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Bronze Age Mining Communities in the Semey and Pavlodar Irtysh region

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Abstract. The publication examines issues in the history of the study of archaeological cultures and the development of metallurgy in the Bronze Age. An important region for understanding the complexity and characteristics of these processes in Northern Eurasia is the territory of the Abay region of the Republic of Kazakhstan. Traces of the emergence of mining and a manufacturing economy have been recorded at sites in the Semey and Pavlodar Irtysh regions. The purpose of this article is to provide a historiographical overview and determine the extent of research on this topic. The list includes works that highlight the results of archaeological research into settlements, burial grounds, and ancient mining sites. The Early Bronze Age period is key to understanding this. Therefore, to achieve this goal, the authors set out to analyze published data on sites whose cultural layers contain evidence of late Eneolithic and Early Bronze Age materials. This allowed us to refine the chronology of the initial Early Metal Age in the region. Data on the ceramic assemblage, metal objects, and burial rites made it possible to examine the historical and cultural affiliations of the monuments. Research materials from ancient mines and workings for tin, copper, and gold characterize ancient technologies developed by tribes that inhabited the region during the Bronze Age. A significant role is given to a historiographical review of studies devoted to the study of metals and the chemical composition of ores, which demonstrate the uniqueness of the ore deposits of eastern Kazakhstan. Data from natural science analyses are necessary to identify the boundaries of a regional metallurgical center and the routes of distribution of products from this center. The discussion and results describe the processes of penetration of the Early Bronze Age archaeological cultures into the region: the Yamnaya and Afanasievo cultures. The use of additional sources allowed the authors to hypothesize the routes taken by the Early Bronze Age population, traces of which have been recorded at sites in Western, Northern, and Eastern Kazakhstan, and to understand their role in the subsequent development of mining and Bronze Age cultures. This concerns the monuments of the first half of the 2nd millennium BC, united into the Alakul and Nura (Fedorovskaya) archaeological cultures. As can be seen from the sources, the subsequent coexistence of two cultural formations in the same territory during the 16th–15th centuries BC became the basis for the formation of the Alekseevsko-Sargary archaeological culture of the 15th–12th centuries BC, which played an important role in the final stage of the Bronze Age.

Keywords: bronze Age; migration; mining; ancient mines; metallurgy; settlement; Afanasievo culture; yamnaya culture

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Сообщества горняков бронзового века Семипалатинского и Павлодарского Прииртышья

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Аннотация. В публикации рассмотрены вопросы истории изучения археологических культур и развития металлургии бронзового века. Важным регионом для понимания сложности и особенностей данных процессов в Северной Евразии является территория области Абай Республики Казахстан. Следы зарождения горного дела и производящей экономики зафиксированы на памятниках Семейского и Павлодарского Прииртышья. Целью настоящей статьи является историографический обзор и определение степени изученности данной проблематики. В список вошли работы, в которых освещаются результаты археологических исследований поселений, могильников и мест древних выработок. Ключевым для понимания является период ранней бронзы. В соответствии с этим для достижения цели авторами поставлена задача анализа опубликованных данных по памятникам, в культурных слоях которых засвидетельствованы поздние энеолитические и раннебронзовые материалы. Это позволило уточнить хронологию начального периода раннего металла в регионе. Данные по керамическому комплексу, предметам из металла, а также погребальному обряду дали возможность рассмотреть историко-культурную принадлежность памятников. Материалы по исследованию древних шахт и выработок на олово, медь и золото характеризуют древние технологии, получившие развитие у племен, населявших регион в бронзовом веке. Важная роль отведена историографическому обзору работ, посвященных изучению металла и химического состава руд, которые говорят об уникальности рудных месторождений восточной части Казахстана. Данные естественнонаучных анализов являются необходимыми для выявления границ регионального металлургического центра и путей распространения продукции из этого очага. В части дискуссии и результатах описываются процессы проникновения в регион раннебронзовых археологических культур: ямной и афанасьевской. Привлечение дополнительных источников позволило авторам предположить, какими маршрутами осуществлялось продвижение раннебронзового населения, следы которого зафиксированы в памятниках Западного, Северного и Восточного Казахстана, и понять их роль в последующем развитии горного дела и культур эпохи бронзы. Это касается памятников первой половины II тыс. до н.э. объединяемых в алакульскую и нуринскую (федоровскую) археологические культуры. Как видно из источников, дальнейшее сосуществование двух культурных образований на одной территории на протяжении XVI–XV вв. до н. э. стало основой для формирования алексеевско-саргаринской археологической культуры XV–XII вв. до н. э., сыгравшей важную роль на завершающем этапе бронзового века.

Ключевые слова: бронзовый век; миграция; горное дело; древние шахты; металлургия; афанасьевская культура; ямная культура

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Семей және Павлодар Ертіс өңіріндегі қола дәуіріндегі кеншілер қауымдастығы

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Андатпа. Бұл басылым археологиялық мәдениеттердің зерттелу тарихы мен қола дәуірі металлургиясының дамуын қарастырады. Қазақстан Республикасының Абай аймағы Солтүстік Еуразиядағы осы үрдістердің күрделілігі мен ерекшеліктерін түсіну үшін маңызды аймақ болып табылады. Тау-кен өнеркәсібі мен өңдеуші шаруашылықтың пайда болуының іздері Семей және Павлодар Ертіс өңірлеріндегі аймақтарда тіркелген. Бұл мақаланың мақсаты – тарихнамалық шолу жасау және осы мәселенің зерттелу дәрежесін анықтау. Бұл тізімге ежелгі қоныстар, қорымдарды, көне тау-кен орындарын археологиялық зерттеу нәтижелерін көрсететін еңбектер енгізілген. Сондықтан, осы мақсатқа жету үшін авторлар мәдени қабаттарында кейінгі энеолит және ерте қола дәуірі материалдарының айғағы бар мекендер туралы жарияланған деректерді талдауды қолға алды. Ерте қола дәуірі мұның түсіндірудің бірден бір жолы болып табылады. Керамикалық кешен, металл бұйымдар, жерлеу ғұрыптары туралы деректер аталмыш ескерткіштердің тарихи-мәдени контексін зерттеуге мүмкіндік берді. Ежелгі кен орындар мен қалайы, мыс және алтын өндіру кәсібінен алынған зерттеу нәтижелері қола дәуірінде аймақты мекендеген тайпалардың қолданған ежелгі технологияларды көрсетеді. Қазақстанның шығыс бөлігінің тау кен орындарының бірегейлігін айғақтайтын металл және металл бұйымдардың химиялық құрамын зерттеуге арналған еңбектерге тарихнамалық шолу маңызды рөл атқарады. Жаратылыстану талдауларының деректері аймақтық металлургиялық орталықтың шекарасын және осы орталықтан шығарылатын өнімдердің таралу жолдарын анықтау үшін қажет. Бұл б.з.б. II мыңжылдықтың бірінші жартысындағы біріктірілген Алакөл және Нұра (Федоровская) археологиялық мәдениеттер ескерткіштеріне қатысты. Дерек көздерінен көрініп тұрғандай, б.з.б. XVI–XV ғасырларда бір аумақта кейінгі екі мәдени формацияның қатар өмір сүруі б.з.б. XV–XII ғасырлардағы Алексеевско-Сарғара археологиялық мәдениетінің қалыптасуына негіз болды, ал аталмыш тайпалар қоланың соңғы кезеңінде маңызды рөл атқарды.

Түйін сөздер: Қола дәуірі; көші-қон; тау-кен өнеркәсібі; ежелгі шахталар; металлургия; Афанасьев мәдениеті; Ямная мәдениеті

Introduction

A comprehensive and systematic study of the monuments left by ancient metallurgists in the territory of Eastern Kazakhstan is associated with the name of the famous Soviet archaeologist and scientist Sergei Sergeevich Chernikov. Under his leadership, numerous monuments dating back to different periods were discovered and meticulously studied by the East Kazakhstan Archaeological Expedition for 15 years. Particular attention was paid to the sites of ancient copper ore mining, tin, and gold deposits. S.S. Chernikov developed a typology of ancient workings, tunneling techniques, and identified the forms and types of tools used in mining and processing ore. Important objects were ancient underground tin, gold, and copper deposits discovered on the Kalba and Narym ridges (Chernikov 1960: 8).

A number of monuments were studied on the Semey dunes near the village of Mechet, as well as Bronze Age burial grounds in the area of Lake Sarykol and in the Shilikty Valley. The settlement complexes of Malo-Krasnoyarka, settlements near the aul of Kanai, near the village of Trushnikovo, and Ust-Bukon became standard monuments in the study of the Bronze Age of the region. An integrated approach to the study of ancient workings, ore deposits and associated settlements and burial grounds made it possible to determine the characteristics of monuments in this region, and the rich archaeological material made it possible to outline the contours of the historical development of the Bronze Age tribes, which, in turn, contributed to the development of a chronological scale.

The exploration of the early development processes of primitive metallurgy in the region under study remains relevant and requires further extensive research using modern methods. These processes originated in the eastern part of Kazakhstan in the first half of the 3rd millennium BC. It was at this historical time that the development of copper and tin deposits began. As is known, in the region under consideration, ancient tin mines extend in a wide strip from the mouth of the Uba River, pass through the central and eastern parts of the Kalba Ridge, cross the Narym Ridge, and then stretch to Chinese Xinjiang. About 37 ancient deposits and workings have been identified in the east of Kazakhstan. The peculiarity of the local tin ore – cassiterite (SnO2) – is that it is located in quartz and pegmatite veins (Baklakov 1932: 193).

Summarizing some of the results of the historiographical analysis of previously conducted archaeological research in the area of interest, it can be noted that they are of the nature of a specific description of monuments. In addition, various publications contain information about random finds. The collection and analysis of all items in one publication will allow us to demonstrate the existence of a rich culture of the region in ancient times.

Until the last decade, no special, targeted study of the remains of ancient mining in the Semey Irtysh region has been conducted. The need for such work is especially important for the Abay region, where a large number of ancient workings of various metals have been registered. Research into ancient mining operations on tin deposits in the Kalba and Narym ridges is promising.

Materials and methods

The research methodology includes a source study approach, using which scientific publications containing information on the Bronze Age monuments of the eastern part of

Kazakhstan were analyzed. The comparative historical method made it possible to specify the chronological positions of the Bronze Age complexes according to relative and absolute chronology. General scientific methods were used, such as analysis, synthesis, generalization, allowing structure, and systematizing the material, which is of fundamental importance for understanding the historical processes of the first half of the 3rd millennium BC – the end of the 2nd millennium BC.

Literature Review

In 1883, in Semey (formerly Semipalatinsk), on the initiative of the secretary of the regional statistical committee, E.P. Michaelis, a local history museum was organized, where a collection of stone tools was presented at the archaeological department. The collection consisted of eighty arrowheads, spears, scrapers, knife-shaped plates and stone axes. Near Semey in 1903, a member of the Semipalatinsk subdepartment of the West Siberian department of the Russian Geographical Society, F.N. Pedashenko, discovered and studied a Neolithic burial in the sands. Local historians did a great job of searching for and registering archaeological monuments in the vicinity of Semey (Andrianov 1929: 43). A.N. Beloslyudov and F.N. Pedashenko were great enthusiasts of archaeology. In 1903, F.N. Pedashenko collected an interesting collection of things in the vicinity of the city, including 72 stone objects.

In the 1950s, under the leadership of E.R. Rygdylon, the Ust-Narym settlement was studied, where residential complexes were excavated. Stratigraphy played an important role in the study of the settlement. The stratigraphic scale showed that the development of the territory began in the Neolithic period, and the peak of the development of the community of that time occurred in the Bronze Age. The stratigraphy of such monuments allows us to trace the stages of progression of ancient communities, starting from groups of simple hunters and cattle breeders and ending with the formation of communities of miners and foundry workers.

In 1951, B.A. Beloslyudov and A.G. Maksimova studied a two-layer monument located near the Aul resort. The early layer contained a collection of fragments of Neolithic ceramics, while the late layer contained ceramics of the Fyodorovo archaeological culture (Ageeva, Maksimova 1959: 32–58). It should be emphasized that the study of monuments of this type allows us to resolve issues of the genesis of the archaeological cultures of the region. The development of the region by primitive societies was a continuous process. Monuments with a cultural layer from the Neolithic period are often overlaid with materials from the Bronze Age. For example, on the banks of the Irtysh River, the remains of individuals with burial goods of the Neolithic period have been found. Of the items presented in this set, it is necessary to pay attention to the collection of ceramic vessels; they are all jar-shaped, with a comb ornament applied to the surface. The vessels were made using the ribbon technique; the surface has traces of polishing (Ageeva, Maksimova 1955: 32–58). In the future, this technique and method of applying ornamentation, only in a more advanced version, will become the basis of ceramic production among Bronze Age groups.

In addition to clay items, there is another important detail of the burial rite: a phalanx (a short tubular bone) of a kulan, painted with red ochre, was found near the buried individual. The use of ochre became a stable burial tradition among the population of the Early Bronze Age; in particular, ochre was actively used by representatives of the ancient Yamnaya archaeological culture. In the studied region, the first monuments with signs of the Yamnaya archaeological

culture were recorded at the Grigoryevka II burial ground, which is located on the right bank of the Irtysh River. The burials were made in ground pits; the skeletons lay on their backs with their legs bent. The burial inventory consisted of clay pots with a comb ornament applied to the surface, and bone arrowheads were also found (Merts 2007: 71–75).

The reason for the discovery of Early Bronze Age sites in the northern regions of Kazakhstan along the line from east to west is that in the northeast sites identified and considered within the framework of the Ust-Bukon archaeological culture were discovered (Tkacheva 1997: 16). The Ust-Bukon complexes cover a chronological range from the end of the 3rd millennium BC to the first half of the 2nd millennium BC. It is also necessary to note the research on Early Bronze Age sites in northeastern and eastern Kazakhstan. V.K. Merts was the first to consider them separately, without mixing them with the so-called Andronovo problematic; the materials from the Early Bronze Age sites allowed the scientist to compare them with the Yamnaya and Krotovo-Elunino types (Merts, Frank 1996: 73; Merts 2003). Currently, 52 monuments dating back to the Early Bronze Age have been discovered in the region (Merts 2010: 49). Monuments such as Nurbay 2, Nurbay 3 and Chemar 1 are synchronized with the complexes of the Elunino archaeological culture of the Early Bronze Age of Altai (Merts 2015: 168). According to calibrated radiocarbon dates, the reference monuments of the Elunino burial grounds cover the 22nd–18th centuries BC (Eluninskii arheologicheskii kompleks… 2016: 240).

A comparative analysis of the ceramic complex of the Ust-Bukon archaeological culture with the ceramics of the Odintsovo, Krokhalevo and Elunino cultures from the Early Bronze Age sites of Western Siberia allowed us to consider them within the following chronological framework: the last quarter of the 3rd millennium BC – the first quarter of the 2nd millennium BC. The Ust-Bukon ceramic type is very similar to the materials of the Vishnevo culture of the Kazakh Ishim region (Tkacheva 1997: 12).

In subsequent periods, the Early Bronze Age monuments will form the basis for the formation of the archaeological culture of the developed Bronze Age. In the studied region, the Early Bronze Age materials were provided by the Kara-Tumsyk burial ground. Separate children's burials were discovered on the territory of the burial ground, and a collection of ceramic vessels decorated with geometric ornaments was collected. The above-mentioned burials (especially separate children's) are typical of the traditions of the early 2nd millennium BC, and then the territory of the necropolis was used by representatives of the Fyodorovo archaeological culture. In the second period of development of the Kara-Tumsyk burial ground, the representatives of the Fyodorovo archaeological culture observed certain traditions when conducting funerals, which are characterized by the following features: the burial rite is cremation; ceramic vessels are ornamented with oblique triangles; the burial inventory included earrings with a socket (Merts 1994: 42-44). In the territory of the former Semipalatinsk region (now the Abay region), the Eskealmas and Masaly burial grounds were discovered, the materials from which are dated to the 16th–14th centuries BC and attributed to the Fyodorovo archaeological culture (Orazbaev 1992). Materials from the early 2nd millennium BC were recorded during a study of the Kenzhekol I burial ground, located on the right bank of the Irtysh River, west of the Kenzhekol settlement. Burial 3 of Excavation I, burial in pit 1 of Excavation II, and burial 12 of Excavation III are dated to the end of the 3rd millennium BC and the first quarter of the 2nd millennium BC. Most of the burials located on the periphery of the burial ground yielded materials that are dated to the 17th–13th centuries BC (Tkachev et al. 2005: 302–305).

Results and discussion

The earliest and most famous pit-type monument in Kazakhstan is the Karagash burial ground. It is located at the foot of the Kent Mountains, in the Karkaraly district of the Karaganda region. One burial was examined in burial pit No.2 of mound No.2. The skeleton of an adult was lying on its back, but the legs with bent knees were tilted to the left, and the head was oriented to the southwest. Several coals were found on the left side of the chest, and particles of red paint were found on the right side. As for the burial inventory, an egg-shaped vessel with a high neck and a body decorated with pinches was installed near the skull. Near the elbow of the left arm were fragments of a wooden vessel with a copper frame, nailed to the rivets with copper nails. A copper tetrahedral awl was found in the neck area, and a copper knife lay near the left shoulder. The data indicated, such as the western orientation of the buried person, an egg-shaped vessel with a high neck, and metal objects, allowed the authors to attribute the monuments to the Yamnaya archaeological culture and synchronize them with the second stage of the development of this culture, which includes the third to the first half of the fourth quarter of the 3rd millennium BC (Evdokimov, Loman 1989: 45). Radiocarbon dating of the Karagash burial mound covers the end of the 30th – beginning of the 28th century BC (Motuzaite-Matuzeviciute et al. 2015: 26, tabl. 1).

Monuments with such characteristics of the material are well comparable with the Early Bronze Age complexes located in adjacent territories. In Western Siberia, they are comparable with the materials from the settlements of Kokuy II, Odino and Loginovo (Krizhevskaya 1970: 153–162; Gening and Evdokimov 1969: 115–117). The ceramic complex of sites included in the Vishnevo type circle has a number of similar features: ceramics with linear-pricked ornamentation is close to the Krotovo type pottery of Western Siberia; pottery ornamented with inclined impressions made with a short stamp is similar to vessels with pit-comb ornamentation from the Trans-Urals and Western Siberia; The pitted dishes are identical to the kitchen utensils found at archaeological sites in the Tyumen Tobol region (Gening et al. 1970: 25, 49; Komarova 1956: 93–103; Krizhevskaya 1977: 77–81; Molodin 1981: 66–69).

At the present stage, Early Bronze Age monuments have been identified further south, in the area of the Burabay mountain-forest massif. In 2022, a new burial ground, Tazhygul, was discovered and explored. It is located in a picturesque valley adjacent to the northeastern part of this massif. This elongated depression is located 15 km northeast of the village of Burabay, 1.5 km southwest of the village of Abylaykhan in the Burabay district of the Akmola region (Sakenov, Ganieva 2022: 126–135). On the territory of the Tazhygul burial ground, a large stone fence (mound no. 1) has been fully explored, and during an inspection of the remains of a 19th-century Kazakh wintering building, the stone fence of an extension (mound no. 2) has been partially studied. Mound No. 1 is located 50 m north of the Karabulak spring. The stone fence was distinguished by inconspicuous flat stones that were tightly adjacent to each other and were carefully laid out, forming a fence. The obtained radiocarbon dates showed: calibration date for sigma 1 - the second half of the 33 - first half of the 32 century BC, for sigma 2 - the middle of the 34 - early 31 century BC.

To date, the results of new radiocarbon dates obtained from the materials of the Kamysty settlement are known. Based on the totality of the analysis results of all the established dates, the monument can be dated to the 17th century BC. Calibration radiocarbon dates obtained by the

AMS method from samples of the burial complexes of Khalvay 3 and 5 are available, which cover the historical period of the 21st – 19th centuries BC (Panyushkina 2015). The Bestamak burial ground, the radiocarbon dates of which were performed in the OxCal 4.2.4 program using the Intal_13 calibration curve and also taking into account the total interval of all calibration dates, is dated to the end of the 21st–15th centuries BC (Logvin 2019: 138). The burial inventory of the Bestamak burial ground is similar to that of the Sintashta burial ground, and the total interval of the Sintashta calibrated dates covers the period 2010–1770 BC for sigma 1 and 2200–1650 BC for sigma 2. The dates were obtained from samples from sites located in the Urals and southern Western Siberia (Molodin et al. 2014: 140).

In order to reveal the historical processes that took place in the Early Bronze Age, the sites studied in northeastern and northern Kazakhstan are compared with the archaeological sites of western Kazakhstan. The Early Bronze Age sites in western Kazakhstan are represented by burials of the Yamnaya culture, which are dated to the 3rd millennium BC (Kushaev 1993). The sites of the Yamnaya archaeological culture were studied on the left bank of the Ilek River, in the Shoktybay III burial mound (Shyngyrlau district, West Kazakhstan region). A burial was discovered with a burial rite characteristic of the Yamnaya culture, and the use of ochre was also noted (Drozhevsky 2002: 45–52). A burial rite using ochre was also recorded at another burial ground, Mamai I, located 7 km south of the village of Kokterek (Khromtau district, Aktobe region). A human burial was investigated in mound No. 3; the lower limbs and the area underneath them, the bottom of the burial chamber, were covered with ochre. The burial inventory is represented by a pot-shaped vessel, a bronze dagger, and a mace head made of white marble (Kushaev 1993).

Early Bronze Age burials have been studied in the territory of the Kresty burial ground. Here, burials of the Yamnaya archaeological culture have been discovered in two mounds (mound no. 3, burial 4; mound no. 10, burial 2). In both cases, human skeletons have traces of ochre backfill; the buried are accompanied by richly ornamented egg-shaped and jar-shaped pots, bronze ornaments, and stone tools. At the Ilekshar burial ground, located 2 km east of the Ulguli settlement (Shyngyrlau district, West Kazakhstan region), metal and bone objects were found in the materials of mound no. 3, which clearly demonstrate the age, sex, and social structure of the Yamnaya archaeological culture population (Gutsalov 2006). A series of radiocarbon dates were established based on the materials of the Kumsai I burial ground, which has 168 fences. Radiocarbon dating of human bones and wood remains from the ceiling showed a date of 4290 ± 40 years ago (Bisembaev et al. 2016: 88). Collective and individual burials of the Yamnaya culture were studied at this site. The combined results of all analyses allow us to date this archaeological site to the 3rd millennium BC (Bisembaev et al. 2016: 84-88).

In general, the Early Bronze Age sites studied in Western Kazakhstan cover the chronological range of the 3rd millennium BC – early 2nd millennium BC (Kushaev 1993). The events that took place in a single historical space – from the western to eastern regions of Kazakhstan during the 3rd millennium BC – are well illustrated by anthropological materials from Western Kazakhstan sites. As a result of the analysis of craniological collections from the Shoktybay III, Kumsai and Zhirenkopa burial grounds, it was established that the skulls and individual human bones, possessing their own morphological specificity, belonged to representatives of the Yamnaya and Afanasievo cultures (Khokhlov, Kitov 2012: 70).

The discovered and studied monuments of the Early Bronze Age in Kazakhstan are interconnected, on the one hand, with the Eastern European, and on the other hand, with the South Siberian complexes. According to the calibrated radiocarbon date, in the first half of the 3rd millennium BC, the territories of Eastern Kazakhstan, Altai and Southern Siberia were inhabited by tribes of the Afanasievo archaeological culture (Görsdorf et al. 1998). From the west, the tribes of the Yamnaya archaeological culture, representatives of the Circumpontic metallurgical province, advanced and migrated.

In light of new archaeological discoveries in the northwestern and northeastern parts of Kazakhstan, the migration routes and eastward expansion of the Yamnaya archaeological culture tribes can be traced, as evidenced by such sites as the Belkaragay settlement in the Kostanay region, the Tazhygul burial ground in the Akmola region, and the Shiderti settlement and burial ground in the Pavlodar region. The materials and burial rites find parallels in the Yamnaya archaeological culture. This is not contradicted by the absolute chronology obtained by radiocarbon dating, which covers the second half and the end of the 3rd millennium BC.

Conclusion

Archaeological materials and the results of radiocarbon dating at this stage confirm that the Early Bronze Age in the territory of northeastern Kazakhstan covered the beginning of the second half of the 3rd millennium BC – the turn of the 3rd and 2nd millennia BC. In order to avoid terminological confusion regarding such concepts as post-Botai, pre-Andronovo, Vishnevo, Shiderti, and so on, we propose to designate all monuments dating from the second half of the 3rd millennium BC to the 20th century BC as monuments of the Early Bronze Age. As mentioned above, the Early Metal Age of northeastern Kazakhstan begins in the second half of the 3rd millennium BC, with the development of copper: copper is alloyed with arsenic, and it is during this period that the plate technique in metalworking is formed.

In northeastern Kazakhstan, a series of new radiocarbon dates have been obtained on the Fyodorovo culture sites, the totality of which indicates their synchronicity with the Petrovka complexes, which were previously considered a priority. The beginning of the formation and, most likely, the original lands of this culture are the territories of Northern and Eastern Kazakhstan and Altai. If the absolute dates of the Fyodorovo monuments in Southern Siberia and Altai correspond to the time scale of the 20th–19th centuries BC, then the monuments located in the territory of northeastern Kazakhstan are dated to the beginning of the 19th century BC. Modern archaeobiological research of the skeletal material of the Petrovka and Fyodorovo collections has demonstrated a greater probability of family ties between these cultures than with the Alakul ones.

In the second half of the 19th century BC, abrupt changes occurred in the economic and social life of the ancient society of the eastern part of the Eurasian metallurgical province, causing active movements of human groups to the west. As a result, these processes led to the formation of monuments of the Fyodorovo archaeological culture in the east, north and central parts of Kazakhstan. In historiography, they were called the "Fyodorovo archaeological culture" (according to the concept of K.V. Salnikov and A.M. Orazbaev), or the "Nura archaeological culture" (according to the concept of A.Kh. Margulan and K.A. Akishev).

If, for comparative analysis with Near Eastern and other chronological schemes in the Sintashta and later in the Alakul time, the spread of the chariot was used, then for the monuments of the Fyodorovo archaeological culture, the objective factor is the cremation rite. The earliest evidence of the use of the cremation rite in burial practice was recorded at the settlement of Yarym-Tepe (northern Iraq). This rite was the main one in the Halaf culture, dating back to the 5th millennium BC (Munchaev, Merpert 1981: 198–203). In the territory of Anatolia, cremation was a traditional burial rite among the powerful Hittite tribes. It is reliably known from archaeological and written sources that the Hittite tribes inhabited Anatolia in the 17th–14th centuries BC. Reliable archaeological confirmation comes from research conducted outside the site (Turkish village) of Bogazkoy (according to written sources, this is near the ancient city of Hattusa, the capital of the Hittites); special places where the dead were cremated were discovered there (Archi 2016).

More interesting arguments can be made about the burial chamber, the so-called cyst. The use of a burial chamber of this type is one of the distinctive rituals of the tribes of the Fyodorovo culture in Kazakhstan. In the Early Bronze Age, cysts were widely used in burial practices in central Anatolia and Mesopotamia (Alekshin 1986: 100–111). At the Koruchu Tepe site (Eastern Turkey), along with cysts built from stones, cysts constructed from mud bricks were recorded.

Based on the analysis of the topography of the burial grounds and archaeological materials, it was established that the core of the Fyodorovo culture was the Early Bronze Age sites of Northern and Eastern Kazakhstan, with the participation of tribes from the southern regions as a result of migration, since Fyodorovo ceramics and the technique of its production have characteristic features of the Circumpontic metallurgical province. Artifacts typical of the Fyodorovo culture of Kazakhstan have been identified at sites of ancient agricultural oases in the south of the country. A striking example of an archaeological site of this type is the Shortugai settlement, located on the left bank of the Amu Darya River; it has been dated by the radiocarbon method to the 20th–18th centuries BC . Vessels on high legs and an author's stand with a master's stamp were discovered in the cultural layer of the Shagalaly II settlement (Sakenov 2024). These items are identical to objects from the monuments of the Kelleli oasis (Turkmenistan), dated to the 18th–16th centuries BC (Sarianidi 1990: 74). A comparison of the above-described categories of items allows us to demonstrate the synchronous development of monuments of the Fyodorovo archaeological culture, which had the same time frame – the 19th–16th centuries BC, along with the general trends of the history of the Ancient World.

Thus, the following processes were observed in Kazakhstan in the Bronze Age. This region was developed by two large tribes, called the Alakul and Fyodorovo archaeological cultures, in historiography and archaeology. The territories of the northern, northeastern and central parts of Kazakhstan became contact areas for both cultures: for the Alakul, which had many common features with the monuments of the west, and for the Fyodorovo, which absorbed components of local early bronze cultures. The long coexistence of two cultural formations in one territory during the 16th–15th centuries BC became the basis for the formation of the Alekseyev-Sargara archaeological culture of the 15th–12th centuries BC.

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Contributions by authors

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