

# SUBSISTENCE ACTIVITY IN THE CONTEXT OF CHANGING ENVIRONMENTS DURING THE PLEISTOCENE-HOLOCENE BOUNDARY IN THE ZERKALNAYA RIVER VALLEY OF THE RUSSIAN FAR EAST

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## ABSTRACT

Archaeological investigations within the Zerkalnaya River Valley have been ongoing since the 1950s. During this period over 25 sites have been identified. These sites evidence an occupation from approximately 20,000 B.P. until about 10,000 B.P. Given the antiquity of these sites, artifactual evidence is largely limited to lithics and a small amount of ceramics. Consequently, a heavy reliance upon indirect evidence has been necessary to reconstruct the paleoecology and subsistence patterns. Archaeological methods of lithic use-wear analysis, lithic and ceramic typologies, radiocarbon dating, and total site excavation, as well as intra-site and inter-site spatial distributions have been employed. Additionally, interdisciplinary methods such as geomorphology, petrography, and palynology have made significant contributions. Since the 1990s, international collaboration at the sites of Ustinovka 3, 6, and 7 have added new methods such as lithic refitting, optical-luminescent dating, and lithic heat-treatment analysis. The use of these indirect methods has permitted the opportunity to begin the reconstruction of changes in subsistence patterns during the Pleistocene-Holocene transition.

## INTRODUCTION

In 1990 a joint Russian and Japanese archaeological project was initiated under the direction of Nina Kononenko of the Institute of History, Archaeology and Ethnography in Vladivostok, Russia, and Hiroshi Kajiwara of Tohoku Fukushi University in Japan. In 1995 American archaeologists were invited to participate in the ongoing investigations in the Zerkalnaya River Valley.

Archaeological practices in the Russian Far East are in large part analogous to those practiced in the U.S., but with a couple of significant exceptions. A major difference is the substantial disparity in temporal dimensions under investigation. For the most part, American prehistoric sequences commence in the area of 12,000 years ago. In contrast, evidence of initial occupation in the Far East exceeds 32,000 years. This temporal disparity structures the nature of inquiry in a number of ways. First, the richness of

cultural diversity both temporally and spatially is enhanced by the increased time depth. That is, while the Paleo-Indian and Archaic phases were unfolding in the New World, the formation of permanent villages during the Neolithic Period was well underway in the Far East.

Second, the complexity of taphonomic concerns is increased considerably. Given the expanded time depth, and the dynamic processes inherent in the glacial fluctuations of the Upper Pleistocene environments, the destruction of biotic materials is substantially complete. This means that artifactual evidence from any sites dating to the terminal Pleistocene is largely limited to non-biodegradable items such as lithics and ceramics.

Virtually all other biotic materials, including most datable carbon residues, have been dissolved in the acidic soils. Consequently, heavy reliance upon indirect forms of data such as geomorphology and pollen analysis play a

substantial role in reconstructing the past. As in the United States, reliance upon interdisciplinary methods and techniques to identify geologic context, climatic conditions, and pollen profiles, as well as lithic and ceramic analytical techniques, have played a central role in the formation of interpretations pertaining to prehistoric cultural conditions.

## THE ZERKALNAYA RIVER VALLEY

Over the previous three decades a cluster of more than 25 archaeological sites has been identified in the Zerkalnaya River Valley. This valley is located in the Primorye Region of the Russian Far East and is approximately five hundred kilometers northeast of the city of Vladivostok on the Sea of Japan. A majority of the sites are situated on terraces adjacent to the river and at a distance of approximately thirty kilometers from the Sea of Japan.

A combination of natural conditions appears to have made this valley particularly attractive during the Upper Pleistocene Period. These included a slightly milder climate compared to surrounding areas and proximity to river resources. In addition to an increasingly enriched floral and faunal resource base during the Pleistocene/Holocene transition, it was also the source of good quality lithic materials which were intensively exploited.

Research in this valley has mainly focused on the sites of Ustinovka 1, 3, 4, 6 and 7. Occupation of the Ustinovka series of sites appears to span the period from the peak of the Last Glacial Maximum, known as the Sartan Glaciation, until the Early Holocene at approximately 8,000 years B.P. (Derevianko 1983:69; Vasilievsky and Gladushev 1989:100; Kononenko 1993:1). The functions of these sites appear to span a wide range of activities, including that of seasonal base camps, lithic workshops, short-term hunting camps, and in the later period semi-sedentary settlements for the purpose of hunting and fishing (Gladushev and Kononenko 1988:36; Kononenko 1996a:117; Krupyanko and Kononenko 1996:304; Tabarev 1994:21).

Direct evidence of cultural occupation at these sites relies almost solely on the presence of lithic

tools, and in the case of Ustinovka 3 the presence of ceramics. The intensive study of lithic assemblages for this region has shown that tool forms in this river valley parallel lithic traditions found in Western Primorye, and that changes in these lithic traditions appear to directly parallel changes in climatic and environmental conditions. These parallels include the use of macroblade technology associated with the steppe-tundra environments of the final Sartan Glaciation. Microblade assemblages commence during the tardi-glacial period along with expanding coniferous forests. Finally, the spread of bifacial techniques coincides with the onset of deciduous forests at the Holocene Transition.

### Ustinovka 7

The site of Ustinovka 7 is located approximately 40 meters above the Zerkalnaya River. The silty soil of this site is reddish brown in color and appears to have been formed during the Last Glacial Maximum (Kajiwara et.al 1996). Tentative results of dating indicate an age of over 18,600 years B.P. Ustinovka 7 is characterized by large blades and elongated flakes. Similar artifacts dating between 23,000 and 14,000 B.P. are found in the Korean Peninsula and the Japanese Archipelago (Vasilievsky 1983:27; Vasilievsky and Gladushev 1989:73; Okamura 1992; Lee and Yun 1992; Tabarev 1994:21; Kononenko 1997:59).

In spite of the absence of faunal remains, the lithic tools, geologic studies and palynological data suggest that at the peak of the final glaciation subsistence activities centered around the hunting of Pleistocene fauna and the limited gathering and processing of plant materials from a relatively impoverished floral community.

The instability of the climatic conditions resulted in alterations in the richness and diversity of regional fauna. This is correlated with, and quite likely served to stimulate, the development and spread of new subsistence strategies in conjunction with corresponding changes in lithic technologies. These rather dramatic climatic changes appear to have resulted in the migration of some populations as Pleistocene fauna retreated to the north, and the establishment of semi-permanent Neolithic villages for others (Kononenko 1997:67).

### Ustinovka 6

Ustinovka 6 has been carbon dated to 11,500 years B.P. At this time the development and spread of microblade tools took place throughout Eastern Asia. A second element to appear during this period is leaf-shaped bifaces in the form of knives and projectile points. Also, transverse and dihedral burins for bone and woodworking appeared. Several developments of significance for subsistence made their appearance during this phase as well. These include the use of edge-ground adzes along with grinding slabs. These items are considered strong indications of a major shift in the focus of subsistence to the processing of plants and wood products.

We also find for the first time the manufacture of two varieties of arrow points. The presence of arrow points, in conjunction with evidence of increased forestation, is suggestive of a major subsistence shift from the hunting of large herd animals to that of smaller individual prey species. The analysis of lithic typologies and low-magnification use-wear indicate that activities such as hunting, butchering, hide scraping, and woodworking were common activities at this location (Gladushev and Kononenko 1988:36; Krupyanko and Kononenko 1996:310). Further, the presence of lithic "fish" effigies, and the immediate proximity of a river which supports anadromous fish, suggest the hypothesis that fishing was beginning to become an important subsistence focus.

### Ustinovka 3

Commencing at around 11,000 B.P. the distinctive microblade tradition began to disappear and was gradually replaced by bifacial lithic technology. This bifacial tradition is represented in the site of Ustinovka 3. The stone industry of this site is characterized by leaf-shaped points and knives, small triangular arrowheads, endscrapers and adzes with polished edges. In association with these lithic tools were recovered ceramic sherds that exhibit similarities with early forms of pottery developed in areas of Eastern Asia such as China and Japan (Garkovik and Zhushikhovskaya 1995:52). Supported by these findings it is felt that this site represents the onset of the Neolithic (Kononenko 1996b:75).

An optical-luminescent date of 10,050 years B.P. has been obtained for this site and recent pollen analysis indicates that a cold and dry condition existed that supported a growth of birch and larch forests with a mixture of alder (Korotky et.al 1996:36). Pollen analysis further indicates the presence of aquatic nuts, reed mace and lime fruit, all of which would have needed to be transported from the river margins to the elevated terrace location of the site. These items, in conjunction with an increased frequency in woodworking and plant processing tools, suggest that a substantial shift to the processing of plant materials had taken place.

The refitting of lithic debris has permitted the identification of specific work areas within the site. Also, the location of ceramic sherd scatters along with the location of two lithic flake caches indicate other distinct activity areas. These items, in conjunction with the discovery of three postholes, indicate that the site probably supported light ground structures and functioned as a semi-permanent seasonal camp which appears to have been repeatedly reoccupied over an extended period of time (Kononenko 1996b:76).

## **CONCLUSIONS**

Through the application of a wide range of interdisciplinary methods and techniques, it has been possible to identify a number of significant geologic and climatic variables which undoubtedly influenced the trajectory of cultural development in the Zerkalnaya River Valley dating from the Upper Pleistocene to the Holocene Periods. These trajectories suggest both an ongoing interaction sphere within the Far East throughout this period, and the simultaneous adaptation to local ecological constraints.

Present evidence indicates that the Russian Far East first became occupied by displaced populations from the north and west at the peak of the Last Glacial Maximum. The large blade industry of these early pioneers is consistent with those found among the mega-fauna hunting groups of the Trans-Baikal area. Given the severity of the Sartan Glaciation it appears that populations seeking a milder climatic condition

entered the maritime region and the Zerkalnaya River Valley.

Occupation of the Zerkalnaya River Valley appears to continue throughout the tardi-glacial period and into the Early Holocene with the onset of Neolithic subsistence strategies. The transition of lithic reduction techniques to that of microblades and burins, in conjunction with the appearance of pottery, provides strong evidence of ongoing interaction with the East Asian Cultural Sphere. Further, replacement of the microblade technique with bifacial forms of points and knives appears to indicate ongoing interaction with cultures to the north along the Amur River. Finally, all of these changes in the material culture of the inhabitants of the maritime region are directly correlated with the amelioration of climatic conditions and the transition to modern floral and faunal biotic communities. It is evident that the maritime region around the Sea of Japan acted as

a refugia during the Last Glacial Maximum and provided the foundation for the later development of Neolithic subsistence practices.

#### NOTES

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