On Early Pottery-Making in the Russian Far East

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EASTERN ASIA IS CONSIDERED to be an important area of early pottery-making. This is especially true for the Japanese archipelago. A series of sites containing archaic ceramics was discovered as early as the 1960s and more sites continue to be discovered today. Most of these sites are dated between 12,000 and 10,000 B.P. and are attributed to the Incipient Jomon period according to current archaeological conceptions (Hanamiyama 1995; Kobayashi 1983; Kurishima 1995; Sensiten Nihon no rekishi 1993; Serizawa 1976; Suda 1995). In the Russian Far East, the problem of pottery-making origins has been explored only recently (Derevyanko and Medvedev 1992, 1993, 1994, 1995; Garkovik and Zhushchikhovskaya 1995; Golubev and Zhushchikhovskaya 1987; Zhushchikhovskaya 1995a, 1995b). Sites containing simple ceramics were discovered in the Amur River basin, the Primorie (Maritime) region, and on Sakhalin Island. These sites are widely dated from between 13,000 to 6000 B.P. In this paper, the expression early ceramics has two meanings. First, early ceramics refers to the assemblages that are determined as early according to their absolute or relative datings. Second, early ceramics are identified as such from their characteristics reflecting the level and complexity of pottery-making technological development. This study of early ceramics assemblages in the Russian Far East is intended to examine the correlation of these two positions and to introduce the reader to an area of Asia not generally represented in the English-language archaeological literature.

The research area of this article includes the Russian Far East territories bordering on the Japan Sea, especially the lower Amur River basin, Primorie (Maritime) region, and Sakhalin Island (Fig. 1). My primary purpose in writing this article is to present and interpret the archaeological data on early ceramics assemblages in the Russian Far East that may not be otherwise available to archaeologists working in Asia. Also, I consider some of the reasons and conditions pertaining to the origins of pottery-making in this research area.

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ARCHAEOLOGICAL DATA

Lower Amur River Region

Two of the most interesting sites containing early ceramics were discovered in the lower Amur River region. These sites are Gasya and Khummy (see Fig. 1).

Gasya — This site is located on the bank terrace of the Amur River not far from Khabarovsk City and consists of several culture-chronological components (Derevyanko and Medvedev 1992, 1993, 1994, 1995). The lowest occupation has two radiocarbon datings of $12,960 \pm 120$ b.p. (floor context) and $10,875 \pm 90$ b.p. (roof context). This component contains stone artifacts associated with the Osipovskaya mesolithic tradition, that is, pebble adze-shaped and scraper-shaped tools, projectile points, bifaces, knives, endscrapers, sidescrapers, blades, and wedge-shaped cores. Also fragments of ceramic vessels were found in the lowest component. An examination of this pottery by Vitaly Medvedev and myself leads me to conclude that the pottery-making technology was unadvanced.

The ceramic paste consists of clay with nonplastic mineral inclusions (quartz, feldspar) and plant fiber temper. The last is identified by long, rough impressions on the surfaces and in the cores of sherds. In some cases the plant fibers are not burned out completely and are thus carbonized. The ceramic samples are very fragile and weak. The walls of the sherds are uneven and thick. The forming method cannot yet be reconstructed with any precision. I have hypothesized that some kind of moulding or a paddle and anvil technique was used because of impressed basketlike patterns on the outer surface of one vessel (Fig. 2B). The ceramic shapes are simple, flat-bottomed but vary slightly. In one case it is possible to determine that there is no distinction between the body and orifice parts (Fig. 2B), and in the other case there is a more developed shape with a distinction between body and orifice parts (Fig. 2A).

The surface of these ceramic samples is unslipped and rough. The outer surface of the simpler vessel has a basketlike impressed pattern. There are deep vertical grooves crossed in some places by horizontally oriented grooves. Previously, impressions were interpreted as the traces of processing by a toothed rough tool (Derevyanko and Medvedev 1994). In my view, the morphology and crosslike pattern of the grooves suggest that they were produced by a tool similar in structure to the basketry impressions. The second vessel (of more complex shape) has another kind of impression on its outer surface: slanting, thin, dense grooves. They seem to resemble the impressions produced by a paddle tool covered with grass (Fig. 2A). Similar kinds of impressions are known for the ceramics from the lowest component of the Gromatukha site located in the middle Amur River basin and dated between 9000 and 8000 b.p. (Derevyanko and Petrin 1995; Okladnikov and Derevyanko 1977). This vessel type is described as having simple decoration: horizontal appliqué bands with finger impressions.

The firing technique of the sherds from the lowest component of Gasya was unadvanced. The presence of carbonized plant fibers in the cores of some sherds is the result of a very low firing temperature, not above 400–500 °C. The black color of the ceramics is produced by smudging during the firing of the pottery.

Khummy — This site is located nearly 200 km east of the site of Gasya and consists of several culture-chronological components (Derevyanko and Medvedev 1995;
Fig. 1. Map of research area showing the distribution of sites containing early ceramics.
Lapshina 1995). The lowest component contains an assemblage of stone artifacts of the Osipovskaya mesolithic tradition, including large blades, bifaces, wedge-shaped cores, endscrapers, adzelike tools, knives, and pebble net sinkers. In addition, a few ceramic fragments were found associated with this component. Radiocarbon dates associated with the lowest component are between 13,000 and 10,000 B.P.

The ceramic collection from this component includes a few small fragments of body sherds and one fragment of an upper body part. The ceramic paste consists of clay with rare inclusions of feldspar, quartz, mica, and plant fiber temper. The fiber impressions are visible within the cores of the sherds. Preliminary botanical analysis of the fibers suggests that they are Cyperaceae (sedges).

The limited sample of small sherds provides little evidence about the shape of the pottery vessels. However, the appearance of the outer and inner surfaces provides some information on the method of forming the vessels. The impressions on the outer surfaces (Fig. 3, left) indicate a crosslike or netlike pattern. The impressions on the inner surfaces are of another kind: straight parallel grooves produced by a wooden implement (Fig. 3, right). These grooves are the result of impressing and were not smoothed. The impressions on the surfaces of ceramic samples reflect the process of forming. A basketlike container may have been used as a mould or a tool may have been wrapped with a woven fabric. The inner surface of the vessel was pressed by a wooden spadelike tool. This reconstruction is hypothetical given the restricted number and small size of the ceramic sample. The firing temperature is determined to have been about 600 °C based on a refiring test.

Researchers have identified other sites containing early ceramics in the middle Amur River basin, including the lowest components of Gromatukha, Ust-Ulma, and Novopetrovka sites. The pottery from these sites is characterized by a paste
that is untempered or includes only plant fibers, is simple in morphology, and was fired at a relatively low temperature. Associated stone artifacts are typical of Early Holocene lithic industries of the Far East and eastern Siberia. Probable ages of these sites range from 12,000–10,500 B.P. (Ust-Ulma) to 11,000–9000 B.P. (Novopetrovka) and 9000–8000 B.P. (the lowest component of Gromatukha) (see Derevyanko and Medvedev 1995).

**Primorie (Maritime) Region**

Three sites containing similar ceramics are known from the Primorie region. They are Almazinka, Ustinovka-3, and Chernigovka-1.
Almazinka — This site is located in the valley of the Amur River in the northern part of Primorie region and is reliably dated by its culture-chronological context (Lynsha 1992; Lynsha and Zhushchikhovskaya 1996). Three absolute dates mark the layer containing the cultural remains at approximately 7500 B.P. Stone objects and ceramics comprise the archaeological collection of Almazinka. Stone artifacts in the assemblage include mainly blades and several tools types, such as large scrapers, projectile points made on blades, and some others.

The ceramic assemblage consists of one vessel's fragments, deposited at a depth of 40–50 cm under the modern surface (Fig. 4). According to data from a petrographic analysis, the ceramic paste consists of hydromicaceous clay with nonplastic aleurite inclusions of quartz, feldspar, biotite, amphibole (grain size is less than 0.2 mm), and sand inclusions of amphibole-biotite granite rock (grain size is more than 0.2 mm). The mineralogical compositions of aleurite and sand nonplastic fractions are the same. The size texture of the sand fraction and distribution of sand grains in the paste are irregular. All of these characteristics suggest that a natural clay rather than an artificially tempered clay was used to make this pottery. The forming method is reconstructed as coiling. Several wall fragments have the traces of coil joints. The thickness of walls is uneven, varying from 0.4 cm to 0.7 cm.

No evidence of surface treatment such as rubbing or slipping is present on the sherds from this site. The firing temperature was relatively low, not above 600 °C according to the results of a color analysis of reﬁred samples. The partially reconstructed vessel shape is simple, without a distinction between body and orifice. The orifice zone is thickened by cornice-like application with incised slanting lines. Based on the size of preserved fragments, I estimate a medium size of the whole vessel.

Ustinovka-3 — The site is located in the valley of the Zerkalnaya River in the northeastern part of Primorie region (Kononenko et al. 1993). Its culture-chronological context is not limited to a single component. Most of the cultural remains are represented by lithic artifacts that belong to the transition period between the Upper Paleolithic and Neolithic. A blade technique for tool manufacture pre-
vailed at this site. The paleobotanical analysis of the site's deposits confirms a Paleolithic to Neolithic transitional period date between 8500 and 8000 B.P. (Verkhovskaya 1993). In addition to these materials, the remains of a Bronze Age occupation were discovered at the site, including pottery and some stone tools.

In 1994 a ceramic assemblage differing from the Bronze Age one was obtained at Ustinovka-3. This assemblage was associated mostly with the lower stratigraphic component and dated to the transitional period from the Paleolithic to the Neolithic (Garkovik and Zhushchikhovskaya 1995). The ceramic collection includes the fragments of two or three vessels, including their upper parts and body pieces (Fig. 5). According to data from a petrographic analysis, the ceramic paste of this sample consists of hydromicaceous clay with aleurite nonplastic inclusions of quartz, feldspar, detrital mica, and sand inclusions of the same minerals corresponding to granite rock. There are also rare grains of effusive rock and flint within the clay matrix. The quantity of sand grains varies from 10 to 25 percent in different samples. The size texture of the sand fraction is uneven and distribution of the grains in the ceramic paste is irregular. The characteristics of the nonplastic inclusions reflect a natural origin rather than an artificial one.

The vessel forming method can be reconstructed from the available sherds. Two traits are interesting as indirect evidence of manufacturing technique. First, there is an absence of sherds with evidence of bonds or coils in the wall construction. Second, there are two layers in the cross section of some vessel walls. These traits may be connected to a forming method such as moulding. Experimental forming of ceramic vessels on a hard mould has shown that small bits or plates of clay might have been used in the initial manufacture. During the forming process the clay was applied to the mould in two layers. This allowed the vessel to attain a more uniform wall thickness. The moulding also places the greatest pressure on the outer layer of clay. A petrographic analysis of some ceramic samples shows a high concentration and density of clay particles in the outer surface layer (1–2 mm thickness). Finally, the flattened rims of vessels are supplemental evidence of moulding. The forming of vessels on a hard mould is executed in a “bottom-up” position that results in flattening of the rim.

The vessel shapes are simple, unrestricted, and straight-walled. No bottom portions of the vessels were found. Some upper parts have small holes along the rim (Fig. 5-1). The outer surfaces show no signs of special treatment. The inner surfaces are characterized by grooves oriented horizontally and slightly sidelong (Fig. 5-1, 5-2, 5-3, 5-4). The width of the grooves is 3–6 mm, the depth is 0.5–1 mm. The experimental modelling of surface treatment methods suggests a similarity between the groovelike traces on inner surfaces of archaeological ceramics and those traces caused by rubbing the surfaces with rough grass, the edge of wooden chips, or the edge of some marine shells. Beyond this, the pottery is undecorated.

The firing temperature is estimated to be not higher than 500–600 °C, according to a refiring test and petrographic analysis. The atmosphere regime was oxidizing.

Chernigovka-1 — The location of the Chernigovka-1 site is in the western part of the Primorie region, in the valley of the Chernigovka River. This site was recently completely destroyed by modern industrial activity. From the late 1980s
Ceramic samples from lowest culture-chronological component at Ustinovka-3: left indicates the outer surfaces; right the inner surfaces.

Fig. 5. Ceramic samples from lowest culture-chronological component at Ustinovka-3: left indicates the outer surfaces; right the inner surfaces.

to the first part of this decade, archaeological recovery of the site's remains was completed (Sapfirov 1989). Unfortunately, the artifacts were obtained without also determining their associated stratigraphic positions. The assemblage includes stone artifacts and ceramics of various culture-chronological contexts from the Neolithic to the Early Medieval period. The stone artifacts in the collection are
especially distinguished by types associated with the Early Holocene period. This includes blades and microblades, blade flakes, large scrapers on the blade flakes, wedge-shaped cores, and primary spalls.

The most interesting group of artifacts is a series of plant fiber-tempered ceramics, including fragments of vessel body and upper body parts. These ceramics are not known from the Neolithic, Paleometallic, or Early Medieval chronological contexts of the site or within the Primorie region as a whole. I assume that these ceramics are associated with the stone artifacts identified with the Early Holocene lithic industry. This is consistent with the association of such fiber-tempered ceramics and Early Holocene contexts elsewhere in the Russian Far East. Nonetheless, at present this assemblage of plant fiber-tempered ceramics is unique for the Primorie region (Plates I and II).

According to the data from a petrographic analysis, the ceramic paste consists of hydromicaceous clay with nonplastic aleurite inclusions of quartz, feldspar, biotite, and sand inclusions of biotite granite rock. The amount of aleurite and sand fractions in the paste is between 40 and 50 percent. The sand fraction is characterized by uneven texture and irregular distribution in the paste. The mineralogical composition of aleurite and sand fractions corresponds to biotite granite rock. All of these features suggest that the nonplastic inclusions are a natural component of the clay, not artificial temper. Organic inclusions are represented by long, narrow grooves corresponding to the traces of burned-out grass on the surface and in the cores of some sherds. Botanical analysis of these traces indicates that the taxa of grass used as a tempering agent may be Cyperaceae.

Two kinds of plant organic impressions can be distinguished on the surfaces of sherds. First, there are mostly thick, irregularly oriented, and curved impressions corresponding to the temper inclusions. Second, there are rough and straight
impressions with a subparallel orientation on both the interior and exterior surfaces. The second impressions may be linked to the forming method. Other aspects of the manufacturing method cannot be securely reconstructed because of the small size of the ceramic sample. The plant impressions on the surface suggest the use of a mould or a paddle and anvil technique in the shaping and finishing of the vessels. Some fragments of the upper vessel parts indicate a simple, unrestricted, straight-walled vessel shape. Small holes are placed along the rim of one vessel. These holes were made before the vessel was fired and are similar to those identified at Ustinovka-3. No other surface treatments were noted in this assemblage.

The firing temperature was about 600°C according to a color analysis of refired samples. The age of the plant fiber-tempered ceramic assemblage from Chernigovka-1 cannot currently be determined by either absolute or relative dating. Based on the inferred culture-chronological correlation between Early Holocene stone assemblages and plant fiber-tempered ceramics, I estimate an age for these materials between 8000 and 7000 B.P. Similar sites from the south-western Primorje region are dated to this interval (Kuznetsov 1992).

Sakhalin Island

The most archaic pottery-making tradition in this region is connected with the sites of the Yuzhno-Sakhalinskaya archaeological culture (Golubev and Zhushchikhovskaya 1987). It is radiocarbon dated to approximately 6500–6000 B.P. The location of this archaeological culture is the southern portion of Sakhalin Island (Shubin et al. 1984).
The lithic assemblages of the Yuzhno-Sakhalinskaya archaeological culture include retouched tools made on blades and blade-like flakes. Only a few partially polished tools have been found. As a whole the stone artifacts are characterized by a combination of Paleolithic and Neolithic technical traits.

Ceramics are found in most of the sites associated with the Yuzhno-Sakhalinskaya culture. The paste of these materials includes two main components: clay and plant temper. The pores and impressions of burned-out plant pieces are fixed on the surfaces and in the cores of ceramic samples. In a few cases, carbonized plant fibers have been identified. The plant temper in ceramics from Kuznetsovo-3 was very rough and irregular, with large cut pieces of Cyperaceae and Equisetum (horsetail), according to botanical analysis. The plant fiber temper in the ceramics from Kuznetsovo-4 and Sadovniki-2 was smaller in size and of a more uniform texture.

This pottery is handmade from short clay bands, a method similar to "slab construction" (Vandiver 1987). The thickness of vessel walls from Kuznetsovo-3 ranges between 8 and 12 mm; at Kuznetsovo-4 and Sadovniki-2 the range is between 6 and 8 mm. The vessels have a flattened bottom and are wider than they are tall, with an unrestricted orifice and straight walls. The shape of these ceramics is boxlike. The sizes of most vessels are small. The surface of the pottery is unslipped and rough. The firing temperature was very low, between 400 and 500 °C. The presence of carbonized plant fibers in the paste reflects this low firing temperature. The pottery from the site at Kuznetsovo-3 is undecorated, whereas the pottery from sites at Kuznetsovo-4 and Sadovniki had a simple appliqué design in some cases. Ceramics associated with the Yuzhno-Sakhalinskaya culture represent a distinct unit of this early pottery-making tradition. It may include two linked phases in the tradition's development, based on the preceding description of paste, vessel wall thickness, and decoration.

DISCUSSION

Early ceramics assemblages from various regions in the northern part of the Sea of Japan basin and the Russian Far East are characterized by certain technological and morphological features. Two types of ceramic pastes can be distinguished, the first employing natural clay without artificial temper (Ustinovka-3, Almazinka) and the second using clay with plant fiber artificial temper (Gasya, Khummy, Yuzhno-Sakhalinskaya culture, Chernigovka-1). Not all of the pottery assemblages provide evidence of forming techniques. At least three can be identified: a moulding technique, perhaps in conjunction with the use of a paddle and anvil (Khummy, Gasya, Ustinovka-3), slab construction (Yuzhno-Sakhalinskaya culture), and coiling (Almazinka).

The absence of surface treatments such as rubbing, smoothing, and slipping is typical of these early ceramic assemblages. The inner surfaces of some vessels were smoothed using a rough tool, grass, marine shell, or wooden chips. However, this is the exception rather than the rule.

The estimated firing temperature was low, not above 600 °C. This corresponds to firing in a simple open fire. Most of the ceramic vessel morphology is simple, without a clear distinction between body and orifice part. Two types of morphological outlines are distinguished: the first is characterized by a round outline
and is the predominant type, and the second is a rectangular form found only in the ceramics associated with the Yuzhno-Sakhalinskaya culture from Sakhalin Island. The bottom of all vessels, when identifiable, is flat (Gasya, Almezinka, Yuzhno-Sakhalinskaya culture).

These features are similar to those described for early ceramics from other regions of eastern Asia and elsewhere in the world. For example, a ceramic paste of untempered natural clay is typical for the earliest pottery of Japan (Vandiver 1991). My inspection of Incipient Jomon ceramics from Kiriyama-Wada and Jin located in Honsū and dated to approximately 12,000–10,000 B.P. suggests some trends involving the technology of paste among these early ceramics. The ceramics from the earliest sites (or components of sites) have a paste prepared of rough, unworked natural clay. The ceramics from later components is characterized by clay in which more of the large particles have been removed, producing a more plastic clay paste that is still untempered. Plant fiber-tempering technology occurred in the pottery of the Initial and Earliest Jomon periods (Nishida 1987). This technology appeared in the early ceramics of North and Central America (Griffin 1965; Hoopes 1994; Reichel-Dolmatoff 1971; Reid 1984), Near East and Central Asia (Amiran 1965; Saiko 1982), and now for the materials from the Russian Far East.

There is some evidence for the use of mould forming methods in ceramic assemblages from south and southeast China dated to 10,000–9000 B.P. (Wang Xiao Qing 1995). The use of moulds in the forming process was popular in several areas of Eurasia (Bobrinsky 1978). According to P. B. Vandiver, the earliest Japanese pottery was formed by a method similar to slab construction. Coiling was not employed in the initial stage of pottery production (Vandiver 1991). The combination of partial moulding and slab construction took place in some cases (Vandiver 1987). Similar examples of this technique were discovered in sites from south China dated between 9000 and 8000 B.P. A roundish stone or a basket may have been used as a mould to which pieces of clay were then applied (Wang Xiao Qing 1995). The coiling method for making pottery is widely represented among archaeological assemblages throughout the world. Obvious evidence for this method can be identified among later ceramics from Jomon sites in Japan.

A relatively simple morphological pattern was a common characteristic of early ceramics. Nonetheless, vessels with a rectangular shape also occurred in early pottery-making. The box-shaped vessels associated with Sakhalin Island’s Yuzhno-Sakhalinskaya culture are similar to those from sites in northern Japan dated to 13,000–10,000 B.P. (Suda 1995). Similar shapes have been identified in early ceramic assemblages from eastern North America, where it has been suggested that the form is related to containers manufactured in wood (Griffin 1965).

Descriptions of most early ceramics fail to mention surface treatments, possibly reflecting the absence of special surface treatment methods for these ceramics. My inspection of early Japanese pottery from the sites associated with Fukui cave, Jin, Kiriyama-Wada, and other Incipient Jomon components has not revealed evidence of any surface treatment such as rubbing, smoothing, slipping, or polishing. There is some evidence that the surface of some pottery from the Initial Jomon period was prepared by a toothed tool.

The firing of early pottery-making is characterized mainly by relatively low
temperatures, and uneven oxidization indicates that open firing was most common (Hoopes 1994; Saiko 1982).

The early ceramic assemblages of the Russian Far East share many technological and morphological properties with early ceramics discovered in other regions of the world. This resemblance may be explained, in part, by the comparable level of pottery-making development that restricted the technological and morphological choice. Variability within these early ceramic traditions developed gradually, as skills and expertise improved. At the same time, it may be noted that regional differences appeared in the very earliest stages of pottery-making. Ceramic assemblages from the Russian Far East show evidence of partial moulds and possibly paddle and anvil techniques. In early Jomon assemblages, slab construction was employed, followed by coiling in later assemblages.

The Russian Far Eastern early ceramic assemblages that represent a common pottery-making level are placed into a fairly wide temporal interval between 13,000 and 6000 B.P. This large interval may reflect the few radiocarbon dates yet available for these assemblages and the lack of other absolute dating methods. This article has shown that sites associated with early ceramics within each of the regions included here are consistently dated to a somewhat narrower interval of time. The lower Amur River basin is characterized by the oldest dates of the sites, ranging from 13,000 to 10,000 B.P. The sites from Primorie region occupy an intermediate position, between 8500 and 7500 B.P., and Sakhalin Island is characterized by the most recent sites, dated to 6500–6000 B.P. This chronological sequence possibly reflects the geographically uneven dynamics for the introduction of pottery-making in the territories of the Russian Far East.

The lower Amur River basin may be interpreted as a region of the earliest ceramics. Radiocarbon dates for the lowest components of the Gasya and Khummy sites are close to the dates of the Jomon sites in Japan containing the most unadvanced pottery. The ages of the sites in the Primorie region associated with early ceramics tend to match dates for sites associated with early pottery from areas to the south and southeast in China (Jiao 1995; Wang Xiao Qing 1995).

A common trait of both the Russian Far Eastern and Japanese sites is the occurrence of early ceramics together with a lithic industry combining elements from the Late Paleolithic and Neolithic. This may reflect certain technical and social contexts linked to the first appearance of pottery in this part of the world. Because the first discoveries of early ceramics in East Asia occurred in the Japanese archipelago, initial conceptions about the origins of pottery-making emphasized this territory (Ikawa-Smith 1976; Serizawa 1976). The discovery of the new sites containing early ceramics in the Russian Far East indicates that the area of ceramic origins needs to be broadened to include the Sea of Japan basin as a whole (Zhushchikhovskaya 1995b). Clearly, this perspective will lead to more comparative and new field research on the origins of pottery-making in East Asia.

ACKNOWLEDGMENTS

I thank all of my Russian colleagues who permitted me to observe and study the early ceramics from archaeological excavations in the Russian Far East. This
includes Vitaly E. Medvedev, Valery A. Lynsha, Valery A. Golubev, Anatoly M. Kuznetsov, Alla V. Garkovk, and Zoya S. Lapshina. I am grateful to Boris L. Zalishchak for conducting the petrographic analysis of early pottery and Natalia B. Verkhovskaya for the botanical analysis of plant fiber-tempered ceramics. I also wish to extend my thanks to Japanese colleagues who helped me to observe the earliest ceramics assemblages of Japan, including Shinpei Kato and Tetsuo Kobayashi (Kokugakuin University in Tokyo), Hiroshi Kajiwara (Tohoku Fukushi University), and Migaku Tanaka (Nara National Institute of Culture Properties, Kokugakuin University). Anne P. Underhill and Sarah M. Nelson have helped extensively in improving the language and style of this article.

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Until recently, the Japanese archipelago has been the only known area of late Pleistocene—early Holocene pottery-making sites in both the Japan Sea basin and eastern Asia as a whole. During the 1990s, however, a series of sites containing ceramics similar to early pottery from Japan (i.e., Jomon) was discovered in the Russian Far East, including the Lower Amur River basin. Basic traits of the ceramics at the sites include untempered or plant tempered paste, simplicity of forming technique and shape, undeveloped surface treatment technology, and low-temperature firing. The ages of these Russian Far Eastern early ceramic assemblages range from 13,000 to 7000 B.P., corresponding to the transition from late Pleistocene to early Holocene. The oldest Russian Far East ceramics are accompanied by stone artifacts made in the blade technique. This association is common at sites from the Japan Sea basin containing early pottery. 

**KEYWORDS:** Russian Far East, late Pleistocene, early Holocene, early ceramics, pottery-making technology.