu* 考古 (Archaeology), 2002.6, pp. 14-29. (a)
- XIA, “Nileke xian Qiongkeke yi hao mudi kaogu fajue baogao 尼勒克县穷科克一号墓地考古发掘报告” (Excavation report of the cemetery of Qiongkeke in Nileke County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2002.3,4, pp. 51-53. (b)
- XIA, “Xinjiang Luobupo Xiaohe mudi 2003 nian fajue jianbao 新疆罗布泊小河墓地2003年发觉简报” (A brief report on the excavation of the Xiaohe Cemetery in Lop Nur in 2003), in *Wenwu* 文物 (Cultural Relics), 2007.10, pp. 4-42.
- XIA, “Xinjiang Tekesi xian Kuokesuxi er hao muqun de fajue 新疆特克斯县阔克苏西二号墓群的发掘” (Excavations of the group of graves no. 2 in the western district of Kuokesu village, Tekesi County, Xinjiang), in *Kaogu* 考古 (Archaeology), 2012.9, pp. 3-22. (a)
- XIA, “Xinjiang Yili Nileke Tangbaleisayi mudi fajue jianbao 新疆伊犁尼勒克汤巴勒萨伊墓地发掘

- 简报” (Preliminary report of the excavation in Tangbaleisayi cemetery in Nileke County, Xinjiang), in *Wenwu* 文物 (Cultural Relics), 2012.5, pp. 13-22. (b)
- XIA, *Xinjiang Xiabandi mudi* 新疆下坂地墓地 (Xabandi cemetery in Xinjiang), Beijing: Wenwu chubanshe, 2012. (c)
- XIA, *Xinjiang Sa'ensa'yi mudi* 新疆萨恩萨伊墓地 (Sa'ensa'yi cemetery in Xinjiang), Beijing: Wenwu chubanshe, 2013. (a)
- XIA, “Xinjiang Aletai diqu gu muzang fajue jianbao 新疆阿勒泰地区古墓葬发掘简报” (Preliminary report on the ancient graves in the Altay region, Xinjiang), in *Wenwu* 文物 (Cultural Relics), 2013.3, pp. 15-19. (b)
- XIA, “Xinjiang Changji Nu'erjia mudi 2012 nian fajue jianbao 新疆昌吉努尔加墓地 2012 年发觉简报” (Preliminary report of the 2012 excavations of the cemetery at Nu'erjia in Changji County, Xinjiang), in *Wenwu* 文物 (Cultural Relics), 2013.12 pp. 22-36. (c)
- XIA, “Xinjiang Habahe Dongtaleide mudi fajue jianbao 新疆哈巴河东塔勒德墓地发掘简报” (Preliminary report of the excavation of the Dongtade cemetery in Habahe County, Xinjiang), in *Wenwu* (Cultural Relics), 2013.3, pp. 4-14. (d)
- XIA (a), “Nileke xian Wutulan mudi kaogu fajue baogao 尼勒克县乌吐兰墓地发掘简报” (Excavation of the Wutulan cemetery at Nileke County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2014.1, pp. 36-57. (a)
- XIA, “Wulumuqi shi Yu'ergou yizhi yu Alagou mudi 乌鲁木齐市鱼儿沟遗址与阿拉沟目的” (Remains in Yu'ergou and graves in Alagou, Urumqi), in *Kaogu* 考古 (Archaeology), 2014.4, pp. 19-35. (b)
- XIA, “Xinjiang Habahe Tuoganbai er hao mudi fajue jianbao 新疆哈巴河托干拜 1 号墓地 发掘简报” (Preliminary report on the excavation of the Tuganbai cemetery no. 1, in Habahe County, Xinjiang), in *Wenwu* 文物 (Cultural Relics), 2014.12, pp. 18-28. (c)
- XIA, “Xinjiang Nileke Wutulan mudi fajue jianbao 新疆尼勒克乌吐兰墓地发掘简报” (Brief report of the discovery of graves in the Wutulan village, Nileke County, Xinjiang), in *Wenwu* 文物 (Cultural Relics), 2014.12, pp. 50-64. (d)
- XIA, “Nileke xian Qialege'er yizhi kaogu fajue jianbao 尼勒克县恰勒格尔遗址考古发掘简报” (Excavation of Qialege'er site at Nileke County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2014.1, pp. 32-35. (e)
- XIA, *Xinjiang Aletai diqu Kaogu yu Lishi Wenji* 新疆阿勒泰考古与历史文集 (Collection of archaeological and historical works on the Altay region, Xinjiang), Beijing: Wenwu chubanshe, 2015. (a)

- XIA, “Bu’erjin Shankou dianzhan mudi kaogu faxian jianbao 布尔津山口电站墓地发现简报” (Preliminary report of the excavation of the Shankou dianzhan cemetery in Bu’erjin), in XIA, *Xinjiang Aletai diqu kaogu yu lishi wenji* 新疆阿勒泰考古与历史文集 (Collection of archaeological and historical works on the Altay region in Xinjiang), Beijing: Wenwu chubanshe, 2015, pp. 138-151. (b)
- XIA, “Bu’erjin xian Kanasixia hukou Tuwaxin cun gu mudifaxian jianbao 布尔津县喀纳斯下湖口图瓦新村古墓地发现简报” (Preliminary report of the excavation of the ancient cemetery at the Tuwaxin village, on the Kanasixia Lake, Bu’erjin County), in XIA, *Xinjiang Aletai diqu kaogu yu lishi wenji* 新疆阿勒泰考古与历史文集 (Collection of archaeological and historical works on the Altay region in Xinjiang), Beijing: Wenwu chubanshe, 2015, pp. 198-215. (c)
- XIA, “Fuyun xian Sawudiege’er mudi kaogu faxian jianbao 富蕴县萨乌迭戈尔墓地发现简报” (Preliminary report of the excavation of the Sawudiege’er cemetery in Fuyun County), in XIA, *Xinjiang Aletai diqu kaogu yu lishi wenji* 新疆阿勒泰考古与历史文集 (Collection of archaeological and historical works on the Altay region in Xinjiang), Beijing: Wenwu chubanshe, 2015, pp. 48-60. (d)
- XIA, “Fuyun xian Suke’erte mudi kaogu faxian jianbao 富蕴县塑柯尔特墓地发现简报” (Preliminary report of the excavation of the Suke’erte cemetery in Fuyun County), in XIA, *Xinjiang Aletai diqu kaogu yu lishi wenji* 新疆阿勒泰考古与历史文集 (Collection of archaeological and historical works on the Altay region in Xinjiang), Beijing: Wenwu chubanshe, 2015, pp. 61-106. (e)
- XIA, “Xinjiang Changji Huizu zizhizhou kaogu diaocha yu faxian 新疆昌吉回族自治州考古调查与发现” (Archaeological investigations and discoveries in the Hui Autonomous Prefecture of Changji), Beijing: Wenwu chubanshe, 2015. (f)
- XIA, “Tacheng shi Abudula Shuikun mudi kaogu fajue jianbao 塔城市阿布都拉水库墓地考古发掘简报” (Excavation of the Abudula Reservoir cemeteries, Tacheng City), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2016.1, pp. 50-60.
- XIA, Hami diqu Wenwu Guanlisuo 哈密地区文物管理所 (Cultural Relics Management Office of the Hami District), “Xinjiang Hami shi Aisikexia’er mudi de fajue 新疆哈密市艾斯克霞尔墓地的发掘” (The discovery of the Aisikexia’er cemetery in Hami City, Xinjiang), in *Kaogu* 考古 (Archaeology), 2002.6, pp. 30-41.
- XIA, Hejing xian Bowuguan 和静县博物馆 (Hejing Museum), “Xinjiang Hejing xian Chawuhu yihao mudi 新疆和静县察吾乎一号墓地” (Cemetery no. 1 at Chawuhugou, Hejing County, Xinjiang), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1992.4, pp. 11-64;
- XIA, Shehezi Bowuguan 石河子博物馆 (Shihezi Museum), “Shihezi shi gumu 石河子市古墓” (Ancient tombs in Shihezi City), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1994.4, pp. 12-20.
- XIA, Tulufan diqu Wenwu ju 吐鲁番地区文物局 (Turfan Regional Cultural Relics Bureau), “Xinjiang

dou Shanshanxian yanghai mudi de kaogu xin shouhuo” 新疆都鄯善县洋海墓地的考古新收获 (New results of the archeological survey in Yanghai cemetery, Shanshan County, Xinjiang), in *Kaogu* 考古 (Archaeology), 2004.5, pp. 3-7.

XIA, Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archaeology, Xinjiang Academy of Social Science), “Xinjiang Ke’ermuqi gumuqun faxian 新疆克尔木齐古墓群发掘简报” (Preliminary report of the excavation of the Ke’ermuqi cemetery), in *Wenwu* 文物 (Cultural Relics), 1981.1, pp. 23-32.

XIANG Chunsong 项春松, LI Yi 李义, “Ningcheng Xiaoheishigou shiguomu diaocha qingli jianbao 宁城小黑石沟石椁墓调查清理报告” (Excavation of a stone-chambered tomb at Xiaoheishigou, Ningcheng, Inner Mongolia), in *Wenwu* 文物 (Cultural Relics), 1995.5, pp. 4-25.

Xinjiang Bowuguan Kaogubu 新疆博物馆考古部 (Department of Archaeology of the Xinjiang Museum), “Qiemo Zhagunluke er hao mudi fajue jianbao 且末扎滚鲁克二号墓地发掘简报” (Preliminary report of the excavation of the no. 2 cemetery in Zahongluke, Qiemo county), *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2002.1-2, pp. 1-21.

Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), *Xinjiang Kaogu Sanshi Nian* 新疆考古三十年 (Thirty Years of Archaeological Research in Xinjiang), Urumqi: Xinjiang Renmin chubanshe, 1983.

Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), “Pami’er gaoyuan gumu 帕米尔高原古墓” (Ancient tombs on the Pamir plateau), in *Kaogu Xuebao* 考古学报 (Acta Archeologica Sinica), 1981.1, pp. 199-228.

Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo 新疆社会科学院考古研究所 (Institute of Archeology, Xinjiang Academy of Social Sciences), “Tashenku’ergan xian Ji’erzankale mudi kaogu fajue jianbao 塔什库尔干县吉尔赞喀勒墓地考古发掘简报” (Brief report on the archaeological excavation of Ji’erzankale cemetery in Tashenku’ergan County), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2014.1, pp. 4-31.

Xinjiang Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Archaeological Team, Institute of Archaeology, Chinese Academy of Social Science), “Xinjiang Yutian xian Liushui qingtong shidai mudi 新疆于田县流水青铜时代墓” (Bronze Age cemetery at Liushui, Yutian County, Xinjiang), in *Kaogu* 考古 (Archaeology), 2006.7, pp. 31-40.

Xinjiang Weiwu’er Zizhiqu Bowuguan, 新疆维吾尔自治区博物馆 (Museum of the Xinjiang Uyghur Autonomous Region), *Xinjiang wenwu guji daguan* 新疆文物大观 (A grand view of Xinjiangs cultural relics and historic sites), Urumqi: Meishu Shenying chubanshe, 1999.

Xinjiang Weiwu’er Zizhiqu Bowuguan, 新疆维吾尔自治区博物馆 (Museum of the Xinjiang Uyghur

Autonomous Region), Bayingeleng Menggu Zizhizhou Wenguansuo 巴音格楞蒙古自治州文管所 (Institute of Cultural Relics of the Bayingolin Mongol Autonomous Prefecture), “Xinjiang Qiemo Zagunluke yi hao mudi fajue baogao 新疆且末扎滚鲁克一号墓地发掘报告” (Report of the excavation of the no. 1 cemetery in Zagunluke village, Qiemo County, Xinjiang), in *Kaogu Xuebao* 考古学报 (Acta Archaeologica Sinica), 2003, no. 1, pp. 89-136.

Xinjiang Weiwu'er Zizhiqu Bowuguan, 新疆维吾尔自治区博物馆 (Museum of the Xinjiang Uyghur Autonomous Region), Akesu diqu Wenguansuo 阿克苏地区文管所 (Akesu Region Office), Wensu Wenhuasuo 温宿县文化馆 (Wensu Cultural Center), “Wensu xian Bozidong muzang qun de diaocha he fajue 温宿县包孜东墓葬群的调查和发掘” (Investigation and discovery of a group of graves in Baozidong, Wensu County), in XIA (ed.), *Xinjiang Wenwu Kaogu Xin Shouhuo (1979-1989)* 新疆文物考古新收获 (1979-1989) (New achievements in the cultural relics and archaeological research [1979-1989]), Urumqi: Xinjiang Renmin chubanshe, 1995, pp. 510-526.

Xinjiang Weiwu'er Zizhiqu Bowuguan Kaogu Dui 新疆维吾尔自治区博物馆考古队 (Archaeological Team of the Xinjiang Uyghur Autonomous Region Museum), “Xinjiang Shufu xian Aketala deng xinshiqi shidai yizhi de diaocha 新疆疏附县阿克塔拉等新石器时代遗址的调查” (Investigation on the Neolithic remains in the Aketala and other villages in Shufu County), in *Kaogu* 考古 (Archaeology), 1977.2, pp. 107-110.

Xinjiang Weiwu'er Zizhiqu Wenguanhui 新疆维吾尔自治区文管会 (Cultural Relics Office Xinjiang Autonomous Region), “Xinjiang Mulei xian Sidaogou yizhi 新疆木垒县四道沟遗址” (The Sidaogou site in Mulei county Xinjiang), in *Kaogu* 考古 (Archaeology), 1982.2, pp. 113-120.

Xinjiang Weiwu'er Zizhiqu Wenhuating Wenwu chu 新疆维吾尔自治区文化厅文物处 (Xinjiang Uygur Autonomous Region Department of Cultural Relics Office), Xinjiang Daxue Lishixi Wenbo yu bu Zhuanxiu ban 新疆大学历史系文博于部专修班 (Department of History, Xinjiang University), “Xinjiang Hami Yanbulake mudi 新疆哈密焉不拉克墓地” (The Yanbulake cemetery in Hami, Xinjiang), in *Kaogu Xuebao* 考古学报 (Acta Archeologica Sinica), 1989.3, pp. 329-362.

Xinjiang Weiwu'er Zizhiqu 新疆维吾尔自治区 (Xinjiang Uygur Autonomous Region), Beijing Ziran Bowuguan 北京自然博物馆 (Beijing Natural History Museum), Xinjiang Weiwu'er Zizhiqu Dizhi ju Cehui Dadui Lianhe Kaocha Dui 新疆维吾尔自治区地质局测绘大队联合考察队 (Xinjiang Uygur Autonomous Region Geological Bureau for Surveying and Mapping Joint Investigation Team), “Tashenku'ergan xian Jirigalei jiu shiqi shidai yizhi diaocha 塔什库尔干县吉日尕勒旧石器时代遗址调查” (Investigation of the Paleolithic site of Jirigalei in the Tashkurgan County), in XIA (ed.), *Xinjiang Wenwu Kaogu Xin Shouhuo (1979-1989)* 新疆文物考古新收获 (1979-1989) (New achievements in the cultural relics and archaeological research [1979-1989]), Urumqi: Xinjiang Renmin chubanshe, 1995, pp. 1-3.

- Xinjiang Wenwu Bowuguan 新疆文物博物馆 (Xinjiang Cultural Relics Museum), “Luntai xian wenwu diaocha 轮台县文物调查” (Investigation on the cultural relics in Luntai County), in *Xinjiag Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1991.2, pp. 1-17.
- XIREN Kurban 西仁·库尔班, “Tashenku'ergan diqu zhuyao kaogu faxian yu mingsheng guji 塔什库尔干地区主要考古发现与名胜古迹” (Major archeological discovery and ancient remains in the Tashenku'ergan region), in *Xinjiang Daxue Xuebao* 新疆大学学报 (Journal of Xinjiang University), 2002.3, pp. 79-83.
- Xizang Zizhiq Wenwu Guanli Weiyuanhui 西藏自治区文物管理委员会 (Tibet Autonomous Region Heritage Management Committee), Sichuan Daxue Lishixi 四川大学历史系 (Sichuan University, History Department), *Changdu Karuo* 昌都卡若 (Karuo in Changdu), Beijing: Wenwu chubanshe, 1985.
- XUE Jibin 薛积彬, ZHONG Wei 钟巍, “Xinjiang Balikun hu quanxin shi hunjing jilu ji quyu bijiao yanjiu 新疆巴里坤湖全新世环境记录及区域比较研究” (Holocene environmental changes recorded by lacustrine sediments in the Barkol Lake and comparative study with other regions), in *Di Siji Yanjiu* 第四纪研究 (Quaternary Science), 2008, vol. 28, no. 4, pp. 610-620.
- XUE Jibin, ZHONG Wei, “Holocene climate variation denoted by Barkol Lake sediments in North-eastern Xinjiang and its possible linkage to the high and low latitude climates”, in *Science China Earth Sciences*, 2011, vol. 54, no. 4, pp. 603-614.
- YABLONSKY T. Leonid, “The Saka in Central Asia”, in DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY T. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, New Haven and Conn: Zinat Press, 1995, pp. 189-252. (a)
- YABLONSKY T. Leonid, “The material culture of the Saka and historical reconstruction” in DAVIS-KIMBALL Jeannine, BASHILOV A. Vladimir, YABLONSKY T. Leonid (eds.), *Nomads of the Eurasian steppes in the early Iron Age*, New Haven and Conn: Zinat Press, 1995, pp. 201-240. (b)
- YAN Wenming 严文明, “Gansu caitao de yuanliu 甘肃彩陶的源流” (The origin of painted pottery in Gansu), in *Wenwu* 文物 (Cultural Relics), 1978.10, pp. 62-76.
- YANG Jidong, “Siba: Bronze Age culture of the Gansu Corridor”, in *Sino-Platonic Papers*, 1998, no. 86.
- YANG Xiaodong 羊向东, WANG Sumin 王苏民, “Yi wan duo nian lai Wulungu hu diqu huafen zuhe ji qi gu huanjing 一万多年来乌伦古湖地区花粉组合及其古环境” (Pollen assemblage and environmental changes in the last 12000 years in Wulungu Lake), in *Gahan qu Yanjiu* 干旱区研究 (Arid Zone Research), 1994, vol. 11, no. 2, pp. 7-10.
- YANG Xiaoping “The oases along the Keriya River in the Taklimakan Desert, China, and their evolution since the end of the last glaciation”, in *Environmental Geology*, 2001, no. 41, pp. 314-320.

- YANG Xiaoping, Paul D. WHITE [et al.], “Hydrological changes and land degradation in the Southern and Eastern Tarim Basin, Xinjiang, China”, in *Land Degradation and Development*, 2006, no. 17, pp. 381-392.
- YAO Yonghui, LI Huiguo, “Tectonic geomorphological characteristics for evolution of the Manas Lake”, in *Journal of Arid Land*, 2010, vol. 2, no. 3, pp. 167-173.
- Yike Zhaomeng Wenwu Gongzuozhan 伊克昭盟文物工作站 (Yike Zhaomeng Cultural Relics Workstation), “Neimenggu Zhungeer Baohaishe faxian qingtongqi 内蒙古准格尔宝亥社发现青铜器” (Metal objects in the Baohaishe site, Zhungger, Inner Mongolia), in *Wenwu* 文物 (Cultural Relics), 1987.12, pp. 81-83.
- YIN Qing 殷晴, “Gudai Xinjiang de nanbei jiaotong ji jingji wenhua jiaoliu 古代新疆的南北交通及经济文化交流” (The ancient North-western Xinjiang communications and the economic and cultural exchanges), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1990.4, pp. 111-128.
- YU Zhiyong 于志永, “Tacheng shi Ergong xian Xiakalanggu'er cun guyizhi diaocha 塔城市二宫乡下喀浪古尔村古遗址调查” (Investigation on the ancient remains in the Xiakalanggu'er village, Ergong district, Tacheng City), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1998.2, pp. 35-38.
- YUE Feng 岳峰, YU Zhiyong 于志勇, “Xinjiang Minfeng xian Niya yizhi yi bei diqu 1996 nian kaogu diaocha 新疆民丰县尼雅遗址以北地区 1996 年考古调查” (Archaeological survey of Niya Beifang site, Minfeng County, Xinjiang), in *Kaogu* 考古 (Archaeology), 1999.4, pp. 11-17.
- YU Jianjun 于建军, “Qiemu'erqieke wenhua de xin renshi 切木尔切克的新认识” (New view on Qiemu'erqieke culture), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2015.3-4, pp. 69-74.
- ZADNEPROVSKII A. Yuri, ЗАДНЕПРОВСКИЙ А. Юрий, *Drevnezemledel'cheskaia kul'tura Fergany* Древнеземледельческая культура Ферганы (The ancient farming culture in Fergana), Moscow: Nauka, 1962.
- ZAKH A. Viktor, “Periodization of the Neolithic in the Tobol-Ishim forest zone”, in *Archaeology, Ethnology and Anthropology of Eurasia*, 2006, vol. 1, no. 25, pp. 70-83.
- ZANG Zhen 臧振, “Sichou zhi lu de qianshen – yushi zhi lu 丝绸之路的前身 – 玉石之路” (The Jade Road – The previous name of the Silk Road), in *Sichou zhi lu* 丝绸之路 (The Silk Road), 1994.2, pp. 36-64.
- ZHANG Feng 张凤, “Xinjiang dongbu diqu gu wenhua tanwei 新疆东部地区古文化探微” (Exploration of ancient cultures in Eastern Xinjiang), in *Xiyu Yanjiu* 西域研究 (Western Regions Studies), 2010.2, pp. 44-52.

- ZHANG Hongchi 张鸿墀, LIU Jie 刘杰, “Kaogu xuezhe zai Xinjiang Yili faxian jujin sanqian nian yiqian de zhongguo zuizao yong mei yiji 考古学者在新疆伊犁发现距今三千年以前的中国最早用煤遗迹” (Archeologists discovered the earliest relics in China carbon dated to 3000 years ago in the Ili region, Xinjiang), 2015. Available at <http://www.kaogu.cn/cn/xccz/20150812/51117.html>, 17-08-2017.
- ZHANG Hongzhao 章鸿钊, Gu Kuang Lu 古矿录 (Records on ancient mines), Beijing: Dizhi chubanshe, 1954.
- ZHANG Liangren, “Metal trade in Bronze Age Central Eurasia”, in MEI Jianjun, REHREN Thilo (eds.), *Metallurgy and civilisation: Eurasia and beyond*, London: Archetype, 2009, pp. 17-25.
- ZHANG Liangren, “Soviet inspiration in Chinese archaeology”, in *Antiquity*, 2011, vol. 85, no. 329, pp. 1049-1059.
- ZHANG Lizhi 张礼智, *Shenghuo zai er jiji dishang de renmen 生活在二级阶地上的人们 (Life of the people on second terrace)*, Xi'an: Shanxi Luyou chubanshe, 2007.
- ZHANG Minghua, *Chinese jade: power and delicacy in a majestic art*, San Francisco: Long River Press, 2004, pp. 4-5.
- ZHANG Ping 张平, CHEN Ge 陈戈, “Xinjiang faxian de shidao, shilian he tonglian 新疆发现的石刀石镰和铜镰” (On the stone knives and stone and copper sickles found in Xinjiang), in *Kaogu yu Wenwu 考古与文物 (Archeology and Cultural Relics)*, 1991.1, pp. 23-29.
- ZHANG Tian'en 张天恩, “Tianshui chutu de shoumian tongpaishi ji youguan wenti 天水出土的首面铜牌饰及有关问题” (Metal ornaments decorated with zoomorphic images recovered from Tianshui and related questions), in *Zhongyuan Wenwu 中原文物 (Central Asian Cultural Relics)*, 2002.1, pp. 43-46.
- ZHANG Xinyu 张昕煜, WEI Dong 魏东, WU Yong 吴勇, NIE Ying 聂颖, HU Yaowu 胡耀武, “Xinjiang Xiabandi mudi rengu de C, N wending tongweisu fenxi: 3500 nian qian dongxi fang wenhua jiaoliu de qishi 新疆下坂地墓地人骨的 C, N 稳定同位素分析: 3500 年前东西方文化交流的启示” (Carbon and nitrogen stable isotope ratio analysis of Bronze Age humans from the Xiabandi cemetery, Xinjiang, China: implications for cultural interactions between the East and West), in *Zhongguo Kexue 中国科学 (Science China)*, 2016, vol. 61, no. 32, pp. 3509-3519.
- ZHANG Xu 张旭, ZHU Hong 朱泓, WANG Minghu 王明辉, WU Xinhua 巫新华, “Xinjiang Yutian Liushui mudi qingtong shidai renlei yachi fei celiang xingzhuang 新疆于田流水墓地青铜时代人类牙齿非测量性状” (Bioarchaeological analysis of Bronze Age populations of the Liushui cemetery using dental non-metric traits), in *Renleixue Xuebao 人类学学报 (Acta Anthropologica Sinica)*, 2014, vol. 33, no. 4, pp. 460-470.
- ZHANG Yingchun 张迎春, “Beifang Mudi: maicang zai damo fudi de qiangu zhi mi 北方墓地: 埋藏

在大漠腹地的千古之谜” (The Northern cemetery: a mystery lasting for thousands of years buried deep in the desert), in *Xinjiang Renwen Dili* 新疆人文地理 (Xinjiang Humanities Geography), 2009.3, pp. 69-75.

ZHANG Yun, KONG Zhaochen, NI Jian, YAN Shun, YANG Zhenjing, “Late Holocene palaeoenvironment change in central Tianshan of Xinjiang, North-west China”, in *Grana*, 2007, vol. 46, no. 3, pp. 197-213.

ZHANG Yunde 张运德, “Zhongguo hetianyu de lishi diwei ji shengmingli 中国和田玉的历史地位及生命力” (A tentative analysis of the historical position of Hotan jade and its vitality), in *Xiyu yanjiu* 西域研究 (Western Regions Studies), 2009.3, 108-113.

ZHANG Yuzhong 张玉忠, “Xinjiang gu mulu 新疆考古述略” (Account on Archaeological Research in Xinjiang), in *Kaogu* 考古 (Archaeology), 2002.6, pp. 483-493.

ZHAO Keliang, LI Xiaoqiang, DODSON John, ATAHAN Pia, ZHOU Xinying, BERTUCH Fiona, “Climatic variations over the last 4000 cal yr BP in the western margin of the Tarim Basin, Xinjiang, reconstructed from pollen data”, in *Palaeogeography, Palaeoclimatology, Palaeoecology*, 2012, nos. 321-322, pp. 16-23.

ZHAO Zhijun, “Flotation results from the Xinglonggou site, North China and the problem of dryland agricultural origins”, in *Antiquities of Eastern Asia*, 2005, A, pp. 188-199.

ZHENG Juxin 郑巨欣, *Shuli de wenming: guanyu shubi de lishi* 梳理的文明：关于梳篦的历史 (The civilization of combs: the history of combs), Jinan: Shandong Huabao chubanshe, 2008.

Zhong Fa lianhe Keliya he kaogu dui 中法联合克里雅河考古队 (Sino-French Expedition Team), “Xinjiang Keliya he liuyu kaogu diaocha gaishu 新疆克里雅河流域考古调查概述” (Outlines of the results from the archaeological excavations in the reaches of the Keriya River, in Xinjiang), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1997.48, pp. 1-12.

ZHONG Wei, PEN Zhanghong, XUE Jibin, OUYANG Jun, TANG Xiaohong, CAO Jiayuan, “Geochemistry of sediments from Barkol Lake in the westerly influenced North-east Xinjiang: Implications for catchment weathering intensity during the Holocene”, in *Journal of Asian Earth Sciences*, 2012, vol. 50, pp. 7-13.

ZHONG Wei, XIONG Heigang, TASHPOLAT Tiyip, SHU Qiang, “The sequence of paleoenvironmental changes since about 4ka BP recorded by Niya section in the southern margin of Tarim Basin, China”, in *Chinese Geographical Science*, 2001, vol. 11, no. 2, pp. 144-149.

ZHONG Wei, XIONG Heigang, TASHPOLAT Tiyip, HIROKI Takmura, SHU Qiang, “Historical climate changes in Southern Xinjiang”, in *Journal of Geographical Sciences*, 2001, vol. 11, no. 4, pp. 449-453.

Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo 中国社会科学院考古研究所 (Institute of Archeology of the Chinese Academy of Social Sciences), *Lintong Baijiacun* 临潼白家村 (*The site of Baijia at Lintong*), Chengdu: Bashu chubanshe, 1994.

- Zhongguo Kexueyuan Kaogu Yanjiusuo Erlitou Gongzuodui 中国科学院考古研究所二里头工作队 (Chinese Academy of Sciences, Institute of Archeology, Erlitou team), “Yanshi Erlitou yizhi san ba qu fajue jianbao 偃师二里头遗址三八区发掘报告” (Brief report on the excavation of sectors 3 and 8 at Erlitou Yanshi), in *Kaogu* 考古 (Archaeology), 1975.5, pp. 302-309.
- Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Team of the Institute of Archeology, Chinese Academy of Social Sciences), Xinjiang Bayinguoleng Menggu Zizhizhou Wenguansuo 新疆巴音郭楞蒙古自治州文管所 (Institute of Cultural Relics of the Xinjiang Bayingolin Mongolian Autonomous Prefecture), “Xinjiang Luntai Qunbake muzang di yi ci fajue jianbao 新疆轮台群巴克墓葬第一次发掘简报” (Preliminary report on the first excavation of the Qunbake cemetery in Luntai, Xinjiang), in *Kaogu* 考古 (Archaeology), 1987.11, pp. 987-996.
- Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo Xinjiang Dui 中国社会科学院考古研究所新疆队 (Xinjiang Team of the Institute of Archeology, Chinese Academy of Social Sciences), Xinjiang Bayinguoleng Menggu Zizhizhou Wenguansuo 新疆巴音郭楞蒙古自治州文管所 (Institute of Cultural Relics of the Xinjiang Bayingolin Mongolian Autonomous Prefecture), “Xinjiang Luntai xian Qunbake muzang di er san ci fajue jianbao 新疆轮台县群巴克墓葬第二三次发掘简报” (Preliminary report on the second and third excavations of the Qunbake cemetery in Luntai County, Xinjiang), in *Kaogu* 考古 (Archaeology), 1991.8, pp. 684-703.
- Zhongguo Shehui Kexueyuan Kaogu Yanjiusuo Henan Er Dui 中国社会科学院考古研究所河南二队 (Second Archeological Team of Henan of the Chinese Academy of Social Science), “Henan Linru Meishan yizhi fajue baogao 河南临汝煤山遗址发掘报告” (Excavation report of the Meishan site in Henan Province), in *Kaogu Xuebao* 考古学报 (Acta Archaeological Sinica), 1982.4, pp. 465-471.
- Zhongri Rizhong Gongtong Niya Yiji Xueshu Kaocha Dui 中日日中共同尼雅遗迹学术考察队 (Sino-Japanese Academic Expedition Team at the Niya Ruins), “Zhongri rizhong gongtong Niya yiji xueshu diaocha baogaoshu 中日日中共同尼雅遗迹学术调查报告书” (Report on the academic investigation by the Sino-Japanese team at the Niya ruins), Tokyo: Nakamura, 1996.
- Zhongshan Daxue Lishi Renleixue Yanjiu Zhongxin 中山大学历史人类学研究中心 (Center for Historical Anthropology, Sun Yat Sen Univeristy), Fuyun xian Wenwu ju 富蕴县文物局 (Cultural Relics Bureau of Fuyun County), Qinghe xian Wenwu ju 青河县文物局 (Cultural Relics Bureau of Qinghe County), “Dong Aletai shan de gudai wenhua yicun 东阿勒泰山的古代文化遗存” (Archaeological remains in Eastern Altai), in *Xinjinag Wenwu* 新疆文物 (Xinjiang Cultural Relics), 2011.1, pp. 1-62.
- ZHUSHCHIKHOVSKAYA S. Irina, DANILOVA Olga, “Spiral patterns on the Neolithic pottery of East Asia and the Far East”, in *Documenta Praehistorica*, 2008, no. 35, pp. 215-226.
- Zizhi Wenwu Pucha Bangongshi 自治文物普查办公室 (Office of Cultural Relics Survey), Kashen diqu Pucha Dui 喀什地区普查队 (Cultural Relics Survey Team of Kashgar), “Kashen diqu wenwu pucha cailiao huibian 喀什地区文物普查材料汇编” (Corpus of material from the

cultural relics survey in Kashgar), in *Xinjiang Wenwu* 新疆文物 (Xinjiang Cultural Relics), 1993.3, pp. 1-112.

ZU Ruiping, GAO Qianzhao, QU Jianjun, QIANG Mingrui, “Environmental changes of oases on the southern margin of Tarim Basin, China”, in *Environmental Geology*, 2003, no. 44, pp. 639-644.

Estratto per riassunto della tesi di dottorato

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Studente: Marcella Festa

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Dottorato: Studi sull'Asia e sull'Africa

Ciclo: 30°

Titolo della tesi :

Bronze Age communities and bronze metallurgy in Xinjiang

Abstract:

La ricerca, condotta attraverso l'analisi dei siti e dei reperti archeologici, verte sullo studio della metallurgia dell'Età del Bronzo nella provincia dello Xinjiang (ca. 2000-1000 a. C.). L'obiettivo è triplice: 1) indagare l'occupazione dello Xinjiang da parte delle prime comunità dell'Età del Bronzo, in termini spazio-temporali, nonché delineare il contesto economico-culturale regionale in cui la metallurgia del bronzo si è sviluppata; 2) individuare i contributi apportati da influenze esterne riconoscendo, ove possibile, interazioni culturali tra le comunità dello Xinjiang e delle regioni circostanti (specialmente Asia Centrale, Siberia sud-occidentale e Cina); 3) fare luce sul ruolo dello Xinjiang nel sistema degli scambi culturali in Eurasia durante l'Età del Bronzo.

La ricerca è basata sullo studio di quattro aree principali: gli Altai, le oasi di Hami e Turfan (chiamate "la regione orientale"), la regione occidentale (che include la aree di Ili-Tacheng e Pamir) e il margine meridionale del bacino del Tarim. Per ognuna di esse sono stati presi in esame l'assetto geografico (che comprende lo studio del paleoambiente e del paleoclima), il contesto archeologico e la metallurgia.

Occupazione e contesto economico-culturale. I risultati dell'analisi condotta dimostrano che durante l'Età del Bronzo le comunità occupano sia gli altipiani sia le terre più a valle

dell'attuale provincia dello Xinjiang. Sembra, infatti, che in periodi precedenti le popolazioni fossero più ridotte, molto sparse e abitassero principalmente le zone di alta quota. Ciò si evince altresì dal fatto che i resti risalenti ai periodi Paleolitico e Neolitico sono stati spesso rinvenuti sugli altopiani. Inoltre, anche la comunità Qiemu'erqieke, l'unica che sembra aver abitato in maniera consistente lo Xinjiang durante l'Età del Rame nel terzo millennio a.C., era stanziata nelle valli situate nella catena montuosa degli Altai. Durante l'Età del Bronzo le comunità si diffondono più ampiamente e sono in grado di sfruttare le risorse ambientali, sia degli altopiani, sia delle oasi del deserto, rispettivamente per il pascolo e l'agricoltura. La maggiore espansione, l'economia agro-pastorizia, il notevole sviluppo della ceramica (che era piuttosto raro o assente nei periodi precedenti) e l'emergere della tecnologia del metallo sono le caratteristiche principali delle comunità dell'Età del Bronzo nello Xinjiang. Il primo millennio a. C. vede la fine dell'Età del Bronzo: la scoperta di oggetti in ferro, vetro, finimenti per cavalli e manufatti di tipo sciita, in siti risalenti a questo periodo, segna l'inizio di una nuova fase, l'Età del Ferro.

Influenze esterne sulla metallurgia. Durante il terzo millennio a. C. la metallurgia nello Xinjiang è in una fase embrionale, come dimostrato dall'attività della comunità Qiemu'erqieke nella regione degli Altai, che è caratterizzata da piccoli elementi in rame e piombo. Nonostante la possibile diffusione dell'influenza della tradizione Qiemu'erqieke a sud (a Lop Nur, sul basso corso del fiume Keriya, Hami e Turfan), essa non sembra aver contribuito all'emergere della metallurgia del bronzo nello Xinjiang. Nel secondo millennio a.C. la tecnologia del metallo appare come risultato di influenze da parte di comunità orientali e occidentali, attraverso l'occupazione regionale (dello Xinjiang occidentale) o i contatti culturali (nello Xinjiang orientale). Nel primo millennio a.C., le migrazioni più importanti si verificano in direzione nord-sud, determinando il trasferimento della tecnologia dei metalli verso lo Xinjiang meridionale attraverso le valli del Tianshan e il deserto Taklamakan. L'analisi mette in luce come i contributi esterni siano stati essenziali per l'emergere della metallurgia del bronzo nello Xinjiang nel corso del secondo millennio a.C., mentre appaiono nettamente più scarse le evidenze relative a un possibile sviluppo interno e a contributi locali. Questo è dovuto probabilmente a una conoscenza ancora insufficiente dello Xinjiang preistorico, determinata dalla mancanza di scavi e ricerche sui siti dell'Età del Rame, che impedisce ancora una completa comprensione dell'evoluzione della metallurgia nella regione.

Ruolo dello Xinjiang nel sistema di scambi culturali in Eurasia. Secondo i risultati della

presente ricerca, durante l'Età del Bronzo il territorio dello Xinjiang è ancora per lo più periferico e le interazioni tra le popolazioni locali e le comunità vicine sono in una fase iniziale. Nel secondo millennio a. C. si assiste a una graduale occupazione dello Xinjiang da parte di due gruppi nell'ovest e nell'est, che hanno introdotto l'uso del metallo a seguito delle influenze dei loro vicini, Andronovo e Siba. Questi due "blocchi" non sembrano avere connessioni reciproche dirette. Tuttavia, mentre lo Xinjiang occidentale è una periferia del territorio Andronovo, caratterizzata da interazioni limitate con l'est, le comunità dello Xinjiang orientale stabiliscono una qualche forma di contatto, preliminare e forse indiretto, con i gruppi delle steppe settentrionali e occidentali e con le comunità del BMAC, ponendo le basi per la creazione di un centro di scambi culturali, quale sarà poi Hami. Alla fine del secondo millennio a. C. le nuove condizioni climatiche portano ad un'occupazione più intensa del territorio dello Xinjiang e alla creazione di rotte che, attraverso l'attuale provincia cinese, collegano diverse popolazioni.

Firma dello studente

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Estratto per riassunto della tesi di dottorato

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Bronze Age communities and bronze metallurgy in Xinjiang

Abstract:

The research focuses on Bronze Age metallurgy in Xinjiang (about 2000-1000 BC) through the analysis of archaeological evidence. The goal is threefold: 1) to investigate the occupation of Xinjiang by the early Bronze Age communities in terms of space and time, and to delineate the regional economic-cultural context, in which bronze metallurgy developed; 2) identify contributions from external influences and to recognize, when possible, cultural interactions between the communities of Xinjiang and surrounding regions (especially Central Asia, South-Western Siberia and China); 3) shed light on the role of Xinjiang in the system of cultural exchanges in Eurasia during the Bronze Age.

The research is based on the analysis of four main areas: the Altai, the Hami and Turfan oases (called "the eastern region"), the western region (which includes the areas of Ili-Tacheng and Pamir) and the southern rim of the Tarim Basin. For each of them the geographic context (including the paleo-environment and the paleoclimate), the archaeological context, and metallurgy have been examined.

Occupation of Xinjiang and cultural and economic contexts. Based on the results of this research, the Bronze Age communities occupied the highlands and the lower lands of the bordering regions of present-day Xinjiang Province. In earlier periods it seems that populations were smaller, more

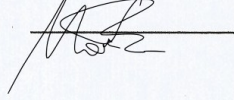
dello Xinjiang. In periodi precedenti sembra che le popolazioni fossero più ridotte, molto sparse e abitassero principalmente le zone di alta quota. Infatti, i resti risalenti ai periodi Paleolitico e Neolitico sono stati spesso rinvenuti sugli altopiani. Inoltre, anche la comunità Qiemu'erqieke, l'unica che sembra aver abitato in maniera consistente lo Xinjiang durante l'Età del Rame nel terzo millennio a.C., era stanziata nelle valli situate nella catena montuosa degli Altai. Durante l'Età del Bronzo le comunità si diffusero più ampiamente e furono in grado di sfruttare le risorse ambientali, sia degli altopiani, sia delle oasi del deserto, rispettivamente per il pascolo e l'agricoltura. L'espansione più ampia, l'economia agro-pastorizia, il notevole sviluppo della ceramica (che era piuttosto raro o assente nei periodi precedenti) e l'emergere della tecnologia del metallo sono le caratteristiche principali delle comunità dell'Età del Bronzo nello Xinjiang. Il primo millennio a. C. vide la fine dell'Età del Bronzo: la scoperta di oggetti in ferro, vetro, finimenti per cavalli e manufatti di tipo sciita, in siti risalenti a questo periodo, dimostrano l'inizio di una nuova fase, l'Età del Ferro.

Influenze esterne sulla metallurgia. Sembra che durante il terzo millennio a. C. la metallurgia nello Xinjiang fosse in una fase embrionale, come dimostrato dall'attività nella regione degli Altai, occupata dalla comunità Qiemu'erqieke, caratterizzata da piccoli elementi in rame e piombo. Nonostante la possibile diffusione dell'influenza della tradizione Qiemu'erqieke a sud (a Lop Nur, il basso corso del fiume Keriya, Hami e Turfan), essa non sembra aver contribuito all'emergere della metallurgia del bronzo nello Xinjiang. Nel secondo millennio a. C. la tecnologia del metallo bronzo apparve come risultato di influenze da parte di comunità orientali e occidentali, attraverso l'occupazione regionale (dello Xinjiang occidentale) o i contatti culturali (nello Xinjiang orientale). Nel primo millennio a. C., le migrazioni più importanti si verificarono in direzione nord-sud, determinando il trasferimento della tecnologia dei metalli verso lo Xinjiang meridionale attraverso le valli del Tianshan e il deserto Taklamakan. Sembra che i contributi esterni siano stati essenziali nell'emergere della metallurgia del bronzo nello Xinjiang nel secondo millennio a. C., mentre le evidenze di un eventuale sviluppo interno e dei contributi locali sono scarse. Questo è probabilmente il risultato di una conoscenza ancora insufficiente dello Xinjiang preistorico, dovuta alla mancanza di scavi e ricerche sui siti dell'Età del Rame, che impedisce ancora una completa comprensione dell'evoluzione della metallurgia nella regione.

Ruolo dello Xinjiang nel sistema di scambi culturali. Secondo i risultati della presente

ricerca, durante l'età del bronzo il territorio dello Xinjiang era ancora per lo più periferico e le interazioni tra le popolazioni locali e le comunità vicine erano in una fase iniziale. Nel secondo millennio a. C. si assistette a una graduale occupazione dello Xinjiang da parte di due gruppi, che impiegavano metallo, nell'ovest e nell'est, a seguito delle influenze dei loro vicini, Andronovo e Siba. Questi due "blocchi" non sembra avessero stabilito connessioni reciproche dirette. Tuttavia, mentre lo Xinjiang occidentale era una periferia del territorio Andronovo, caratterizzata da interazioni limitate con l'est, le comunità dello Xinjiang orientale avevano stabilito una qualche forma di connessione, preliminare e forse indiretta, con i gruppi delle steppe settentrionali e occidentali e con le comunità del BMAC, ponendo le basi per la creazione di un centro di scambi culturali, quale sarà poi Hami. Alla fine del secondo millennio a. C. le nuove condizioni climatiche portarono ad un'occupazione più intensa del territorio dello Xinjiang e alla creazione di rotte che, attraverso l'attuale provincia cinese, collegavano diverse popolazioni.

Firma dello studente

A handwritten signature in black ink, consisting of several stylized, overlapping loops and lines, positioned above a horizontal line.