

## Chronology of Neolithic sites in the forest-steppe area of the Don River

Roman Smolyaninov<sup>1</sup>, Andrey Skorobogatov<sup>2</sup> and Aleksey Surkov<sup>2</sup>

<sup>1</sup> Lipetsk state pedagogical university Pyotr P. Semenov-Tyan-Shansky, Lipetsk, RU  
rws17@rambler.ru

<sup>2</sup> P. Semenov-Tyan-Shansky "Terra", Voronezh, RU  
surkovarh@mail.ru  
a.m.skorobogatov@mail.ru

**ABSTRACT** – *The first ceramic complexes appeared in the forest-steppe and forest zones of Eastern Europe at the end of the 7<sup>th</sup>–5<sup>th</sup> millennium BC. They existed until the first half of the 5<sup>th</sup> millennium BC in the Don River basin. All these first ceramic traditions had common features and also local particularities. Regional cultures, distinguished nowadays on the basis of these local particularities, include the Karamyshevskaya and Middle Don cultures, as well pottery of a new type found at sites on the Middle Don River (Cherkasskaya 3 and Cherkasskaya 5 sites).*

**KEY WORDS** – *Early Neolithic; Neolithisation; pottery technology; radiocarbon chronology*

### **Kronologija neolitskih najdišč na območju gozdne stepe ob reki Don**

**IZVLEČEK** – *Prvi keramični kompleksi so se na območju gozdne stepe in gozdov v vzhodni Evropi pojavili na koncu 7. do 5. tisočletja pr. n. št. V dolini reke Don so se ti kompleksi obdržali do prve polovice 5. tisočletja pr. n. št. Vse te prvotne keramične tradicije imajo skupne značilnosti, pa tudi lokalne posebnosti. Med regionalne kulture, ki jih danes ločimo na podlagi teh lokalnih posebnosti, uvrščamo kulturo Karamyshevskaya in kulture na območju srednjega toka reke Don, kakor tudi lončeno novega tipa, ki je bila odkrita na najdiščih Cherkasskaya 3 in Cherkasskaya 5.*

**KLJUČNE BESEDE** – *zgodnji neolitik; neolitizacija; tehnologija lončenine; radiokarbonska kronologija*

### **Introduction**

Neolithic sites in the forest steppe Don River basin have been known since the first half of the 20<sup>th</sup> century. The research conducted in this region, as in other areas of Eastern Europe, allowed the identification of both local cultures and cultural entities, connected to the Neolithisation process and the first appearance of pottery. Pottery appeared to be a marker of transition to the Neolithic in this region, even when flint industry remained the same as during the Mesolithic, which is widely recognised for the European part of Russia. The particularities of pottery

types also became the leading feature for differentiating between archaeological cultures (*Sinyuk 1986*).

### **Description of the region**

The forest-steppe of the Don River basin area (Maps 1, 2) encompasses the Upper and Middle Don River with its tributaries, including those with outflows located within the steppe zone. The Don flows from North to South, which was of crucial importance for contacts between the populations of the Don region

and the ancient communities of the Azov Sea and Pre-Caucasian regions in the south, the Northern Caspian Sea region (and beyond with the Central Asian region) in the south-east, and finally the Balkan area through the Upper and Middle Dnieper territories – in the west and south-west.

According to the modern administrative division, the forest-steppe of the Don basin is located in Lipetsk and Voronezh regions of the Russian Federation.

The forest-steppe area is a temperate landscape transitional between forest and steppe, characterised by the alternation of closed mostly deciduous trees growing on grey soils and grassland steppe territories in the Black Earth region (*Milkov 1961*). The landscape of the forest-steppe zone changes from north to south. Three sub-zones occur in the central region: northern, typical and southern forest-steppe.

The topography of Neolithic sites is similar throughout the whole region: sites were situated on offshore bars, the upper parts of the first terrace above the flood-plain and sometimes on bedrock shores. Most have been found near the high-water beds of such rivers as the Voronezh, Bitug, Savala, and Tikhaya Sosna.

Neolithic sites in the forest-steppe Don region are arranged into groups in the middle and lower river zones. During spring floods, most of them are covered with water.

### The earliest Neolithic cultures

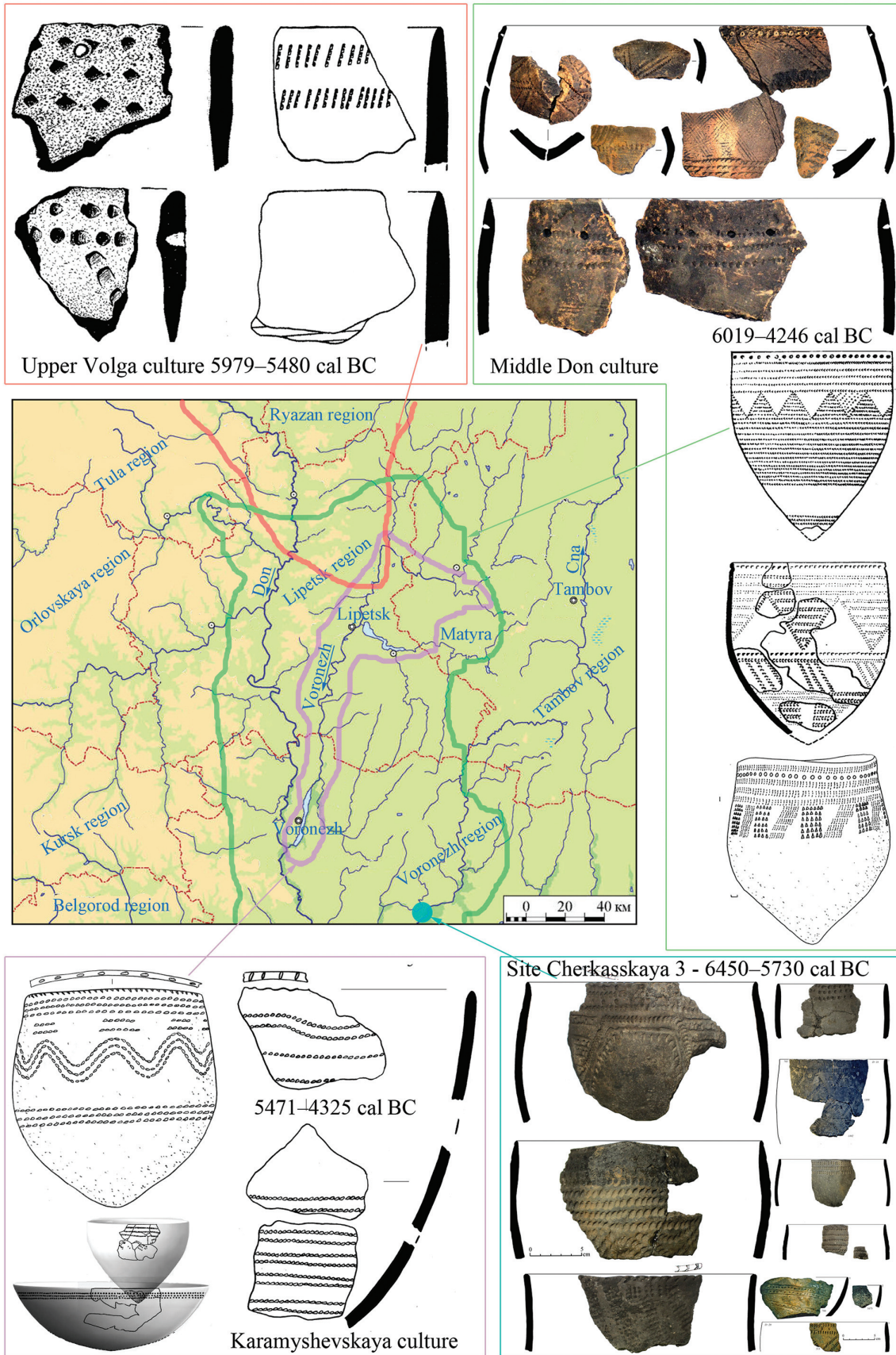
The modern understanding of the early Neolithic period of the region was formed after studies of Neolithic sites at the beginning of this century. An investigation near the village of Karamyshevo in the Upper Don River basin allowed us to distinguish a very particular pottery type and thence a new archaeological culture called Karamyshevo (*Smol'yaninov 2009*) (Fig. 1). Excavations in the village of Cherkassk (Vo-



**Map 1.** The territory of the forest-steppe in Don region.

ronozh region) in the Central Don River area conducted from 2009 to 2015 (Voronezh region) yielded Early Neolithic pottery considerably different from all the known pottery complexes of the forest-steppe Don. It was found at the Cherkassk 5 site at the mouth of the Bitug River (the left tributary of the Don) (*Gapochka, Skorobogatov and Surkov 2015*).

A small part of Cherkassk 5 was excavated in 2014–2015. The cultural layer of this site was found under two-metre-thick alluvial sterile deposits. Pottery tempered by shell, with a polished surface was found at the bottom of the cultural layer (*Gapochka, Skorobogatov and Surkov 2015*). Later on similar pottery was found in the low layer of Cherkassk 3. Two dates were made on one sample at 7474±65 BP (6450–6225 cal BC, Hela-3520) and 7610±45 BP (6570–6398 cal BC, GrA-62165) (Fig. 2.1). Also, organic crust from pottery of this type from Cherkassk 5 was dated to 7115±130 BP (6236–5730 cal BC, SPb-



Map 2. Distribution map of early Neolithic cultures in the forest-steppe in Don region.

1465). It is possible to assume the old age of these materials can be explained by the specifics of the dated material (organic crust); however, typologically, this pottery appears to be among the most ancient.

However, from our point of view, pottery moulding skills were mastered as a result of direct contacts with the population of the Elshan culture, which had skills and arrived in the Don region at the close of 6<sup>th</sup> century BC. The Don population adopted these skills very rapidly.

Materials attributed to the Karamyshevo culture (Fig. 1) were found at 26 sites located only in the basin of the Voronezh River (the left tributary of the Don River). It is supposed to be an Early Neolithic culture, based on stratigraphic data and radiocarbon dates (Tab. 1), and its chronological position coincides with Elshanskaya, Upper Volga and other early Neolithic cultures.

Karamyshevo culture appeared to be one of the oldest within the group of Early Neolithic materials in this region based on radiocarbon dates that range from the beginning of the 6<sup>th</sup> to the first half of the 5<sup>th</sup> millennium BC. The oldest dates were acquired from organic crust on pottery from the lower layer of the Ivnitsa site; the latest dates are from pottery from Vasilyevsky Kordon 5 and 7 and Karamyshevo 9. The beginning of the development of Karamyshevo culture might be dated to the same time or a later period of the Elshanskaya culture at Gorodok 1, a site located near the Upper Don (about 40km north of the Don basin): 6760±90 BP (5841–5515 cal BC, Ki-14075) and 6870±100 BP (5983–5621 cal BC, Ki-14114). Radiocarbon dates made on organic crust from pottery of this stage from Ivnitsa – 6940±40 BP (5471–5303 cal BC, Poz-42054) – and Karamyshevo 5 – 6570±60 BP (5790–5230 cal BC, Ki-11088) – confirm this hypothesis.

One of the main indicators of Karamyshevo culture is pottery. The Neolithic/Eneolithic sites contain a few stone tools characteristic of the Upper Don region. Karamyshevo pottery is distinguished by its texture and decoration. In most cases, the pottery has similar production features; it was made with an original type of raw material – a non-sanded high plasticity silty clay with natural inclusions (pottery from different sites varies in the composition of natural inclusions) such as sand, decomposed vegetation debris, undissolved pieces of clay (which were less than 1mm in size), small shell inclusions (in the form of

slot-like square holes 2–3mm in size), and reddish brown chalybeate matter less than 1mm in size. The moulding composition contained plastic raw material with organic liquid (holes with rusty friable substance). Pots were formed with sculptural modelling techniques (patch modelling). Surfaces were smoothed with a soft material. The vessels were low-fired, with a short-term exposure to heat at 650–700°C (a 3-layer fracture). The pottery was light brown, with thin walls (no more than 0.7mm thick).

Later, the Karamyshevo pottery was produced from sanded silty clay containing natural inclusions like the pottery of the Middle Don culture. As far as surface finishing is concerned, Karamyshevo pottery can be subdivided into two groups: one with thoroughly smoothed surfaces and burnished exterior surfaces, and one with smoothed surfaces with scratches (sometimes the exterior was smoothed after being decorated with scratches), which also might be a chronological indicator.

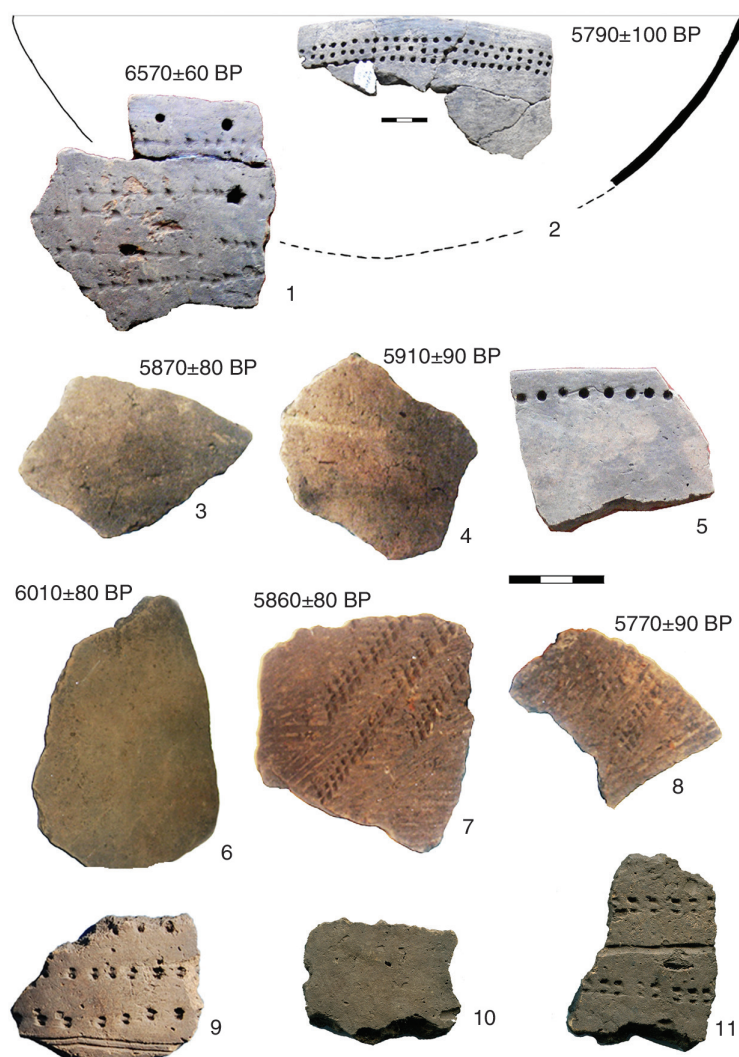
Most of the pottery fragments were not decorated. Thus, out of over 500 fragments of pottery from the Vinnitsa site, 62% of the pottery finds were not decorated, about 25% were decorated with oval, triangle and doubled strokes, 11% were decorated with a short-toothed comb, only 21 pottery fragments had thin and shallow incised lines on the surface, and 10 fragments were decorated with a pit pattern. This indicates the relatively early nature of the site, whereas the sites evidencing later cultures such as Karamyshevo 9 or Vasilyevsky Kordon 7 contain more decorated pottery.

Pottery from the late Karamyshevo sites is characterised by the distribution of pit and comb imprints in the decoration, the increase in the decorated surface, the appearance of false cord decoration made with oval impressions arranged in lines. This material was found at sites such as: Karamyshevo 9 where it is dated to 5790±100 BP (4850–4450 cal BC, Ki-12160) and 5630±100 BP (4710–4325 cal BC, Ki-12161); VasilyevskyKordon 5, dated to 5870±80 BP (4940–4530 cal BC, Ki-15194) and 5910±90 BP (4940–4530 cal BC, Ki-15625); VasilyevskyKordon 7 where it is dated to 6010±80 BP (5080–4710 cal BC, Ki-15624), 5930±80 BP (5000–4590 cal BC, Ki-15192), 5860±80 BP (4860–4520 cal BC, Ki-15193) and 5770±90 BP (4810–4440 cal BC, Ki-15199); VasilyevskyKordon 3 where it is dated to 5868±120 BP (5036–4458 cal BC, SPb-1638). These sites existed in the Upper Don River basin until the second half of the 5<sup>th</sup> millennium BC.

Nowadays, Middle Don Culture (Fig. 3.1–3) is not regarded as chronologically older than other cultures in this region, especially regarding materials from the Cherkasskaya 5 site. Currently, more than 100 sites located in the forest-steppe Don are attributed to this culture. However, only a few sites have been excavated and have a clear stratigraphy. The pottery from its early stage (6<sup>th</sup> millennium BC) is contemporaneous with the pottery of the early stage of Karamyshevo culture. The first stage of Middle Don culture is characterised by archaeological layers with stroke-ornamented pottery (not comb pottery), which was revealed in material from the Monastery site in Pobityuzhye, a lower layer of the Cherkassk site (A. T. Sinyuk's excavation in 1979–1981), and also at Inyasevskaya, Shapkinskaya 6, and Plautinskaya 2 in the Khoper River basin.

Similar materials in the Upper Don basin were found only at Yarlukovskaya Protoka, Dobroye 1 and Universitetskaya 3. There are several earlier radiocarbon dates for this stage: for Dobrovsky – 6912±120 BP (6019–5621 cal BC, SPb-1287); site Cherkassk 3, a low layer – 6715±64 BP (5730–5525 cal BC, Hel-3491); Yarlukovskaya Protoka (point 222) – 6774±120 BP (5903–5484 cal BC, SPb-1637) and a late one, which are transitional between the first and second stages, based on pottery from Universitetskaya 3: 6190±100 BP (5400–4800 cal BC, Ki-15959), 6140±90 BP (5300–4840 cal BC, Ki-15432) and 6050±90 BP (5300–4700 cal BC, Ki-15441).

It is also necessary to underline other cultural influences of the Neolithic in this region. The southern periphery of the Upper Volga culture can be traced in the northern part of the Upper Don area. There are a few sites with poor cultural layers. Four sites of the Upper Volga culture are known. Beryozovka 4B, dated by Olga A. Chichagova to 6780±140 BP (5979–5480 cal BC, IGAN 2007), can be attributed to the early stage of Upper Volga culture (Naumova, Smolyaninov 2009).



**Fig. 1. Pottery of Karamyshevskaya culture (1 Karamyshevo 5; 2 Karamyshevo 9; 3–5 Vasil'evskii Kordon 5; 6–8 Vasil'evskii Kordon 7; 9–11 Ivnic).**

The Upper Volga and Elshan cultures have similar dates in the 5<sup>th</sup> century BC (Zhilin et al. 2002; Zaretskaya, Kostlyyova 2008.5–14). Having analysed ceramic and stone tools, most researchers define an early stage with plain and stroke-ornamented pottery and late stages with the appearance of pit and comb pottery. Some authors put the early stage of the Upper Volga culture as separate cultures – the Valday culture, according to publications by Nina N. Gurina and the Volga-Oka culture according to Yuri B. Tsetlin (Tsvetkova 2012).

The earliest pottery pieces found in the western Upper Volga region and attributed to the Kotchishche type are characterised by a smoothed and burnished surface, chamotte or sometimes organic matter, decorations with isolated strokes, or prints made with a two- or three-pronged comb (Gurina 1996).

Pottery decorated by comb impressions and traced lines which is attributed to Dnepro-Donetsk culture can be also distinguished in the forest-steppe Don basin. This type of pottery appeared in the Middle Don River very early, almost at the same time as complexes of Middle Don culture. Organic crust from pottery found on the site Cherkassk 3 was dated to  $6851\pm34$  BP ( $5832-5662$  cal BC, KIA-51099). There are two such sites in the Upper Don River basin: near Lipetsk waste treatment facilities and at Karamyshevo 9, but they are later. The appearance of this pottery at Neolithic sites of the region must have been related to intertribal communication networks connecting the communities of the Dnepro-Donetsk culture around the middle of the 5<sup>th</sup> millennium BC. Two radiocarbon dates were obtained on the same vessel from Karamyshevo 9 in the Upper Don area:  $5650\pm90$  BP ( $4710-4330$  cal BC, Ki-15191) and  $5160\pm160$  BP ( $4170-3760$  cal BC, Ki-11088).

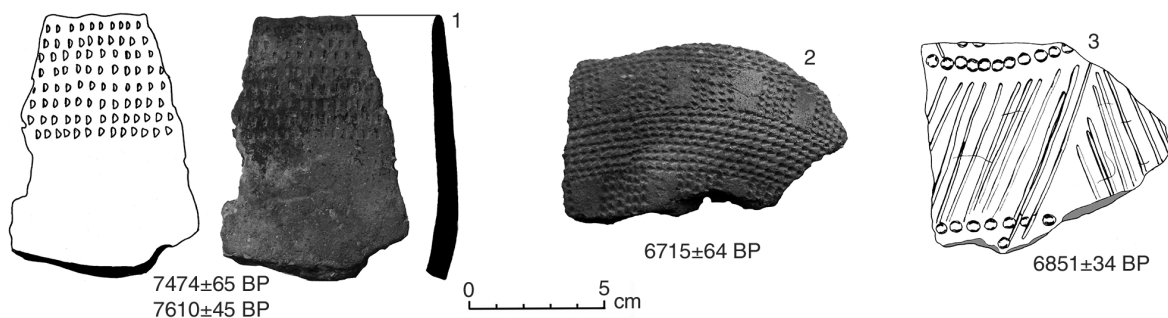
#### Middle Don Culture (second and third stage): contacts with the Eneolithic world

Small, thin comb impressions along with pin-pointed pattern in decoration of pottery (*Gapochka* 2001) are typical of the second stage. The second stage of Middle Don Neolithic culture must have been related to the expansion of early Eneolithic communities from the Lower Don culture into the Don forest-steppe area (*Skorobogatov* 2011a.178–180). There is much more material from settlements of the second stage, dated to the end of the 6<sup>th</sup> and the first half of the 5<sup>th</sup> millennium BC. They are found both on the Voronezh and on the Don rivers: Universitet 3, Universitet 1, Karamyshevo 9, Ksizovo 6, Savitskoye, Kurino 1, Vasilyevsky Kordon 1, Lipetsk Lake, Cherkassk, and Cherkassk 3. Only one date was obtained for the material from Yarlukovskaya Protoka site for this stage –  $5770\pm200$  BP ( $5207-4246$  cal BC, SPb-1288), and one from Cherkassk –  $5997\pm33$  BP ( $4985-4795$  cal BC, Hela-3771). Meanwhile, only one radiocarbon date was obtained on organic crust from pot-

tery of the Cherkassk type from the Cherkassk site –  $5763\pm32$  BP ( $4710-4535$  cal BC, Hela-3884). It is important to note that single  $^{14}\text{C}$  dates for the early Eneolithic of the Don forest-steppe are contemporaneous with the second stage of Middle Don Neolithic culture (*Skorobogatov* 2013.273).

The beginning of the third stage (the second half of the 5<sup>th</sup> millennium BC) is marked by an expansion of the people of the Middle Don Culture and active contacts with newcomers from neighboring areas, namely Neolithic communities with comb-pit pottery, and continued contacts with Eneolithic communities of the Middle Don Culture. So far, we have no radiocarbon dates for this stage. The final stage of the Middle Don Culture (a ‘vestigial’ Neolithic stage) as well as the end of a vestigial/Neolithic stage in this region may be related to the latest Neolithic sites, where mixed ceramic Neolithic-Eneolithic complexes have been found. These complexes have clear features of late Middle Don (Dereivsk) and Repinsk cultures, such as Yamnoye, Ksizovo 6, Vasilyevsky Kordon 17, Vasilyevsky Kordon 27 *etc.*, and late stroke and pit-comb complexes, pottery of the Ksizovsky type and rhomb-pit pottery. These materials meanwhile can be roughly dated between the first half and the third quarter of the 4<sup>th</sup> millennium BC. Four dates were obtained on pottery from the Yamnoye site:  $4850\pm90$  BP ( $3950-3350$  cal BC, Ki-16634),  $4960\pm90$  BP ( $3970-3630$  cal BC, Ki-16635),  $4790\pm80$  BP ( $3710-3360$  cal BC, Ki-16636),  $4910\pm80$  BP ( $3950-3620$  cal BC, Ki-16637), and also a date for rhomb-pit pottery from the Ksizovo 6 site –  $4630\pm90$  BP ( $3635-3100$  cal BC, Ki-13309).

It is necessary to point out that starting from the developed Neolithic – the beginning of the second stage of Middle Don Culture (the end of 6<sup>th</sup> and first half of the 5<sup>th</sup> millennium BC) the appearance of various Neo-Eneolithic cultures can be traced in the Don forest steppe area, which appears to be one of the particularities of this region. These cultures left

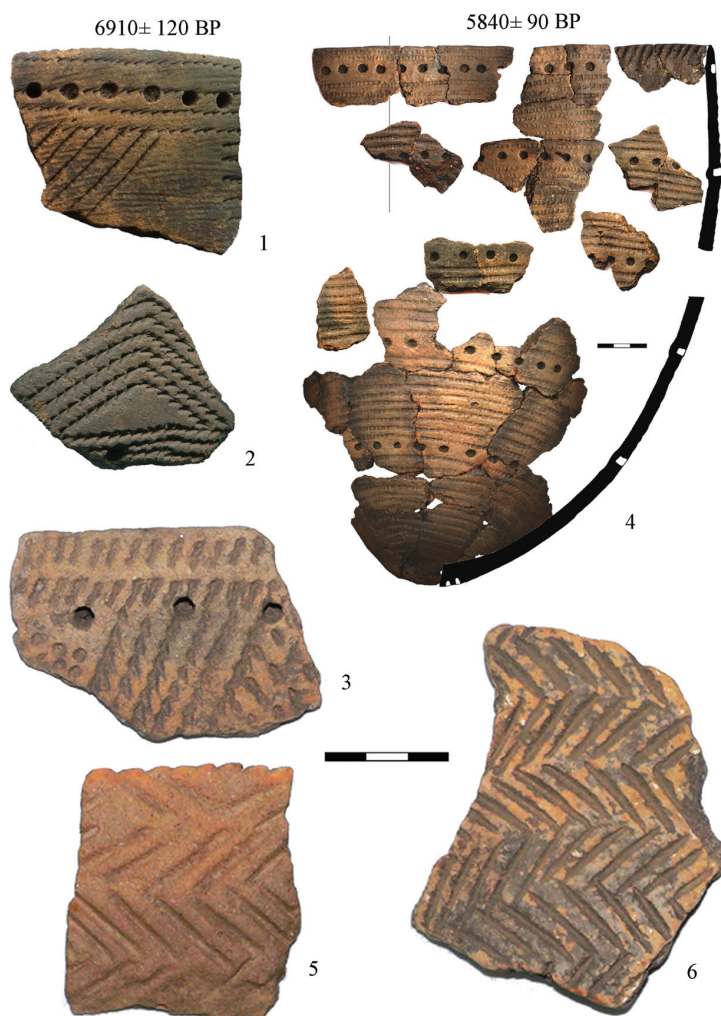


**Fig. 2.** Cherkasskaya 3 site. Early Neolithic pottery of non-local origin (1–2) and pottery of the Dnepro-Donetskaya culture (3).

a clear imprint on the material culture of the local ancient population. Along with pottery attributed to the southern Middle Don culture, there are pottery materials of the Dronikh culture (Fig. 3.5–6) which relate to influences from the south-east (Surkov 2007.113–114). Only two dates are currently available for Dronikh pottery; from Plautino 1 – 5830±80 BP (4850–4490 cal BC, Ki-15436), and Dronikh – 5650±80 BP (4690–4340 cal BC, Ki-15437). The appearance of Lyalovskaya culture material in this region is related to northern migration. This pottery type from the Ivnitza site was dated to 5840±90 BP (4932–4494 cal BC, Ki-16638), and from the Ksizovo site 6 to 5820±130 BP (4995–4371 cal BC, Ki-13307) and 5400±120 BP (4458–3975 cal BC, Ki-13308).

### Conclusions

On the basis of the foregoing discussion, we can conclude that the first pottery complexes appeared in the forest-steppe and forest zones of Eastern Europe at the end of the 7<sup>th</sup> or beginning of the 6<sup>th</sup> millennium BC, and they existed in the Don River basin until the first half of the 5<sup>th</sup> millennium BC. All of these early ceramic complexes had a number of common features bearing certain specific features. These particularities are represented in the local cultures that are now identified. Thus it was possible to distinguish between Karamyshevo and Middle Don cultures, and also the new type of pottery found at the sites located in the Middle Don basin (Cherkassk 3 and Cherkassk 5). We can also suppose that the beginning of the sec-



**Fig. 3. Pottery of the Middle Don culture (1–3), Lyalovskaya (4) and Dronikhinskaya (5–6) cultures: 1 Dobroe 1; 2 Ivnitza; 3 Universitetskaya III; 4 Ivnitza; 5 Plautino 1; 6 Droniha.**

ond Neolithic stage in this region (the Neo-Eneolithic period, according to Dmitry Ya. Telegin (2004)) can be connected with the cultural influence of the Lower Don culture. The third stage can be related to the appearance of the Lyalovsk culture (Fig. 3.4), which is represented by pottery decorated by pit and comb impressions.

∴

### References

- Cvetkova N. A. 2012. *Rannij neolit bassejna Verhnej Volgi (po rezul'tatam izuchenija kamennoj industrii)*. Kratkii soobshhenija instituta arheologii. Vyp. 227. Moskva: 271–280. (in Russian)
- Gapochka S. N. 2001. *Neoliticheskie pamyatniki s nakol'chatoy i nakol'chato-grebenchatoy keramikoy lesostepnogo Dona*. Avtoreferat dissertatsii na soiskanie uchenoy stepeni kandidata istoricheskikh nauk. Voronezh. (in Russian)

- Gapochka S. N., Skorobogatov A. M. and Surkov A. V. 2015. Razvitie material'noy kul'tury naseleniya epokhi neolita Srednego Dona v svete sovremennykh issledovaniy. *Materialy mezhdunarodnoy nauchnoy konferentsii, posvyaschenoy 75-letiyu Viktora Petrovicha Tretjakova, 12–16 maya 2015 goda, Sankt-Peterburg, Rossiya*. Institut istorii materialnoy kul'tury, Gosudarstvennyy Ermitazh, Samarskii gosudarstvennyy sotsial'no-pedagogicheskii universitet. Sankt-Peterburg: 115–118. (in Russian)

- Gurina N. N. 1996. Valdajskaja kul'tura. In *Neolit Severnoj Evrazii*. Moskva: 184–192. (in Russian)
- Lavrushin Yu. A., Spiridonova E. A., Bessudnov A. N. and Smol'yaninov R. V. 2009. Prirodnye katastrofy v golotse-ne basseyna Verkhnego Dona. GEOS. Moskva. (in Russian)
- Levenok V. P. 1973. Neoliticheskie plemena lesostepnoj zony Evropeyskoy chasti SSSR. *Materialy i issledovaniya po arkheologii SSSR 172: 185–197*. (in Russian)
- Mil'kov F. N. 1961. *Srednyaya polosa evropeyskoy chasti SSSR*. Moskva. (in Russian)
- Naumova T. V., Smol'yaninov R. V. 2009. Pamyatniki verkhnevolzhskoy kul'tury na Verkhnem Donu. *Arkheologicheskie pamyatniki Vostochnoy Evropy 13: 37–42*. (in Russian)
- Oshibkina S. V. (ed.). 1996. *Arkheologiya. Neolit Severnoj Evrazii*. Moskva. (in Russian)
- Sinyuk A. T. 1986. *Naselenie basseyna Dona v epokhu neolita*. Voronezhskii gosudarstvennyi pedagogicheskii universitet. Voronezh. (in Russian)
- Smolyaninov R. V., Klokov A. Yu. 2005. Materialy epokhi neolita s mnogoslownogo poseleniya u ochistnykh sooruzheniy v cherte g. Lipetsk. *Problemy izucheniya pamyatnikov arkheologii Vostochnoy Ukrainy 2: 31–34*. (in Russian)
- Skorobogatov A. M. 2011a. *Eneoliticheskie pamyatniki Donskoy lesostepi*. Dissertatsiya na soiskanie uchenoy stepeni kandidata istoricheskikh nauk. Voronezh. (in Russian)
- 2011b. *Otchet o raskopkakh stoyanki Cherkasskaya v Voronezhskoy oblasti v 2010 godu*. Arkhiv Instytuta Arheologii Rossiiskoi akademii Nauk R-1. Moskva. (in Russian)
2012. Materialy stratifitsirovannoy eneoliticheskoy stoyanki Cherkasskaya-3 na Srednem Donu. *Problemy izucheniya pamyatnikov arkheologii Vostochnoy Ukrainy 3: 152–165*. (in Russian)
2013. Eneolit basseyna Verkhnego i Srednego Dona v svete novykh dannykh. *Tverskoy arkheologicheskiiy sbornik 9: 264–278*. (in Russian)
- Smolyaninov R. V. 2009. *Ranniy neolit Verkhnego Dona (po dannym keramicheskikh kompleksov)*. Avtoreferat dissertatsii na soiskanie stepeni kandidata istoricheskikh nauk. Sankt-Peterburg. (in Russian)
2013. *Otchet o raskopkakh poseleniya Vasil'yevskiy Kordon 3 v Dobrovskom rayone Lipetskoy oblasti v 2012 godu*. Arkhiv Instytuta Arheologii Rossiiskoi akademii nauk. R-1. Moskva. (in Russian)
2016. Postroyki epokhi rannego neolita na Verkhnem Donu. *Samarskiy nauchnyy vestnik 1(14): 72–76*. (in Russian)
- Smolyaninov R. V., Klokov A. Yu. 2005. Materialy epokhi neolita s mnogoslownogo poseleniya u ochistnykh sooruzheniy v cherte g. Lipetsk. *Problemy izucheniya pamyatnikov arkheologii Vostochnoy Ukrainy 2: 31–34*. (in Russian)
- Smolyaninov R. V. Surkov A. V. 2014. Ranniy neolit Verkhnego Dona. *Samarskiy nauchnyy vestnik 3(8): 161–171*. (in Russian)
- Surkov A. V. 2007. *Neoliticheskie pamyatniki Srednego Pokhoper'ya*. Voronezhskii gosudarstvennyi pedagogicheskii universitet. Voronezh. (in Russian)
2008. K voprosu o kul'turnom statuse neoliticheskikh pamyatnikov s nakol'chato-grebenchatoy keramikoy na Verkhnem Donu. *Arkheologiya vostochnoevropeyskoy lesostepi 2(1): 105–113*. (in Russian)
2013. Stoyanka Ivnitsa na r. Voronezh: itogi issledovaniya 2010–2012 gg. *Arkheologicheskie pamyatniki Vostochnoy Evropy 15: 167–186*. (in Russian)
- Surkov A. V., Skorobogatov A. M. 2012. *Mnogoslownaya stoyanka Yamnoe (materialy issledovaniy)*. Voronezhskii gosudarstvennyi pedagogicheskii universitet. Voronezh. (in Russian)
- Telegin D. Ya. 2004. O khronologii i periodizatsii kul'tur neolita i mednogo veka Yugo-Zapada Vostochnoy Evropy. In *Ponyatie o neo-eneoliticheskom vremeni. Problemy khronologii i etnokul'turnykh vzaimodeystviy v neolite Evrazii (khronologiya neolita, osobennosti kul'tur i neolitizatsiya regionov, vzaimodeystviya neoliticheskikh kul'tur v Vostochnoy i Sredney Evrope)*. Sankt-Peterburg: 106–121. (in Russian)
- Vybornov A. A., Surkov A. V. 2009. Novye dannye po khronologii srednedonskogo neolita. *Arkheologicheskie pamyatniki Vostochnoy Evropy 13: 58–59*. (in Russian)
- Zareckaja N. E., Kostyl'jova E. L. 2008. Radiouglerodnaja hronologija nachal'nogo jetapa verkhnevolzhskoy ranne-neoliticheskoy kul'tury. *Rossijskaja Arheologija 1: 5–14*. (in Russian)
- Zhilin M. G., Kostyleva E. L., Utkin A. V. and Jengovatova A. V. 2002. Mezoliticheskie i neoliticheskie kul'tury Verhnego Povolzh'ja. *Po materialam stoyanki Ivanovskoe VII: 248*. (in Russian)



Tab. 1. Radiocarbon dates of sites from the forest-steppe area of the Don River.

No.	<sup>14</sup> C (BP)	(2σ) (cal BC)	lab-index	dated material	<sup>13</sup> C	site	information about dated material	cultural context	references
1	7474±65	6450–6225	Hela-3520	organic crust (Fig. 2.1)	-29,6	Cherkasskaya 3	Surface finds (No. 45)	nonlocal early neolithic	Skorobogatov 2012
2	7610±45	6570–6398	GrA-62165	organic crust (Fig. 2.1)		Cherkasskaya 3	Surface finds (No. 45)	nonlocal early neolithic	Skorobogatov 2012
3	6530±120	5703–5231	SPb-1978	organic crust		Cherkasskaya 3	Surface finds (No. 45)	nonlocal early neolithic	Skorobogatov 2012
4	6827±110	5978–5550	SPb-1463	organic crust		Cherkasskaya 5	Surface finds (No. ČS-5-12, PM)	nonlocal early neolithic	Gapochka, Skorobogatov and Surkov 2015, Fig. 1.1
5	6687±110	5837–5389	SPb-1466	organic crust		Cherkasskaya 5	Excavation of 2014, depth –253cm (No. 338)	nonlocal early neolithic	Gapochka, Skorobogatov and Surkov 2015
6	7115±130	6236–5730	SPb-1465	organic crust		Cherkasskaya 5	Excavation of 2014, depth –260cm (No. 376)	nonlocal early neolithic	Gapochka, Skorobogatov and Surkov 2015
7	6380±40	5471–5303	Poz-42052	organic crust		Ivnitsa	Excavation of 2010 (No. 1268), square M12, depth –35cm, layer 3 – gray-brown sandy loam	karamyshevskaya	Surkov 2013
8	6720±40	5716–5607	Poz-42053	organic crust		Ivnitsa	Excavation of 2010. No. 1379, square I14, depth –33cm, layer 3 – gray-brown sandy loam	karamyshevskaya	Surkov 2013
9	6940±40	5904–5731	Poz-42054	organic crust		Ivnitsa	Excavation of 2010. No. 1399, square I14, depth –34cm, layer 3 – gray-brown sandy loam	karamyshevskaya	Surkov 2013
10	6570±60	5790–5230	Ki-11088	pottery (Fig. 1.1)		Karamyshevo 5	Excavation of 2002, square 10, depth –72cm	karamyshevskaya	Smolyaninov, Surkov 2014
11	5870±80	4940–4530	Ki-15194	pottery (Fig. 1.3)		Vasilievsky Kordon 5	Excavation of 2007, square 105, depth –35cm	karamyshevskaya	Smolyaninov, Surkov 2014
12	5910±90	4940–4530	Ki-15625	pottery (Fig. 1.4)		Vasilievsky Kordon 5	Excavation of 2007, square 104, depth –31cm	karamyshevskaya	Smolyaninov, Surkov 2014
13	6010±80	5080–4710	Ki-15624	pottery (Fig. 1.6)		Vasilievsky Kordon 7	Excavation of 2007, No. 3819, square B2, depth –70cm	karamyshevskaya	Surkov 2008; Smolyaninov, Surkov 2014
14	5930±80	5000–4590	Ki-15192	pottery		Vasilievsky Kordon 7	Excavation of 2007, No. 4427, square B2, depth –77cm	karamyshevskaya	Smolyaninov, Surkov 2014
15	5860±80	4860–4520	Ki-15193	pottery (Fig. 1.7)		Vasilievsky Kordon 7	Excavation of 2007, No. 4135, square B4, depth –72cm	karamyshevskaya	Smolyaninov, Surkov 2014
16	5770±90	4810–4440	Ki-15199	pottery (Fig. 1.8)		Vasilievsky Kordon 7	Excavation of 2007, No. 5134, square D16, depth –32cm	karamyshevskaya	Surkov 2008; Smolyaninov, Surkov 2014

No.	<sup>14</sup> C (BP)	(2σ) (cal BC)	lab-index	dated material	<sup>13</sup> C	site	information about dated material	cultural context	references
17	5790±100	4850–4450	Ki-12160	pottery (Fig. 1.2)		Karamyshevo 9	Excavation of 2002–2003, No. 5134, square D16, depth –32cm	karamyshevskaya	Smolyaninov, Surkov 2014
18	5630±100	4710–4325	Ki-12161	pottery		Karamyshevo 9	Excavation of 2002–2003, above base layer	karamyshevskaya	Smolyaninov, Surkov 2014
19	5868±120	5036–4458	SPb-1638	pottery		Vasilievsky Kordon 3	Excavation of 2012, construction 1, layer 2	karamyshevskaya	Smolyaninov 2013; Smolyaninov 2016
20	6780±140	5979–5480	IGAN-2007	ground		Berezovka 4B	Excavation of 1999. Low layer of the test-pit 4 sq.m., depth 120–125cm	Upper volga culture	Smolyaninov, Naumova 2009
21	6851±34	5832–5662	KIA-51099	organic crust (Fig. 2.3)		Cherkasskaya 3	Excavation of 2012. No. 4218. Low layer, depth –296cm	Dnepr-Donetsk culture	Skorobogatov 2012
22	5160±160	4170–3760	Ki-11088	pottery		Karamyshevo 9	Excavation of 2002–2003. Square 605, depth 30–40cm	Dnepr-Donetsk culture	Smolyaninov 2009; Smolyaninov, Klokov 2005
23	5650±90	4710–4330	Ki-15191	pottery		Karamyshevo 9	Excavation of 2002–2003. Square 605, depth 30–40cm	Dnepr-Donetsk culture	Smolyaninov 2009; Smolyaninov, Klokov 2005
24	6910±120	6019–5621	SPB-1287	pottery (Fig. 3.1)		Dobroe 1	Excavation of 1985. Square 3, depth –60cm	Middle Don culture	Sinyuk 1986
25	6715±64	5730–5525	Hela-3491	organic crust (Fig. 2.2)	–29,5	Cherkasskaya 3	Excavation of 2012. No. 3330. Square Ž3, low layer, depth –270cm	Middle Don culture with non-local infiltrations	Skorobogatov 2012
26	5997±33	4985–4795	Hela-3771	organic crust	–28,2	Cherkasskaya	Excavation of 2010. No. 10492. Square A12, depth –213cm.	Middle Don culture	Skorobogatov 2011b
27	6190±100	5400–4800	Ki-15959	pottery		Universitetskaya 3	Excavations of A. T. Sinuk in 1968-1970	Middle Don culture	Vybornov, Surkov 2009; Sinyuk 1986
28	6140±90	5300–4840	Ki-15432	pottery		Universitetskaya 3	Excavations of A. T. Sinuk in 1968-1970	Middle Don culture	Vybornov, Surkov 2009; Sinyuk 1986
29	6050±90	5300–4700	Ki-15441	pottery		Universitetskaya 3	Excavations of A. T. Sinuk in 1968-1970	Middle Don culture	Vybornov, Surkov 2009; Sinyuk 1986
30	6774±120	5903–5484	SPB-1637	pottery		Yarlukovskaya protoka (site 222)	Excavations of V. P. Levenok, layer 6	Middle Don culture	Levenok 1973
31	5770±200	5207–4246	SPB-1288	pottery		Yarlukovskaya protoka (site 222)	Excavations of V. P. Levenok, layer 5	Middle Don culture	Levenok 1973
32	5840±90	4932–4494	Ki-16638	pottery (Fig. 3.4)		Ivnitsa	Prospections of A. N. Merkulov in 2009. Test-pit	Iyalovskaya	Surkov 2013

No.	<sup>14</sup> C (BP)	(2σ) (cal BC)	lab-index	dated material	<sup>13</sup> C	site	information about dated material	cultural context	references
33	5820±130	4995–4371	Ki-13307	pottery		Ksizovo 6	Excavation of 2005. Excavation 2, square 29, depth –364cm.	lyalovskaya	Lavrushin et al. 2009
34	5400±120	4458–3975	Ki-13308	pottery		Ksizovo 6	Excavation of 2005. Excavation 2, square 31, depth –315cm.	lyalovskaya	Lavrushin et al. 2009
35	5225±90	4319–3802	Ki-13313	pottery		Kurino 1	Excavation of A. N. Bassudnov in 1991. Square 376, depth –40cm.	lyalovskaya	Bessudnov 1996
36	6000±50	5200–4800	Gin-13546	human bone		Ksizovo 6	Excavation of 2005. Excavation 2, burial 2 (a child 12 years old)		Lavrushin et al. 2009
37	6000±50	5200–4800	Gin-13544	human bone		Ksizovo 6	Excavation of 2005. Excavation 2, burial 4 (a man 40-45 years old)		Lavrushin et al. 2009
38	5830±80	4850–4490	Ki-15436	pottery		Plautino 1	Prospections of A. V. Surkov in 2002	dronikhinskaya	Surkov 2007; Vybornov, Surkov 2009
39	5650±80	4690–4340	Ki-15437	pottery		Dronikha	Excavation of A. T. Sinuk in 1980	dronikhinskaya	Surkov 2007; Vybornov, Surkov 2009
40	5763±32	4710–4535	Hela-3884	organic crust	–30,3	Cherkasskaya	Excavation of 2010. No. 10736. Square B15, depth –209cm.	cherkasskiy type	Skorobogatov 2011a; Skorobogatov 2011b
41	4850±90	3950–3350	Ki-16634	pottery		Yamnoe	Excavation of 2008. Square K8, depth –70cm.	lyalovskaya	Surkov, Skorobogatov 2012.Fig. 23
42	4960±90	3970–3630	Ki-16635	pottery		Yamnoe	Excavation of 2007. Square I7, depth –78cm.	pin-pointed pottery	Surkov, Skorobogatov 2012.Fig. 34.3
43	4790±80	3710–3360	Ki-16636	pottery		Yamnoe	Excavation of 2009. Square B'25, depth –38cm.	lyalovskaya	Surkov, Skorobogatov 2012.Fig. 38.2
44	4910±80	3950–3620	Ki-16637	pottery		Yamnoe	Excavation of 2009. Square B19, depth –29cm.	pin-pointed pottery	Surkov, Skorobogatov 2012.Fig. 22
45	4630±90	3635–3100	Ki-13309	pottery		Ksizovo 6	Excavation of 2005. Square B19, depth –29cm.	rhomb-pit pottery	Lavrushin et al. 2009
46	5080±125	4250–3600	Le-1013	wood		Universitetskaya 3	Excavations of A. T. Sinuk in 1968–1970	lyalovskaya	Arkheologiya. Neolit Severnoy Evrazii 1996.209
47	4770±60	3660–3370	Le-725	stick from a fish-trap		Podzorovo	Excavations of M. E. Foss in 1959, and V. P. Levenok in 1969	lyalovskaya	Arkheologiya. Neolit Severnoy Evrazii 1996.209