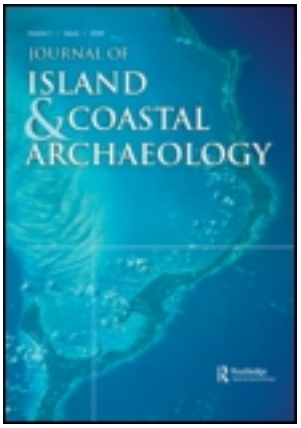

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Yaroslav V. Kuzmin [a], Oksana V. Yanshina [b], Scott M. Fitzpatrick [c] & Olga A. Shubina [d]

[a] Institute of Geology & Mineralogy, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia

[b] Peter the Great Museum of Anthropology and Ethnography ("Kunstkammer"), Russian Academy of Sciences, St. Petersburg, Russia

[c] Department of Anthropology, University of Oregon, Eugene, Oregon, USA

[d] Sakhalin Regional Museum, Yuzhno-Sakhalinsk, Russia

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The Neolithic of the Kurile Islands (Russian Far East): Current State and Future Prospects

Yaroslav V. Kuzmin,[1] Oksana V. Yanshina,[2] Scott M. Fitzpatrick,[3] and Olga A. Shubina[4]

[1]*Institute of Geology & Mineralogy, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia*

[2]*Peter the Great Museum of Anthropology and Ethnography ("Kunstkammer"), Russian Academy of Sciences, St. Petersburg, Russia*

[3]*Department of Anthropology, University of Oregon, Eugene, Oregon, USA*

[4]*Sakhalin Regional Museum, Yuzhno-Sakhalinsk, Russia*

ABSTRACT

In this article we present a review of the archaeology and chronology of the Neolithic (i.e., pottery-bearing) cultural complexes of the Kurile Islands. Previous studies revealed only general patterns of Neolithic pottery and lithic typologies in the archipelago within a tentative chronological framework. However, recent research has now firmly established an occupation of the southern part of the Kurile Islands dating to as early as ca. 7000 BP. Based on preliminary investigations it appears that major economic activities focused on hunting, fishing (with possible exploitation of coastal fishes), and the gathering of plants. Interestingly, there is as of yet no solid evidence for the widespread use of marine resources (shellfish and mammals) in the Kuriles during the Neolithic, though this issue requires further research due to a dearth of properly excavated sites. Several potentially important sites are also suggested for continuing investigation of Neolithic archaeology in the Kurile Islands which has important ramifications for our understanding of coastal and island adaptations in the North Pacific.

Keywords island colonization, Northwestern Pacific, Kurile Islands, Neolithic, pottery

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Address correspondence to Yaroslav V. Kuzmin, Institute of Geology & Mineralogy, Siberian Branch of the Russsian Academy of Sciences, Koptyug Avenue 3, Novosibirsk 630090, Russia. E-mail: kuzmin@fulbrightmail.org

The value of these islands lies in the fisheries. All their streams and lakes teem with salmon and trout, whilst off the coasts cod, herring, iwashi, halibut, and other fish abound.

H. J. Snow, *Notes on the Kuril Islands* (1897:87)

INTRODUCTION

The investigation of how and when islands were colonized in the past, and the subsequent adaptations that took place to a vast array of marine (and generally aquatic) environments, are among some of the more interesting and important issues in world prehistory (e.g., Erlandson 2001; Erlandson and Fitzpatrick 2006; Rick and Erlandson 2010). Questions related to island settlement are often rooted in attempting to understand the mechanisms involved with movement (seafaring) to and through island chains from a larger landmass (e.g., continents)—and in some cases, using these as virtual paths from one to another. Recent data (Fedje et al. 2009) demonstrate that humans in the North Pacific were able to cross open water as early as ca. 10,600–10,900 BP, with even earlier evidence further south on Okinawa during the Upper Paleolithic ca. 35,000 BP (Matsu'ura 1999; Oda 1990) and in mainland Japan where obsidian was transported from Kozu Island to Honshu between 25,000–15,000 BP (Tsutsumi 2007:183).

The Kurile Archipelago, which stretches for about 1,200 km between Hokkaido Island (Japan) and the Kamchatka Peninsula (Russia) (Figure 1), represents a potential stepping-stone of islands for human movement from the Japanese Archipelago to Kamchatka and beyond during the Late Pleistocene/Early–Middle Holocene (e.g., Erlandson and Braje 2011). However, the Kuriles have received relatively little archaeological attention, especially in regards to the earliest stages of colonization that help us temporally contextualize the role they played in early human migrations.

The significance of identifying the earliest archaeological complexes from the Kurile Islands for understanding broader issues of prehistory of the North Pacific is clear. However, a dearth of publications since the 1990s, primarily a result of few concerted attempts to archaeologically investigate these islands over the last 20 years, has made it difficult to delineate when humans first arrived in this part of Northeast Asia. In this paper, we present an updated review and discussion based on the most recent research and reviews of the existing literature. Because the majority of Neolithic sites are situated in the southern Kurile Islands, we primarily focus on this area (Figure 1). Due to the complicated nature of the region historically, both Russian and Japanese names are given for important islands and other localities (see Stephan 1974:248–252; spelling of geographic names generally follows Stephan 1974).

It should also be noted that the term "Neolithic" for the Kuriles in particular, and in the Russian Far East in general as part of greater East Asia, refers to the first presence of pottery in archaeological assemblages (e.g., Barnes 1999; Kuzmin 2006a; Oshibkina 1996). This corresponds to the term "Jomon" in Japanese prehistory (e.g., Aikens and Higuchi 1982:95; Crawford 1996). In addition, while agriculture is seen as a necessary component for Neolithic sites in a European context (e.g., Thomas 1993), intensive food production was absent throughout the prehistory and early history of the Kuriles.[1]

ENVIRONMENTAL BACKGROUND

The Kurile Islands are located in the North Pacific between the larger landmasses of Hokkaido Island and the Kamchatka Peninsula (Figure 1). The archipelago is comprised of 36 large islands and 20 smaller ones, with the largest landmasses—Kunashir [Kunashiri], Iturup [Etorofu], and Urup [Uruppu]—located in the south. General information about the geography of the Kuriles can be found in Suslov (1961:401–411), Stephan (1974), and Ivanov (2002:438–441).

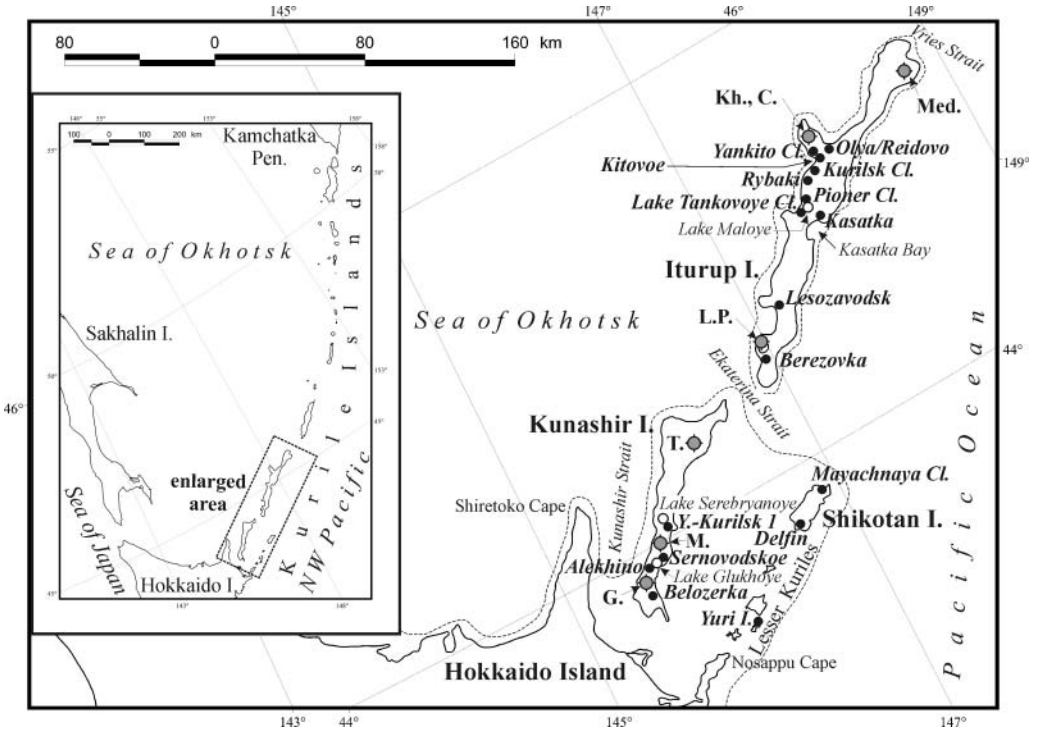

Figure 1. *Geographic setting of the southern Kurile Islands and the location of principal Neolithic sites (after Golubev 1973a, 1989; Knorozov 1992; Zaitseva et al. 1993). The dashed line is the 100 m isobath. Grey circles with spikes are modern active volcanoes: G.—Golovnin Caldera; M.—Mendeleev Volcano; T.—Tyatya Volcano; L.P.—Lvinaya Past' Caldera; Kh., C.—Bogdan Khmelnitsky and Chirip volcanoes; Med.—Medvezhy Volcano. Open circles are lakes studied for paleoenvironment. Black circles are archaeological sites: Cl.—cluster. The Pioner Cluster includes the Pioner [Rubetsu] and Kuybushevo sites; the Lake Tankovoye Cluster includes the Lake Tankovoye and Malaya Kuybyshevka sites. The Kurilsk Cluster includes the Kurilsk 1, 2, and 3 sites. The Mayachnaya Cluster includes the Mayachnaya 2 and 3 sites.*

Recently, the Kuriles were the subject of an extensive international project on biodiversity of the archipelago in which a plethora of information on flora and fauna were collected (Pietsch et al. 2003).

Overall, the climate is oceanic in nature, with cool and wet conditions more favorable in the southern part of the island chain which greatly influences vegetation types. In the southern islands, forests predominate while in the central and northern Kuriles (roughly north of Urup) grasslands and bush thickets (dwarf pine and alder, and gold birch) dominate the terrain. Invertebrates, fish, seaweed (particularly brown algae), and marine mammals are plentiful throughout the entire Kurile Islands as was observed by early explorers (e.g., Snow 1897:87).

The environment of the Kuriles would have proven challenging for human occupation due to the harsher climate along with relatively frequent volcanic activity and tsunamis which are known to have devastated the archipelago in the past (e.g., Ganzey et al. 2011). Sea currents are also very strong in the straits between the islands; the Ekaterina Strait [Kunashiri Suido] is particularly noteworthy in this regard. Snow (1897:57),

for example, described several types of tidal and wind-driven currents and waves which made crossing of this strait a difficult enterprise even for sailboats. Nonetheless, given the antiquity of human settlement in northern Japan and the southern Kuriles, it was clear that native groups were capable seafarers and in times of stress such as a volcanic event, could have relocated if necessary or reached out for assistance to people on other islands which is not uncommon in archipelagic situations.

The environment of the southern part of Kurile Islands during the Holocene is relatively well-studied (Korotky et al. 2000; Razjigaeva et al. 2002, 2008, 2011; Razzigaeva et al. 2010). During the early Holocene (ca. 10,000–7500 BP), vegetation on Shikotan Island and the Lesser Kuriles [Habomai] island group (Figure 1) consisted of fir–larch open forest with dwarf pine. At ca. 7500–4500 BP, climatic conditions were the most favorable during the entire Holocene in the southern Kuriles, with a predominance of pure broadleaved and mixed coniferous-broadleaved forests. It appears that warmer currents began to heavily influence regional climate at this time. At around ca. 6500 BP, sea level reached its maximum and was 2.5–3 m higher than the present day. Climatic cooling around ca. 4700–4500 BP coincided with sea level fall, resulting in an increase in conifers. At ca. 4000–3400 BP, minor sea level transgression was identified (1.5–2.5 m above modern) and after ca. 3500 BP, significant climatic deterioration is seen, with conifers becoming the dominant vegetation. Between about 3000–2600 BP, another minor sea level transgression was established (1.2–1.5 m above the modern one).

The most recent data on the Holocene environments of the southern Kuriles derive from the analysis of lake sediments on Kunashir and Iturup islands (Anderson et al. 2011). Three lakes were studied: Lake Maloye on Iturup, and Glukhoye and Serebryanoye lakes on Kunashir (Figure 1). Results demonstrate that on the Kunashir Island at ca. 9000−7200 BP the landscape was dominated by birch-oak forests, and at ca. 7200−5200 BP broadleaved forests were the main vegetation type. At ca. 5200−2000 BP, landscapes of mixed coniferous-broadleaved forests were present, corresponding to the second climatic optimum during the Subboreal period. On Iturup during the Preboreal period (ca. 10,000−9000 BP) spruce-birch forests existed with a mixture of thermophilous elements (oak, elm, nut tree, ash, and beech). In the Boreal and Atlantic (Climatic Optimum) periods ca. 8000−5000 BP, mixed forests of birch and broadleaved species from the above mentioned species were predominant. During the Subboreal period (ca. 5000−2000 BP), birch was the most important species in vegetation cover while oak also remained common. The primary difference between the islands of Kunashir and Iturup is that in the south (Kunashir), broadleaved and mixed coniferous-broadleaved vegetation formations prevailed in the Holocene while in the north (Iturup), mixed birch-broadleaved, birch, and birch-larch forests dominated.

As for a land bridge between Hokkaido and the southern Kuriles, only Kunashir and the Lesser Kuriles were connected during the Last Glacial Maximum (ca. 20,000–18,000 BP) and afterwards, up to ca. 8000 BP. Both Iturup and Urup remained separated from Hokkaido and Kunashir due to deeper waters between these landmasses which exceeded 100 m in depth, namely the Ekaterina and Vries [Etorofu and Kaikyo] straits (Figure 1). As we explain below, based on current evidence, it appears likely that the southern Kuriles were first colonized after separation which would have required some type of watercraft to migrate.

HISTORY OF ARCHAEOLOGICAL RESEARCH

The first systematic archaeological investigations of the Kurile Islands were conducted between the 1880s and 1930s by Japanese scholars, including Torii Ryuzo, Baba Osamu, Nagao Matoroku, Ishikawa Teiji, Kono Tsunekiti, and others (see Prokofiev 2006; Stephan 1974:21–28; Yamada 1996). However, one of the first reports on Neolithic (i.e., Jomon) artifacts was published by the Swedish scholar Schnell (1932:49–58) who

described pottery and stone tools collected in 1929–1930 by another Swedish scientist, Sten Bergman, at several destroyed sites on Iturup and Kunashir islands. Studies by the Japanese in the early twentieth century were concentrated in the northern Kuriles, with one of the primary objectives geared toward describing the later Okhotsk culture (see Befu and Chard 1964; Chard 1956).

After the end of World War II when the Kuriles came under control of the USSR, Soviet archaeologists continued to survey for and excavate a number of prehistoric sites. The first major expedition was undertaken in 1956 by R. V. Chubarova (later Kozyreva) who surveyed several islands and conducted small-scale excavations on Iturup (Chubarova 1960) and Kunashir (Kozyreva 1964:697–698). Two major localities on Iturup were studied—one near Kasatka [Toshimoi] Village which was almost completely destroyed, and the other on the coast of Kuybyshevskiy Bay near Pioner [Rubetsu] Village (see Atlas 1994:28), previously visited by S. Bergman (see Schnell 1932:51), which was also badly damaged.

Later, from 1963 to the late 1980s, V. A. Golubev conducted systematic surveys and excavations of numerous prehistoric sites in the Kuriles, making significant contributions to the region's prehistory. The most intensive excavations were carried out in 1963–1966, 1968, and 1974–1976 (Vasilevsky and Golubev 1996). Golubev (1968, 1970, 1973a, 1973b) described the principal Neolithic sites and is credited with establishing the Yuzhno-Kurilsk [Southern Kurile] archaeological culture (i.e., cultural complex; see Trigger 2006:343) which formed the basis of his PhD thesis (Golubev 1972). The majority of archaeological sites belonging to this culture were located in the southernmost Kuriles—Kunashir, Iturup, and Urup islands—as well as the Lesser Kuriles (Yuri site; Golubev 1989). Generally, Golubev (1972, 1973a) confirmed earlier estimations by Chubarova (1960) that the cord-marked pottery was indicative of the Neolithic stage in the southern Kuriles and the hallmark of the Yuzhno-Kurilsk culture (e.g., Golubev 1970, 1972, 1989). Results of V. A. Golubev's investigations were later summarized by Vasilievsky (1973:163–207; 1975) who discussed his findings within the broader spectrum of North Pacific prehistory.

Other researchers who have studied Neolithic sites in the region have included the well-known Soviet archaeologist A. P. Okladnikov who visited the Kuriles in 1965 [not in 1971 as it is reported by Stephan (1974:29)] (see Vasilevsky and Golubev 1996:43; Vasilievsky 1973:172). In 1970–1971, V. O. Shubin organized excursions for an archaeological club comprised of high school students who described in more detail several sites which were known previously (see Steshenko and Gladyshev 1977). Shubin (e.g., 1994) later continued research in the 1970s–1990s. In the 1980s, Knorozov (1992) and Spevakovsky (1989) conducted survey and small-scale excavations in the southern Kuriles. The most important finds were at Yankito on Iturup which turned out to represent the earliest human occupation yet known for the entire Kuriles (see also Prokofiev 2003; Yanshina et al. 2008, 2009; Yanshina and Kuzmin 2010), as well as the Delfin (Dolphin) shellmidden on Shikotan which contained a possible Neolithic component (see Vasilevsky et al. 2010:16). Further research at the Yankito site by O. Yanshina (Yanshina and Kuzmin 2010; Yanshina et al. 2009) in 2007 essentially confirmed the earlier results by Y. V. Knorozov, but expanded excavation to open up larger and spatially separated areas.

In the 1990s and 2000s, archaeological research carried out by Russian scholars in the Kuriles decreased dramatically as the result of changing political and economic issues. This led to scholars mainly conducting surveys to record sites along with occasional small-scale excavations. Prokofiev (2002) published the results of a survey he conducted in the Lake Kuybyshevskoye (also known as Tankovoye) area of Iturup Island (see Atlas 1994:28) where he discovered human burials in association with Jomon-like artifacts. Research by members of the International Kuril Island Project in 2000 (Fitzhugh et al. 2002, 2004), and subsequent large-scale research by members of the Kuril Biocomplexity Project (KBP) in 2006–2008

(Gjesfjeld 2010; Phillips 2010, 2011; Phillips and Speakman 2009; Shubin 2008; Shubina 2010), has begun to add greatly to the body of knowledge on archaeology of the Kuriles, primarily those sites associated with the Epi-Jomon [Zoku-Jomon] and Okhotsk cultures that post-date the Neolithic. While much of the archaeological research done by the KBP to date has not yet been published, ongoing analysis will surely be productive in filling in many of the archaeological and chronological gaps in the prehistoric record of the Kuriles. Overall, archaeological survey and inventory of prehistoric sites in the Kurile Islands which began in the 1960s (see Golubev 1973a) has continued up until more recent times (e.g., Samarin 2008; Samarin and Shubina 2007), with a more comprehensive list and map of archaeological sites in the Kuriles having now been published (see Samarin 2009; Vasilevsky 2009).

NEOLITHIC COMPLEXES OF THE KURILE ISLANDS

The Early (Early/Middle) Neolithic

Secure traces of a human presence in the Kurile Islands can now be firmly dated to the Neolithic stage, but not earlier. Some supposed pre-Neolithic (i.e., Late Paleolithic) finds were reported for the northern Kuriles (Salova 1976) and Iturup Island (Prokofiev 1988) based on material recovered in surface collections, although no artifacts from undisturbed contexts have yet been recorded. Occupation of the Kurile Islands before the Holocene is certainly possible, however, especially if we take into account several Late Pleistocene sites known from both Hokkaido and Kamchatka (see Dikov 2003; Kuzmin 2000; Ono et al. 2002:487–488).

The first reliable evidence of human occupation of the Kurile Islands is known from Iturup Island where a cluster of at least two sites—Yankito 1 and 2, known collectively as the Yankito site cluster (Figure 1)—were found in the 1980s (Knorozov 1992; Zaitseva et al. 1993). Excavation of 10.5 m^2 of the estimated 1,000 m^2 area at Yankito 2 in 2007 by O. V. Yanshina demonstrated the archaeological richness and relatively good preservation of cultural layers in situ, a rare occurrence in the Kuriles especially given the extensive economic and military activities that have taken place along the coast historically and subsequent destruction of this and other parts of the island landscape. Prior to the most recent work at Yankito (see summary of methods and findings in Yanshina and Kuzmin 2010), Prokofiev (2003) had identified a single potsherd from the Yankito 1 site shown to him by Y. V. Knorozov as belonging to the Early Jomon, Urahoro pottery type, which was later confirmed during Yanshina's excavations (see Yanshina and Kuzmin 2010:181) which found an association with Urahoro pottery to the Initial/Early Jomon. A brief account of Yankito was recently published (Yanshina and Kuzmin 2010), though we provide here additional details with a particular focus on pottery, one of the most important cultural identifiers in the Kuriles prehistorically.

Ceramic vessels from the Yankito 1 and 2 sites have truncated conoidal shape and thick flat bottoms (Figure 2, no. 3; Figure 3, no. 5; also see Yanshina and Kuzmin 2010:fig. 4). They were manufactured from a clay paste admixed with finely chopped grass, providing good thermal resistance under low firing temperature. Both external and internal surfaces were treated with a comb-like implement. In the mouth area, there is a narrow strip of cord-marked impressions made by using a stick wrapped with rope; strips are horizontal and limited from above and below by short inclined lines, similar to horizontal zigzagging. This kind of pottery is very similar to the Urahoro type which according to by modern Japanese conventions, belong to the Blade Arrowhead culture of the Incipient Jomon found on Hokkaido (e.g., see Kimura 1999; Yamahara 2007).

Stone tools from the Yankito 2 site—cutting and splitting instruments, arrow and spear heads, knives, scrapers, drills, and abraders (see Yanshina and Kuzmin 2010:fig. 3)—are typical of all Early Neolithic sites within the Sea of Japan region, including the Blade Arrowhead culture of Hokkaido (Kimura 1999). However, one can observe

Figure 2. *Early and Middle Jomon pottery from Iturup Island. Middle Jomon: 1—Kitovoe site; 2—Rybaki site (unpublished data by O. A. Shubina); Early Jomon: 3—Yankito 2 (unpublished data by O. V. Yanshina). Bars are in centimeters (color figure available online).*

important differences between the former and latter complexes related to the processing of stone tools. The lithic industry of the Yankito site is based on the use of flint and basalt while on Hokkaido, obsidian was the preferred material. Stone tools at Yankito 2 are made using flakes; products of their secondary processing were bifaces for making points, and both unifaces and bifaces for manufacturing the rest. The lithic industry of the Blade Arrowhead Culture on Hokkaido represents only prismatic technology, and the main form of tool blank is a middle and large sized prismatic blade with only marginal secondary processing. These differences are curious given the similarity seen in ceramics. This may originate from peoples simply using different raw materials that were not related to particular cultural phenomena.

Unfortunately, there does not appear to be any other sites that cannot yet be equivocally associated with the Early Neolithic, apart from the Yankito cluster. On Iturup,

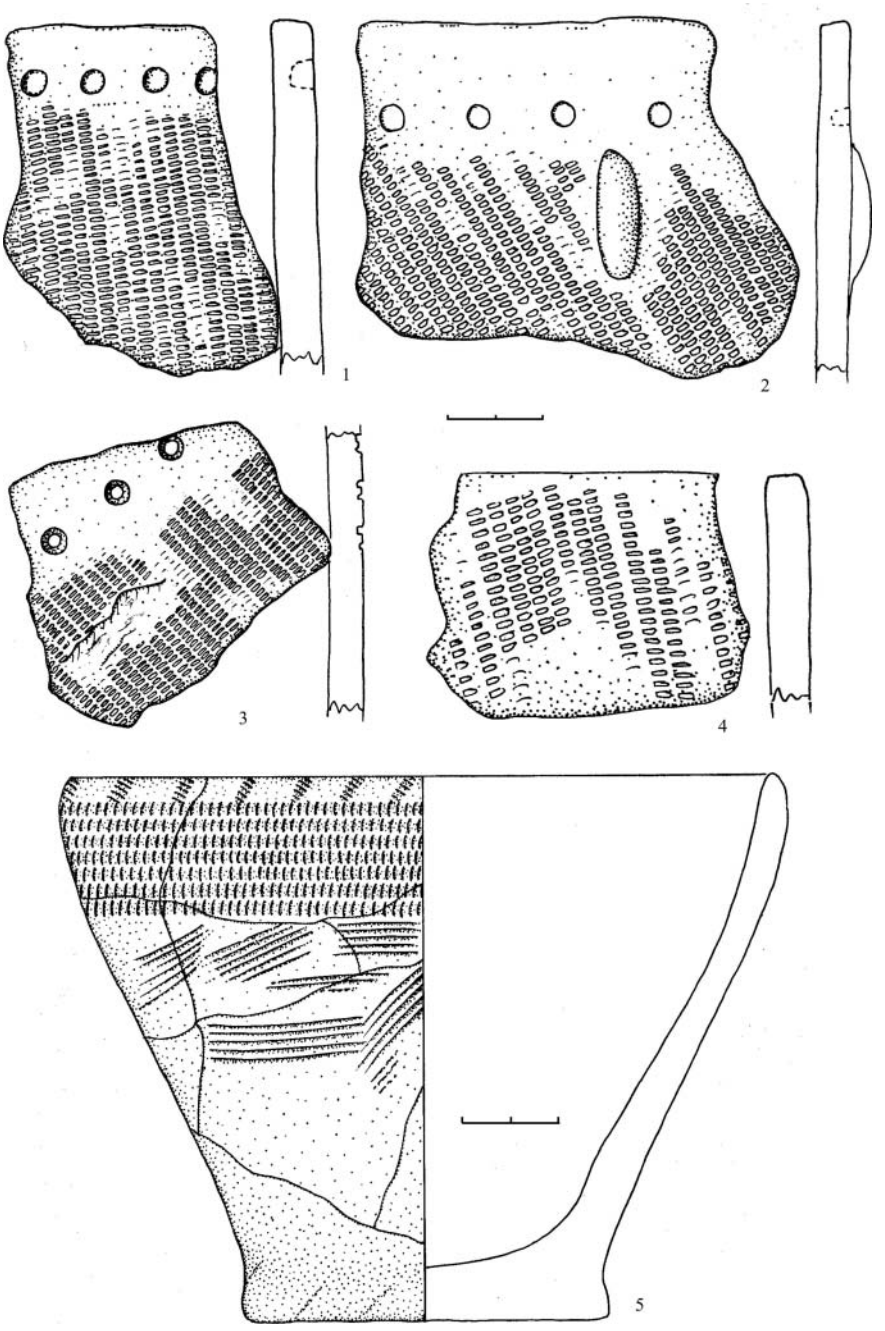

Figure 3. *Early and Middle/Late Jomon pottery from Iturup Island. Middle/Late Jomon: 1—Kurilsk 3 site; 2—Olya 1; 3–4—Kurilsk 1 (drawing from photographs in unpublished excavation report by V. I. Gulyaev participated in the 1982 campaign by the Peter the Great Museum of Anthropology and Ethnography along with Y. V. Knorozov); 5—Yankito 1 (unpublished data by O. V. Yanshina). Bars are in centimeters.*

arrowheads and knives were found on the destroyed surface near Pioner Village (Figure 1; in the original source, the name of the village located 5 km from the Pioner is given as Kuybyshevo but is non-existent now) (Golubev 1978; see also Vasilievsky 1973: 163–166, 255; Vasilievsky 1975:65–67). Due to the absence of pottery, the site could have been dated to within pre-ceramic times, although its general appearance is similar to the early stages of Jomon (e.g., Vasilievsky 1975:67). Yamada (1996:3) and Vasilevsky (2008:170) mentioned a find of Urahoro type potsherds from the Kitovoe site near the village of the same name between the Yankito and Kurilsk [Shana] sites (Figure 1). This was surface collection only and so it is difficult to discern its cultural affiliation from the available data. Another site was found on Kunashir Island near Sernovodsk [Tofutsu] Village known as 'Sernovodskoe' (Figure 1). Here, cord-marked pottery with thick walls was collected from the surface (Vasilevsky and Shubina 2006:166) and is provisionally dated to no later than 5,000 years ago (Vasilevsky 2008:170). However, it is clear now that this type of pottery cannot be used as an index of the Early Neolithic and likely belongs to the Middle–Late Neolithic (see below).

It should be noted that archaeological materials from the above mentioned sites presumed to be Early Neolithic originate only from surface collections which are stored at the Museum of Archaeology, Sakhalin State University in Yuzhno-Sakhalinsk (see Prokofiev 1999; Vasilevsky and Golubev 1996). These collections are not published and require additional study to be properly placed in a chronological context.

The Middle–Late Neolithic

The principal cultural complex of this time is the Yuzhno-Kurilsk culture. The primary sources for this section are papers and books by Golubev (1968, 1970, 1972, 1973a, 1973b, 1986, 1989, 1995) and Vasilievsky (1973, 1975). It should be noted that excavations in the 1960s and 1970s were rare, and few samples for radiocarbon (^{14}C) dating were collected from these contexts. Most of the collections were acquired from destroyed sites, without much, if any, stratigraphic control. The results of excavations were also published in an abridged fashion, all of which have made description of the Yuzhno-Kurilsk culture fairly tentative.

The Middle–Late Neolithic in the southern Kurile Islands is represented by many more sites than studied by Golubev (1970, 1972, 1973b), but most of them have been partly or completely destroyed and are known only from surface collections. In the initial stage of Neolithic research in the Kuriles, these sites were combined into the Yuzhno-Kurilsk culture (Golubev 1970, 1972; Vasilievsky 1973). As archaeological investigation of the larger region progressed in the 1980s–2000s, including on Sakhalin and Hokkaido, it became clear that these were multicomponent assemblages, with artifacts from the Middle–Late Jomon and Epi-Jomon periods mixed together. Unfortunately, the summarizing of new observations done in the 1980s–2000s is not yet complete, and issues of cultural chronology of the Middle–Late Neolithic of Kurile Islands have not been fully analyzed.

The primary concentration of Middle–Late Neolithic finds is on Kunashir and Iturup, though some sites are known on Urup. The Kasatka, Reidovo [Bettobu], Alekhino, Pioner, Lake Tankovoye, Sernovodskoe, and Rybaki sites are the most representative sites (Figure 1) and were occupied between ca. 4200–2500 BP (Table 1). Both the stone and ceramic assemblages are similar to Hokkaido complexes of the same age.

According to Vasilievsky (1975), stone tools include mostly arrowheads (the most numerous lithic artifact type), spear points, knives, adzes, axes, scrapers, perforators, hammerstones, and pebble net sinkers. Arrowheads are usually small (1.2–1.7 cm long), though some can reach up to 2.7–3.2 cm long. They are of various shapes: double retouched triangular with straight bases, triangular with concave bases, triangular and stemmed, leaf-shaped, rhomb-like, triangular, and partly retouched. Knives are double-retouched with an oval-concave blade, leaf-shaped, stemmed, triangular, elongate-oval,

Table 1. **Radiocarbon dates from Neolithic sites in the southern Kurile Islands.**

Site, layer	^{14}C date, BP	Lab code	Material dated	Calendar date, cal BC*	Reference**
Early Neolithic					
Yankito, locality 1	7030 ± 130	I-?	Charcoal	6210–5660	[1]
	6980 ± 50	Le-3230	Charcoal	5980–5750	[1]
Yankito, locality 2	7055 ± 45	AA-78928	Charcoal	6020–5840	[1]
	6895 ± 55	AA-78927	Charcoal	5900–5670	[1]
Middle/Late Neolithic (Yuzhno-Kurilsk culture)					
Kasatka	4220 ± 160	Le-4462	Charcoal	3350–2350	[2, 3]
	4000 ± 100	I-16047#	Charcoal	2870–2210	[4]
	3880 ± 30	OS-67417$	Charcoal	2470–2240	[4]
	2720 ± 60	Le-3231	Charcoal	1000–800	[2, 3]
Olya	4020 ± 30	Le-4220	Charcoal	2620–2470	[2, 3]
	3610 ± 40	Le-2167	Charcoal	2130–1880	[2, 3]
	2410 ± 40	Le-2419a	Charcoal	750–690	[2, 3]
Rybaki [Arimoi]	3980 ± 60	Le-4083	Charcoal	2830–2290	[2, 3]
	3930 ± 30	OS-67412$	Charcoal	2560–2300	[4]
Berezovka	3610 ± 40	Le-2820	Charcoal	2130–1880	[2, 3]
	2710 ± 40	Le-2821	Charcoal	970–800	[2, 3]
Lesozavodsk	3560 ± 40	Le-2374	Charcoal	2020–1770	[2, 3]
	3020 ± 40	Le-2373	Charcoal	1400–1150	[2, 3]
Lake Tankovoye	3550 ± 20	Le-4459	Charcoal	1950–1780	[2, 3]
	2990 ± 110	Le-4458	Charcoal	1490–920	[2, 3]
	2930 ± 40	Le-2369	Charcoal	1260–1010	[2, 3]
	2710 ± 40	Le-2372	Charcoal	970–800	[2, 3]
	2520 ± 40	Le-2621	Charcoal	800–520	[2, 3]
	2505 ± 35	AA-37085	Burnt food	790–430	[4]
	2460 ± 40	Le-3226	Charcoal	760–410	[2, 3]
Malaya Kuybyshevka	2710 ± 40	Le-4460	Charcoal	970–800	[2, 3]

*Calib 6.0.1 software was used (with ± 2 sigma; and rounding to the next 10 years and combining all possible intervals).

**Numbers correspond to those articles: [1]—Yanshina and Kuzmin (2010); [2]—Kuzmin (2006b); [3]—Zaitseva et al. (1993); [4]—this article.

#Sample was collected by Y. V. Kuzmin and Y. V. Knorozov from in situ cultural layer in 1988, and dated in the USA (for Lab Code, see Yanshina and Kuzmin 2010).

$Samples were dated within the framework of the Kuril Biocomplexity Project.

segment-like, and sub-rectangular ones. Scrapers are of different shapes and sizes, including large ones (*skreblo* in Russian terminology). Spear points are of a different shape, including those which are shouldered and propeller-like (at Lake Tankovoye cluster; see Golubev 1973b:251). Raw materials used include mainly chert, jasper-like rock,

Figure 4. *Middle Jomon lithic artifacts from the Olya 1 site. 1–5—arrowheads; 6–8—end scrapers; 9–12—knives. Raw material: 1—obsidian; 2–9, 11–12—basalt; 10—silicified schist (unpublished data by O. A. Shubina) (color figure available online).*

obsidian, sandstone, andesite, and basalt. The Middle Jomon assemblage of stone tools from the Olya 1 site is an example of the diversity of lithic artifacts found during the Middle–Late Neolithic (Figure 4).

Pottery is the most distinctive part of the Yuzhno-Kurilsk culture artifact complex. Vessels are usually large and irregular conoidal in shape with thick walls, wide rims, and narrow flat bottoms. The external part of vessels is covered by cord-mark impressions. Often, the upper part of the body is decorated by an ornamental belt consisting of appliqué rolls. The rims are of two types: simple ones and more elaborate ones with relief ledges and appliqué bands. Due to current uncertainty on the status of the Yuzhno-Kurilsk culture (see below), we provide examples of typical Middle Jomon pottery in Figure 2 (nos. 1–2) and Figure 3 (nos. 1–4).

As for other archaeological features, several dwellings have also been excavated. These are usually semi-subterraneous with vertical walls (up to 0.6–0.8 m deep) of round or rectangular shape and are small, ranging from 3–5 m long in diameter. Dwellings have a corridor and entrance on the leeward side, with evidence of postholes and a hearth in the center (Vasilievsky 1973:172). A single burial ground, presumably associated with the Yuzhno-Kurilsk culture/period, was found in the 1980s near Lake Tankovoye by Knorozov (1992), though it was only preliminarily investigated (Prokofiev 2003; see also Vasilevsky and Shubina 2006:166). In total, 18 graves were documented, with individuals interred in paleosols within the sand dunes. Unfortunately, the generally poor preservation of human remains has not permitted detailed bioarchaeological analysis.

DISCUSSION

Radiocarbon Chronology

Overall, despite decades of study, the chronology of Neolithic complexes in the southern Kuriles remains incomplete. It is clear that the Yankito cluster on Iturup Island dating to ca. 7000 BP is the oldest documented site in the Kurile Islands (Table 1). As for later period sites, Golubev (1973b:253, 1989:92) and Vasilievsky (1975:74) have determined that the age of the Yuzhno-Kurilsk culture dates to around the second to first millennium BC. In subsequent research, Golubev (1995) assigned some sites to two different phases: 2500–3000 BP (Alekhino) and 3000 BP (Lake Tankovoye) based on the limited ^{14}C dates available at the time.

Presently, there are about 20 ^{14}C dates for the Yuzhno-Kurilsk culture (Table 1). Initially, all sites in the Kuriles dated to between ca. 4200 and 1800 BP were associated with this particular complex (Kuzmin 2006b:35). Later, there was a provisional boundary placed between the Yuzhno-Kurilsk culture and the following Epi-Jomon complex to ca. 2500 BP (Vasilevsky et al. 2010). The oldest ^{14}C value from the Delfin shellmidden, ca. 2500 BP (see Spevakovsky 1989; Zaitseva et al. 1993), is considered by some scholars to be associated with the Neolithic (Vasilevsky et al. 2010:16). However, the shape of pottery found seems to clearly be that of the Okhotsk cultural type (Spevakovsky 1989:51:fig. 1). From this context, ^{14}C dates of ca. 2500–900 BP were obtained, including one on human bone, which gave a date of ca. 2280 BP (though this requires a reservoir age correction of up to several hundred years; see Kuzmin et al. 2001, 2007). In sum, it is currently difficult to correlate the Delfin site material with the Neolithic (Jomon).

Given that the Epi-Jomon sites north of Iturup are ^{14}C-dated to ca. 2300–1700 BP (Fitzhugh et al. 2002; Phillips 2010), ca. 2510–1750 BP at Shikotan (Spevakovsky 1989), and ca. 2500–1700 BP in the southern Kuriles (Vasilevsky et al. 2010), we can provisionally date the end of the proper Neolithic in the Kuriles to ca. 2500 BP which is why ^{14}C dates younger than ca. 2500–2400 BP are not included here compared to previous studies (Kuzmin 2006b). On neighboring Hokkaido, the beginning of the Epi-Jomon is dated to ca. 250 BC (Yamaura and Ushiro 1999) corresponding to a date of ca. 2300–2200 BP. The long sequence of ^{14}C dates at some sites (Kasatka, Olya, Berezovka [Tannemoi or Ruyaushi], Lesozavodsk [Kamoikotan], and especially Lake Tankovoye) demonstrate that different phases of the Yuzhno-Kurilsk culture are represented, as well as possibly younger Epi-Jomon and Okhotsk complexes (see ^{14}C dates for these sites in Kuzmin 2006b; Vasilevsky et al. 2010; Zaitseva et al. 1993).

Thus, based on current knowledge, it is possible to place the age range of the Neolithic in the Kuriles to ca. 7000–2500 BP, consistent within the broader cultural-historical spectrum found in the Sea of Japan basin. The important observation is the dearth of ^{14}C dates in the time period of ca. 7000–4200 BP (Table 1). Given the fact that we already have at least 20 ^{14}C values for the Neolithic in the southern Kuriles, it is possible that at ca. 7000–4200 BP, population density was quite low, explaining the paucity of sites during this time span even after 50 years of survey.

Cultural Chronology and Periodization

From the beginning of Neolithic studies in the Kurile Islands, it became evident based on similar artifact typologies and subsistence remains that there must have been close connections with neighboring Japan (primarily Hokkaido Island) which were facilitated by the use of watercraft. This allowed scholars to use data from this area to create a cultural chronological framework and periodization in the Kuriles. However, the absence of hard evidence (i.e., well-excavated sites) greatly complicated this task.

Observations and comparisons were initially developed by Chubarova (1960). The inventory of stone artifacts and ceramics from the Kasatka site was found to be similar to the Late Jomon of Japan, particularly the Ubayama and Horinouchi pottery styles (Chubarova 1960:132). These styles are

associated with the late and final stages of Jomon on the Kanto Plain of Honshu Island in Japan (e.g., Kobayashi 2004:31, 165). Chubarova (1960:138) (see also Kozyreva 1964) concluded in 1956 that Kasatka was the oldest among the localities first studied in the Kuriles. Another attempt by Knorozov (1992) established two types of Middle–Late Neolithic pottery, "coastal" and "calendar". The "coastal" type was found at the Olya, Reidovo, Tikhaya, and Lesozavodsk sites and dated to 4000–3000 BP, while the "calendar" type was identified at Lake Tankovoye (east bank) and dated to 3000–2300 BP (Zaitseva et al. 1993). Unfortunately, Knorozov's (1992) data were not related to information presented by Chubarova (1960) and were based mainly on surface collections.

The latest attempt to summarize all data available for the Neolithic of Kurile Islands was recently conducted by Vasilevsky et al. (2010). Sites older than ca. 7000 BP were considered as Early Neolithic, sites within ca. 7000–4200 BP as Middle (or Developed) Neolithic, and sites dated to ca. 4200–2500 BP as Late Neolithic. In this scheme, practically all of the existing problems in defining the Neolithic period in the Kuriles are inherited which hampers a useful cultural chronology within this particular time period.

The scheme by Vasilevsky et al. (2010) does not have strong archaeological grounding and only determines the limits of Jomon-like sites in the Kurile Islands, making the internal sequence of cultural events within the Kuriles' Jomon unclear. The reasons for dividing it into early, middle, and late stages are also somewhat obscure. Data obtained on the Yuzhno-Kurilsk culture sites are also not particularly useful because the assemblages consist of material that has been admixed.

Currently, cultural periodization and chronology of the Neolithic in the Kurile Islands remains underdeveloped. The reasons for this are twofold. First, there has been a paucity of archaeological research in the Kuriles, and that which has been done has often not followed modern archaeological conventions in recovery. This has resulted in major gaps in the cultural chronology for the islands. The best assemblages we currently have at our disposal to examine the colonization of the Kuriles and subsequent maritime adaptations rests with the beginning (Yankito cluster) and the end (Epi-Jomon) of the Neolithic epoch in the southern islands. It is still unclear what happened between these cultural periods. Currently, the "Yuzhno-Kurilsk culture" is a mostly historiographic phenomenon, with no well-controlled excavations and the inclusion of numerous later (i.e., Epi-Jomon) artifacts into a "Yuzhno-Kurilsk" assemblage.

Another issue is attempting to define which epoch the Yankito complex actually belongs. We prefer to consider it as the boundary between the Early and Middle Neolithic, though, as noted previously, this is different from the view taken by Japanese archaeologists working on Hokkaido. We should point out that due to the discovery of very early ceramic vessels in East Asia (Boaretto et al. 2009; Kuzmin 2010) and revision of some of the early regional complexes (Osipovka and Gromatukha in the Amur River basin, and Mikoshiba on Honshu Island; see Derevianko and Medvedev 2006; Tsutsumi 2008), it has become possible to place the emergence of the Neolithic in the northeastern and eastern regions of Asia much earlier than previously thought, now dating to around the Late Glacial period (ca. 14,800–12,300 BP). Because of this, the internal periodization of the Neolithic in Northeast Asia has also changed. Russian scholars currently consider the earliest ceramic sites in the Kuriles (Yankito cluster) as Early/Middle (Developed) Neolithic when pottery was widespread in northern Eurasia. The rest of the Neolithic complexes in the Kurile Islands should henceforth be assigned to the late phase (see Vasilievsky et al. 2010).

Colonization and Occupation

Islands such as the Kuriles are amenable to studying the processes involved with human adaptation to new landscapes given their pristine environments and ecological fragility (e.g., Fitzpatrick and Keegan 2008; Kirch 2007; Rick and Erlandson 2010). Archaeologists (e.g., Cannon and Meltzer

2004; Meltzer 2004) have suggested that one strategy that humans may have developed when encountering new environments (whether terrestrial or insular), was to remain highly mobile and opportunistic. This mobility would then be reduced as groups more widely explored their landscapes and found needed resources. Eventually, specific areas would be identified which were advantageous to long-term survival (e.g., fresh water, easy accessibility to food, fuel, stone, etc.). Current data in the southern Kuriles suggest that the earliest people ca. 7000 BP probably followed this strategy. Although several early sites have been documented on Iturup Island, they remain sorely understudied and we know little about the adaptive diversity of these early coastal peoples and how they adjusted not only to learning a new landscape, but to dealing with the rising sea levels and changing land- and seascapes during the Holocene. It would be expected too that marine foods played an important role in the diet, though interestingly, the evidence is ephemeral.

Archaeologically, one of the more central issues in the Kuriles is related to identifying evidence of early human colonization and examining how humans explored and utilized their island landscapes. Due to the dearth of research in the southern Kuriles, it is currently unknown whether these early groups were exclusively mobile, as some sites such as the Yankito cluster suggest a degree of sedentism and appear to have been base camps that contain evidence of a variety of activities. Is it possible that early peoples settled first along the western side of Iturup from which they ventured out to logistical foraging camps elsewhere on Iturup or other islands? This model suggests a degree of residential sedentism at select base camps, but data are needed to test issues of mobility to help determine if people actually led a somewhat settled lifestyle during the Early to Middle Holocene. If so, this would seem to have been predicated on the exploitation of marine foods for which there is currently little evidence. Human settlement systems would have also been affected by sea level changes, natural catastrophes, and/or associated landscape reorganization, factors that need to be integrated into current models of settlement and subsistence.

Subsistence

Unfortunately, Neolithic sites in the Kurile Islands are found in either highly acidic volcanic soil matrices (e.g., Yankito) or sand dunes; in both cases, the preservation of organic remains is extremely poor. For example, no plant remains have yet been recovered from Neolithic contexts in the Kuriles. In such cases, it is only possible to reconstruct economic activities from the typology of stone tools, though this is not, of course, necessarily reflective of the true nature of local subsistence strategies. Based on limited evidence, it has been suggested that Neolithic inhabitants in the southern Kuriles subsisted on terrestrial hunting, fishing, and gathering (e.g., Vasilievsky 1973:175). The use of marine sources by groups associated with the Yuzhno-Kurilsk culture has been alluded to (Golubev 1989:93; Vasilievsky 1973:175), though the data is sparse.

Currently, there is no reliable evidence of Neolithic peoples in the Kuriles gathering mollusks or hunting marine mammals. Again, given the early stages of archaeological research here, only very general conclusions can be made regarding the nature of terrestrial hunting, coastal fishing (possibly), and the gathering of wild plants and fruits. It is clear, however, that marine resource use became widespread in the Kurile Islands in the following Epi-Jomon period (e.g., Fitzhugh et al. 2002; Okada H. 1998) despite it being well-developed during the Jomon period along the northern part of the Japanese Archipelago (e.g., Niimi 1994; A. Okada 1998; H. Okada 1998; Yamaura 1998).

As for the remains of different terrestrial (bear) and marine (seal and killer whale) animals at the Alekhino site (Golubev 1970:222), they most likely belong to the later Epi-Jomon or Okhotsk cultural complex [upper cultural layer according to Golubev (1970:223–224)], which is dated to ca. 2500–1800 BP (Kuzmin 2006b:32; Zaitseva et al. 1993)]. The same is also probably true for the Kasatka site where Chubarova (1960:128) noted destroyed shellmiddens,

though their association with Neolithic artifacts and pottery remains ambiguous. It is also worth noting that the pottery with plain walls and stick stripes, different from Jomon-like varieties with cord-marked designs, was detected (Chubarova 1960). This could be an additional argument in favor of some association of Kasatka's materials with shellmiddens during the Epi-Jomon/Okhotsk period. Examination of the Kasatka site area by Y. V. Knorozov and Y. V. Kuzmin in 1988, and 20 years later by Samarin (2008), did not reveal marine shells in the Neolithic cultural layer. At the Sernovodskoe site, shellmiddens with bones of marine fish and mammals are associated with poorly fired, walled ceramic vessels that have little or no decoration (Golubev 1970:224). This is atypical for Jomon, but quite characteristic for the Naiji (Ainu) complex of the late Middle Ages according to our current knowledge.

Preservation and Visibility of Sites

Because the southern Kurile Islands are a very dynamic region in terms of volcanism, earthquakes, tsunamis, and other natural agents (sea waves and wind), this has affected the preservation of archaeological sites and their visibility during survey. Holocene volcanic activity in the southern Kuriles was not very active compared to the Late Pleistocene (Ganzey et al. 2011; Razjigaeva et al. 2011), with only thin tephra layers detected at different localities on Kunashir and Iturup. These resulted from eruptions of several major volcanoes, including Golovnin Caldera along with Mendeleev and Tyatya on Kunasir Island as well as Lvinaya Past' Caldera and Bogdan Khmelnitsky, Chirip, and Medvezhy volcanoes on Iturup (Razjigaeva and Ganzey 2006) (Figure 1). At some archaeological sites around the Lake Tankovoye cluster, thin volcanic ash layers were also detected (Kuzmin 1991). As such, it does not appear that volcanism and earthquakes significantly affected Neolithic sites in the southern Kuriles. The same is true for tsunamis which seem to have primarily impacted the Lesser Kuriles and to some extent the southern part of Kunashir (Ganzey et al. 2011). However, aeolian deposition and movement is common in the southern Kuriles and has influenced the preservation of prehistoric sites (Razjigaeva and Ganzey 2006:130–136). Because many of these sites are located on or around sand dunes, shifting sands have buried and re-exposed cultural layers as was observed in the Lake Tankovoye cluster (Kuzmin 1991) and at the Kasatka site (Samarin 2008).

The main factor affecting the preservation and visibility of archaeological sites in the southern Kuriles is human-induced erosion. Several sites and site clusters, including Kasatka, Lake Tankovoye, Yankito, Olya, and Rybaki, have been severely impacted or destroyed by military activity during construction of installations and the movement of armored vehicles by Japanese forces in the 1930–1940s and the Soviet army in the 1950–1980s. Military maneuvers such as exercises conducted by the Japanese Navy in November 1941 in Kasatka [Hitokappu] Bay prior to the Pearl Harbor attack in Hawaii, caused serious damage to much of the coastal landscape. After the late 1940s, these activities accelerated when the southern Kurile Islands became heavily militarized by the Soviet Union, and resulted in countless archaeological sites being destroyed or badly damaged.

The fact that the majority of prehistoric sites in the southern Kuriles are located on coastal terraces and dunes, and on the coast along the cliffs (Kuzmin 1991), have made them extremely vulnerable to modern human impacts. As a result, archaeologists often find scattered potsherds and stone artifacts in close proximity to where the initial site would have been. This is a phenomenon that has been observed since archaeological survey began in the Kuriles (e.g., Chubarova 1960; Golubev 1973a; Fitzhugh et al. 2002; Schnell 1932). While it is difficult to estimate how many archaeological sites have actually been lost, the amount of scattered artifacts show that many features (dwellings and burials) have been destroyed, though it is still possible to establish the presence of prehistoric human activity in a given area. The ongoing discovery of new sites in the Kurile Islands is a testament, however, to the

fact that many have still survived and deserve archaeological attention.

CONCLUSION

As we have demonstrated, the study of the Neolithic period in the Kurile Islands is still in its infancy. Very few controlled excavations have been conducted thus far, with the results having only been published infrequently and sporadically. The most important task now is to more intensively investigate sites with good potential to reveal earlier evidence of human occupation in the southern Kuriles, particularly the Yankito cluster (Early/Middle Neolithic), and Kasatka, Olya, Lake Tankovoye, and Rybaki sites (Middle–Late Neolithic). The newly discovered Belozerka site on Kunashir Island (Samarin 2008), recently ^{14}C -dated to ca. 5000–3700 BP (authors' unpublished data), is also a good candidate for more detailed research in the future. Another potentially early Neolithic complex is found at the Mayachnaya 2 and 3 sites on Shikotan Island.

In addition, studies of subsistence should be conducted with the help of advanced techniques, including stable isotope analysis of animal and human remains and lipid analysis of potsherds (e.g., Craig et al. 2007) to help resolve questions relating to subsistence, particularly given the relative absence of faunal material. The identification of sources of obsidian is another important avenue of study. Given that initial compositional research has had good success in the region for discriminating various sources of lithic materials (e.g., Grebennikov et al. 2010; Kuzmin and Glascock 2007; Phillips 2010), future examination that includes earlier sites would surely prove productive. Geochemical analysis of pottery (e.g., Fitzpatrick et al. 2006) might also prove useful in examining manufacturing techniques and sources of clay used in pottery production and how these artifacts, like lithic material, were distributed through various exchange behaviors within or between islands in the region. Additional ^{14}C dates from charcoal and/or bones from undisturbed contexts in association with lithic tools and pottery is critical for developing a firmer chronological framework for the Neolithic of southern Kuriles.

Only after new data from secure excavations are collected and further scientific analyses performed on a broad range of artifactual and zooarchaeological material, we will be able to more fully understand the mechanisms by which prehistoric occupation in the Kuriles was structured and how peoples adapted to maritime environments in more insular and remote regions of the Russian Far East, a phenomenon that still remains inadequately studied in relation to other parts of Northeast Asia. Overall, while the earliest stages of occupation in the Kurile Islands are relatively unknown, the existing evidence demonstrates an occupation that took place by at least around 7000 BP, if not earlier. Opportunities to investigate the Yankito site cluster on Iturup would surely be productive in identifying a range of human behaviors related to initial colonization of islands and subsequent maritime adaptations that took place during the Holocene as seafarers explored these aquatic realms.

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END NOTE

1. One reviewer suggested that the term "Neolithic" is uninformative and somewhat contradictory given that it generally describes a new age of lithic biface and flake production and the

onset of food production and intensification. They further suggested that the term "Ceramic Horizon" might be more appropriate. But to call the complexes found during this time period "Ceramic" would also not be entirely accurate given that pottery is also found later in time during the Epi-Jomon and Okhotsk complexes. As such, we continue to use this terminology, but recognize that as further research is conducted on the chronology and archaeology of this earlier phase of human settlement, that it may require further revision.

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