Chapter 3

The Eurasian Steppe in the Bronze Age

According to the paleogeographical data (Lavrushin, Spiridonova 1995a, b), the Subboreal period, which had started in the mid-third millennium B.C. and was marked, as already mentioned, by an abrupt cooling of the climate, at the turn of the third-second millennium B.C. gave way to a new temperature rise. Some researchers believe this caused the rise in moisture and humidity in the climate and subsequent change of the natural zones. In the second quarter of the second millennium B.C., the climatic conditions resulted in the development of the grass multiherbaceous Steppe and the spread of forested areas in which, alongside the prevailing birch and pine, lime and oak reappeared.

But if earlier the interaction of human beings and nature had been determined by the specific character of the Steppe ecological zone, with its inherent alternations of climate, now another natural factor acquired paramount significance—the richness of the territory in copper deposits. This metal, which came into use with the beginning of the Eneolithic period (or the Copper Age), already had assumed great importance among the Pit-Grave peoples, while the Catacomb Culture populations appeared to be skilled metalworkers, as apparent from the metal artifacts discovered in their burials.

The need for metal was stimulated by the transition of a portion of the Pit-Grave population to mobile livestock husbandry. Herd animals had become easily alienable moveable property, and they therefore required protection, giving rise to the use of weapons and hence to the promotion of metalworking.

Formerly metal had come to the Steppe from the very rich Bulgarian mines (Chernykh 1978; Ryndina 1971), but this source later was depleted, and the farming settlements were abandoned and the mines forsaken. This is linked by S. Todorova (1979) to an ecological crisis, the flooding of the territory. The search for local raw material led to the discovery of the Uralian copper beds, including the richest deposit at Kargaly, the initial use of which deposit E. N. Chernykh (1998) dates to the Pit-Grave period.

In the Urals, along the ancient fault line of Magnitogorsk-Orenburg,

a native copper outcrop was known; the prehistoric miners used this solely for the deposits of oxidized ores located in the upper levels easily accessible to them.

All together, the geographical, climatic, and demographic factors determined the unprecedented transformations in culture in the following period, and can be described as the fourth stage in the evolution of the food-producing economy of the Eurasian Steppe (Kuzmina 1996–97).

Proto-Urban Culture in the Urals

Two outstanding events in Russian science took place in 1973: A. I. Ashikhmina, as a member of V. F. Gening's expedition, examined the remains from the burial grounds of Sintashta in the Bredinsky district of the Chelyabinsk Region (*AO* 1973; 1974, 132, 133); while K. F. Smirnov, assisted by S. A. Popov, studied burial mound N 25 in the cemetery of Novy Kumak near Orsk (*AO* 1973; 1974, 175, 176), demonstrating the similarity of its collection of ceramic vessels with those of the Poltavka and Catacomb cultures.

While the burial ground of Sintashta yielded an exceptional set of artifacts (Gening et al. 1992), the burial mound of Novy Kumak for many years remained the only stratified site. In 1976, at a conference in Samara (Kuibyshev), K. F. Smirnov and I (Kuzmina, Smirnov 1976) identified among the published materials those ceramic types from sites in the territory of the Urals and Western and Northern Kazakhstan, including the sites of the Petrovka type discovered earlier by G. B. Zdanovich (1975; 1988) and assigned by him to the fifteenth century B.C. According to the stratigraphic data of Novy Kumak, we placed all of these artifact collections in the Novy Kumak chronological horizon, positioned between the time of the Catacomb Culture and the advanced Andronovo Culture of the Alakul type.

As to the chronological placement of this horizon, we, both having already researched the history of wheeled transport and horse cheek-pieces (K. F. Smirnov 1957; 1961; Kuzmina 1974a), dated it "prior to the Mycenaean shaft burials" (sixteenth century B.C.), where, as shown by A. M. Leskov, cheek-pieces analogous to those of the Steppe were present. Most important, though, is that, contrary to G. B. Zdanovich (who sought the origin of the Petrovka sites in the Kazakhstanian Neolithic, admitting the possibility that the Southern Central Asian and Abashevo components participated in their formative development), we advanced a bold hypothesis of a western influx of people that led to the development of the Novy Kumak horizon sites, constituted by the European cultures of Abashevo and Poltavka, and the European

Post-catacomb Culture of the MVK.[1] In conclusion, our opinion was that the founders of the Novy Kumak-type sites were Indo-Iranians, which confirmed the hypotheses we had developed earlier. These provisions were argued in the monograph "The Origin of Indo-Iranians in Light of the Latest Archeological Data," published in 1977 for the International Congress in Dushanbe.

Somewhat later, an article by V. F. Gening (1977), "The Burial Ground of Sintashta and the Issue of the Early Indo-Iranian Tribes," came out, in which he published some remarkable materials from the burial ground, dating them to the sixteenth century B.C. and acknowledging that Indo-Iranians were their founders.

In 1988 a monograph by G. B. Zdanovich, *Bronzovyi vek Uralo-Kazakhstanskikh stepei* (The Bronze Age of the Uralo-Kazakhstanian Steppe), appeared, in which the Petrovka complexes of Northern Kazakhstan were published and the results of their study summarized. In 1992 V. F. and V. V. Gening and G. B. Zdanovich published in full the materials of Sintashta.

Later, particularly in recent years, a large number of burial grounds in the southern Urals and western and northern Kazakhstan have been discovered and excavations of Ustye and Arkaim (now widely known) have been carried out (N. B. Vinogradov 1995a; G. B. Zdanovich 1995a; 1997). Excavations of the settlements of Kuisak (Malyutina, Zdanovich 1995) and Alandskoye have begun.

The material of the burial grounds of the Ural region, Kamenny Ambar (Kostyukov et al. 1995), Solntse II (Epimakhov 1996), and Bolshekaragansky (Botalov et al. 1996); of western Kazakhstan, Tanabergen II, Vostochno-Kuraili I, and Zhaman-Kargala (Tkachev 1998); and of northern Kazakhstan, Bestamak (Kalieva et al. 1992), have been published.

I. M. Batanina's (1995) analysis of the formerly classified space and aerial photographs of the earth's surface, which enabled the detection in the area between Magnitogorsk, Troitsk, and Orenburg of about two-tenths of the settlements (Gening et al. 1992, fig. 1), was important for the study of this type of complex (Map 10). Two more sites were discovered in the year 2000 (Epimakhov 2002, fig. 1).

At present the database is quite rich and representative of this horizon, and it is time for a broader interpretation. However, such an interpretive study is hindered by the fact that the bulk of the burial material has been published, but the material from the settlement sites has been described only in preliminary publications (N. B. Vinogradov 1995a; G. B. Zdanovich 1997), and it is difficult to assess them;[2] the typological classification of the Sintashta complex—the promised second volume—has not yet been published either.

It is also important to mention the significance of analyses of certain inventory categories such as the study of metallurgy and metalworking undertaken by S. A. Grigor'ev (1994). These data allow one to form a general idea of the cultures of the Steppe peoples in the Novy Kumak period.

In the Urals, settlements are usually situated by rivers, on high, steep promontories. Circular, oval, or square in plan, they are enclosed by defensive walls, constructed either of palisade walls made up of vertical logs (posts) 0.3–0.5 m in diameter or timber frameworks packed with clay. Around the outside circumference of the wall is a defensive ditch 1.5 m deep and 1.2–3.5 m wide, with 0.4 m high banks and 2–2.5 m wide gateways—wide enough for the passage of a vehicle or a chariot. At the large settlements of Olgino and Alandskoye, the walls are surrounded on the outside by vertical stone slabs or plinths over a meter in height. The planned settlements probably were constructed within a short time by a large, well-organized team. Some settlements underwent remodeling and repairs, sometimes changing the original site.

The interior layout of settlements, also built according to plan, is circumscribed between the interior and the exterior walls. Houses consist of adjacent rectangular or trapezoidal chambers with ceilings that possibly sloped toward the center of the settlement. Most chambers had hearths and wells. Outdoor drains were established. Timber and packed clay, or adobe, were used for the construction of house frames.

At the settlement of Sintashta, two rows of pisé walls form a circle 140 m in diameter, partitioned into compartments by radial walls (G. B. Zdanovich, Gening 1985, 151). The settlement of Arkaim, measuring 20,000 sq. m, is representative of the style of settlement plans that have double concentric circles of pisé walls divided by radial streets, often with a square inside (G. B. Zdanovich 1989b, 181, 182). The outer wall is 160 m in diameter, 4 m in width.

At an early stage, the settlement of Ustye was a fortress, circular in plan, built of a defensive wall of vertical pine logs and surrounded with a ditch 3 m deep and 4.5 m wide. In the second construction phase, the settlement was rebuilt into a rectangular fortress with rounded corners measuring 2 ha in area. The defensive wall is constructed of a timbered framework filled with earth. The settlement is again encircled with a ditch (N. B Vinogradov 1995a, 17). Inside, two sections of standard-sized chambers divided by the arterial road were discovered. The houses are rectangular, each measuring 160 sq. m in area, dug into the ground as deep as 0.4 m; the walls are constructed of a timbered framework filled with earth. Every dwelling has a round stone hearth with traces of metalworking and a circular pit that could have served as an ash-pit in the smelting process (S. A. Grigor'ev 1994).

Similar fortified settlements were discovered in Transuralia (Kulevichi III, Semiozernoye) and in Northern Kazakhstan: Bogolyubovo I, Novonikolskoye I, and Petrovka II. In Bogolyubovo and Semiozernoye, the ditch protected a promontory; in Novonikolskoye it enclosed a rectangular area measuring 95 x 60 sq. m; and in Petrovka, an area measuring 70 x 120 sq. m, divided into two parts by the inner ditch (Vinogradov 1983; Zdanovich 1988, 133).

The center of "the country of towns" located between Magnitogorsk and Orenburg is of special interest; it was in an area that probably held small ancient mines, not far from the Kargaly copper deposit, the location of the largest mines in the Urals (Map 10). The sites there are 40–70 km apart—the visibility range of watch-fires—which ensured reliable protection and control over all the territory (Gening et al. 1992, fig. 1) and which conformed to the ancient rules of frontier defense found in the Old World.

In recent years many burial grounds have been discovered and excavated (Fig. 9). Some of them, based on the similarity of ceramic types, belong to nearby settlements that are generally separated by a river or, less often, by hills. Examples are the complex of Sintashta, the complex of Arkaim, the Bolshekaragansky burial ground (Botalov et al. 1996), and Ustye and Solntse II (Epimakhov 1996). The burial grounds consist of earthen mounds containing one or two large central graves, usually with a wooden timber-roofed chamber. Sometimes, around the central grave, peripheral graves smaller in size were found; such tombs were more recent and involved a new excavation of the original mound.

A different picture was noted in Sintashta, where, in the major burial mound complex, forty burials were found, and in the minor, ten; a sacrificial altar was also discovered. But, unfortunately, because of the unique character of the complexes, many details failed to be recorded in the field, and therefore the structure of the complex is still not quite clear, and various interpretations reconstructing the history of Sintashta (for instance, Gening et al. 1992, figs. 198, 210, 213) seem fanciful.

At all the burial grounds, the deceased lie in a flexed position, usually on their left sides, though sometimes on their right sides, and, rarely, on their backs with their knees raised (Fig. 11). The orientation of the burials is variable. There are vessels and very rich accompanying inventory in the graves, including stone maces, copper axeheads, adzes, knives or daggers, socketed spears, socketed and shafted arrows, stone and bone arrows, bone shovels and parts of the compound bow, copper lash-wrappings, abraders, clay tubes for carrying air to the furnace (in three cases), and finally, a rich assortment of adornments (Fig. 13). One must remember also that many of the richest major burials were looted in ancient times.

In several cases, at the top of the mound, sometimes with clay daub and traces of fire, a funeral feast was discovered (Figs. 11, 12). It consisted of domestic animal bones, including those of the horse. On the ceiling of the pit, in the compartment between the pit wall and the chamber or in the grave itself, burials of horse pairs were found, often together with cheek-pieces, or only hides of sacrificial animals along with skulls and hoofs, or, finally, only cheek-pieces.

The horses usually lie on their sides, their heads turned in opposite directions, muzzles facing each other; or more rarely, one horse after another lying on the same side. In the burial ground of Bestamak, a gravel pit was cleared in which three horses stood vertically (Kalieva et al. 1992). Sacrificial altars have also been found.

A sensational discovery in Sintashta revealed impressions of spoked wheels at the bottom of the graves, traces of the most ancient chariots in the world. They were discovered in the burial grounds of Krivoye Ozero, Kamenny Ambar, and Solntse II, in the Urals; and Ulyubai, Berlik II, and Satan in Kazakhstan (Gening et al. 1992, fig. 57: 8; Zdanovich 1988, 76, 88, fig. 29: 2–6; 31: 9–12; Tkachev 1998; Kuzmina 1994a, b, c; Kostyukov et al. 1995; Anthony, Vinogradov 1995; Botalov et al. 1996, fig. 17: 10; 18: 4).

There is insufficient evidence to reconstruct the economy of this population. Evidence of farming is lacking. Cattle and sheep or goat herding was intensive, but pigs were uncommon. Horse breeding played an important role. The horse was used as a meat animal and also for transportation. According to P. A. Kosintsev (1995, 6), the Sintashtians' horses were purebred, semi-thin-legged, and stood on average 136–144 cm high at the shoulder. Five- to eight-year-old horses were used in the burial rite. These established facts testify to the high development and great cult significance of the horse.

Undoubtedly metallurgy and metalworking were the most important occupations of this society, indicated by the discoveries of an unprecedented amount of copperware in burials and remains of metalworking in almost every dwelling in the settlements, as well as by the location of the sites near mines. (Ore from the mine of Kisenet was found in the neighboring settlement of Ustye.) Several types of hearths at Ustye were used in ore smelting: one in the shape of a groove clad with stone, one a two-chambered hearth, and one dome-shaped. Many had a chimney-like flue and were connected to a circular pit that served as an ash-pit. The use of these hearths was an important step forward in the development of metallurgy when compared to the Pit-Grave period, for such hearths could be fired at higher temperatures. The development of firewood-thermal potential is viewed by L. White as a decisive factor in the history of civilization.

According to S. A. Grigor'ev's (1994) data, rich oxidized ores from the upper part of sulfide-copper deposits were utilized. The slags have an increased arsenic content, which is indicative of not only the use of the Uralian deposit of Tash-Kazgan ores but also the alloying of copper, that is, the making of arsenic bronze, an important innovation discovered after the Pit-Grave period. What is important is that the stimulus for metallurgical innovations at Sintashta came from the West, namely, from the East European Fatyanovo-Balanovo and Catacomb metallurgical traditions.

Metallurgy by its nature was a localized, domestic production, as apparent from its presence in every settlement that has been excavated; there are no signs of craft specialization. At the same time, the scope of production leaves no doubt that the Sintashtians, though not specialized craftsmen, engaged in the communal metallurgical enterprise and worked to produce metals exported to the Volga and Don regions, which lacked the sources for raw materials. Petrovka metallurgy was a result of an inherited metallurgical tradition (S. A. Grigor'ev 1994, 122–26).

Thus, at the Novy Kumak stage, a number of significant interrelated innovations were introduced: (1) spoke-wheeled chariots were employed for minor skirmishes; (2) methods of horse training and harnessing to a chariot by means of cheek-pieces were discovered; (3) the extraction of local copper deposits on a large scale was conducted; and (4) metal smelting and alloying were perfected, thereby improving the quality of metal artifacts. Finally, the spatial organization of settlements, which followed a clear-cut plan with a well-designed fortification system, was established. All these factors demonstrate the tremendous advances in social evolution that occurred during the Novy Kumak stage.

The peoples that mastered these innovations gained in strength, leaving behind their neighbors, and this enabled them to establish wide cultural contacts in Eurasia and to begin moving along the future Silk Road routes.

As mentioned above, a quarter of a century ago K. F. Smirnov and I (1977) advanced a bold hypothesis that the sites of the Novy Kumak horizon belong to the group of European cultures and appeared in the Urals and Kazakhstan as a result of the migrations from the West of the peoples of the Abashevo, Poltavka, and the MVK cultures. It is now possible for these conclusions to be validated, specified, and substantially corrected. Our first concern is to address the origins of the cultures and their independent chronological sequences.

The lower level of the Kuisak settlement is assigned to the Pit-Grave

Culture, the ceramics of the middle level reflect elements of both the Pit-Grave and Abashevo cultures, and the upper level is Sintashtian (Malyutina, Zdanovich 1995). At the settlement of Beregovka I, the lower level was identified as the Abashevo Culture, the middle, as the Novy Kumak Culture, and the upper, as the Timber-Grave Culture (Vasil'ev et al. 1995a, b). In the cemeteries of Tanabergen, Kuraili, and Zhaman-Kargala, and burial mound No. 11 at Bolshekaragansky, the major graves were of the Poltavka Culture and the later secondary graves (added at a later time) of the Sintashtian type. In the Alexandrovka IV burial ground the complexes are mixed; Abashevo vessels were found together with those of the Poltavka Culture (Tkachev 1998). On the Don, in the Kondrashkinsky burial mound, the major burial is of the Catacomb Culture, and the secondary graves (added at a later time) are of the Abashevo Culture (Pryakhin et al. 1989). On the lower Volga, many sites of the Catacomb Culture preceded those of the Timber-Grave Culture (Malov, Filipchenko 1995). These facts document the integration of the Abashevo and Poltavka cultures leading to the development of the Sintashta-type sites and indicating the participation of representatives of the Catacomb Culture.

Within the Novy Kumak horizon, the earlier placement of the Sintashtian-type sites and the later placement of the Petrovka-type sites was established based on stratigraphic data from the settlement of Ustye, the necropolises of Krivoye Ozero, Stepnoye I, and Kamenny Ambar (N. B. Vinogradov 1995a).

Thus these chronological placements have established that the sites, which we previously assigned to the Novy Kumak horizon, indeed fall into two chronological phases or types: the earlier Sintashtian type and the succeeding Petrovka type. The Sintashtian type is most likely to have its origins in the Urals at the contact zone of various Southern Russian cultures. The Sintashtian is characterized by a number of archaic features (for instance, the presence of supine burials) and the prevalence of a ceramic style that combines elements of the Poltavka, Post-Catacomb, and, particularly, Abashevo Culture. According to N. B. Vinogradov, at this stage the predominant settlement plans were circular and oval in configuration.

In the Petrovka-type sites, reflecting, probably, a partial movement of the population eastward, the ceramic styles are no longer hybridized, instead showing the influence of the local traditions.

Burials and burial grounds with inventories similar to those of Novy Kumak, including ceramics and other ritual goods such as cheek-pieces and almost every kind of weapon found in the Urals, have been discovered in the Middle Volga Region. These include the burial at Alekseevskoye and the burial grounds of Lopatinsky II, Utevka VI, and Pota-

povka (the Potapovka-type site is used as the general designation of such sites) (Agapov et al. 1983; Vasil'ev et al. 1991; 1992; 1994; 1995a, b). The ceramic collections of the Samara sites show elements more typical of the local Poltavka Culture.

The same artifact inventory (or assemblage)—cheek-pieces and weapons—was found in the burials and cemeteries of the Don Region. These are the burial mounds of Filatovka, Usman, Pichayevsky, Vlasovsky I (burial mound N 16), Pavlovsky (burial mound N 57), Vvedensky, Kondrashovsky, Bogoyavlensky, Kondrashkinsky, the Selezni burial ground, and so on (Sinyuk, Kileinikov 1976; Vinnikov, Sinyuk 1990; Sinyuk 1996; Pryakhin et al. 1991; Pryakhin 1992; Pryakhin, Matveev 1989; Moiseev, Efimov 1995). A. T. Sinyuk (Sinyuk, Kozmirchuk 1995, 42; fig. 1: map) assigns them to the Petrovka-Abashevo-type site, A. D. Pryakhin to the Abashevo Culture.

From the ceramic assemblages of a number of the Don Region sites, the Poltavka and Catacomb ceramic styles and characteristics can be identified. The origins for these ceramic assemblages are disputed: K. F. Smirnov and I spoke of a Western influence, whereas V. S. Bochkarev (1995) introduced the notion of a Volgo-Uralian center of origins, accepted by me, but disputed by A. D. Pryakhin, who considers the Don Region as a culture area within the larger cultural community of the Eurasian Steppe.

Nevertheless, it is clear that, within a short period of time, a new culture spread throughout the Steppe from the Don to Central Kazakhstan, characterized by advanced metallurgy and the emergence of chariot warfare. Its center was situated in the Southern Urals, where fortified fortresses have been discovered. V. V. Otroshchenko believes that the origin of this new culture came out of the necessity to protect the area of the copper mines, the metallurgists themselves, and their products. This opinion seems convincing to me.

Many aspects of everyday life as well as the nature of the demographic processes of the Sintashtian society remain unknown. First, the archaeological levels at the settlement of Arkaim and the lower levels of Ustye have relatively few artifacts; also it is not clear what caused the fire at Arkaim, forcing its abandonment. K. Jettmar (1997) interpreted the site as a religious and cultural center. This conclusion is unacceptable because Arkaim is clearly a center of metallurgy, and no special cult structures have been discovered there. As for the layout of the site, interpreted by Jettmar as a model of the universe, the Avestan Vara—a finding independently substantiated by myself (Kuzmina 1994c, 71-73; 1975), I. M. Steblin-Kamensky (1995, 165, 167); and N. L. Chlenova (1995, 174-84)—indicates that Vara is not a ritual center, but "a dwelling for cattle, a dwelling for people" and, thus, indeed, it

correlates with the Sintashtian settlements. In addition, K. Jettmar believed Arkaim to be a unique structure, though, in essence, it is an ordinary settlement. It should be mentioned that, although neither in the Potapovo Range of the Volga Region, nor in the Abashevo Range of the Don Region have settlement-fortresses yet been recorded, this type of site is present in the Steppe in the settlements of Kamenka in the Crimea and at Liventsovka and Karatayevka in the Don Region, close to the area of the MVK Culture (Bratchenko 1976: 110–16), which points to the Western—namely, Eastern European—origin of the town fortresses in the Steppe. N. Ya. Merpert (1995), who investigated the geographic distribution of circular fortresses, has shown that there were multiple centers for the origins of such fortresses. This architectural style did not originate in Anatolia or in the Balkans, but at the sites of Central and Eastern European Eneolithic cultures (Moravian, Lengyel) and, particularly, at Tripolye, which maintained close contacts with the Steppe. Previously I put forth an alternative point of view, that the circular layout of the fortresses began as an imitation of a Steppe military camp made up of vehicles located around the circumference of a circle (Kuzmina 1994c). Today this point of view seems unsubstantiated, especially if one considers the intricacy of the layout and the elaborate construction of the fortresses.

Second, the contrast between the monumental nature of the architecture and the relatively small number of interments in the burial grounds is striking. Third, at the settlements the dwellings are more or less identical with regard to their dimensions, functions, and artifact inventories. The design of the architectural plan might have required an administrative head who also oversaw the labor of huge teams of builders. Fourth, although in most graves the artifact inventory is similar, the most prestigious symbols such as the mace are present not only in the largest and richest burials (Nelin 1995) but also in others. However, some burial mounds are distinguished by their larger dimensions, the intricate construction of the chamber, and their riches, presumably indicative of social stratification within the society, not yet accompanied by differences in property ownership.

The presence of chariots, horses, and weapons in burials can be explained in terms of the Indo-Iranian tradition in which these are regarded as attributes and symbols of the privileged class of warrior-charioteers—the *rathaeshtar*s—the class to which the king belongs. Proceeding from this, a hypothesis has been advanced that in the Sintashtian society social stratification began to occur, resulting in the emergence of a military elite (Smirnov, Kuzmina 1977; Kuzmina 1994c). This hypothesis was challenged by D. G. Zdanovich (1997), but it still seems convincing. I also wish to draw attention to the fact that

in the large burials where there is a rich assortment of weapons, very often adzes are found—a tool used by wood-workers, not warriors. At three examples of military burials—in the burial grounds of Kamenny Ambar, Solntse II, and Bestamak—pieces of ore and nodules were found, which testifies to the fact that the deceased were not only warriors but also experienced metallurgists. This brings to mind the image of an ancient Indo-Aryan god, Tvashtar (literally, "creator"), whose name derives from the common Indo-European stem **twer*, as in the Russian *tvorit'* ("to create") and *tvorets* ("creator"), a term that refers to both an experienced master and a god. Tvashtar in Indian mythology is the inventor of the chariot, metallurgy, and other crafts.

It appears that in the Sintashtian society an elite group emerged consisting of persons endowed with creative and administrative abilities who also performed military functions as well. If such a scenario is true then the burials of warrior-charioteers belong to this top stratum (distinguished by status markers and not wealth), while the burials of ordinary members of the community probably are to be found in the cemeteries or other types of burials. Undoubtedly, this question needs further study and a statistical analysis of the burial inventories.

G. B. and D. G. Zdanovich (1995) have raised the question as to whether these sites represent the formation of proto-urban civilization on the Steppe. The sites cannot be identified as early towns, for they lack two key functions: they are neither centers of specialized craft, nor the residential centers of a rich aristocracy and other leaders. Thus one apparently can speak only of an incipient trend toward the establishment of proto-urban civilization.

The Chariots of the Eurasian Steppe

The chariots at the Sintashta- and Petrovka-type sites are reconstructed from the wheel impressions found in the specially prepared groove pits found at the bottom of the graves (Figs. 11, 12). They have been found in the Ural region: in Sintashta, burials NN 5, 12, 19, 28, 30 (V. F. Gening et al. 1992, 130; fig. 56; 163-67; fig. 78; 80; 183, 184; figs. 91, 93: 2; 203, 205; figs. 106-8; 209, 210, 214, 215; fig. III) and, possibly, in burial N 16 and in the minor burial mound (Gening et al. 1992, 153, 339); in the burial grounds of Krivoe Ozero (Anthony, Vinogradov 1995, 38; fig. on p. 36; 39); Kamenny Ambar 5, graves NN 8 and 6 (in the latter, one wheel) (Kostyukov et al. 1995, 162, 163; fig. 9); Solntse II, burial mound N 4, grave N l; 5, grave N 2; 11, grave N 2 (Epimakhov 1996, 26, 29, 33, fig. 4); and also in the later burial ground of Vetlyanka IV, burial mound N 14, burial N 6 (Gorbunov et al. 1990, 31, 32, 36).

In Northern Kazakhstan, chariot wheel impressions were found in the burial ground of Berlik II, burial mound N 2, grave N 1, and burial mounds N 10 and Ulyubai (G. B. Zdanovich 1988, 76; fig. 31). In Central Kazakhstan, at the late Petrovka complex of the Satan burial ground, burial mound N 1, fragments of a chariot were found. These consist of the wooden remains of the body's rectangular platform, measuring 106 x 60 cm, and, beneath the platform, two grooves: one with the remains of a felloe (outer wooden rim where spokes are attached) from a burnt wheel, the other with a felloe fragment, a circular spoke slot, the rotted remains of the hub, and, beneath the felloe, a piece of dyed-red rawhide belonging to a leather tire, and four bone pegs fixing the tire to the wheel (Evdokimov 1981, 434; Novozhenov 1994, 158–60, fig. 97).

During the course of the excavations, it was apparent that the lenticular-base grooves are 0.8–1.1 m long (only in one grave are they shorter), usually 0.2–0.4 m wide and 0.15–0.35 m deep. Segments of wheel impressions also include three or four rectangular spokes (in section, 3–4.5 cm wide), and at Satan, the spokes appear to be circular. The reconstructed chariot, based on these impressions, shows the wheel to be 0.9 m in diameter, with 8–12 spokes. The space between the two wheels (the gauge) is standardized, 1.2–1.4 m. According to data from the Satan burial mound, the chariot body is rectangular, measuring 1.06–0.6 m, and the wheels have leather rims. The wheels are 0.2–0.4 m from the sides of the grave, perhaps determining the maximum size of the protruding hub of the wheel. Along with the chariots in the pit or on the roof, there is a pair of horses or skulls with cheek-pieces, to symbolize the draft team that pulled the chariot.

This evidence enables one to establish the presence in the Sintashta-Petrovka society of two-wheeled chariots with spoked wheels, drawn by a pair of horses. V. F. and V. V. Gening and G. B. Zdanovich (1992, fig. 80; 94; 108) and D. Anthony and N. B. Vinogradov (1995, fig. on p. 38) are responsible for the reconstructions of these chariots.

M. Littauer and D. Crouwel (Littauer, Crouwel 1996a, 934–35) disagree with these reconstructions, since they believe the current extant information insufficient for a complete recreation. They also point out that the size of the protruding hub was insufficient to assure the steadiness of the chariot. Therefore they considered these wheeled vehicles not to be true chariots but "proto-chariots" (two-wheeled carts). Again they challenge the hypothesis that the origins of the chariot occurred on the Steppe (a view advocated by D. Anthony and myself), and insist upon supporting their earlier conjectures that the chariot originated in Western Asia.

As for the size of the protruding hubs resulting in instability, there

are no comparative examples for the Sintashtian chariots, since the only existing chariots from Egypt are many centuries later in date. Furthermore, it is very likely that a dismantled chariot or only some parts representing the chariot were placed in the grave. The latter possibility is more likely when we consider that only one wheel was placed in Kamenny Ambar, grave N 6, and in grave N 8 there was an imitation of a cheek-piece. In many burials, instead of a pair of horses, there was just a pair of skulls, so these are ritual chariots—*vehicula religiosa*. From such ritual chariots, it would be difficult to reconstruct the early prototype of a chariot used in warfare.

Those researchers who argue against a Steppe origination for two-wheeled chariots, following E. V. Izbitser's opinions (1993), have emphasized the fact that there is an absence of two-wheeled vehicles that could have been the prototype for the chariot from the Steppe (Fig. 8). We have already challenged this opinion. In actual fact, two-wheeled vehicles with solid wheels are common at the Pit-Grave and Catacomb burials (for instance, Storozhevaya Mogila, Pervo-Konstantinovka, burial mound N 1, burial N 8; Marievka, burial mound N 11, catacomb grave N 27; Lola, etc.) and are represented by clay models (for instance, in the Three Brothers burial mound (Novozhenov 1994, 133, 140).

Two-wheeled carts with solid and cross-bar wheels, cattle- or, sometimes, camel-drawn, make up a large group of petroglyphs (rock-carvings) found on the Steppe, as explained by V. A. Novozhenov (1994, 89, 97, 103; figs. 51, 53) (Fig. 20). Thus, in contrast to the Danube Region but similar to Western Asia (the Caucasus) and Central Asia (the Steppe), the principal types of wheeled transport were all present: wagons and two-wheeled carts, with closed bodies (Gei 2000). The development of this technology and wheel construction parallels that found in the ancient East.

The necessary conditions for the invention of the chariot originated during the Eneolithic period of the Steppe. And, in contrast to Western Asia, where the horse was practically unknown, in the Steppe the horse—this essential element—was also present. Thus, this suggests that our opinion (P. M. Kozhin, N. N. Cherednichenko, V. B. Kovalevskaya, V. S. Sorokin, D. Anthony, myself, and other researchers) about the independent, and, indeed, prior, invention of the chariot in the Steppe remains valid. An independent center for the origins of the chariot on the Steppe is not ruled out by S. Piggott (1983) and P. R. Moorey (1986).

In the attempt to resolve the issue of the origin of chariots on the Steppe, an analysis of horse cheek-pieces (part of the bridle) is essential.

At sites of the following cultures—Post-Catacomb, on the Dnieper and the Donets, and in the Crimea; Abashevo, in the Don Region, in the Volga Region, and in the Urals; Potapovka type, in the Volga Region; Sintashta and Petrovka types, in the Urals, and in Western, Northern, and Central Kazakhstan—cheek-pieces in the shape of a shield with multiple prongs or inserted spikes made of antler were found (Fig. 14). I mapped and classified these using typological classifications and the evolution of technological developments over time (Kuzmina 1994c).

V. A. Novozhenov considerably augmented my classification system using the functional (use) classifications (Fig. 16). The early type of the bridle has one strap on the horse's nose, fastened together with the types I-A and I-B cheek-pieces. The further development of the bridle is linked with the appearance of the cheek-strap fastened together with the type-II cheek-pieces with additional minor orifices; the next improvement is the appearance of inserted spikes (the type III cheek-pieces).

A classification based on even more finely divided types, but not entirely convincing, was put forward by Yu. V. Goncharova (1996; 1999). Here, the typological and functional methods of classification were combined, and secondary markers such as the characteristics of the spikes and the shape of the upper projection were used to create type categories. However, she still obtained the same results we did, as did S. Penner (1998), who examined the geographic spread of cheek-pieces and Mycenaean ornaments throughout the Old World.

According to our researches, the earliest cheek-pieces were those from Eastern Europe with solid spikes, followed by cheek-pieces with a special upper projection for the nose band; finally, cheek-pieces with inserted spikes, sometimes with a hole or slot in another part, were present. We all believe that the origin for the invention of cheek-pieces was Eastern Europe, from which such artifacts spread to the Balkans and Greece.

A. D. Pryakhin and V. I. Besedin (1998) disagree with these classification systems and instead identified two types of cheek-pieces, the Eastern one with no ornament (the Urals, Kazakhstan) and the ornamented Western one, whose center of dispersion was the Abashevo Culture of the Don Region, a conclusion that is, in fact, not disputed. V. S. Bochkarev (1998) had the final say in this discussion. In his report at the State Hermitage Museum, given at the conference in honor of B. B. Piotrovsky's ninetieth birthday, he put forth an elaborated version of my typology, drawing attention to the raised border of the cheek-pieces and suggesting the probable connection between the evolution of the cheek-pieces and that of the bone buckles of the MVK Culture. The typology of the latter is thoroughly worked out (Sava 1992; Litvinenko

1995b; 1996; Yu. P. Matveev 1996) and has been placed within the chronological sequences for the Monteoru, Glina III, Stekenberg, Otomani, Tay, and Vittenberg cultures, allowing the earlier phase of the MVK Culture to be dated to the eighteenth–seventeenth centuries B.C. V. S. Bochkarev, preceded by E. Zaharia (1990), dated the cheek-piece from Monteoru to the early period and came to the conclusion that the Mycenaean cheek-pieces, used for the chronological placement of my cheek-piece typology, came to Mycenae from the Danube Region and were a later derivative of the Danubian ones. These interpretations led V. S. Bochkarev to assign the cheek-pieces and, accordingly, the whole Sintashtian horizon, to the earlier time (see Appendix in this book).

At present the data base for studying the cheek-pieces has expanded, and the number of the known artifacts is more than 200 specimens. New discoveries, including those from stratified sites, have been made in the Urals and in Eastern and Northern Kazakhstan. The type-I cheek-pieces have been found in the Sintashtian graves with some surviving Catacomb and Poltavka features in the necropolises of Bolshekaragansky, Tanabergen, Kuraili; the type I and II examples come from the Krivoye Ozero burial ground; the type-II cheek-pieces, from the Sintashtian graves of Kamenny Ambar, Solntse II, Zhaman Kargala, and Bestamak.

New discoveries of cheek-pieces from the Abashevo sites in the Urals and in the Sintashtian ones in Western Kazakhstan have been made, but, unfortunately, the materials are unpublished. On the Volga, new examples of the type-III cheek-pieces have been found in the Petrovka burial mounds of Zolotaya Gora, Berezovka, and on the Don, in the Selezni burial mound (Kalieva et al. 1992; Matyukhin 1994; Kostyukov et al. 1995; Anthony, Vinogradov 1995; Epimakhov 1996; Botalov et al. 1996; Tkachev 1998; Dremov 1996; Pryakhin, Besedin 1998). These all bear out the established typology.

The most ancient type-I cheek-pieces are characteristic of the European MVK and Abashevo cultures, which form the basis of the formation of the Sintashtian-type sites, and of the latter (Fig. 15). The type-I examples have no ornament. The type-II cheek-pieces from the Danube to the Volga are often decorated with the Mycenaean ornament, and the type-III cheek-pieces, typical of the Abashevo (or Pokrovka-Abashevo) complexes of the Don Region, of the Pokrovka and Petrovka, as well as of the Alakul ones, are likewise decorated with the Mycenaean ornament, which independently corroborates the evolutionary scheme and proves that the European Steppe was the origin of chariots.

The chronology of the Novy Kumak chronological horizon sites is

based on correlations: (1) of the cheek-pieces and ornaments with Shaft Graves IV of Mycenae, whose date, 1570–1550 B.C., is terminus post quem of the type-I cheek-pieces; (2) of the cheek-pieces and horse brasses with the Monteoru Culture; and (3) of the segmented clay beads with a number of European cultures.

Contacts with the Danube Region intensified at the late stage of the MVK Culture, which spread westward up to the Danube (Chernyakov 1996; Litvinenko 1996). Cultural exchange between Greece and the Danube Region occurred overland and by sea. In the Crimea, the MVK Culture settlements (Kamenka) and fishermen-merchants' harbors with lighthouses have been found, which is evidence of trade along the coast (Kislyi 1996). This allows us to demonstrate our hypothesis for far-reaching European contacts with the Steppe and to assume that by that time, trade networks had already been established along the coast of the Black Sea up to Hellas.

As previously mentioned (Bochkarev 1992; Kuzmina 1992; 1994c; 1998b), the absolute chronology of the Sintashtian-type sites is based on the European chronology system.[3] In recent years Mycenae has been assigned to a century earlier, on the basis of (1) correlations with the sites of Egypt and the Near East; (2) revision of the scheme of G. Caro and A. Furumark; and (3) the date of the volcano eruption on Santorini island, established with the help of ^{14}C analysis (S. Dietz 1991; Warren, Hankey 1989; Betancourt 1987; Manning 1988; Åström 1987; Dickinson 1994). There also exists a tendency to push the traditional chronology of the Middle European sites of stages A l, A 2 by Reineke to earlier dates, based upon the dendrochronological data (R. Krause et al. 1989; Randsborg 1992; Kuniholm 1993; Bochkarev 1992). The dendrochronology, worked out in Europe, assigns the traditional dates to a century or two earlier, but these dates are still much later than the calibrated radiometric dates.

The use of the Mycenaean chronological sequences has been challenged by V. I. Besedin (1996), who disputes the fact that the Steppe ornament style came from Mycenae and instead naively proposes this ornament style originated in the Abashevo Culture (why not the Catacomb one?) (Fig. 15). However, he did not account for the unquestionable data and vast literature on the spread of the Mycenaean ornamental style throughout Europe, Egypt, and the Near East. In actual fact, the Mycenaean ornamental style is based on the very specific usage of spirals. The convergence of both these styles (Mycenean ornament and Abashevo) is impossible.

V. I. Besedin's view was dismissed by V. A. Trifonov (1996a, b). Here he again raised the old question of the possible Near Eastern origin of

the Mycenaean ornamental style, emphasizing the presence of circular and spiral ornamentation in Kul-Tepe (Kanish).

The question of the origins of Mycenaean ornamental style is very interesting and deserves further study. Nevertheless, it is worth noting that variants of spiral and circle ornament were spread throughout the Old World, including the Danube Region. As for the ornamental style of the Kul-Tepe artifacts (Özguç 1986), it differs greatly from the Mycenaean. The latter shows particularly close similarity to the ornamental style of a number of the Early Bronze Age complexes of Southeastern Europe.

V. A. Trifonov rejected the hypothesis that the Eurasian Steppe was the center of origin for the chariot in the Old World by referring to M. V. Gorelik's (1985) work, which allegedly proved the Western Asian origin of horse chariots. In fact, Gorelik failed to give a typological classification of wheeled transport, examining together both the heavy four-wheeled warrior wagons drawn by big Syrian donkeys and mules and the light, two-wheeled horse chariots, which led him to erroneous conclusions.

As for the equine representations on the Syrian and Palestinian seals and seal impressions (Porada 1980), they are too schematic, the depicted species is unidentifiable, and likely feature not horses but other sub-species within the horse family (Figs. 6, 7). Only in the sculptural art of Kul-Tepe are there images that can be unambiguously acknowledged as those of horses (Özguç 1950).

The fact that over two hundred cheek-pieces were found on the Steppe, as opposed to very few in the ancient Near East, and the fact that the stratigraphic position of the Near Eastern cheek-pieces is mostly undetermined and dates no earlier than to the mid-second millennium B.C., support our argument for the earliest origin of horse chariots on the Eurasian Steppe. The total absence of any horse bones from the Western Asian osteological materials also supports our argument. Even S. Bökönyi's identification (1991) of two equidae from Norsun-tepe in Anatolia as horses has been questioned by the prominent paleozoologist A. von den Driesch (Boessneck and von den Driesch 1975; 1976). Although, judging from textual materials dating to the turn of the third to second millennium B.C., the horse was already known in Western Asia, even in the latter half of the second millennium B.C. (after the spread of horse chariots by the Indo-Aryans into Western Asia), horses appear to have been imported, exotic, and incredibly expensive. Documents from the archives of the kings of Egypt and the Hittite kingdom and from Kul-tepe (Moorey 1986; Yankowska [Yankovskaya] 1956; 1981; 1982) support this conclusion. Thus the rar-

ity of the horse in Western Asia helps to explain why the invention of the horse-drawn chariot did not take place here.

At the same time, in the Steppe, in the burials of the Catacomb Culture type, two-wheeled vehicles, called *biga*s, are known; discovery of horse bones and ritual horse burials are evidence for the development of a horse cult. At the sites of the MVK Culture, as well as at the Abashevo sites, the most ancient and most archaic types of cheek-pieces were discovered, lacking both the upper projection for the noseband and the Mycenaean ornamental style.

These data when considered as a whole contradict the views of M. Littauer and V. A. Trifonov, who dispute the hypothesis for the Steppe origin of the chariots. As a result of the new discoveries of dozens of cheek-pieces in stratified sites, the origins of the horse chariot in the Steppe can be further supported. More to the point are V. A. Trifonov and other authors' objections to our—K. F. Smirnov's and my (Smirnov, Kuzmina 1977)—chronology of the Novy Kumak horizon sites, following along the lines of A. M. Leskov's research by cross-dating the cheek-pieces with Mycenae.

On the basis of the new radiocarbon dates of the burial grounds of Krivoye Ozero, Potapovka, and Utevka VI, we may now assign an earlier time period for the Sintashta-Petrovka-type sites. This shifts the Novy Kumak horizon to the turn of the third-second millennium B.C. (N. B. Vinogradov 1995a; Anthony, Vinogradov 1995; Kuznetsov 1996; Trifonov 1996a, b) (see Appendix).

The dispute over the use of Mycenae chronology and the calibrated dates for support of this date of origin has caused heated debates. The calibrated dates have been accepted neither in Germany nor in Russia. They conflict greatly with the historical chronology of Egypt and the ancient Near East (Chernykh 1997) and allow too large a margin—for the Sintashta burial mound, for instance, 2250–1390 B.C. without calibration (Kuzmina 1994c) (see Appendix).

The dispute over the radiocarbon dates bears a direct relation to the issue of the origin of chariots: if the calibrated dates are accepted, the Eurasian chariots and bone cheek-pieces appear to be earlier than the Western Asian ones.

In this connection, a discovery on the Zeravshan near Panjikent in the Zardcha-Khalifa burial ground is of great interest (Figs. 16, 17, 18). Sintashtian-type shield cheek-pieces and a bronze pin with a depiction of a horse, similar to the Eurasian Steppe style and craftsmanship (the closest comparisons can be made to the horse pairs found on the knife from Seima and the golden ring from the Mynshunkur burial ground in Semirechye [Kuzmina 1994c, 256]), were found alongside artifacts typical of the Bactria-Margiana complex: a metal mirror with a protrud-

ing handle, a silver vessel with a spout, a toilet bottle, etc., characteristic of the Namazga VI period and possibly late Namazga V (Bobomulloev 1993; Bostongukhar 1998).[4]

These mirrors can be compared to examples from Takhta-Bazar, from the chance discoveries in Southern Bactria studied by E. During Caspers (1997), who found parallels to them in the ancient East, and the mirrors, vessels, pins, and bowls published by V. I. Sarianidi and P. Amiet (Ligabue, Salvatori 1988: Sarianidi, in Ligabue et al., 1988, fig. 14; Amiet in Ligabue, Salvatori 1988, 161, fig. 10-12).

These comparative materials enable one not only to define more precisely the age of the Sintashtian cheek-pieces, but also to confirm my hypothesis about the decisive influence of the Steppe on the spread of the horse and the horse chariot in Southern Central Asia (Kuzmina 1978a) (Fig. 20).

In Northern Central Asia, familiarity with the horse is documented by the presence of horse bones in the osteological materials of the Tazabagyab Culture settlements (Kavat 3, Kochka 15, Bairam-Kazgan 2), by the horse figurine at the Kavat 3 settlement in Khorezm, and by the findings of horse bones at settlement N 16 in Kairakum (Itina 1977, 138, 195; fig. 69: 2, pl. III, IV). In Central Asia and Kazakhstan the petroglyphs of two-wheeled chariots with four-, six-, and eight-spoked wheels, drawn by a pair of horses, are also known. They are represented in the petroglyphs of Tajikistan (Tekke-tash, Akjilga), Kirghizstan (Saimaly-tash), Southern (Tamgaly, Karatau), and Eastern (Smagul, Moinak) Kazakhstan (Kadyrbaev, Mar'yashev 1977; Novozhenov 1994; Sher 1980; Samashev 1992). The closest comparisons to the chariots of the Central Asian and Kazakhstanian petroglyphs are in rock carvings from the Altai, in Tuva, Mongolia, and Xinjiang: these regions make up a unified zone for depictions of horse chariots in the Old World. In recent years the possible dating of a considerable number of chariots in this zone of petroglyphs to the Bronze Age has been achieved. For example:

1. Chariot representations, analogous to those in the petroglyphs, have been found on vessels of the Timber-Grave and Andronovo cultures (Figs. 20, 21).

2. In Tuva, chariot drawings have been found in association with Okunevo masks.

3. In Mongolia, on the Darvi-Somon deer stone—dating from the mid-first-millennium B.C. based on the weapon represented—a chariot with horses depicted in the "Scythian" manner and stylistically different from other representations can be assigned to the Bronze Age.

4. The chariot representations of the Steppe zone are similar to the pictographs in ancient Chinese characters of the Yin and Zhou periods.

Since chariots and horses in China were borrowed from Eurasian Steppe populations, this analogy is chronologically significant.

Thus, multiple evidence—representations of the horse chariot in petroglyphs and on vessels of the Bronze Age; findings of chariots and draft-horses with chariot harnessing in burials; findings of bone cheek-pieces in burials and at settlements; and, finally, the discovery of ritual horse burials and multitudinous examples of horse bones in the osteological materials of settlements—all prove that by the second millennium B.C., horse breeding was particularly developed among the Eurasian pastoral peoples of the Timber-Grave–Andronovo group. The horse cult came from their Steppe ancestors, who appear to have domesticated the horse as early as the fourth millennium B.C.

These data allow one to assume that the pastoral peoples of Central Asia had many connections with groups from the northern part of the Steppe, thus introducing the settled agricultural groups of Turkmenistan and Bactria to the horse (Figs. 19; 32; 33). In the cultures of the latter area, the horse began to play an important role only in the period of Namazga VI, since it is at this time that there is evidence for active contacts between pastoralists and farmers, and by the movement of pastoral peoples southward.

In Southern Turkmenistan, at the time of Namazga VI, essential innovations in wheeled transport took place, such as spoked wheels suitable for light vehicles and horse-drawn chariots. The spread of this vitally important innovation is apparent from the discoveries at the Namazga-depe settlement of a wheel model with a double-sided hub and brown-painted asymmetrical spokes, and an accentuated hub; at Tekkem-depe, of a model with six red-painted spokes; and at Elken-depe, of a wheel with nail impressions, possibly also resembling spokes. A clay horse's head in the Namazga VI level in the upper part of the eponymous settlement, and the first authentic discovery of horse bones at the settlements of Turkmenistan—Kelleli 1, Namazga-depe, Takhirbai 3 (Tsalkin 1970b)—are assigned to the same time. Moreover, it is particularly important that the verifiable discovery of horse bones came from settlements where Steppe-type pottery was also found.

It is possible that these Steppe peoples also played a certain role in developments in India (Fig. 20). Although it has been argued on the basis of questionable evidence that the domestic horse was already known to the Harappa Culture populations, it was only in the Post-Harappa epoch that it became widespread in India. The horse cult was also introduced then, as witnessed in the ritual horse burials or inclusion of their images in the burials of Swat (Katelai, Loebanr) and Gomal (Gumla, period V, and Khatkhala, period B). Such ceremonies are unknown in India, Southern Central Asia and Iran, and Western Asia

(Kuzmina 1977a, 34), although well known in the Eurasian Steppe of the Eneolithic period. The possible influence of Central Asian peoples on the development of horse breeding in India is also verified by the paleozoological data that show that the horses of Swat belonged to the Eastern breed (Azzaroli 1985, 353–55) and by the stylistic manner in which chariots are represented in petroglyphs. Here the chariots are executed not in the Western Asian manner—in profile—but in plan (overhead view)—characteristic of the chariot petroglyphs of Northern Eurasia and Central Asia. This important stylistic peculiarity most likely reflects Central Asian influence on the development of wheeled transport in India in the latter half of the second–first millennia B.C.

The appearance of the Bactrian camel as a transport animal in Baluchistan may also be attributed to Central Asian influence (Fig. 35). At the Post-Harappa settlements of Pirak, camel bones and clay camel figurines were found, including those with holes designed for harnessing to vehicles, and, along with these, representations of horses and horsemen. J.-F. Jarrige dates this assemblage to the latter half of the second to early first millennium B.C. (Jarrige, Santoni 1979, vol. I), notes that Bactrian camels were atypical of previous cultural periods in Baluchistan, and thus attributes the presence of Bactrian camels and horses to Central Asian influences.

All of these data point to the great importance of the chariot and the horse for the development of the future Great Silk Road routes.

The Crisis of the Complex Economy, the Development of Nomadism in the Eurasian Steppe, and the Origins of the Great Silk Road Routes

The presence of fortified settlements and advanced metallurgy were necessary conditions leading up to the development of towns in the Steppe. The specific ecological situation of the vast Steppe, however, was exploited not by the economic intensification and specialization of herding and farming, but by the expansion of pastoral activities more suitable to the Steppe. The pastoral peoples thus abandoned the process of urbanization that had begun to take shape in the eighteenth century B.C. and instead adopted extensive livestock husbandry, which required larger areas of land. The large Timber-Grave and Andronovo communities came into existence. Their florescence marked the following—fifth—stage of economic development in the Steppe (Kuzmina 2003).

The fifth stage—the fifteenth-thirteenth centuries B.C.—is characterized by the peak florescence of the Steppe culture, apparent from the large quantities of Timber-Grave and Andronovo settlements and

burial grounds, exceeding by several times the number of the sites of previous periods.

The locations of the settlements, situated on the flood plains or on the upper terraces above the floodplains, the very areas that today are subject to flooding, points to the fact that the climate was drier and warmer during the Bronze Age. According to the paleobotanical and osteological studies in the Ukraine, in the Volga Region, and in the Ural region (Kremenetsky 1991; Spiridonova 1991; Lavrushin, Spiridonova 1995a, b), the vegetation and fauna were similar to the present. The author's studies and analyses of charcoal from the Elenovsky area settlements, as determined by G. N. Lisitsina, indicate the presence of lime, birch, aspen, and fir (the Siberian pine); the Siberian pine does not exist in the Asian Steppe zone today. This is supported by the presence of beaver bones in many settlements of the Urals and Kazakhstan, where nowadays this animal is extinct. But the main fauna representatives are the Steppe Zone animals. Such landscape and climatic conditions were favorable for conducting a complex economy.

By the second millennium B.C., the situation in the Steppe had become stable, and the Timber-Grave and Andronovo communities had consolidated (Figs. 24–28). This is apparent from the unification of funeral rites and the types of ceramics. The population had a settled way of life; people inhabited unfortified settlements, usually consisting of large, long-term, semi-subterranean houses. In the forest-steppe the dwellings were constructed of framework-and-post, and in the Steppe stone was often used.

Farming was practiced, as made apparent by the discovery of grains and stems of grasses (wheat, possibly rye, and millet), stone querns, pestles, hoes, horn reapers, numerous sickles, and storage pits for grain in dwellings. Naturally, this being the Steppe, grass pollen was discovered in palynological analyses. Judging by the scope of production, plow rather than hoe cultivation was practiced. Farming was quite important in the forest-steppe and insignificant in the Steppe. At Steppe settlements there was a lack of storage pits for grain and a smaller quantity of agricultural implements, and the location of some settlements was in the open Steppe, characterized by wormwood (artemesia) and saline soils.

The fundamental basis of the economy was livestock husbandry. In the Timber-Grave Culture, the herd consisted of cattle and sheep or goat, horse, and, in much smaller numbers, pig (Tsalkin 1958; *Arkheologiya* 1985). In the Andronovo Culture, the pig was completely absent. Analysis of the osteological materials from the Elenovsky area allowed V. I. Tsalkin (1972b) to establish that the Andronovo Culture population bred horses both as transport and food animals. Discoveries of

bone devices, possibly designed for milking mares, and beaker-form vessels, suggest the possibility of the invention of *kumiss*.

The Andronovo Culture, for the first time in the world, developed three breeds of horses: (1) the small horse, 128–136 cm high at the shoulder, similar to modern Kirghiz horses; (2) the middle-sized horse, 136–152 cm high at the shoulder, weighing 350 kg (these were already present in the Sintashtian sites and clearly predominant in the herd); and (3) the tall, highbred, gracile horse, 152–160 cm at the shoulder, employed as draft-animals for the chariots. The latter were used in sacrifices, placed in the burials of warriors, and represented in numerous petroglyphs. Horses of this elite breed may be the ancestors of the modern "Akhal Teké" horses and of Thoroughbred racers bred from them. A sophisticated level of horse breeding is a distinguishing feature of the Andronovo livestock economy, and it determines the outstanding role the Andronovo Culture peoples played in the history of Eurasia (Kuzmina 1997b).

Another peculiarity of Andronovo livestock husbandry is the presence in the herd of the Bactrian camel. This was domesticated in the late fourth millennium B.C. in Southern Central Asia and, possibly, in Iran, a conclusion validated by osteological materials and by figures of Bactrian camels harnessed to vehicles (Kuzmina 1963a; 1978b; 1983; 1994c). In the Andronovo Culture, its use is documented by the presence of camel bones (Alekseevka, Arkaim, Atasu, Ust'-Narym, and Petrovka II), by ritual burials (Aksu-Ayuly, Telzhan-Kuzeu, Mily-Kuduk, and Begazy), by a small figure (Ushkatta), and by representations of camel-drawn vehicles in petroglyphs.

Cattle and sheep/goat occupied the central place in the herd. According to V. I. Tsalkin's data, members of both the Timber-Grave and Andronovo cultures raised cattle of the Eastern European breeds: long-horned massive bulls 126 cm high at the shoulder and weighing 350 kg and large sheep 73 cm high and weighing 50 kg.

The osteological materials show essential regional differences in the herd composition: in the forest-steppe, cattle prevail; in the Steppe, sheep or goat. (At the Andronovo sites in the forest-steppe, cattle make up 37–52% of the herd and sheep or goat, 37–44%; in the Steppe, 26–34% and 50–63%, respectively.) However, although the sheep is more prolific, producing up to seven lambs a year, in the Steppe, cattle prevailed in the actual herds. When we take into account the weight of individuals of different species, it appears that the Andronovo Culture population's meat supply was composed of 60–70% beef, 20–30% horse, and only 10% mutton.

The first authentic evidence not only of beef cattle breeding, but of dairy cattle breeding, also comes from this period, documented by the

analysis of the contents of pots from the Elenovsky area burial grounds and by the emergence of vessels with holes designed for cheese-making.

In the fifteenth to thirteenth centuries B.C., very orderly methods of keeping livestock were apparent. Data from a number of settlements show that young animals were used mostly for food: 50% of the individuals slaughtered were under two years of age, 75% under three. An important achievement was keeping cattle stalled; the emergence of this practice is validated by the layout of many Timber-Grave and Andronovo dwellings that have a fenced-off chamber with organic remains on the floor.

The emphasis on using cattle for both beef and dairy secured a stable beef-and-dairy diet for the society, and this led to population growth and a demographic explosion. This form of livestock herding suggests that the economy was settled, with the cattle returning every evening to the settlement for milking. This sets a limit to the possible extent of the radius for pasturage for the livestock population, for in the Eurasian Steppe 1 sq. km of pasture can feed six to seven head of large ungulates, at the most.

Pastoral activities may be in conflict with limited environmental resources. First, the constant growth of the population requires more and more food, i.e., a bigger livestock population. Second, even with the most rational system of using pastures radially over a year, in which the herd is constantly driven within a range of several kilometers around the settlement, in the course of twenty to twenty-five years overgrazing of the steppe occurs, and the productivity of pastures falls by a factor of two to four. Their regeneration takes approximately half a century (Mordkovich 1982, 186–88).

These factors necessitated the movement of the Timber-Grave and Andronovo settlements to a new location several dozen kilometers away every twenty to twenty-five years, which accounts for the fact that the archaeological components of the Steppe settlements represent a single occupation, relatively small. Also, the burial grounds of these settlements have relatively few burials, each containing people of only one generation. The demographic analysis of the Elenovsky area sites, comparing the amount of dwelling area at the settlements with the number of burials in the corresponding burial ground (and taking into account the average lifespan in Andronovo society, which, according to V. P. Alekseev, was about thirty years), shows that the settlement and the burial ground probably functioned from twenty-five to fifty years (Kuzmina 1974b; Evdokimov 1984).

In the fifteenth to thirteenth centuries B.C., such ecological limitations resulted in society's extensive transition, by means of territorial

expansion and the development of new ecological niches in foothills and deserts, facilitated by the domestication of the camel. The constant pressure of the surplus population stimulated the gradual expansion and development of new territories. This explains both the large quantities of fifteenth- to fourteenth-century B.C. sites in the Steppe zone, and the territorial expansion of the Timber-Grave and Andronovo cultures, archaeologically well documented.

The Timber-Grave peoples occupied the whole Steppe and forest-Steppe zone; on their border with the forest, they influenced the formation of the Prikazanskaya Culture (Khalikov 1969). Some small Timber-Grave groups forced their way to the Danube Region (the late "Ocher burials" group), and others penetrated into Central Asia, evidenced by burials in the Yangi-Yul' oasis in Tashkent, Orekhovskoe, the burial grounds of Patma-sai, Karalemata-sai, and Parau in Western Turkmenistan (Kuzmina 1963c; 1988; 1994c; Kuzmina, Vinogradova 1996; Mandelshtam 1966), and participated in the formation of the Tazabagyab Culture in Khorezm (Itina 1977).

The Andronovo peoples of the Alakul type populated the Southern Urals and a considerable part of Kazakhstan (except Eastern Kazakhstan), reaching Southern Siberia (the Ermak burial ground near Omsk) (Map 11; Figs. 24–25). The Andronovo peoples of the Fedorovo type settled in the territory from the Urals and the greater part of Kazakhstan (except Western Kazakhstan) up to the Yenisei, and in Siberia they advanced into the forest zone (Komarova 1962; Kuzmina 1985; 1994c; Maksimenkov 1978; Matyushchenko 1973a; Molodin 1985; Vadetskaya 1986), where they influenced the establishment of the food-producing economy and the development of the Andronovoid cultures (Kosarev 1981; Obydennov 1986; Obydennov, Shorin 1995).

The discovery of such sites in the Tian Shan and the Pamirs testifies to the development of a new ecological niche, namely, the highlands. The Andronovo influence, mediated by the tribes of Xinjiang and Northwest China, can be traced all the way down to Anyang in the Henan Province (Kozhin 1977; Kuzmina 1973b; Antonova 1988; Varenov 1989).

In the sixth stage—the thirteenth or twelfth to ninth centuries B.C.—the economic crisis was aggravated by an ecological one. A considerable cooling of the climate occurred. The territory of a number of the Timber-Grave and Andronovo settlements of the developed stage, situated on the first terraces above the flood plain, was blocked now by river banks and inundated with spring floods.

As has already been mentioned, the complex economy, with its settled domestic livestock breeding, confined the growth of the herd to the size of the nearest pastures, which hampered the further develop-

ment of this type of economy. The solution to the crisis lay in the more productive type of livestock husbandry, namely, the driving-to-pastures (or *jailau*) method. Under the driving-to-pastures system of livestock herding, the herds are driven off to remote pastures, and every season the pastures are changed, which enables an unlimited increase in the livestock population. This more progressive system makes it possible to harmonize the needs of the society with the possibilities of different natural niches. Several types of seasonal nomadism are known: meridional, desert, vertical, and so on (Rudenko 1961). In some regions these types had already been established in the previous period. Meridional transhumance implies that in winter cattle are driven off to the South, where it is warmer and the blanket of snow is thinner. (Horses are capable of getting fodder from under the snow, provided that the blanket of snow is under 0.5 m; sheep can also get fodder, along with horses.) The emergence of this form of transhumance is documented by late Timber-Grave and Andronovo sites in the Caspian Sea North Littoral and Transcaspia (Galkin 1992). Under the desert nomadic system, herdsmen drive their herds to the desert in early spring when it is watered and covered with vegetation. The existence of this form of transhumance is borne out by the finding in Khorezm of Andronovo-type ceramics over the abandoned dwellings of the Tazabagyab Culture (Itina 1977). The vertical form suggests that in spring the herds were driven to highlands covered with alpine plants and tall herbage (Mordkovich 1982, 65–71).

Such sites are known in the Tian Shan (Arpa, and numerous burial grounds of the Semirechye type) (Bernshtam 1952; Kuzmina 1970; Galochkina 1977) and the Pamirs (the Yuzhbok burial ground, etc.) (Litvinsky 1972) (Fig. 26). As a rule, stationary winter settlements are situated in foothills and in well-protected valleys on fertile soils, often in the vicinity of mines.

The distribution of Bronze Age sites in the Steppe, deserts, and highlands shows that herdsmen established optimal routes, taking into account the presence of water sources, subsoil water for digging wells, and mountain passes. Superimposing this map of the locations of Bronze Age sites on maps showing the routes of medieval and twentieth-century nomads brings one to the conclusion that the traditional paths were optimal (A. V. Vinogradov, Kuzmina, et al. 1973; Kuzmina, Lyapin 1984). These routes were also used for the movement of caravans. By tracing the origins of their operation, it can be inferred that the precursors for the Great Silk Road routes began as far back as the Bronze Age.

The new form of economy was furthered by the selection of a herd fit for migrations. It was composed of specialized breeds of horses and

the Bactrian camel, with the pig either absent (the Andronovo Culture) or not playing any important role (the Timber-Grave Culture). Essential changes in the herd composition over time can be singled out: in the Late Bronze Age the sheep population increased (Shortandy-Bulak: by 81%), and the horse numbers doubled (Tsalkin 1972b; S. Ya. Zdanovich 1981). These animals are the best for the nomadic economy, for they are capable of getting fodder from under the snow.

Another important condition for the transition to mobile livestock husbandry in the twelfth to ninth centuries B.C. was the invention of a light framework dwelling, the protoyurt (Orazbaev 1970; Narynov 1980; Kuzmina, Livshits 1987). Traces of such round or square small dwellings have been discovered throughout the Steppe.

The third important factor was the emergence of horseback riding linked to fighting. Spindle-shaped bone cheek-pieces, both three-hole ones with the holes in two planes (Kirovo, Ilyichevka, Volynska Greblya, Atasu) and three-hole ones with the orifices in one plane (Dereivka, Usatovo, Subbotovo, Zhirnokleevka, Yazevo, Shortandy-Bulak, Kent) date from the thirteenth–twelfth centuries B.C. and from the ninth to seventh centuries B.C. at Sialk VI, Hasanlu (K. F. Smirnov 1961; Leskov 1971; I. I. Sharafutdinova 1982; Margulan 1979; Varfolomeev 1988). They have broad analogies in the West. There is a mold of a bronze cheek-piece of this type at the settlement of Dalverzin; actual cheek-pieces are found in Iran (Giyan 1, Sialk VI, Hasanlu). They were designed for harnessing a horse for riding. Extensive evidence of the spread of the new fighting method in the ancient East is also recorded in this period.

The first riders represented in the monumental art of the ancient Near East were those in scenes of the battle of Kadesh, in Tell el Amarna and Saqqara, dating back to the fourteenth century B.C. (Schäfer, Andrae 1925, 381; Yadin 1963, 219–24). In the Hittite army, the emergence of riders is attested by a relief from Zincirli and a seal from the Louvre (Meyer 1953, 32; Herzfeld 1937–38, 51). But it was only from the late twelfth century B.C. that detachments of riders began to play an important role in ancient Eastern armies. The quantity of representations of riders in art gradually grew, reflecting the growth of their role in troops (Kuzmina 1971; 1973a; Azzaroli 1985).

From the twelfth century B.C. armed riders were known in Assyria (Handicock 1912, 355, pls. XVII–XVIII; Meissner 1920, 217–19; Yankovskaya 1956, 44; Ebeling 1951; Kammenhuber 1966; Saggs 1963; Hanfmann 1961). From the turn of the second to first millennium B.C., mounted warriors formed part of the Israelites' army (the Bible, 1 Kings 5: 4, 26). In Tell Halaf a relief representing a rider was found (Yadin 1963, 284–86).

In the Assyrian army mounted warriors were divided into those wielding lances and those wielding bows (VDI 1951: 2: 296, 299; 3: 330). In the early first millennium B.C., representations of lances appeared in monumental art: in the reliefs of the palaces of Shalmaneser II in Khorsabad and of Ashurbanipal in Nineveh, in the murals of the palace of Shalmaneser III in Til Barsip (Layard 1849, 1852; Botta, Flandin 1849–50; Thureau-Dangin, Dunand 1936; Yadin 1963, 415–17, 442–43, 450, 451), and also in glyptics (Herzfeld 1937–1938, 50, 51).

These innovations developed slowly in the economy of the Steppe peoples. Only in a complex economy could they establish the driving-to-pastures method. These data, contrary to the opinion of M. P. Gryaznov (1957) and G. E. Markov (1973), show that the transition to mobile pastoralism did not have the character of a spontaneous leap but was a long natural process caused both by the specifics of the Steppe ecology and the whole course of the evolution of pastoralism, which lasted for centuries. This process ultimately resulted in the establishment in the Scythian period of the mobile form of pastoralism—nomadism.

The Origin and Spread of the Bactrian Camel

The issue of the domestication of Bactrian camels has long been disputed. According to F. Pritzwald, the Bactrian camel came into use very late: only in the tenth century B.C. did representations of Bactrian camels and mention of them in texts appear in Assyria (Pritzwald 1924, 259–67). It is assumed that Bactrian camels were brought by the nomads from Central Asia, where they still exist (Walz 1954, 84, 85).

In the late nineteenth century, the wild Bactrian camel, the *khavtagai*, was found in the Gobi Desert, where it was described by N. M. Przhevalsky (Przewalski) and then by G. E. Grum-Grzhymailo, P. K. Kozlov, and Sven Hedin. At the present time, the range of the wild Bactrian camel has diminished and is limited by the Transaltaian Gobi and possibly the bend of the Tarim; in Mongolia only a few hundred *khavtagai*s have survived (Bogolyubsky 1929, 14, 15; Khaveson 1940, 117; Sokolov 1961, 109–12; fig. 21). A. G. Bannikov (1945) has proved that the surviving Bactrian camel has not become wild, as some researchers suggest, but is wild per se, a conclusion validated by pronounced morphological differences. It is the opinion of zoologists that the *khavtagai*'s range used to be considerably broader and stretched westward up to Kazakhstan.

The issue of the origin of Bactrian camels now can be solved, as a result of discoveries of camel bones at sites in Turkmenistan that date from the fourth millennium B.C. on, which allows one to date the domestication of the Bactrian camel precisely to this time (Fig. 33).

At farming settlements in Southern Turkmenistan, domesticated camel bones were found at Anau in the upper level of the southern mound (Duerst 1908, 383–84; Zeuner 1963, 359), dating from the latter half of the fourth millennium B.C., and in Geoksyur 5 in the second construction phase, in the level of Namazga III, the first half of the third millennium B.C. (Tsalkin 1970a, 156). These offer the most ancient evidence of the domestication of Bactrian camels in the Old World.

In the Bronze Age, the camel was already widespread: in the level of Namazga IV among the fauna of the settlements of Shor-depe, Altyn-depe, Khapuz-depe, Namazga-depe, and Kelleli 1; in the level of the Namazga V epoch at Ulug-depe; Namazga VI, at Tekkem-depe and Madau (Tsalkin 1970a, 157; Ermolova 1970, 226, 227).

In Bactria the appearance of the camel is recorded by findings of bones at the settlement of Sapalli-tepe dating to the early second millennium B.C. (Askarov 1973, 131; 1977, 120, pl. XLV, 13; Batyrov 1974, 135). The representations of Bactrian camels in the figural art of Altyn-tepe, Taichanak-depe, Khapuz-depe, Ulug-depe, Taip, and Takhirbai 3 are indicative of the development of camel breeding in Central Asia (I. Maksimov 1976, 76; figs. 13, 16; Shchetenko 1968, 22; figs. 12: 2, 12, 13; Masson 1959, 15; fig. 13: 1, 4–8; 1970, pls. XV, 6; XVI).

In Margiana, clay camel figures abound at the settlements of Togolok 1, 2, and Gonur 1; the camel is represented on seal-amulets (Sarianidi 1976, 61, 62; fig. 18; 1990, pls. XXIII: 11, 12, 14; XXIV: 12, 13, 15, 16; LXXVII: 13; LXXXVIII: 1), and also on a bronze mirror from Takhta-Bazaar (Fig. 33). In Bactria, images of Bactrian camels occur on stone seal-amulets from the Sapalli-tepe burial (Askarov 1977, 120, pl. XLV, 13) and also copper figures (Pittman 1984, 43; figs. 10, 11; Salvatori 1989).

Where was the domestication center of this animal species located? S. N. Bogolyubsky (1929, 14, 15) located the Bactrian camel's original home in the Eurasian Steppe, between 40° and 50° latitude north of the equator. My assumption has been that the domestication center of the Bactrian camel was in Central Asia and Kazakhstan (Kuzmina 1963a, 39, 40). F. Bulliet, B. Compagnoni, and M. Tosi outline an area that includes Central Asia and Central and Eastern Iran (Bulliet 1975, 141, 148; Compagnoni, Tosi 1978, 87–100).

At the settlement of Shakhr-i-Sokhta in Sistan in phase VII and VI levels, dating from 2700–2600 and 2600–2500 B.C., respectively, several bones of undetermined species were found, as well as camel dung and camel hair used for yarn, neither of which can help identify the camel species. The authors do not rule out the possibility that the animal from Shakhr-i-Sokhta was a Bactrian camel (Compagnoni, Tosi 1978,

91–95; fig. 1, 2, 4). In Southern Iran, at Khurab, a copper axe whose head featured the representation of a camel was discovered (Maxwell-Hyslop 1955, 161; Zeuner 1955, 162, 163; pl. XXXVI). The animal's appearance has stirred up a dispute: only one hump is distinctly visible, but the camel's form is similar to that of the Bactrian camel. The date of the Khurabian head is also disputed: C. Lamberg-Karlovsky assigned it to 2600–2400 B.C. (1969, 163–68), whereas E. During Caspers (1971, 60–64) dated it to the early third millennium B.C.

As unquestionable evidence of the familiarity of the Iranian population with the Bactrian camel, the discovery of Bactrian camel bones at the Shah-tepe settlement in level III dating back to the mid-third millennium B.C. is useful. According to W. Amchler (1939, 80, 122), the Bactrian camel appeared at the Caspian Sea Southeast Littoral as a result of borrowing from the peoples of Northeast Turkestan, its original home.

V. I. Tsalkin (1970a, 156, 157) believed that Central Asia could not have been the center of the domestication of the Bactrian camel because he was not aware of camel bones in the Mesolithic and Neolithic levels, "which could evidence its diffusion into this territory in a wild state. Thus the possibility of its local domestication is also ruled out." At the present time the situation has changed: bones of the wild camel *Camelus Knoblochi-Nering* were determined at the paleolithic site of Samarkand (Lev 1972, 17–29). Bactrian camel bones were discovered at the Neolithic burial ground of Tumek-Kichidjik in the delta of the Amu Darya (Vinogradov 1974, 500, determination by N. M. Ermolina) and at the Kelteminar site of Tolstova in Khorezm (excavations by A. V. Vinogradov, determination by V. I. Bibikova). One should also keep in mind that the ecological conditions in Central Asia are quite suitable for this species to live here in a wild state, and also that Central Asia is situated near the present-day home of the wild Bactrian camel, whose range has diminished during the historical period. Most important, though, it is in Central Asia that the most ancient bones of the already domesticated Bactrian camel in the Old World, dating from the fourth to third millennium B.C., were discovered, as are all the most ancient indisputable representations of this animal dating back to the third to second millennium B.C. These findings of bones and figures are numerous, not isolated. The representations of Bactrian camels harnessed to vehicles, which have no parallels in the entire Old World, bear out the wide economic use of the camel as a transport animal in this region (Kuzmina 1980b).

All these lines of evidence lead one to acknowledge that Central Asia was certainly the principal center of the domestication of the Bactrian

camel. It is possible that Afghanistan and some eastern regions of Iran were also part of the most ancient zone of the use of Bactrian camels. As previously mentioned, the Near East in ancient times was the home of the one-humped camel, the dromedary, while the Bactrian camel was practically unknown there until the late second millennium B.C.[5]

The oldest and most unusual representation of the Bactrian camel is the Mesopotamian cylindrical seal of 1800–1400 B.C., which features two men sitting face to face on the Bactrian camel's humps (Bulliet 1975, 62; fig. 20). All other representations and mentions of the Bactrian camel in the Western Asian texts date only from the Assyrian period. This data has been repeatedly cited in the literature (Kuzmina 1963a; Yankovskaya 1956, 40; Salonen 1956; Walz 1951; 1954; Luckenbill 1927; Horn 1950; 1952; Lambert 1960; Bulliet 1975, 153–59).

The most ancient written information concerning the Bactrian camel is contained in the Kuyunjik inscription of Tiglath-Pileser I (1115–1077 B.C.) and a document of the Assyrian king Ashurbelkal (1074–1057 B.C.), about a purchase of Bactrian camels from merchants involved in trading with the East. After that, Bactrian camels are recorded in the inscriptions and annals of Ashurnasirpal I (1050–1032 B.C.), Shalmaneser III (858–824 B.C.), Shamshi-Adad V (823–811 B.C.), and Sargon II (721–705 B.C.). Representations of Bactrian camels appeared in Assyria in the early first millennium B.C.: they are found on the Black obelisk in Nimrud, on the gates of Balawat, in the relief in a military camp in Kuyunjik, and also on seals from the period of Shalmaneser III. The texts declare that camels came into Assyria as a tribute from the East.

In the early Assyrian documents the Bactrian camel is called by the Semitic word denoting the dromedary, *gammlu*, but with a note that it is two-humped; in the eleventh century B.C. the term *udru* appeared, which goes back to the Iranian name of the Bactrian camel (Salonen 1956, 85–87; Kent 1953, 118, 178). This is important linguistic evidence of the fact that, first, the Bactrian camel became known in Western Asia only in the late second millennium B.C., and, second, that the Semitic peoples became acquainted with this animal through contact with Iranian-speaking people, from whose language its name was derived. These linguistic data correspond well with the hypothesis that it was in this time that the Iranian-speaking people appeared in the territory of Iran and advanced gradually westward, bringing with them Bactrian camels and horses, which is reflected archaeologically in the spread of representations of these animals in Iran in the early first millennium B.C. (*7000 ans*: 78, pl. XXXI: 3); the cult of these animals among the Iranian-speaking peoples was well established and survived

into the Achaemenid and following periods (Kuzmina 1963a, 42, 43; 1978a, 103–8; Obel'chenko 1978, 68–81; Kadyrbaev, Maryashev 1977, 176, 177; Korol'kova 1998, 137–49).

In connection with the issue of the establishment of the ancient range of Bactrian camels, it is important to emphasize that the Achaemenid reliefs of Persepolis represent Bactrian camels as a tribute of the Parthians, Arahosians, and Aryans (Schmidt 1953, pls. 19, 30, 33, 39, 41; 1970, 148–49), i.e., the boundaries of the spread of this species remained almost untouched as against the Eneolithic period, which validates the hypothesis about the localization of the Bactrian camel's original home in Central Asia and, possibly, in Afghanistan and Eastern Iran.

Thus, archaeological data has established that in Central Asia, the Bactrian camel was domesticated in the fourth millennium B.C. and in the third to second millennium B.C. was widely employed as draft power for harnessing to vehicles with solid wheels, a distinguishing feature of wheeled transport in Central Asia in the Bronze Age (Fig. 34). Evidently, from the farmers of Central Asia, the camel, already in a domesticated state, was borrowed by the people of the Andronovo Culture, who used it as draft power for vehicles, as reflected in the petroglyphs and plastic art of Khorezm and Kazakhstan (Itina 1977, 90; Kuzmina 1994c, 203, 257; figs. 34: 10, 11; 55: 8, 9).