DOI: 10.17746/1563-0110.2018.46.1.100-107

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A Periodization of the Timber-Grave Culture in the Western Orenburg Region: Archaeological and Natural Science-Based Evidence

Stages in the evolution of the Srubnaya (Timber-Grave) culture in the Orenburg region, Western Urals, are reconstructed using a multidisciplinary approach. Using the morphology and composition of buried soils, the relative chronology of burial mounds in the cemeteries was determined. The earliest paleosols indicate arid conditions, whereas the latest ones testify to greater humidity. The comparison of data from various analyses suggests that mounds contemporaneous in terms of ^{14}C dates display resemblance in funerary rite, burial goods, and paleosol characteristics. The technological analysis of ceramics based on A.A. Bobrinsky's approach showed that vessels from earlier mounds are more standardized, whereas those from later ones are more diverse. Based on the set of data, the evolution of the Timber-Grave culture in the region falls into three stages.

Keywords: *Late Bronze Age, Timber-Grave culture, Western Urals, burial mounds, typology, periodization.*

Introduction

The periodization of the Timber-Grave culture still remains a controversial issue, and scholars distinguish from two to four stages in its development in different regions (Kachalova, 1985: 33–36; Gorbunov, Morozov, 1985: 98–102; Vasiliev, Kuzmina, Semenova, 1985: 65–81; Sinyuk, Pogorelov, 1985: 134–138; Semenova, 2000: 161–178; Otroshchenko, 2003: 76–84; Vasiliev, 2010: 68–73). In dividing the development of the Timber-Grave culture in the Volga-Ural region, archaeologists have mainly relied on the typological method owing to the lack of sufficient stratigraphic data. Thus, we may observe that specific features of individual stages in their models of periodization are blurred (Vasiliev, Kuzmina, Semenova, 1985: 64–65, 75–79; Semenova, 2000: 161–165, 171–172, 177–178; Vasiliev, 2010: 72).

The Western Orenburg region is the northeastern periphery of the Volga-Ural region. Identification of particular stages in the development of the Timber-Grave culture in that area is hampered by the fact that it is not possible to determine the chronological position of the burial sites according to stratigraphic data. The mounds in almost all barrows were made over already existing

Archaeology, Ethnology & Anthropology of Eurasia 46/1 (2018) 100–107 E-mail: Eurasia@archaeology.nsc.ru

surface graves, and individual instances of cutting one burial by another have been observed. In this case, the use of the typological method for solving this problem is to a certain extent difficult, since the funerary rite throughout the entire period of the Timber-Grave culture demonstrates similar features; the ceramic vessels from the burials are similar in shape and ornamental decoration, and metal objects are almost always of the same type. For these reasons, in order to determine a clearer chronological position of the burial mounds, in addition to the methods of archaeology, this study will employ the results of radiocarbon dating, paleosol analyses, as well as technical and technological analysis of pottery, for the first time in the history of research on the sites of the Timber-Grave culture in the Orenburg Cis-Urals.

Research objects and discussion

Science-based methods have been used for studying the Skvortsovka, Labazovsky, Bogolyubovka, Mustaevo V, Pleshanovo II, and Uranbash cemeteries. A whole complex of studies (analysis of paleosols, technical and technological analysis of pottery, and radiocarbon dating) was carried out at three of these sites: the Skvortsovka, Labazovsky, and Bogolyubovka burial grounds. Technical and technological analysis of pottery and radiocarbon dating were performed at Pleshanovo II; paleosol analyses were carried out at Mustaevo V, and technical and technological analysis of pottery was made at Uranbash. All the results obtained for each site have been published (Khokhlova, Khokhlov, 2005: 50–60; Morgunova, Golieva, Evgeniev et al., 2009: 40, 42–52, 63–73; Morgunova, Golieva, Degtyareva et al., 2010: 76, 79–98, 119–141; Kryukova et al., 2012; Salugina, 2012; Mukhametdinov, 2012; Bogolyubovskiy kurgannyi mogilnik…, 2014: 99–102, 103–115, 131–159). In this article, for the first time, all these studies have been considered together. The comprehensive approach has made it possible to distinguish three stages in the development of the Timber-Grave culture in the Western Orenburg region (see *Figure*).

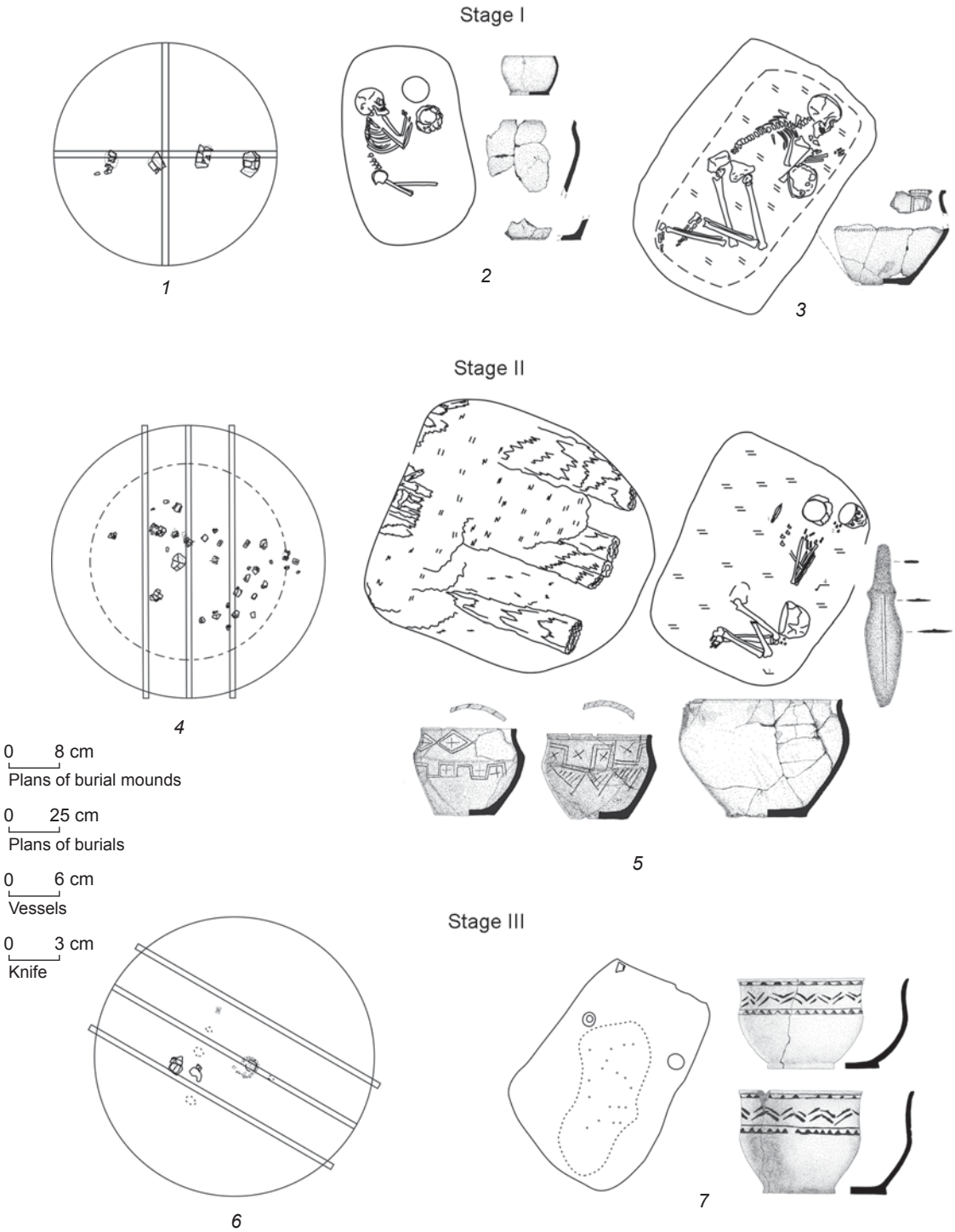
Burial complexes of stage I. All of these complexes are characterized by a small number of burials in the barrow (not more than ten), burial pits of sub-rectangular shape, and orientation of the buried person to the NE or N. The pits are predominantly of medium size (0.7–1.5 m^2), but large pits (2.0–3.4 m^2) have also been found. Burial chambers of oval form, orientation of the buried person to the W or NW, or secondary burials occur rarely. Sometimes, organic matting has been found in the graves. Scarce burial goods are a common feature of burials at stage I; the goods are represented mainly by pottery, including undecorated jars, pots that are bent in the middle of the profile, and smoothly profiled pots. In isolated cases, bones of animals have been found in the burials. If covers are present over the graves, they are made of either stone or wood.

At the present, the historiography of the Timber-Grave culture traditionally recognizes that all the distinctive features mentioned for stage I are inherent in the burial complexes of its developed (or classical) stage, while the sites of the formative period of the Timber-Grave culture are characterized by a more sophisticated set of features and more variegated goods (Semenova, 2000: 161–171; Vasiliev, 2010: 68–70). However, this approach to the periodization of the Timber-Grave antiquities is not always justified (Kuptsova, 2015).

The main features of the funerary rite at stage I of the Timber-Grave culture in the Orenburg region show clear parallels to the preceding post-Catacomb cultural traditions, and to a lesser extent to the cultures of the Sintashta-Potapovka circle (Vasiliev, Kuznetsov, Semenova, 1995: 22; Mimokhod, 2013: 336). From the former, the carriers of the Timber-Grave culture inherited such features of the funerary rite as burial of the deceased in pits of sub-rectangular or oval shape in the flexed position on the left side, with their heads oriented to the N, NE, or E, as well as a scarcity of burial goods. These features are typical of the Lola and the Volga-Don Babino cultures (Mimokhod, 2013: 27, 33, 56; 2014: 102, 103, 109). Placement of undecorated flat-bottomed jar-like vessels with closed and open necks is also associated with the post-Catacomb traditions. Jars were typical for all post-Catacomb cultural entities. Serial production of undecorated jar-like vessels, which at a later time commonly occurred in the Timber-Grave pottery collections, started in this environment (Mimokhod, 2013: 62; 2014: 110). It should be especially emphasized that these features of the funerary rite, inherited from the post-Catacomb population, are dominant and define the outlook of the Timber-Grave culture both at the first and the subsequent stages of its development. Jar-like vessels constitute one of the most common categories of dishware (Mochalov, 2008: 180–181).

The features of the so-called "cultures of the chariot circle" (the Sintashta and Potapovka cultures) also manifest themselves in the burial mounds of stage I. These features include the construction of extensive and in some cases deep grave pits, and the use of organic matting (Vasiliev, Kuznetsov, Semenova, 1995: 5, 11, 12). The spread of pots that are bent in the upper third of the profile, and smoothly profiled pots, is associated with the heritage of those cultures (Tkachev, Khavansky, 2006: 27; Mochalov, 2008: 130–132).

The technological analysis of pottery from the burial complexes testifies to a greater homogeneity of the skills of its manufacturing at stage I as compared to the later stages. Thus, the pottery from burial mound 4 of



Burial complexes of stages I–III of the Timber-Grave culture in the Western Orenburg region.
1 – planigraphy of burial mound 12 at the Bogolyubovka cemetery; *2* – Skvortsovka cemetery, 4/4; *3* – Skvortsovka cemetery, 4/10; *4* – planigraphy of burial mound 1 at the Bogolyubovka cemetery; *5* – Skvortsovka cemetery, 3/20; *6* – planigraphy of burial mound 10 at the Bogolyubovka cemetery; *7* – Bogolyubovka cemetery, 10/5.

the Skvortsovka cemetery and burial mound 12 of the Bogolyubovka cemetery shows the predominance of silty clay with the addition of grog and organic solution as the raw material. The pastes of all vessels in burial mound 3 of the Uranbash cemetery were composed according to the recipe: clay + grog + organic solution.

Close radiocarbon dates were obtained from two sites of stage I of the Timber-Grave culture in the

Western Orenburg region (see *Table*). They correspond to the dates of the terminal stage of final entities of the Middle Bronze Age: the Lola and the Volga-Don Babino culture (the Krivaya Luka cultural group) (Mimokhod, 2011: 29, 32). Also close are some radiocarbon dates of the Potapovka (Kuznetsov, Mochalov, 2012: 53) and Sintashta (Epimakhov, Hanks, Renfrew, 2005: 97–98) cultures.

The calibrated dates of the burial mounds of stage I fall into the chronological range of the 21st–18th centuries BC, presumably encompassing several centuries, which in fact seems to be unlikely. The analysis of paleosols and climate in that period clarifies the situation. All burial mounds of stage I were made in arid climatic conditions before the onset of a more favorable humid period correlating with the later stages of the development of the Timber-Grave culture. This is consistent with the available data on the climate of the late third–early second millennium BC, when the natural conditions were characterized by sharp aridization (Demkin et al., 2009: 181). It can be assumed that burial mounds of stage I of the Timber-Grave culture in the Western Orenburg region were formed at the so-called turning point of climate change, that is, when the direction of the evolution of soils was changing (Khokhlova, 2006: 107), in our case, from the arid to humid period. Reconstructing natural conditions in the beginning of the Late Bronze Age, soil scientists have established that climate amelioration started no earlier than the 18th century BC (Demkin et al., 2009: 181). This is why the probable "turning point" refers to the mid–late 19th century BC, since a certain amount of time was needed before the next stage

Radiocarbon dates of burial sites of the Timber-Grave culture in the Western Orenburg region

Burial complex	Material	^{14}C-date, BP	Calibrated date, BC		Laboratory code
			1σ	2σ	
		Stage I			
Skvortsovka cemetery, 4/8	Human bone	3550 ± 90	2020–1750	2140–1660	Le-8585
Bogolyubovka cemetery, 12/1	Same	3544 ± 80	1980–1760	2060–1680	Spb-680
		Stage II			
Labazovsky cemetery, 1/3	Wood	3480 ± 60	1880–1730	1950–1620	Le-7681
Same	"	3400 ± 80	1815–1608	1873–1565	ИГАН-3354
Labazovsky cemetery, 1/2	"	3530 ± 50	1849–1865	1928–1773	ИГАН-3356
Labazovsky cemetery, 2/2	"	3340 ± 60	1690–1320	1770–1490	Le-7682
Same	Human bone	3490 ± 100	1940–1680	2150–1500	Le-7685
"	Wood	3710 ± 70	2019–1994	2202–1981	ИГАН-3355
Skvortsovka cemetery, 3/20	"	3450 ± 75	1890–1680	1950–1600	Le-8587
Same	Human bone	3680 ± 100	2210–1920	2450–1750	Le-8581
Skvortsovka cemetery, 3/19	Animal bone	3460 ± 40	1880–1730	1890–1680	Ki-16263
Skvortsovka cemetery, 3/5	Human bone	3480 ± 160	2030–1610	2300–1400	Le-8584
Skvortsovka cemetery, 3/30	Animal bone	3400 ± 40	1750–1620	1780–1600	Ki-16265
Skvortsovka cemetery, 3/25	Same	3210 ± 70	1530–1400	1690–1310	Ki-16267
Bogolyubovka cemetery, 1/5	Soot deposits on a vessel	3450 ± 150	1950–1600	2200–1400	Spb-576
Same	Wood	3400 ± 70	1780–1610	1890–1520	Spb-575
Bogolyubovka cemetery, 1/20	"	3300 ± 80	1690–1490	1770–1410	Spb-577
Bogolyubovka cemetery, 1/31	Human bone	3487 ± 100	1950–1680	2150–1500	Spb-681
Bogolyubovka cemetery, 2/2	Same	3432 ± 70	1830–1640	1920–1600	Spb-679
Bogolyubovka cemetery, 2/6	"	3498 ± 100	1950–1680	2150–1500	Spb-685
Bogolyubovka cemetery, 3/2	"	3366 ± 70	1750–1600	1830–1490	Spb-684
Bogolyubovka cemetery, 3/4	"	3360 ± 120	1780–1500	2000–1400	Spb-686
Bogolyubovka cemetery, 11/3	"	3250 ± 150	1740–1380	1900–1100	Spb-683
Pleshanovo II cemetery, 2/5	Wood	3390 ± 30	1700–1660	1760–1610	Le-9897
		Stage III			
Bogolyubovka cemetery, 13/6	Human bone	3424 ± 100	1880–1620	1050–1450	Spb-682

to allow for the formation of soil properties, which make it possible to distinguish the burial mounds of the first and subsequent periods. This date (the 19th century BC) fits the chronological range proposed by a number of scholars as a chronological framework for the Timber-Grave culture (Chernykh, 2007: 86; Molodin, Epimakhov, Marchenko, 2014: 142, 145). Apparently, the earliest sites of this culture were created during the late stages of the post-Catacomb, Sintashta, and Potapovka antiquities.

Burial complexes of stage II. First of all, we should note the spread of multi-burial barrows (sometimes over 30 burials under a single mound). Burial chambers of large sizes located in the center of the barrow and covered either by thick layers of wood or stone slabs occur more frequently than at the sites of stage I. Additional elements, such as organic matting and covering, and sprinkling with ocher, have been found in the burials made over large areas. A new element in the funerary rite of the Timber-Grave culture at stage II is that in some cases stone, wooden, or stone-wooden covers were found under the same mound. Some peripheral burials were made according to the cremation rite. Double burials (face to face) occur in some burial mounds, which must have occurred under the influence of the Alakul funerary rites (Rafikova, 2008: 6, 11).

The typological range of pottery at stage II became wider than at stage I also due to the incorporation of the Alakul component. Burial goods became more varied, too; in addition to pottery, they are represented by adornments, insignia of power, implements of labor, and in isolated cases by wooden dishware.

In technological terms, the pottery from the burial mounds of stage II demonstrates variability. Thus, fundamentally different types of raw materials were selected for manufacturing dishware. Silts, and silty and natural clay was found in the pottery from the Skvortsovka (burial mound 3) and Labazovsky necropolises; silty clay and natural clay was used in the pottery from the Bogolyubovka cemetery (burial mounds 1–3, and 11); silts and clay were present in the composition of pottery from the II Pleshanovo cemetery, and only natural clay was used in the pottery from the Uranbash necropolis. The composition of pastes also varied from 2 (burial mounds 2 and 4 of the Uranbash cemetery) to 13 (burial mound 3 of the Skvortsovka cemetery) recipes. This situation indicates that although the population that left the burial mounds of stage II was culturally relatively homogeneous, this homogeneity was formed on the basis of the interaction of several communities with various skills of pottery manufacturing.

Judging by the results of the summation of radiocarbon dates (with the exception of those that had an error of over 150 years), calibrated with the probability of 1σ, the sites of stage II of the Timber-Grave culture can be dated to the period from the late 19th to 17th century BC (see *Table*). The reconstruction of paleoclimatic conditions has shown that burial mounds of this stage were built at the beginning of climate amelioration with some increase in humidity. According to the study of the paleosols of the Lower Volga region, this climatic situation occurred in the 18th to 16th centuries BC (Demkin et al., 2009: 181). Taking into account the main array of radiocarbon dates, stage II of the Timber-Grave culture in the Western Orenburg region can be dated to the 18th to 17th centuries BC.

Thus, the cultural situation at stage II changed as compared to stage I under the influence of the traditions inherited from the cultures of the Sintashta-Potapovka circle, which began to intensively manifest themselves in the Timber-Grave environment. In addition, ties with the Early Alakul culture started to intensify. In the historiographic tradition, the sites with these features are attributed to the Pokrovsk stage of the Timber-Grave culture (Vasiliev, Kuzmina, Semenova, 1985: 62–75; Semenova, 2000: 161–168; Bogdanov, Khalyapin, 2000: 44–45).

Speaking about the chronological position of the "Pokrovsk" Timber-Grave antiquities, we should mention two different points of view on the correlation of the Pokrovsk and Sintashta-Potapovka sites. According to the first view, the Pokrovsk, Sintashta, and Potapovka complexes were contemporaneous, as evidenced by the similarity of the funerary rite and some categories of burial goods, as well as a number of coinciding ^{14}C-dates (Malov, 2001: 200–201; Zeleneev, Yudin, 2010: 143; Yudin, Matyukhin, 2006: 67–70). The second point of view is that chronologically the Pokrovsk sites followed the Sintashta-Potapovka sites, and the similarity of these complexes is not of a chronological, but a genetic nature (Vasiliev, Kuznetsov, Semenova, 1995: 36–37; Kuznetsov, Semenova, 2000: 130–134).

It seems that only the early "sites of the Pokrovsk type" (in other terminology, the complexes of the late stage of the Don-Volga Abashevo culture (Pripadchev, 2003: 53)) were contemporaneous to the Sintashta and Potapovka sites. The so-called Pokrovsk Timber-Grave complexes definitely appeared after the "chariot" cultural entities. This is confirmed by the archaeological materials of the Orenburg Cis-Urals, where Timber-Grave sites with the "Pokrovsk" features belong already to stage II of the development of the culture, thus following the sites of the Sintashta-Potapovka circle.

Burial complexes of stage III. The appearance of pottery revealing the traditions of the Kozhumberdy, Fedorovka, and West-Alakul pottery in the Timber-Grave complexes should be considered the most important feature of this stage. Sometimes pottery is combined with stone structures in the form of boxes or rings, or with the rite of cremation. There were cases when burials performed according to the ritual of cremation were equipped with stone boxes or fences, yet vessels of a

typical Timber-Grave appearance were placed inside. The combination of stone boxes and stone rings with cremation indicates the Andronovo influence on the funerary rite (Kuzmina, 1994: 42–43). These features were not manifested at the earlier stages of the Timber-Grave culture.

At the same time, it should be emphasized that the actual Timber-Grave traditions, such as the funerary rite performed in the form of inhumation in pits of sub-rectangular shape and orientation of the buried person placed on the left side with his head to the N, NE, or E, also remain the determining features at stage III. Pottery of a typical Timber-Grave appearance was found along with the Timber-Grave-Andronovo vessels. Thus, in spite of a significant influx of different cultures, we cannot speak about complete change in the cultural situation of that period of the Timber-Grave culture development.

Technologically, the pottery of stage III reveals both similarities and differences as compared to the dishware of the previous period, and as a rule demonstrates clear differences from the pottery of stage I. Most of the pottery from the burial mounds of stage III at the Bogolyubovka cemetery (burial mounds 10 and 13) was made of ferruginous clay. This raw material was not found in the complexes of stage I at the same site. Pottery of stage II was made both of silty and natural clay, but as opposed to stage III, the former were dominant. The composition of the molding compounds used for the pottery from the burials of stage III at the Bogolyubovka cemetery is quite standard: clay, grog, and organic solution, often resulting from squeezed manure. Pottery from the burial mounds of stage III at the Uranbash cemetery (burial mounds 8 and 9) technologically demonstrates the greatest variety in paste composition (up to six different recipes were used).

A distinctive aspect of the burial complexes from stage III is partial preservation of vestigial features. Thus, southern, southeastern, and northwestern orientation of the buried, typical of the pre-Timber-Grave period, was observed in a number of cases. Sometimes the arms were found in the position typical of the burial ritual of the post-Catacomb cultures: the left arm was bent at the elbow in such a way that the hand was in front of the face; the right arm was at a right angle so the hand was at the elbow of the left arm; both arms were stretched to the knees. In isolated cases, intermittent ditches were found around the mounds. The features of the pre-Timber-Grave period occur in pottery in exceptionally rare cases.

It is difficult to establish the chronological range of the sites of stage III. Only one radiocarbon date has been obtained (see *Table*). It has a relatively large error and gives a wide interval; thus, it cannot be unequivocally used for dating the entire stage. An entire series of dates has been obtained from the materials of the settlement of Gorny in the Orenburg Cis-Urals, where a large number of earthenware with Andronovo features was found (Lunkov, 2004: 28: 30–31). These dates with a probability of 1σ fit into the interval of the 17th to 14th centuries BC, and may serve as a basis for attributing the site to stage III of the Timber-Grave culture. According to E.N. Chernykh, the settlement of Gorny should be dated to the 17th to 15th centuries BC (Chernykh et al., 2002: 125, 127). The soils under the mounds of stage III show the most "humid" properties, which indicates more favorable climatic conditions than those of the present day. According to the study of paleosols in the Lower Volga region, such a climatic situation occurred in the 16th to 12th centuries BC (Demkin et al., 2009: 181). Proceeding from the above facts, stage III of the Timber-Grave sites in the Western Orenburg region can be dated to the 16th to 15th centuries BC.

Conclusions

The Timber-Grave culture on the territory of the Western Orenburg region evolved in three stages, which is confirmed by the archaeological materials and data obtained using natural science-based methods. The core of this culture emerged on the basis of the traditions of the post-Catacomb tribes and the population that left the sites of the Sintashta-Potapovka circle with the predominance of the former. Its evolutionary development in this territory took place at stage I, which was caused by a lack of contacts with the carriers of other cultures. The natural and climatic situation is characterized by arid conditions before the onset of a more favorable humid period. The chronological range of this stage is the 19th century BC.

At the II and especially at stage III of the Timber-Grave culture, its carriers were involved in a complex process of interaction with tribes belonging to different cultures (the Alakul and the Kozhumberdy cultures), which is manifested in a sophistication of ritual norms and a greater variety of burial goods. The Andronovo component is most pronounced at stage III. Natural and climatic conditions corresponding to stage II are characterized by amelioration with some increase in humidity compared to the previous period. The most favorable situation in terms of humidity has been reconstructed for stage III. The chronological framework of stage II is the 18th to 17th centuries BC, of stage III the 16th to 15th centuries BC.

Acknowledgement

This study is a part of the Public Contract No. 33.1389.2017/ПЧ for performance of research work. Studies of paleosols were performed under the Public Contract No. 01201356686.

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Received January 14, 2016.