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THE NEOLITHIZATION OF SIBERIA AND THE RUSSIAN FAR EAST: MAJOR SPATIO-TEMPORAL TRENDS (THE 2013 STATE-OF-THE-ART)

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ABSTRACT. The updated chronology of the earliest pottery-containing complexes in Siberia and the Russian Far East is presented herein. The appearance of pottery (i.e. the process of Neolithization) in this vast region of Eurasia is discussed based on a model that represents a simple approximation of calendar ages between key sites as isolines. No clear spatio-temporal patterns for the origin and spread of pottery in northern Asia can be observed because pottery-making (unlike agriculture) could have emerged in different parts of the Old World at various times. Before modeling of pottery dispersal is conducted, careful evaluation of typology and technology of ceramics and stone artifacts should be done, in order to avoid the confusing situation when the results of modeling contradict the basic archaeological information.

INTRODUCTION

The process of Neolithization in the Old World can generally be seen as the emergence of two prehistoric phenomena: (1) pottery and (2) agriculture and stock breeding. While in the Levant and most of western/central Europe the beginning of the Neolithic is usually connected with the appearance of plant cultivation and animal husbandry, in East Asia and northern Eurasia pottery is considered as the primary criterion of the Neolithic (see Kuzmin 2010, 2013a; Kuzmin et al. 2009:892–4). In recent years, particular attention has been given to the process of pottery appearance among the Eurasian hunter-gatherers (e.g. Gronenborn and Petrasch 2010; Hartz et al. 2012). In northern Asia, pottery emerged at the end of the Pleistocene in the hunter-gatherers' continuum (e.g. Kuzmin 2010). This article presents updated information on the Neolithization of Siberia and the Russian Far East compared to the overview by Kuzmin and Orlova (2000), using the sources available up to mid-2013.

MATERIALS AND METHODS

In order to determine spatiotemporal trends in the spread of pottery throughout Siberia and the Russian Far East, key sites are selected based on data obtained mainly from 2000 to the present (Table 1). A rigorous evaluation of the association between ^{14}C dates and pottery was conducted using the primary publications. Previously, several sites have been related to the Neolithic (and presumably the presence of pottery) based on archaeologists' viewpoints (Kuzmin and Orlova 2000), especially in northeastern Siberia and the Kamchatka Peninsula. However, at several sites (e.g. Koolen' 3, Kukhtui 3, Khurendzha 8, Terkuemkyun 1, Lakhtina 2, Chertov Orvag, and Avacha; see Kuzmin and Orlova 2000), no pottery was found in primary association with the ^{14}C-dated charcoal. While it is still possible to call these sites "Neolithic" in terms of general periodization (with some reservations), it would be incorrect to include them in the data set. The present database (Table 1) is purposely not large, because the main task of this analysis is to establish the major features for the age of pottery through the vast territory of northern Eurasia (~14,000,000 km^2; see Figure 1).

After the selection of sites, ages were calibrated using the CALIB v 6.1.1 software (see Reimer et al. 2009); the median calendar ages are plotted in Figure 1. Isolines of these values were created with the help of GIS software ArcView 3.3 (Esri Co., Redlands, CA, USA), in the "Module Spatial Analyst" regime by the "Interpolate Surface" command (IDW method), for 14 intervals of 1000-yr length each (2000–16,000 cal BP). This is the simplest possible interpolation, without any

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Table 1 Selected dates associated with the earliest pottery in Siberia and the Russian Far East, and their ^{14}C dates.

Site nr.	Site name	Lat. N	Long. E	^{14}C date (BP)	Material dated	Lab code	Calibrated date (cal BP)*	Reference
1	Khummi	50°22′	137°07′	13,260 ± 100	Charcoal	AA-13392	15,450–16,780 (16,120)	Kuzmin et al. 1997
2	Gromatukha	51°49′	128°49′	12,340 ± 70	Charcoal	MTC-05936	14,020–14,910 (14,470)	Nesterov et al. 2006
3	Chernigovka	44°22′	132°31′	10,770 ± 75	Pottery temper	AA-20936	12,560–12,850 (12,710)	Kuzmin 2006
4	Puzi 2 [Ado-Tymovo 2]	51°08′	142°41′	8780 ± 135	Charcoal	SOAN-3819	9540–10,180 (9860)	Kuzmin 2006
5	Ust-Karenga 12[a]	54°28′	116°31′	12,180 ± 60	Charcoal	AA-60210	13,800–14,240 (14,020)	Kuzmin and Vetrov 2007
6	Studenoe 1/1	50°03′	108°15′	11,995 ± 150	Charcoal	AA-33040	13,420–14,230 (13,830)	Buvit et al. 2003
7	Belkachi 1[b]	59°12′	131°54′	5970 ± 70	Charcoal	Le-676	6660–6990 (6830)	Alekseyev and Dyakonov 2009
8	Siktyakh[c]	69°53′	125°02′	5220 ± 170	Charcoal	IM-530	5610–6310 (5960)	Alekseyev and Dyakonov 2009
9	Agrobaza 4	61°40′	148°48′	4790 ± 50	Charcoal	Beta-140689	5230–5610 (5420)	Slobodin 2001
10	Batareinaya	59°28′	150°56′	2640 ± 50	Charcoal	MAG-1007	2550–2870 (2710)	Lebedintsev 2000
11	Tytyl 4	67°18′	169°24′	4290 ± 100	Charcoal	MAG-1094	4530–5280 (4910)	Kiryak 2010
12	Kurupka 2	64°52′	174°52′ W	2310 ± 40	Charcoal	Le-2660	2160–2450 (2310)	Dikov 1997
13	Opukha 1	61°49′	174°15′	2600 ± 100	Charcoal	MAG-945	2360–2920 (2640)	Orekhov 1999
14	Ust-Polovinka	70°19′	88°33′	4060 ± 120	Charcoal	Le-1017	4190–4850 (4520)	Khlobystin 2005
15	Goreliy Les[d]	52°53′	103°13′	7000 ± 150	Charcoal	Riga-50	7580–8160 (7870)	Veksler 1989
16	Ust-Kova[e]	58°17′	100°20′	6195 ± 70	Charcoal	KRIL-380	6910–7250 (7080)	Vasilievsky et al. 1988
17	Eleneva Cave[f]	55°58′	92°29′	6900 ± 115	Charcoal	SOAN-3998	7570–7950 (7760)	Makarov 2005
18	Kornachak 2	53°09′	85°59′	7340 ± 175	Charcoal	SOAN-2290	7800–8510 (8160)	Kuzmin and Orlova 2000
19	Korchugan 1a	56°28′	76°18′	6740 ± 100	Human bone	SOAN-7133	7430–7790 (7610)	Marchenko 2009
20	Koksharovsky Kholm	58°19′	60°53′	7560 ± 200	Charcoal	Le-7880	7970–8970 (8470)	Shorin and Shorina 2011
21	Barsova Gora II/19	61°17′	73°17′	7500 ± 200	Charcoal	Le-8594	7870–8770 (8320)	Dubovtseva 2011

*Calibration was performed using the CALIB 6.1.1 software (see Reimer et al. 2009); with ± 2σ, and all possible intervals combined and rounded to the next 10 yr. Mean ages are in parentheses (see Figure 1).

[a]This value comes from Layer 7.

[b]This value comes from Layer VII.

[c]This value comes from Layer VII.

[d]This value comes from Layer VI.

[e]This value comes from Layer 2.

[f]This value comes from Layer 11G.

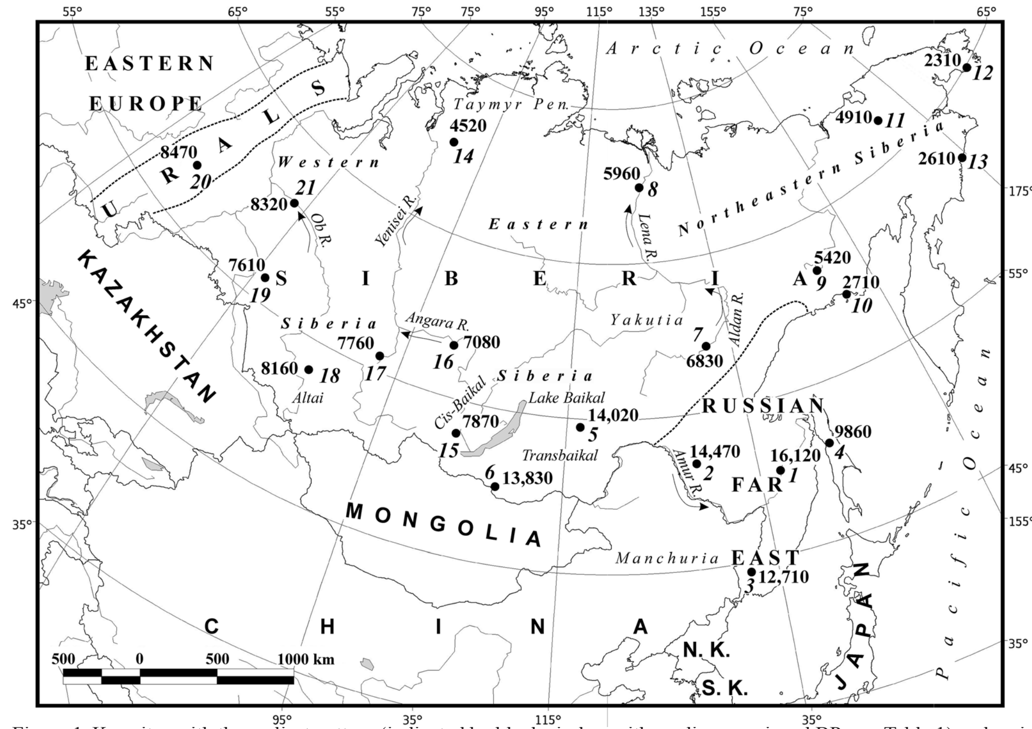

Figure 1 Key sites with the earliest pottery (indicated by black circles, with median ages in cal BP; see Table 1) and main geographic regions in Siberia and the Russian Far East. N.K. – North Korea; S.K. – South Korea. Site numbers (in bold italics) correspond to those in Table 1.

corrections for absence of data in neighboring regions. Although this information exists (see below), it was not entered into the database in order to see which "predicted" values will be generated after this formal attempt to produce ages based on limited knowledge.

RESULTS AND DISCUSSION

In Figure 2, isolines for the ages of the oldest appearance of pottery in the region under review are drawn. They do not represent a clear east-west cline as suggested by some scholars (e.g. Dolukhanov and Shukurov 2004). For example, the earliest pottery in the Altai region of western Siberia (Kornachak 2 site, median age of ~8160 cal BP) is older than in the neighboring territories east of the Altai, namely in the Yenisei and Angara River basins: Eleneva Cave (~7760 cal BP) and the Ust-Kova site (~7080 cal BP), respectively (in Figure 2, see the 8000 cal BP isoline, dashed for this purpose).

The assumption about the origin of pottery in one particular region of Eurasia (i.e. East Asia) and its spread toward the west (i.e. Siberia and eastern Europe) as suggested previously (e.g. Davison et al. 2009) cannot be supported by solid evidence. This is because no reliable information exists about the genetic relationship (i.e. one originates directly from the other) between ceramic complexes. It seems that the region with the earliest pottery in Siberia and the Russian Far East, the Amur River Basin, did not contribute to the spread of ceramics into the neighboring areas. There is no clear similarity between the pottery of the Osipovka (i.e. the Khummi site) and Gromatukha (i.e. the Gromatukha site) cultural complexes (dated to ~16,120–14,470 cal BP) and the potsherds from the Ust-Karenga 12 site (~14,020 cal BP) located west of the Amur River Basin (e.g. Kuzmin and Vetrov 2007:15) (see Figures 1–2).

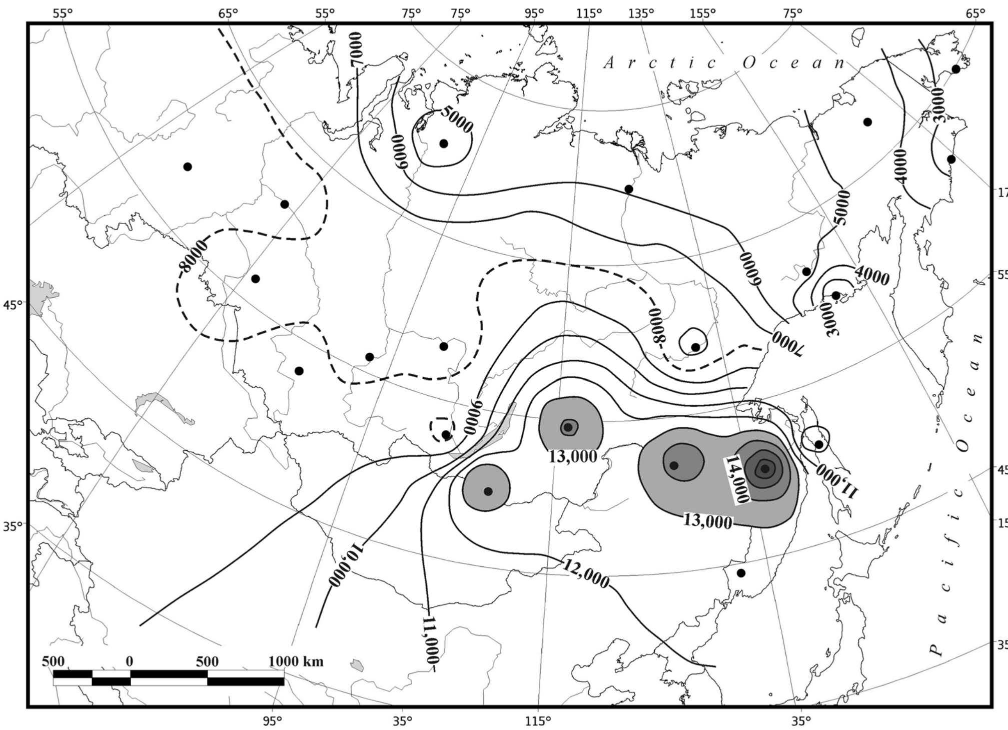

Figure 2 Isolines for the age of the earliest pottery in Siberia and the Russian Far East (in cal BP). Key sites are the same as in Figure 1; the areas with the oldest values are shaded gray.

There are two main centers of pottery dispersal in Siberia in the Holocene (e.g. Kuzmin 2013b): (1) the Cis-Baikal region, from where pottery with a net-impressed design spread to the neighboring regions after ~7900 cal BP: Yakutia (first appearance at ~6800 cal BP), Yenisei River Basin (~7800 cal BP), and part of Transbaikal (after ~7900 cal BP) (see also McKenzie 2009); and (2) Aldan River Basin in Yakutia, from where pottery of the Syalakh and Belkachi cultures spread to the north and northeast after ~6000 cal BP (see also Alekseyev and Dyakonov 2009). This information clearly does not fit with the supposed spread of pottery in northern Eurasia (*sensu* Dolukhanov and Shukurov 2004).

The "predicted" ages generated in this study by simple interpolation of the Siberian data set to the neighboring regions appear to be unrealistic (see Figure 2): for Mongolia, the predicted age is ~12,000–9000 cal BP while the existing evidence shows that it should be ~8500–6400 cal BP (Sériadès 2004; S A Gladyshev, personal communication, 2013). For Korea and northeast China [Manchuria], predicted values are ~13,000–11,000 cal BP; however, based on solid data it should be ~7700 cal BP (Korea; e.g. Cho and Ko 2009) and ~8300 cal BP (Manchuria; Shelach 2006).

In this author's opinion, it is fundamentally wrong to "model" the spread of pottery from a supposed center(s) of origin using the ^{14}C dates. Before doing this, one must show that there is a genetic relationship between the pottery complexes, like in the case of the origin and spread of agriculture from the Levant to western/central Europe (e.g. Gkiasta et al. 2003). For Siberia and the Russian Far East, this is impossible in most cases because pottery-making requires only knowledge of firing and raw material (e.g. Darvill 2002:338), and people were familiar with firing clay since at least 26,000 yr ago (e.g. Vandiver et al. 1989). Therefore, the results of such modeling are practically meaningless from the view of archaeology. However, some scholars still explore this approach for northern Eurasia (e.g. Hartz et al. 2012), and the discussion about its validity is ongoing (see Kuzmin 2013c; Hartz and Piezonka 2013). Undoubtedly, some heuristic models can be used as working hypotheses (e.g. Gronenborn 2009, 2011), but rigorous analysis is required to turn them into solid evidence. Clearly, much work is still needed to understand the patterns of pottery distribution in northern Eurasia.

CONCLUSIONS

Current knowledge of ^{14}C ages of the early pottery complexes from Siberia and the Russian Far East does not allow to draw any reliable conclusion about the place(s) of pottery origin and spread. According to the available data, the oldest pottery is known from the southern part of the territory, notably the Amur River Basin. The age of the pottery complexes decreases toward the west (via the eastern and western parts of Siberia) and northeast (in the direction of northeastern Siberia). However, no straightforward spatiotemporal trends can be observed. It is incorrect, therefore, to assume that pottery originated in one particular region and then spread to the neighboring territories, as suggested by the hyperdiffusionism paradigm (e.g. Childe 1954; see other examples in Trigger 2006:326–44). An unbiased analysis of the entire data set (including both pottery and stone artifacts) should be carried out in the near future to reveal the details of the Neolithization process in Siberia and the Russian Far East.

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