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PLEISTOCENE TEXTILES IN THE RUSSIAN FAR EAST: IMPRESSIONS FROM SOME OF THE WORLD'S OLDEST POTTERY

ABSTRACT: Recent excavations at a series of terminal Pleistocene sites in the Amur River basin and the Primorye region of the Russian Far East have produced some of the earliest evidence of pottery production in the world (Derevianko, Medvedev 1995, Zhushchikhovskaya 1996, 1997a, 1997b). Additionally, and like the novel reports of an elaborate textile industry for Upper Paleolithic Moravia (Adovasio et al. *1996, 1997, Soffer* et al. *1998), systematic visual and microscopic examination of impressions on these Far Eastern ceramics reveals the presence of a sophisticated plant-fiber-based perishable technology. Interestingly, the technological types represented in this assemblage precisely mimic those recovered from the earliest levels of a number of western North American sites and may represent the prototype for this venerable industry as expressed in the New World.*

KEY WORDS: Russian Far East – Perishable technology – Pleistocene pottery – Mass harvesting

BRIEF HISTORY OF DISCOVERY AND EXCAVATION

Currently, some of the world's oldest pottery derives from the Gasya site in the lower Amur River basin of the Russian Far East (Derevianko, Medvedev 1995). This material dates to ca. 12,960 ± 120 BP (Le–1781) and is associated with flaked stone tools described as Mesolithic. As might be expected of a site of such age which was excavated in the mid-1970s, Gasya was not initially recognized or identified as a ceramic-bearing site nor was evidence of perishable fiber artifacts considered a possibility.

Between 1989 and 1996, a series of additional sites with early ceramic assemblages were discovered and excavated in three large and nearly contiguous regions of the Russian Far East (*Figure 1*). These sites include Khummy, Gromatukha, Ust-Ulma, and Novopetrovka in the Amur River basin; Ustinovka–3, Almazinka, Chernigovka–1, Chertovy Vorota, and Boisman–1 in the Primorye Region; and Kuznetsovo–3, Kuznetsovo–4, and Sadovniki on Sakhalin Island. These materials date variously from the 13th to 7th millennia BP, with the oldest ceramics primarily deriving from Gasya and Khummy in the Lower Amur River basin and the youngest from sites at the southern end of Sakhalin Island. In addition to Gasya, this preliminary study focuses on ceramic materials recovered from Chernigovka–1 and Gromatukha.

Chernigovka–1 was discovered in 1985 by members of an archaeological club from the local school in the village of Chernigovka. A site visit and general survey was conducted in 1987 by specialists from the Education College of Ussuryisk and from the Institute of History, Archaeology, and Ethnography of Peoples of the Far East, Russian Academy of Sciences. Unfortunately, field excavations were not possible because the site was greatly disturbed prior to its discovery. However, abundant but unstratified artifactual materials were collected. As with Gasya, during a re-examination of the archaeological materials in 1995, the presence of Late Pleistocene/Early Holocene ceramics, unusual for the Primorye region, was recognized.

FIGURE 1. Regional map of the southern Russian Far East and Manchuria showing the Amur River basin and the location of the three sites featured in this report.

Gromatukha was first discovered in 1961 and excavated in 1965–66. During the excavation three cultural horizons were distinguished and a collection of approximately 3,000 ceramic specimens were recovered. The results of this excavation were reported in 1977 by Derevianko and Okladnikov but included only a preliminary assessment of the ceramics. The focus of their report was the archaeological culture termed Gromatukhinskaya and its relationship with other culture complexes. The authors noted, however, that a quantity of ceramic fragments contain grass-like impressions on their surfaces and botanical inclusions in the paste. The mean radiocarbon date produced by these ceramic sherds is 11,500 ± 90 BP.

The ceramics from these sites are under study by my colleague and co-author, Irina Zhushchikhovskaya, of the Far Eastern Division, Russian Academy of Sciences, and at the urging of Olga Soffer, she has been fit to allow me to scrutinize the impression casts made therefrom. In a manner similar to the recent studies of Upper Paleolithic Moravian fiber artifact impressions conducted by myself, Adovasio, and Soffer, this preliminary study represents not only an attempt to further elucidate the technological processes of early ceramic manufacture, but, perhaps more importantly, involves furthering our understanding of the early appearance, necessity, and ubiquity of perishable fiber artifacts in the archaeological record. The recognition of these qualities as associated with that long ago orphaned artifact class called perishables has been slow to germinate but is currently making headway and has already reshuffled our thinking about human agency and activity in the Upper Paleolithic (Adovasio *et al.* 1996, 1997, Soffer *et al.* 1998).

ENVIRONMENTAL SETTING

Regional Setting

Amur River Basin

At 4,416 km (2,744 mi) long, the Amur River is the eighth largest river in the world and the largest in Siberia. Its drainage basin encompasses some 1,855,000 km^2 (716,200 mi^2). Also known as the Black Dragon River, the headwaters of the Amur rise where Mongolia, Russia, and China meet. The river is officially formed by the union of the Argun and Shilka rivers. From this junction it flows for ca. 1,770 km (1,100 mi) to the east and southeast along the Russian-Chinese border. It then turns north and flows an additional ca. 1,046 km (650 mi) through Russia and empties into the Tatar Strait and Sea of Okhotsk. Incredibly, it remains undammed and is bridged only twice, making it the largest free-flowing, navigable river in the world. The river is fed primarily by monsoon rains that fall in summer and fall. The upper and middle reaches of the Amur flow through alternating sections of mountain valleys and open plateau country. The lower Amur flows through a low, open plain which is often inundated during the high-water season from May to October. From November to May the river is icebound and functions, perhaps even more efficiently than in summer, as a highway.

While much of the basin lies in the taiga vegetation zone, the river traverses steppe, broad-leaved, mixed broad-leaved, and coniferous forests. Within this wide range of habitats, the river and basin are home to a truly unique, rich, and varied biota. Nearly 100 species of fish, including the endangered kaluga (a sturgeon), 200 species of birds, including endangered species of storks and cranes, and an incredible array of mammals, including sable, roe deer, reindeer, boar, brown bear, moose, snow sheep, Amur leopard, and Siberian tiger (Winchester 2000), inhabit the region. Regarding this broad biological diversity typical of the region and the highest in Russia, Smirenski (1998) recently and succinctly described it as the only place where "... taiga and subtropical forests coexist ... oaks grow next to larches, leopards coexist with wolverines, and Siberian tigers hunt reindeer."

Monsoonal climate patterns prevail in this area with dry, cold air from Siberia in the winter and moist ocean winds in the summer predominating.

Primorye Region

The Sikhote Alin mountains and the region's proximity to the Sea of Japan are the defining characteristics of the Primorye territory, the most southerly part of the Russian Far East. This region, often described as maritime, extends from the North Korean border to just south of the mouth of the Amur River and is typically divided into three areas, south, east, and north. The southwest-northeast trending Sikhote Alin range forms a mountainous spine down the middle of this region, and while the highest peak, Mount Tardoki-Yani, is only 2,077 m (6,814 ft), the mountains are rugged and the relief is complicated. The west side of this range is drained by the northward-flowing Ussiri River, a branch of the Amur, where it forms the Russian-Chinese border. The east side is highly dissected by short, swiftly-flowing streams and the coastal plain is quite narrow with few harbors save for those of Peter the Great Bay in the south. The configuration of the coast itself ranges from deeply ingressed bays and lagoons in the south to small box bays and inlets in the east and north (Cassidy 1999).

As with the Amur River basin proper, this area can be characterized as biotically rich and diverse. The mountains themselves are densely forested with birch and conifers on the higher slopes and mixed deciduous forest lower down. The climate is dominated by the Pacific monsoon, with cold winters and almost constant northerly winds. Summer, with its onshore southeast winds, is wet and warm. However, in the south of the Primorye territory, the climate is ameliorated by the warm waters of the north-flowing Tsushima Current (Cassidy 1999). Along the more exposed eastern and northern coasts of the Primorye territory the relatively strong and cold coastal currents flow south from the Sea of Okhotsk through the Tartar Strait (Cassidy 1999) and similarly influence the climate albeit in an opposite manner. Combined with the rugged terrain, the harshness of the climate here creates what has been described as an inhospitable region (Cassidy 1999). Indeed, no archaeological sites have been discovered along the northern coast of the Primorye region.

Site Setting

Gasya

The site of Gasya is located ca. 80 km (50 mi) east of Khabarovsk, near the old Nanai village of Sakachi-Alian (see *Figure 1*). This position essentially marks the border between the middle and lower course of the Amur and is in an area famous for numerous Neolithic petroglyphs typically found along the banks of the river. The landscape is dominated by a low-lying plain. The vegetational community is primarily comprised of coniferous trees, shrubs, and bushes, and the climate is of the continental variety with hot summers and severe, cold winters.

In terms of the local geomorphology, Gasya is located near a cap-like protrusion of a low river terrace. The site is deeply stratified and its cultural deposits vary 1–2.3 m (3.28–7.55 ft) thick. Represented in these deposits are several chronocultural components of consequence including: (1) Mesolithic (Osipovskaya culture), (2) Neolithic, (3) Early Iron Age, (4) Early States' period, and (5) the ethnographic Nanai. The earlier Mesolithic cultural remains primarily correspond to a layer of dense light-brown or light-reddish clay which overlies basaltic bedrock. During the 1980 excavations, a few fragments of pottery were discovered in association with Mesolithic stone artifacts. The earliest pottery was recovered from a depth of ca. 220–224 cm (86.6–88.2 in). At this same depth, several stone artifacts including a knife, a blade-like flake, three scrapers, and a pebble blank of an adz-like tool as well as numerous charcoal fragments were collected. A charcoal sample was submitted for radiocarbon analysis and returned a date of ca. 12,960 ± 120 BP (Le–1781).

Initially, the pottery fragments recovered from the deepest levels of the site were interpreted as representing parts of a single vessel. A probable graphic reconstruction of this vessel was published by Derevianko and Medvedev (1995). Now, after a recent re-examination of this material, it seems more likely that the fragments do not represent a single vessel. However, the earlier graphic reconstruction does correctly portray the main morphological traits of the pottery.

Chernigovka–1

Chernigovka–1 is located in the western reaches of the Primorye territory ca. 100 km (62 mi) east of Lake Khanka, a lake shared by Russia and China and the largest in the Far East (see *Figure 1*). The site is situated near the confluence of two rivers, the Ilistaya and Chernigovka. This area, like that surrounding Lake Khanka, consists of fertile plains with low-lying hills along the river valleys. The vegetative community is dominated by deciduous trees (mostly oaks), bushes, and various grasses. The site is far enough from the coast to be dominated by a continental type climate with mean summer temperatures of ca. 20–25°C and mean winter temperatures of ca. –20°C.

The site is situated near a relic rock which protrudes ca. 10 m (33 ft) above the surrounding modern surface. Extensive quarrying activities at this locale were unfortunately responsible for destroying the better part of the site. However, as noted above, abundant but unstratified artifactual materials were recovered. During the initial analyses of these materials the following chronocultural components were distinguished: (1) Mesolithic (early Holocene), (2) Neolithic, (3) Bronze Age, and (4) Early States' period. The Mesolithic component is represented by a series of stone artifacts including a wedge-shaped core, blades and micro-blades, a ski-shaped flake, blade-shaped flakes, scrapers on large flakes, and a bifacially flaked blank of an adz-like tool.

In the course of the preliminary analyses, Neolithic ceramics, Bronze Age ceramics, and Early States' period ceramics were recognized, but no ceramics attributable to a Late Pleistocene/Early Holocene context were detected. During a re-examination of the archaeological materials from Chernigovka–1 in 1995, a series of small, fragmentary, plant-tempered pottery sherds, which had previously escaped notice, were recognized. This material, unusual for the Primorye region, exhibits archaic technological features inconsistent with Neolithic or later ceramics. Despite the partial destruction of the site and its poor stratigraphy, this material is confidently attributed to an Early Holocene context (Zhushchikhovskaya 1995).

Gromatukha

Gromatukha is located further afield in the region drained by the middle course of the Amur, at the confluence of the Zeya and Gromatukha rivers (see *Figure 1*). Like the site of Gasya, Gromatukha is situated near a cap-like protrusion of a low river terrace. It is worth noting that this location is quite favourable for fishing. The immediate area is covered by dense forest.

This well stratified site, dominated by interbedded sands and loam, yielded materials which initially were attributed to various stages of the Gromatukhinskaya culture and were thought to all be of Neolithic age (Derevianko, Okladnikov 1977). Additionally, the older artifacts from the site were thought to represent a close connection between the stone tool industries of the Gromatukhinskaya culture and that of the Mesolithic culture called Osipovskaya, which was centered on the lower Amur. Consequently, it was assumed that the later Gromatukhinskaya culture, located in the middle Amur region, derived from a migratory component of the Osipovskaya culture.

Additional studies of the stone tool assemblage from Gromatukha revealed a Late Pleistocene/Early Holocene or Mesolithic complex which was typologically distinguished and separated from the Neolithic materials. The ceramic assemblage from the site totals ca. 3,000 specimens and the initial report on the site (Derevianko, Okladnikov 1977) included only preliminary descriptions. At that time the authors noted that some amount of the ceramic assemblage exhibited grass-like impressions on their surfaces and traces of macrobotanical inclusions in the paste. Radiocarbon dates based on this material are as old as 13,310 ± 110 BP.

THE IMPRESSIONS

This preliminary study focuses on a set of 15 positive casts of fibrous impressions present on the ceramics recovered from the sites of Gasya, Chernigovka–1, and Gromatukha. Eight of these specimens derive from Gasya, five from Chernigovka–1, and two from Gromatukha. Three of the specimens exhibit definitive evidence of having been impressed with one type of perishable fiber construction, and one specimen manifests two distinctive and dissimilar impressions. This ratio of the number of sherds with identifiable fiber artifact impressions to total sherd quantity is similar to those reported in the studies of the Upper Paleolithic Moravian ceramic impressions (Adovasio *et al.* 1997, 1999).

Analytical Procedures

The analytical methodology used to analyze the impressions follows that specified in Chapman, Adovasio (1977) for negative impressions recovered from open archaeological loci. Positive impressions were prepared according to protocols specified by Drooker (1992: 251–254). Positive casts were examined and photographed by employing a research-grade Leica-Wild M10 1:10 zoom stereomicroscope with an apochromatically corrected optical system, and all measurements were taken with both a Helios dial sliding caliper and a Fowler MaxCal electronic digital sliding caliper. Measurements are presented in the metric system.

As indicated above, in all but one case each clay fragment presents one impression of a single technological type. On the remaining specimen, more than one type was discovered to be impressed on its surface. In this case, a single specimen number is assigned to the clay fragment and the separate impressions associated with it are designated by sequential lower case letters (e.g., #1a, #1b).

The five identifiable impressions were assigned to two textile/basketry types, one cordage type, and one cordage construction category according to procedures outlined in Adovasio (1977), Emery (1966), and Hurley (1979).

Analytical Results

Textiles/Basketry

One distinctive and obvious technological type and one highly degraded form were identified in this Russian Far East impression sample. These specimens derive from Gromatukha and Chernigovka–1, respectively, and are assigned technological type numbers I and II.

Type I: Close Simple Twining, Z Twist Weft
Specimen #1b, from Gromatukha (*Figure 2*), represents a classic example of plain or simple twined weaving over single warps and can be described as weft-faced twining. The specimen consists of tightly spaced warps and Z-twisted weft rows. The individual plies of the weft rows are produced from final S twist cordage probably two-ply, Z spun, S twist cordage (see Type I cordage description, below). The warps are obscured and thus of indeterminate configuration, however, it can be discerned that they are of similar diameter resulting in a fully flexible texture. The mean diameter of the wefts is 1.05 mm with six weft rows per centimeter, while that of the warps is 1.50 mm. There are six weft rows per centimeter and four for the warps. Additionally, the weft plies exhibit approximately six twists per centimeter and an angle of twist ranging from 20° to 30°. The raw material from which the wefts and warps were created appears to be retted vegetal fiber but of unknown genus and species. The specimen is unmended and lacks selvage. The section of fabric preserved in this impression is quite distinct and displays only slight pre-impression use-wear. Method of insertion of new warp and weft elements is unknown. The specimen is a wall or body fragment and may derive from either a portion of a flexible woven bag or mat or from a length of fabric of an indeterminable shape. This specimen may have been produced on a hanging or horizontal non-heddle frame.

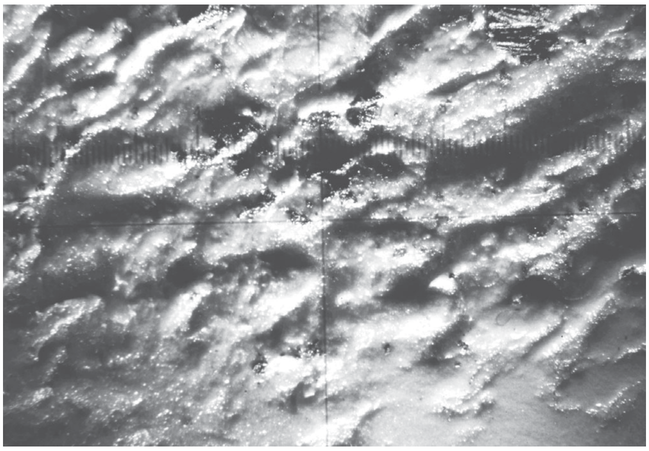

FIGURE 2. Gromatukha #1b, close, simple twining, Z-twist weft.

Type II: Open Simple(?) Twining, Z Twist Weft
Specimen #8, from Chernigovka–1 (*Figure 3*), represents twined weaving over single or possibly paired warps. The specimen represents plain twining if the warps are single and diagonal (twill) twining if the warps are paired. The alignment of the warp crossings indicates that this specimen is more likely to represent plain rather than diagonal twining. Specifically, the highly degraded specimen consists of warps and Z-twisted weft rows spaced at regular intervals leaving the warps exposed. The weft of this specimen is produced from S twist cordage while the composition of the warp is indeterminable. Texture is flexible with the thread-like wefts measuring only 0.32 mm in diameter on a spacing of 1.1 mm. Due to its fragmentary state, the specimen is presumed to have endured heavy use-wear. Any other measurements or attributes such as mends, selvage, wear, and method of insertion of new elements, are undetectable. The fineness of the weft elements indicates that this specimen probably derives from a woven bag or a length of fabric of unknown shape. Though it is possible to manually produce lengths of fully flexible fabric with a gauge as fine as that evinced by this specimen, production would be far simpler on a hanging or horizontal non-heddle frame.

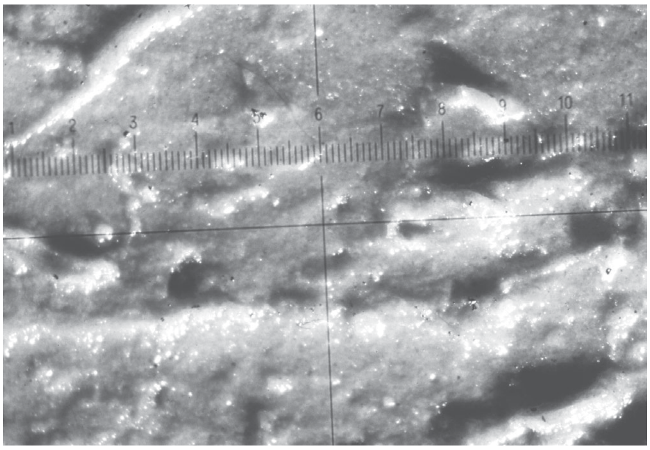

FIGURE 3. Chernigovka–1 #8.

Cordage and Cordage Constructions
In addition to the flexible textile described above, three impressions of cordage and/or cordage constructions, representing two structural categories, have been identified to date in the Russian Far East sample. These specimens are briefly described and discussed below by sequentually numbered type. Two impressions are from Gromatukha while the remaining impression derives from Gasya. The impressions from Gromatukha both belong to the same technological class and represent an example of multiple ply cordage.

Multiple-ply cordage consists of two or more twisted sets of elements (i.e., two or more single plies) secondarily twisted upon one another. Generally, the plies forming multiple-ply cordage, taken individually, are twisted or spun in the same direction. When these plies are then united to form a more substantial structure (i.e., multiple-ply cordage), they are combined by twisting together in the direction opposite that of their initial spin. The alternation of twist directions over successive stages of manufacture serves to interlock the plies together in a coherent composition. It is interesting to note that the cordage components of the twined textile specimens described above are produced from this same Type I cordage.

The remaining specimen, from Gasya, exhibits classic characteristics of a cord-wrapped stick rolled along the surface of the still wet clay.

Type I: Multiple, Two-Ply, Z Spun, S Twist

These specimens (#1a and #2, Gromatukha, *Figures 4, 5*) represent one of two basic forms of two-ply cordage. Specifically, they consist of two Z spun fibrous bunches combined with a final S twist. Both of the specimens are quite similar in details of construction. The overall length of the constructions varies from ca. 1–3.5 cm. The angle of twist for both specimens is in the 20–30° range with a mean of 6 twists per centimeter. Specimen #2 is the finer of the two with a mean diameter of 0.74 mm while #1b averages 1.07 mm in overall diameter with a strand or ply diameter of 0.66 mm. Owing to the fineness of the specimens, they were probably manufactured of bast fibers processed via plant stem retting. The specimens exhibit no splices or decorative components and are not rat-tailed. The degree of wear appears to be fairly light.

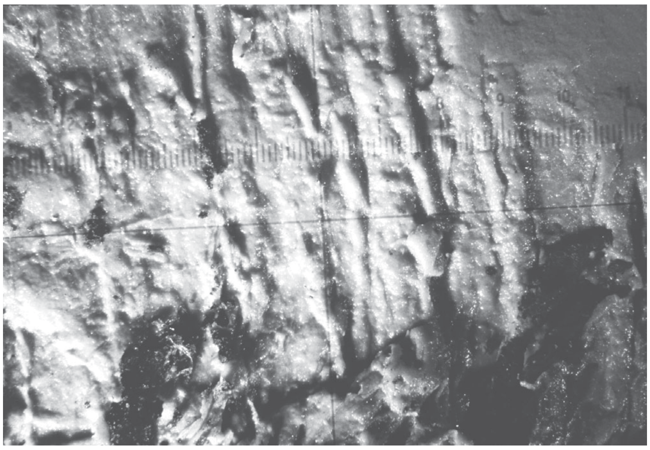

FIGURE 4. Gromatukha #1a.

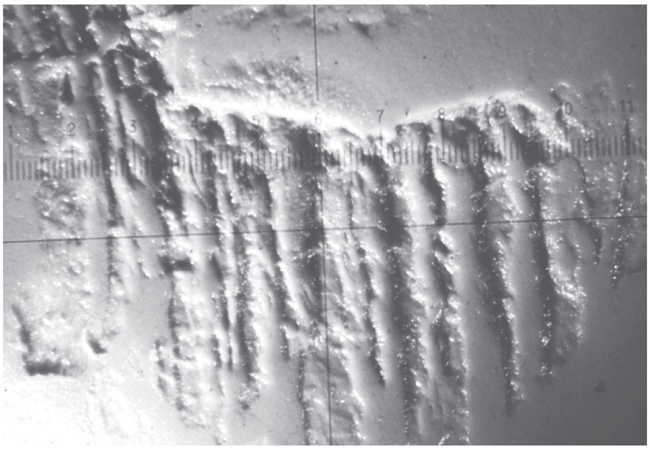

FIGURE 5. Gromatukha #2.

Type II: Cord-Wrapped Stick

This specimen (#N2, Gasya, *Figure 6*) derives from the rim portion of the sherd. Superficially, the impression resembles a series of cord-wrapped sticks lying parallel to one another and oriented at an angle of ca. 60° to the long axis of the rim sherd. Closer examination reveals the presence of successive oblique crossings and not just a series of parallel impressions. To produce such a configuration, the cord must be wound around the stick with wide spaces between successive wrappings and then it must be wrapped again from the opposite direction while carefully crossing the first wrapping with each complete turn. In this case, the initial wrapping was executed from left to right while the final turns were made from right to left. Though somewhat obscured, the cordage appears to be either a multiple or compound variety produced with a final Z twist. It is also quite a bit heftier than the Gromatukha cordage with a diameter of 2.50 mm. The specimen compares quite favourably with the results of rolling a construction labelled cord #257 as described in Hurley (1979: 103).

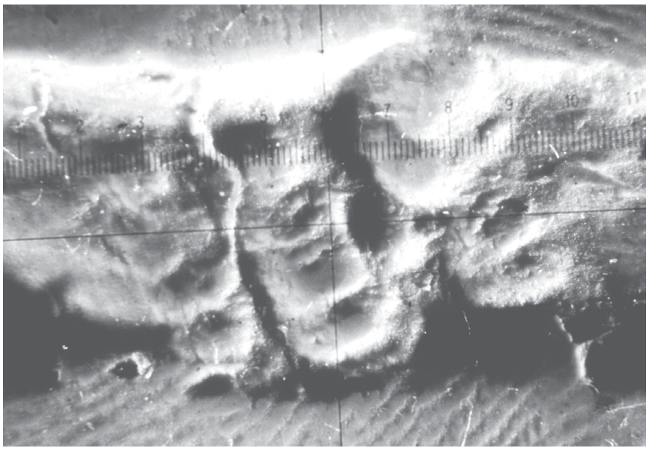

FIGURE 6. Gasya #N2.

INTRAREGIONAL CORRELATIONS

In general, and based solely on the perishable fiber artifact impressions, the technology of pottery manufacture evinced at these three sites is internally quite consistent but differs markedly from one site to the next. The Gasya materials exhibit parallel striations, perhaps created by scraping with a comb or the edge of a shell. Only a rim sherd from this assemblage manifests the distinctive hallmarks of a unique perishable fiber-based technology. The interior and exterior surfaces of the Chernigovka ceramics are quite smooth with little evidence of a fiber artifact industry incorporated into pottery production. The small Gromatukha assemblage, by contrast, contains certain and robust evidence of fiber-impressed artifacts.

Based on these observations, there appears to be a certain amount of standardization within each site, but regionally, the manufacture of pottery – and more specifically the method of surface treatment, decoration, and finish – is by contrast, not uniform or standardized. In terms of fiber artifact technology, however, there may be a greater degree of uniformity expressed in this region. Both specimens of twining, which derive from the pair of sites furthest apart, utilize Z-twist weft rows and a simple or plain form of warp engagement. Additionally, the weft plies exhibit a final S twist. Distinctive criteria such as these have been used ethnographically and archaeologically for over a century to recognize properties of group cohesion and identity (e.g., Adovasio, Gunn 1975, 1977, Adovasio, Maslowski 1980, Carr, Maslowski 1995, Douglas 1930, 1933, 1934, Hyland 1997, Hyland, Adovasio 1997, Mason 1885, 1894, 1900, Morris, Burgh 1941, Pryor, Carr 1995).

CHRONOLOGICAL CONSIDERATIONS AND EXTERNAL RELATIONSHIPS

Direct radiocarbon assays indicate that the range of dates associated with the Gasya material is ca. 10,875–12,960 BP; Gromatukha dates to the interval ca. 10,400–13,300 BP; while the Chernigovka–1 material dates to a slightly younger time period bracketed by radiocarbon dates of ca. 8,000 and 11,000 BP (Jull *et al.* 1998). This brief listing as well as radiocarbon dates associated with ceramic materials from other sites in the region preliminarily indicates that the lower Amur River basin was the center of the earliest appearance and development of pottery making technology in the southern Russian Far East (Kajiwara 1999, Zhushchikhovskaya 1997b).

In order to illuminate potential relationships among ceramic-bearing cultures in east Asia and the relative position of the Russian Far East sites at the Pleistocene/Holocene transition, a brief review of the radiocarbon chronology for Jomon in Japan and for a series of sites in southern China from which pottery has been recovered is in order.

The transition from Paleolithic to Jomon in Japan is in large measure determined by the appearance of pottery. The earliest Jomon pottery, termed Initial Jomon, variously dates from 10,000 BP to 12,500 BP and some may be as old as 13,000 BP (Aikens, Higuchi 1982, Serizawa 1979). Curiously, the oldest material derives from the southern islands of Japan whereas the earliest ^{14}C dates for pottery from Hokkaido, at the northern end of the Japanese archipelago and nearest the Russian Far East, are approximately 8,500 BP (Aikens, Higuchi 1982: 113).

In China, the oldest pottery derives from a number of sites in the southern provinces of Jiangxi, Guanxi, and Guandong. This material dates between 10,000 BP and 13,000 BP (Jiao 1994). And even more remarkably, one date of 14,520 ± 140 BP is said to be associated with pottery recovered from a cave site in Jiangxi province (MacNeish, Cunnar 1998).

In terms of the morphology of the impressions, the overall appearance of the Gromatukha cordage is strikingly reminiscent of, though perhaps somewhat finer than, the decorative treatment seen on a ceramic type illustrated in Aikens and Higuchi's *Prehistory of Japan* (1982: 116). This particular figure illustrates string-rouletted decoration which is known as the Yoriitomon motif. This particular decorative theme is associated with and is a hallmark of Initial Jomon. While one similar feature on a handful of specimens does not strongly or convincingly argue for a direct exchange or sharing of technological information between peoples of the Amur basin and the island Jomon, it is, nevertheless, an interesting coincidence.

Whatever the significance, if any, of the one decorative congruence noted above, the relationships between the pottery manufacturing peoples of the Russian Far East, southern China, and Japan and the issue of technology sharing currently remain unclear. Given the pene-contemporaneity of the oldest dates from these areas, it is understandable that the models proposed for the development of ceramic technology in east Asia have historically relied on ecological and environmental factors associated with the Pleistocene/Holocene transition (e.g., Kajiwara 1999, Serizawa 1976, Zhushchikhovskaya 1997b). The preliminary research reported herein does not claim to elucidate this situation or suggest a new model of development except to point out, obviously, that more work is required here. It is also worth noting that, given the fiber artifact impression evidence, even the earliest pottery evinces different ideas concerning its manufacture. This may suggest an even earlier origin and/or a series of nearly simultaneous but independent origins.

Further abroad, a series of recent studies of impressions on fired clay fragments and figurines from the European Paleolithic have conclusively indicated that elaborate and complex perishable fiber artifact industries were in place at least 27,000 year ago (Adovasio *et al.* 1996, 1997, Soffer *et al.* 1998). These industries included the production of fully flexible twined fabrics, plaited baskets, knotted nets, and various cordage-based constructions. The high likelihood that similarly well developed industries might exist 14,000 years later in the Russian Far East is self-evident. However, this point is emphasized if only to argue for and demonstrate the necessity and ubiquity of perishable fiber artifacts at all times and places inhabited by *Homo sapiens* (Adovasio, Hyland 2000).

In western North America, the oldest extant fiber artifacts derive from a series of sites in the northern Great Basin. The developmental basketry sequence in this area begins ca. 11,000 BP and includes such items as open and close, simple, Z twined bags, mats, burden baskets, trays, and coarse receptacles of a variety of configurations. These items are invariably twined and specifically derive from sites like Fort Rock Cave (Cressman 1942, Cressman, Bedwell 1968, Bedwell 1973), Paisley Five Mile Point Cave No. 1 (Cressman 1942, Adovasio 1970, Andrews, Adovasio, Carlisle 1986), and Dirty Shame Rockshelter (Andrews, Adovasio, Carlisle 1986).

Of considerable interest here is the possible relationship of the Russian Far East perishable industries to those employed by the initial colonists of the New World. In most basic construction particulars the earliest northern Great Basin basketry (and cordage) is not unlike the material reported here. For instance, the specific technological twining type and its method of construction adopted by these early First Americans and that in evidence on the Gromatukha and Chernigovka pottery sherds are identical. Surely, this is a relationship worthy of further exploration.

IMPLICATIONS AND OVERVIEW

Though the current sample size is limited, a number of implications can be derived from this study. First, the ceramic impressions from these sites provide another avenue of discovery concerning the manufacture, use, and meaning of pottery in the Russian Far East. While the general and primary forming methods employed to produce pottery appear to be rather similar throughout the region, the manner of impressing the wet body of a pot with a fiber construction does not. Contrasting evidence such as this can be used to determine issues of relatedness, degrees of interaction between various sites, workshop/community standardization, and levels of regional experimentation.

Second, as has been demonstrated by the discovery of fiber-based perishable artifacts via impression analysis in the Moravian Upper Paleolithic and as is again demonstrated here, it can be seen that from early on perishable fiber artifacts are a necessary and indispensable part of any culture's technological repertoire. We must keep in mind and appreciate that though preservationally challenged, perishable fiber artifacts typically far outnumber durable artifacts. For example, concerning his excavations in north-central Coahuila, Taylor (1966: 73) noted that finished perishable fiber artifacts were four times more common than artifacts of wood and twenty times more common than stone tools. This must also certainly be the case in the rich riverine habitats exploited by the occupants of these sites.

Third and concerning riverine and lacustrine resource foci, near which these sites are located, perishable technologies are indispensable for harvesting and exploiting fish such as salmon. The wide and rich variety of species available in the Amur basin makes fishing viable nearly year round and sites such as Gasya are perfectly located to efficiently exploit this resource base. Such technologies, as may have been developed in the Russian Far East, would perfectly position and preadapt these populations to a later arising maritime focus, which as Cassidy (1999) points out did not develop along the coastal regions of this area until after the onset of the Holocene.

Finally, as with the Moravian sites and our poor collective ability to discern evidence of perishable fiber artifact manufacture, here too, there was an initial lack of recognition concerning the presence of Late Pleistocene/Early Holocene ceramics with impressions of fiber artifacts. Again, this demonstrates that many times our preconceived notions as to what ought or ought not to be present at a given site of a given age clouds and limits our ability to admit new possibilities. Ideological and theoretical biases can be quite powerful and often subtly alter our ability to see new and wonderful things. Gould (2000: 255) recently and usefully reviewed the "idols" of Francis Bacon including the "idol of the theater", a concept which encapsulates this type of bias. We could do well to heed the wisdom of this 16th century English philosopher. Throughout much of the history of the study of the Paleolithic and Paleoindian periods we have given ourselves over to a narrowed idea of lifeways revolving around big game, stone tools, and manly behaviour. What is becoming increasingly apparent as we restudy materials from previously excavated sites is that the diversity we take for granted in the ethnographic present and our current modern world may well have been a hallmark of previous lives as well. We must continue to think "out of the box" and "beyond the idol" that has constrained our understanding of the ancient world.

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REFERENCES

ADOVASIO J. M., 1970: The Origin, Development and Distribution of Western Archaic Textiles and Basketry. *Tebiwa: Miscellaneous Papers of the Idaho State University Museum of Natural History* 13, 2: 1–40.

ADOVASIO J. M., 1977: *Basketry Technology: A Guide to Identification and Analysis.* Aldine Publishing, Chicago.

ADOVASIO J. M., GUNN J., 1975: Basketry and Basketmakers at Antelope House. *The Kiva* 41, 1: 71–80.

ADOVASIO J. M., GUNN J., 1977: Style, Basketry and Basketmakers at Antelope House. In: J. Gunn, J. N. Hill (Eds.): *The Individual in Prehistory: Studies of Variability in Style in Prehistoric Technologies.* Pp. 137–153. Academic Press, New York.

ADOVASIO J. M., HYLAND D. C., 2000: The Need to Weave: The First Americans Used More Fiber Than Flint. *Scientific American Discovering Archaeology* 2, 1: 36–37.

ADOVASIO J. M., HYLAND D. C., SOFFER O., 1997: Textiles and Cordage: A Preliminary Assessment. In: J. Svoboda (Ed.): *Pavlov I – Northwest: The Upper Paleolithic Burial and its Settlement Context*. Pp. 403–424. The Dolní Věstonice Studies, Vol. 4. Institute of Archaeology, Academy of Sciences of the Czech Republic, Brno, Czech Republic.

ADOVASIO J. M., MASLOWSKI, R. F. 1980: Textiles and Cordage. In: T. F. Lynch (Ed.): *Guitarrero Cave*. Pp. 253–290. Academic Press, New York.

ADOVASIO J. M., SOFFER O., KLÍMA B., 1996: Upper Paleolithic Fibre Technology: Interlaced Woven Finds from Pavlov I, Czech Republic, c. 26,000 Years Ago. *Antiquity* 70, 269: 526–534.

ADOVASIO J. M., SOFFER O., HYLAND D. C., KLÍMA B., SVOBODA J., 1999: Textil, košíkářství a sítě v mladém paleolitu Moravy (Textiles, Basketry, and Nets in Upper Paleolithic Moravia). *Archeologické rozhledy* LI: 58–94.

ANDREWS R. L., ADOVASIO J. M., CARLISLE R. C., 1986: *Perishable Industries from Dirty Shame Rockshelter, Malheur*

County, Oregon. Issued jointly as Ethnology Monographs No. 9 and University of Oregon Anthropological Papers No. 34. Department of Anthropology, University of Pittsburgh, Pittsburgh, and Department of Anthropology, University of Oregon, Eugene.

AIKENS C. M., HIGUCHI T., 1982: *Prehistory of Japan*. Academic Press, New York.

BEDWELL S. F., 1973: *Fort Rock Basin: Prehistory and Environment*. University of Oregon, Eugene, Oregon.

CARR C., MASLOWSKI R. F., 1995: Cordage and Fabrics: Relating Form, Technology, and Social Processes. In: C. Carr, J. E. Neitzel (Eds.): *Style, Society, and Person: Archaeological and Ethnological Perspectives*. Pp. 297–343. Plenum Press, New York.

CASSIDY J., 1999: *Reconstruction of the Paleo-Coastal Landscape of the Primorye Region, Russian Far East*. Paper presented at the 64th Annual Meeting of the Society for American Archaeology, Chicago.

CRESSMAN L. D., 1942: *Archaeological Researches in the Northern Great Basin*. Carnegie Institution of Washington, Publication No. 538. Washington, D.C.

CRESSMAN, L. S., BEDWELL S. F., 1968: Report to the Secretary, Department of the Interior, on Archaeological Research on Public Lands in Northern Lake County, Oregon, under Permit for 1967 and Through the National Science Foundation as Annual Report. June 30, 1968, Grant No. GS 1652.

DEREVIANKO A. P., MEDVEDEV V. E., 1995: The Amur River Basin as One of the Earliest Centers of Ceramics in the Far East. In: *Toadzia Kekutonodoku No Kigaen (The Origin of Ceramics in Eastern Asia)*. Pp. 11–26. Tohoku Fukushi University Press, Sendai.

DEREVIANKO A. P., OKLADNIKOV A. P., 1977: *Gromatukhinskaya Culture*. Novosibirsk.

DOUGLAS F. H., 1930: Pomo Indian Close Coiled Basketry. *Denver Art Museum Leaflet* 5.

DOUGLAS F. H., 1933: Indian Basketry: Varieties and Distribution. *Denver Art Museum Leaflet* 58.

DOUGLAS F. H., 1934: Apache Indian Coiled Basketry. *Denver Art Museum Leaflet* 64.

DROOKER P. B., 1992: *Mississippian Village Textiles at Wickliffe*. University of Alabama Press, Tuscaloosa.

EMERY I., 1966: *The Primary Structures of Fabrics: An Illustrated Classification.* The Textile Museum, Washington, D.C.

GOULD S. J., 2000: Deconstructing the "Science Wars" by Reconstructing an Old Mold. *Science* 287, 5451: 253–261.

HURLEY W. M., 1979: *Prehistoric Cordage: Identification of Impressions on Pottery*. Aldine Manuals on Archaeology No. 3. Taraxacum, Washington D.C.

HYLAND, D. C, 1997: Perishable Industries from the Jornada Basin, South-Central New Mexico. Unpublished Ph.D. dissertation, Department of Anthropology, University of Pittsburgh, Pittsburgh.

HYLAND D. C., ADOVASIO J. M., 1997: The Mexican Connection: A Study of Sociotechnical Change in Perishable Manufacture and Food Production in Prehistoric New Mexico. Paper presented at the 62nd Annual Meeting of the Society for American Archaeology, Nashville, Tennessee.

HYLAND D. C., ADOVASIO J. M., TAYLOR R. E., 1998: Corn, Cucurbits, Cordage, and Colonization: An Absolute Chronology for the Appearance of Mesoamerican Domesticates and Perishables in the Jornada Basin, New Mexico. Paper presented at the 63rd Annual Meeting of the Society for American Archaeology, Seattle, Washington.

JULL A. J. T., O'MALLEY J. M., DEREVIANKO A. P., KUZMIN Y. V., MEDVEDEV V. E., TABAREV A.V., ZENIN V. N., VETROV V. M., LAPSHINA Z. S., GARKOVIK A. V., ZHUSHCHIKHOVSKAYA I. S., 1998: Radiocarbon Chronology of the Oldest Neolithic Cultures in the Southern Russian Far East, Trans-Baikal, According to the Results of the Direct Accelerator Mass Spectrometry Ceramic Data.

KAJIWARA H., 1999: *The Origin of Early Pottery in North-Eastern Asia in the Context of Environmental Change*. Accessed on 13 Feb 2000 at www.tfu.ac.jp/kenkyushitsu/kajiwara/The_Origin_of_Pottery_Manufacture.html.

MACNEISH R. S., CUNNAR G., 1998: The Sino-American Jiangxi Origin of Rice Agriculture Project: Analysis and Theory. Paper presented at the 63rd Annual Meeting of the Society for American Archaeology, Seattle, Washington.

MASON O. T., 1885: Basket-Work of the North American Aborigines. *Report of the United States National Museum for 1884.* Pt. 3: 291–306.

MASON O. T., 1894: *Woman's Share in Primitive Culture*. New York.

MASON O. T., 1900: Types of American Basketry. *Scientific American* 83:57–58.

MORRIS E. H., BURGH R. F., 1941: *Anasazi Basketry: Basket Maker II Through Pueblo II, A Study Based on Specimens from the San Juan River Country*. Publication No. 533. Carnegie Institution of Washington, D.C.

PRYOR J., CARR C., 1995: Basketry of Northern California Indians: Interpreting Style Hierarchies. In: C. Carr, J. E. Neitzel (Eds.): *Style, Society, and Person: Archaeological and Ethnological Perspectives*. Pp. 259–296. Plenum Press, New York.

SERIZAWA C., 1976: The Stone Age of Japan. *Asian Perspectives* 19, 1.

SERIZAWA C., 1979: Cave Sites in Japan. *World Archaeology* 10, 3:340–349.

SOFFER O., ADOVASIO J. M., HYLAND D. C., KLÍMA B., SVOBODA J., 1998: Perishable Technologies and the Genesis of the Eastern Gravettian. *Anthropologie* 36, 1–2: 43–68.

SMIRENSKI S. M., 1998: *Establishment of a Private, Non-Commercial Protected Territory: Muraviovka Park of Sustainable Land Use*. Society for Conservation Biology.

TAYLOR W. W., 1966: Archaic Cultures Adjacent to the Northeastern Frontiers of Mesoamerica. In: G. F. Ekholm, G. R. Willey (Eds.): *Archaeological Frontiers and External Connections*. Pp. 59–94. Handbook of Middle American Indians, Volume 4. University of Texas Press, Austin.

WINCHESTER S., 2000: Black Dragon River. *National Geographic* 197, 2:2–33.

ZHUSHCHIKHOVSKAYA I. S., 1995: Paper presented at the International Symposium "On the Origin of the Pottery in Eastern Asia," Sendai, Japan.

ZHUSHCHIKHOVSKAYA I. S., 1996: Current Data on the Early Pottery of Primorie Region, Russian Far East. *Journal of Korean Historical Society* 4: 301–312.

ZHUSHCHIKHOVSKAYA I. S., 1997a: Current Data on Late-Pleistocene/Early-Holocene Ceramics in the Russian Far East. *Current Research in the Pleistocene* 14: 89–91.

ZHUSHCHIKHOVSKAYA I. S., 1997b: On the Early Pottery-Making of the Southern Far East. 10:331–343.

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