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谨以此辑纪念翁独健先生(1906—1986)诞辰一百周年

TO THE MEMORY OF PROF. WENG DUJIAN

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Relations of the Andronovans with the Population of Xinjiang and Other Regions of China in the Bronze Age[1]

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It is reasonable to presume that the Andronovo influence stretched as far as China. In the Anyang culture momentous achievements of world civilization——metallurgy, wheeled transport and horse-breeding——are present in their developed form, having had on the Yellow River no preceding development. Pursuant to the ancient tradition created in the epoch of the formation of the Chinese state system, civilization in the interior took shape independently. This traditional autochthonous hypothesis is embraced by most Chinese archaeologists (Cheng Te-k'un 1961; Chang Kwang-Chih 1959; 1965; 1968).

In accordance with another hypothesis put forward by M. Loehr (1949; 1957; 1965) and the outstanding Russian scholar S. V. Kiselev (1960), and accepted by Li Chi (1957), W. Watson (1961), E. Kuzmina (1973), Ping-ti Ho (1975), S. Kuchera (1977), Kryukov, Safronov, Cheboksarov (1970), and Varenov (1983), the formation of Chinese civilization was furthered by the western impulse. In Eurasian Steppe metallurgy, wheeled transport and horse-breeding go back to the fourth millennium B. C., while the celts, spears and single-edged knives of Anyang have prototypes and analogies in the Andronovo and Seima-Turbino complexes.

It has now been established that metal appeared in China in the pre-Anyang epoch on the northern periphery in the cultures of "significant others," i. e., ethnically non-Chinese peoples (J. Prusek 1971; Wu En 1985; Lin Yün 1986). These cultures were systematized by K. Linduff (1994; 1995; 1996; 1997; 1998). In the Qijia culture in Gansu (2500—1900 B. C.) were found the oldest barley and wheat, the horse, forged copper awls and rare cast

bronze awls, knives, celts, gold rings, a mirror, plaques, and earrings (Debaine-Francfort 1995: 320, fig. 19, 61). In the cultures of Zhukaigou (phases 3, 4, 5) in Inner Mongolia (2000—1500 B. C.), Lower Xiajiadian in the northeast of Inner Mongolia and Hebei (2000—1600 B. C.); Erlitou (periods 3, 4) in the Central Plain (1750—1530 B. C.) (Chang Kwang-Chih 1968) and Yueshi in Shandong (2000—1600 B. C.), there are incipient signs of a food-producing economy (the pig and horse) and metallurgy. In China, together with metal, there appeared wheat, barley and sheep, all cultivated in the Near East and spread in the third millennium B. C. into the Steppe, as well as the horse, which was domesticated in the Steppe. This testifies to the food-northwestern impulse. The multiethnic population of Northern China apparently played a pivotal role in the spread in the Central Plain of the food-producing economy, horse-breeding and metallurgy, introduced from the north——the Steppe (Linduff 1994; 1995a; 1997; 1998; Fitzgerald-Huber 1995; 1997).

Relations with the north may have been realized via Xinjiang and along the steppe corridor of Gansu. In the north Xinjiang is connected with Siberia by a pass through the Altai mountains. In the west it is linked by the Tersek Davan Pass with Ferghana and by an easily passable route along the Ili river through the Tian Shan with Semirechye. The ecological conditions of Eastern Turkestan are very diverse: from the north it is circumscribed by the Altai mountains; from the south by the Pamir, Kunlun and Altyn mountains. From west to east Tian Shan separates Dzungaria from the Tarim Basin; most of the territory is occupied by the Taklamakan Desert, but in places the fertile river and lake valleys are suitable for farming and Steppe plots for cattle-breeding (Petrov 1966; 1967). This determined the diversified character of the economic and cultural types of the region. The Afanasyevo culture was the first in Xinjiang to have a food-producing economy. It is represented by the burial grounds of Tuzu near Urumchi and Keremchi in the Altai district (Wang Binghua 1996: 75; Molodin, Alkin 1997). In terms of the funeral rite and its implements, close to the Afanasyevo culture is the Gumugou burial ground, whose exact attribution is impossible in default of pottery (Debaine-Francfort 1988; Mair 1995; Mallory 1995; Mallory Mair,2000; Kuzmina 1998). The calibrated date of Gumugou is 2030 1815 B. C. The population raised cereals, sheep, goats, cows and Bactrian camels, manufactured fabrics of the European type (Barber 1998), wore the traditional dress of a Steppe inhabitant: a cap, a caftan, trousers and boots, and used forged copper articles. It belonged to the Caucasoid anthropological type (Alexeev 1988; Han Kangxin 1994; 1998; Chikisheva 1994). The

Afanasyevo Culture is genetically related to the Pit-grave and, partially, Catacomb cultures (Kiselev 1949; Vadetskaya 1986; Tsyb 1984; Novgorodova 1989). The arrival of the Afanasyevo Culture representatives from the west to Siberia, Tuva and Mongolia is viewed as the first wave of the migration of the Indo-Europeans——Tocharians——eastward (Semenov 1993), the creators of Gumugou being also numbered among them (Jettmar 1985; Mallory 1995; 1998; Mallory Mair, 2000; Pulleyblank 1996; Renfrew 1998; Kuzmina 1998).

Northern Chinese peoples may have received from the Afanasyevo tribes, who came from the west, metal, wheat and barley, the carriage and the wheel, the sheep and the horse. All these terms were borrowed into the Chinese language from the Indo-European proto-language via Tocharian (Pulleyblank 1996: 1 24). It is likely that the rites of domestic animal sacrifice, familiar in the European Steppes from the fourth millennium B. C., were also adopted. In Siberia the Afanasyevo Culture was succeeded by the Andronovo Culture of the Fedorovo type, which came from Eastern Kazakhstan. In the Fedorovo burial grounds reminders of the Afanasyevo ceramic tradition can be distinctly traced, but genetically these ethnoses differ. As already mentioned, at the early stage of Novy Kumak Andronovo tribes organized large-scale metallurgical production. The history of Andronovo metallurgy is closely associated with that of Turbino Seima, studied by E. Chernykh and S. Kuzminykh (1989). Turbino Seima bronzes are an assortment of types, comprising celts, adzes, double-edged knives(daggers), single-edged knives, often with a figured handle, spears, including those with a socketed shaft, hooks, and bracelets. Turbino Seima bronzes are distinguished by the use of stannous bronze and the casting of thin-walled celts, chisels and spears with a blind all-metal socket. The invention of a strong bronze alloy, which enabled the production of implements with a cast socket, was a momentous innovation of the epoch. The abundant cassiterite deposits of Eastern Kazakhstan served as the source of tin.

Turbino Seima bronzes form part of the complexes of entirely different cultures that are connected by a system of rivers. From Eastern Kazakhstan, where a great number of chance findings are concentrated, tin and bronze came by the Irtysh River eastward to the Altai along the Ob (Elunino, Tsygankova Sopka) and to the north of the Altai along the Irtysh's fributary Om (Rostovka, Sopka 2, Omskii Klad), and also by the Irtysh to the north where the Ob and the Irtysh converge with the basin of the Uralian rivers. From

there metal would find its way to the Kama (Turbino) and further to the Volga (Seima). This "tin" road preceded the Great Silk Road which would connect Asia and Europe. What is the origin of the Turbino Seima bronzes? E. Chernykh and S. Kuzminykh (1989: 259—261 270) dated them to the l6th century B. C. and presumed that the complex formed in Siberia as a result of the interaction between the culture of the Baikal's hunters and fishermen and that of the Altai's horse-breeders and metallurgists. A clan of armed nomad metallurgists would carry out distant raids on horseback and spread their products in the west. V. Bochkarev (1986) established wide European systems of bronzes and determined the chronological sequence of the complexes: Turbino Sejma Rostovka and Samus' IV, Turbino being synchronized with the Abashevo culture. O. Kuz'mina (2000: 65—134) confirmed the relationship between the metallurgy of the European Abashevo culture and Turbino and demonstrated that many types of the early Andronovo metal from Sintashta developed traditions of Abashevo metalworking (adzes, double-edged and single-edged knives, spears, shafted arrows, hooks, bracelets). This bears out the role of the European traditions for the metalworking of Turbino Abashevo Sintashta. However, there is a group of bronzes of eastern origin in Seima (Chernykh 1970: 155—173). In Sintashta two articles of stannous bronze alloyed with lead (Pb) and antimony (Sb) were found, which points to their being exported from Eastern Kazakhstan (Zaikova 2000). It is probable that from there come Turbino's single-edged knife with a representation of an argali and Seima's with a pair of horses (Bader 1964: 115—123, fig. 113; 1970: fig. 52).

This allows one to propound a working hypothesis for the formation of Turbino Sejma bronzes as a result of the interaction between the population of Eastern Europe (above all, Abashevo and, partially, Catacomb tribes) and early Andronovo tribes of the Fedorovo type in Eastern Kazakhstan. There bronzes have already been found in the Kanai burial ground which preserves the eneolithic traditions, and the early Marinino stage of the Fedorovo type has been established (Tkacheva 1997: 12). The acceptance of the calibrated C^{14} dates of the Abashevo (Kuz'mina O. 2000) and early Andronovo monuments of the Novy Kumak stage makes one assign Turbino to an earlier time and date it to the turn of the third-second millennium B. C. It may be presumed that it was the early Andronovo tribes of Siberia and Eastern Kazakhstan that were instrumental in the appearance in China, in the northern contact zone, of tin and of bronze articles, stone and clay molds, the technique of casting celts and spears with a hidden socket, as well as types of the adze, the

single-edged knife and the ring-headed dagger in Erlitou in Henan (Linduff 1994: fig. 3, 18) and the dagger from Zhukaigou, phase 5 (Linduff 1997: fig. 6 bottom). The type of twisted-butt daggers with animal figures on the handle was widely developed in China (Lin Yün 1986: fig. 49, 17; Linduff 1996a: fig. 9; Chzhun Suk Be 2000: fig. 2, 1—6). China's socketed spears are analogous with Andronovo spears, which go back to the Abashevo Turbino prototypes (Loehr 1956; Varenov 1987; 1989). The pitchfork-shaped spear with a hook from Shenna in Qinghai (Wagner 2001) resembles the spears from Rostovka and from the Altai (Chernykh, Kuzminykh 1989: fig. 29, 30).

Having received the initial western impulse, Chinese metallurgists began to develop their own production. In the 14th—13th centuries B. C. on the Yenisei, Andronovo Fedorovo tribes were ousted by the newly arrived tribes of the Karasuk culture. In Eastern Kazakhstan and Semirechye the development of the Andronovo culture was still under way. In the 13th or 12th to 9th centuries B. C., pottery made with an applied roller and many types of metal articles, common from the Danube to the Altai, spread here, and the activity of the metallurgical centres of Semirechye and Ferghana intensified. Relations with Xinjiang stepped up. Xinjiang's monuments are diverse, and they include: agricultural tepe, cattle-breeders' sites, burial grounds, hoards and chance findings (Jettmar 1985; 1992; 1996; Alkin 1987; Antonova 1988; Debaine-Francfort 1988; Kuchera 1988; Havrin 1992; Kuzmina 1996a, b; 1998; 2000; Zadneprovsky 1992; 1993; 1994; 1995; 1997; Semenov 1993; Molodin, Alkin 1997; Molodin 1998; Shui Tao 1998; Ke Peng 1998; Mei, Shell 1998; 1999; Mallory Mair, 2000). Of particular importance are the works of Debaine-Francfort and Mei and Shell. Xinjiang's population belonged to different anthropological types, including Pamiro Ferghan (Andronovo) (Han Kangxin 1998). The monuments and pottery are diverse and attempts to establish their local and chronological classification (Chen, Hiebert 1995; An Zhimin 1998) are so far unconvincing (Komissarov 1997). There are Andronovo monuments in Xinjiang: in the Sazi burial ground in Tuoli on the border with Eastern Kazakhstan burial mounds with stone and earthen banks were discovered and a Fedorovo vessel was found (Mei, Shell 1999: 573, fig. 3: 1); in the burial ground and at the settlement of Tacheng (Chuguchak), Andronovo pottery with stamped geometrical ornamentation in the shape of a herringbone, triangles and zigzags was found. A large jug decorated with herringbone and a small jug ornamented with nail impressions (Mu Shunying 1996: 27, fig. 14), analogous to the vessels of Eastern Kazakhstan, were

published. An adze, a pair of earrings, beads and a copper ingot were also found there. At the agricultural settlement-tepe of Xintala in the Tarim Basin (the radiocarbon date is 1700—1300 B. C.), two archaeological layers were discovered. In the lower one painted pottery was found together with vessels with comb-shaped geometrical ornament, a stone mold for casting the awl, and an awl and a knife; and on the surface a celt and a socketed arrow were found (Debaine-Francfort 1998: 16; Mei, Shell 1998: fig. 3: 1; 1999: fig. 7).

Metal articles of the Andronovo type were found at other monuments of Xinjiang. In the Qizilchoqa burial ground of the Wupu group (Hami) (C^{14} date is 1350—1000 B. C.) a chisel, a socketed arrow, a mirror with a handle and beads sewn on boots were found (Debaine-Francfort 1988: 18—19, II: 5). In Yanbulaks(Qumul group) (C^{14} date is 1110—525 B. C.) 76 burial grounds were excavated and 94 bronze articles were found: single-edged knives, socketed arrows, awls, rounded plaques with punson ornament (flat and with an eyelet). A celt and a ring-headed knife were found at the Lanzhouwan settlement of the Nanwan group (C^{14} date is 1385±75 B. C.). A celt, knives, an arrow, an awl, a mirror with a central projection, earrings and beads were found in the Nanwan grave (C^{14} date is 1050 B. C.). At the Qaraqocho settlement in Turfan (C^{14} date is 945—100 B. C.), a sickle and awls were found. In the burial grounds of Wupu and Lafuqiaoke (hapchoq, 1165—890 B. C.) bronze single-edged knives and adorations were found (Wang Binghua 1996: 77).

In the burial grounds of Wubao and Lafuqiaoke (1165 890 B. C.), bronze single-edged knives and ornaments were found (Wang Binghua 1996: 77).

Chance findings are also known in Eastern Turkestan. A celt and an arrow or javelin were discovered in Krorän by Sven Hedin (Bergman 1935: Table XVI 1, 7). An asymmetrical celt was found in Xinjiang, and a celt-spade and an adze with a ledge in Urumchi (Debaine-Francfort 1988: figs. 9, 3, 5). In the area of Tacheng and Tuoli (Mei, Shell 1999: 573, fig. 4) two axes, four sickles, an adze, a celt, a celt-shovel, a chisel and a spear were found, some of the articles being made of bronze containing 2—10% tin. In the Tian Shan near Jili an adze was found; in Jining, a chopper-sickle; in Nilike, a celt; in Xinguan, a chisel. In Jimusa'er and Qitai two axes were found; in Hami, a celt and a sickle; in Kuisu in Balikun, another axe; in Chagimale in Huayuan near Hami, an arrow and two knives: one ring-headed and one with a deer's head.

The hoard found in Agharsin (Gongliu) in Toquztara is very interesting. It was discovered in 1975 at a depth of 1 meter (Debaine-Francfort 1989: 200, fig. 20, Table 11, 5,

6; Ke Peng 1998: fig. 1 6; Wang and Cheng 1989: 95, 96). The complex was found in the vicinity of graves with stone slabs. It contained a vessel of red baked clay and 12 bronze articles: three axes with hanging butt-ends, three sickles, five chisels and a celt-hammer. An Zhimin (1998, photo 2 5) includes three more adzes. Originally, the hoard was attributed to the Warring Kingdoms period, to the developed Iron Age (Wang Binghua 1989: 200). C. Debaine-Francfort (1989: 200) pointed out the possibility of synchronizing it with the Andronovo culture, but she attributed it to the Saka epoch. Ke Peng (1998: 580) referred it to Andronovo and dated these findings to 1500—1000 B. C. I assigned the hoard to the Andronovo Culture and dated it to the $13^{th}-11^{th}$ centuries B. C. (Kuzmina 1994: 241). The comparison of Xinjiang's bronze artifacts with those of Andronovo allows us to specify their chronology and origin.

Thus, metallurgy in China emerged as early as the turn of the third-second millennium B. C. under the influence of the Eurasian Steppe. It was mediated by the ethnically non-Chinese tribes of China's northern periphery ("significant others" according to K. Linduff 1996b), but, initially, by the Afanasyevo Culture tribes and then the Turbino Seima and Andronovo. The technology of making the bronze alloy, the use of gold and the casting of spears and celts with a hidden socket in a two-part mold, all were borrowed. Particularly active were the relations of Semirechye, Ferghana and Eastern Kazakhstan with Xinjiang, where the Andronovo population settled and where all the specific types of implements of the Semirechye metallurgical center were in general use.

Other innovations of Chinese civilization were horse-breeding and wheeled transport. Horse bones are represented in the metalliferous cultures of the early second millennium B. C. (Qijia, Siba and Longshan) (Linduff 2000). But their share is negligible and there are no domestication data (Linduff 2000). Judging by the depictions (Linduff 2000: fig. 1, 2) and, particularly, graphs denoting the horse in Chinese oracle-bone inscriptions, it was the wild Przhevalsky horse (Mair 1998). Its range in the historical epoch embraced the whole of the Eurasian Steppe, including Mongolia. The Przhevalsky horse is untamable. Since the number of chromosomes of the domestic and Przhevalsky horses is different, the latter could not be the ancestor of the former. The domestic horse may have originated from the tarpan in the Ponto-Caspian Steppes, where, by the fourth-third millennium B. C. its cult had already emerged and its representations in art and its ritual sacrifice had appeared. In Southern Siberia the domestic horse is familiar in the Afanasyevo culture, but in

the first stage it was used only as food (Bökönyi 1995; Kuzmina 2000; Linduff 2000).

The Afanasyevo Culture was probably also familiar with the use of vehicles that had solid wheels made up of three parts assembled by hammerwork, with a protruding hub. Draught animals were a pair of bulls or oxen (Leontiev 1980: 65; Vadetskaya 1986; Gryaznov 1999). The similarity in construction of the Old World carriages and wheels in the late fourth to mid-third millennium B. C. gave birth to the hypothesis that they had a monocentric origin in the Near East (Childe 1954; Piggott 1969; 1983; Littauer, Crowel 1979). This type of transport is also familiar in the Andronovo Culture. The appearance of the carriage in China is evidenced by its representations in petroglyphs in Xinjiang and Inner Mongolia (Cheremisin, Borisova 1999; *Ancient Art*) and the finding of a wheel from the cemetry of Kezierqueqia (Qizilchoqa) near Qumul(Hami) in Xinjiang, dating to 1350—1000 B. C. (Mallory Mair, 2000: 142, 143, 324, 325: fig. 64). Horse bones were found in Xinjiang at sites of the latter half of the second to the early first millennium B. C.: Shirenzi, Lanzhouwanzi, Nanwan, Wupu, Kezierqueqia (Debaine-Francfort 1988: 18—21; Jettmar 1992), and cheek-pieces of the Steppe type were found in Shirenzi and Nanwan.

The most important innovation of the first quarter of the second millennium B. C. was the spread of light fighting chariots with two spoked wheels, harnessed to a pair of horses. The oldest findings of chariots and horses in warriors' graves are familiar in the Urals and on the Volga (Gening 1979; Kuzmina 1994; 2001), and in representations in Anatolia and Syria (Littauer, Crowel 1979; Moorey 1986). Having emerged in the epoch of the formation of the Andronovo Culture at the monuments of Sintashta and Petrovka, chariots dominated in the Steppes in the third quarter of the second millennium B. C. in the Timbergrave (Srubna) and Andronovo cultures, which is recorded by cheek-pieces, representations on vessels and in petroglyphs. The representations of chariots in Xinjiang (Cheremisin, Borisova 1999: 129—134, pl. I; II) are analogous with the Andronovo chariots of Kazakhstan and Semirechye and are executed not in the Near Eastern manner, in profile, but in the Eurasian, one *en face* (Littauer 1977; Novozhenov 1994), which indisputably corroborates their northwestern steppes origin in China.

It is interesting that the graph denoting the chariot in oracle-bone inscriptions (Shaughnessy 1988: fig. 4) resembles the pattern in petroglyphs of Central Asia (Novgorodova 1981). Chariots proper were discovered in the 1930s at the imperial cemetery of the Shang dynasty and near the palace in the capital of the Yin kingdom in Anyang, and later

in its neighbourhood near Beijing, in Xiaotun, Dasikong, Baijiafen, Xibeigang, and also in Liujiahe, etc. (*Kaogu Xuebao* 1947 ＃2; 1955 ＃5; 1979 ＃1; *Kaogu* 1961 ＃2; 1972 ＃4; 1977 ＃1; 1987 ＃＃5, 12; 1998 ＃ 9; *Wenwu* 1977 ＃5; Cheng Te-k'un 1960: 71, 260, pl. XVIII c; XXV d, map 1; Watson 1961: 64, pl. 48; Dewall 1964: 124－127; Ping-ti Ho 1975: 354－357; Li Chi 1977: 113－115, fig. 19; Kuchera 1977: 133－140, 173, figs. 64－67; Kozhin 1977; Kryukov et al. 1978; Varenov 1980: 164 169; Shaughnessy 1988: 191 194; Linduff 2000). Of particular interest is the tomb of the royal Fu Hao, who was a consort of the king Wu Ding (circa 1200 B. C.). The tomb is situated in Xiaotun at the imperial cemetery in Anyang (Henan Chutu 1981: 147, 148: figs. 136,181; Linduff 1994: 418; So, Bunker 1995: 36). Alongside a set of Chinese articles, including those with inscriptions, the complex comprises a twisted-butt knife, a bronze mirror of the Andronovo type, jade rings and bracelets resembling Seima types, stone figurines of people and horses, comparable with Andronovo plastic art. These articles are probably of northern origin. In the complexes of Anyang two types of items can be singled out: one, local articles, including those with emperors' names; two, imported pieces of northern origin: Andronovo temple-rings of the Fedorovo type made of gold alien to China, socketed two-bladed arrows and spears atypical of China, and single-edged knives with a zoomorphic handle.

Beside the graves of the kings and elite there were discovered the che-maken pits (literally, "a pit with a chariot and horses"). Their date is 1250－1100 B. C. They contain weapons, a chariot whose wheels are placed into segmentary grooves, analogous to those of Sintashta, and two horses, laid, as in Sintashta, on their sides in parallel to each other. A quadriga was found only once (Xiaotun M 20). Chariots with four horses were typical of the succeeding Zhou dynasty (Komissarov 1980; Shaughnessy 1988; Linduff 2000). Sometimes a charioteer or a groom was buried to accompany the deceased in the afterlife. Cheek-pieces are rectangular, with a central orifice, made of bronze (a Chinese innovation). The harness, as in Andronovo, has a nose-strap. In contrast to the Near Eastern wheels, the Chinese ones are multispoked, like those of Andronovo. Other peculiarities construction of on of the Chinese chariots are also similar to Andronovo, as well as one can judge by petroglyphs. This points to the Steppe origin of chariots in China (Dewall 1964; Kozhin 1969; 1977; 1988; Li Chi 1977; Kuzmina 1973 a; 1977; Piggott 1978; 1983; Varenov 1980; Komissarov 1980; Shaughnessy 1988; Linduff 2000; Mallory Mair, 2000). Northern tribes served as mediators in their transfer to Anyang. This is borne out by ritual oracle-