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The dominant culture period within the Upper Paleolithic age in Northeast Asia has traditionally been recognized through the diagnostic blade and microblade tool-making technology. Recent evidence gained from excavations in South Korea at both the Goreari and Jingnel sites have challenged the understanding that blade tool cultures were confined to the geography of Siberia, China, and Japan.

These microblade using cultures were the model of the "Asian microlism,"¹ emerging 25,000 years ago in Northeast Asia. It has been suggested that groups using this lithic tool technology were influential in unifying the Paleolithic cultures of this region, and were ultimately responsible for a period of cultural florescence therein (Derevianko, Volkov, and Lee 1997; Lee 1998).

In our endeavor to understand the relationship between Upper Paleolithic micro-blade artifacts and the techniques used in their manufacturing process, we attempt a holistic understanding of agent-based components of manufacture. These include analysis of tools in light of *materials* selected, *basic components* of their manufacture, and the *end-uses* to which they are employed. By doing so we can expose the *chaîne opératoire*, technical, coreshaping and flaking techniques used by the Upper Paleolithic artifact makers.

In Asian typologies, the "sub-wedged shaped core" is one of several diagnostic core types that have been excavated in significant quantities throughout Siberia and the Far East within distinct Upper Paleolithic horizons (see Kiryak et al. 2003). These artifacts, also reported in the Upper Paleolithic cultural layers within Korean multilayered pebble tool tradition sites (Lee et al. 2003), are the specific focus of our analysis.

Although the emergence of a blade-making technology first appears in the archaeological record around 40,000 years ago, patterns in evidence from absolute dating methods (Derevianko 1994; Lee 2004) indicate a punctuated technological adaptation towards the end of the Paleolithic, revealing a preference towards the sub-wedge shaped core method. Also of interest to our presentation is how these artifacts correspond to the North American Pebble Tool Tradition (see Carlson 1983:73-97), notably to pebble

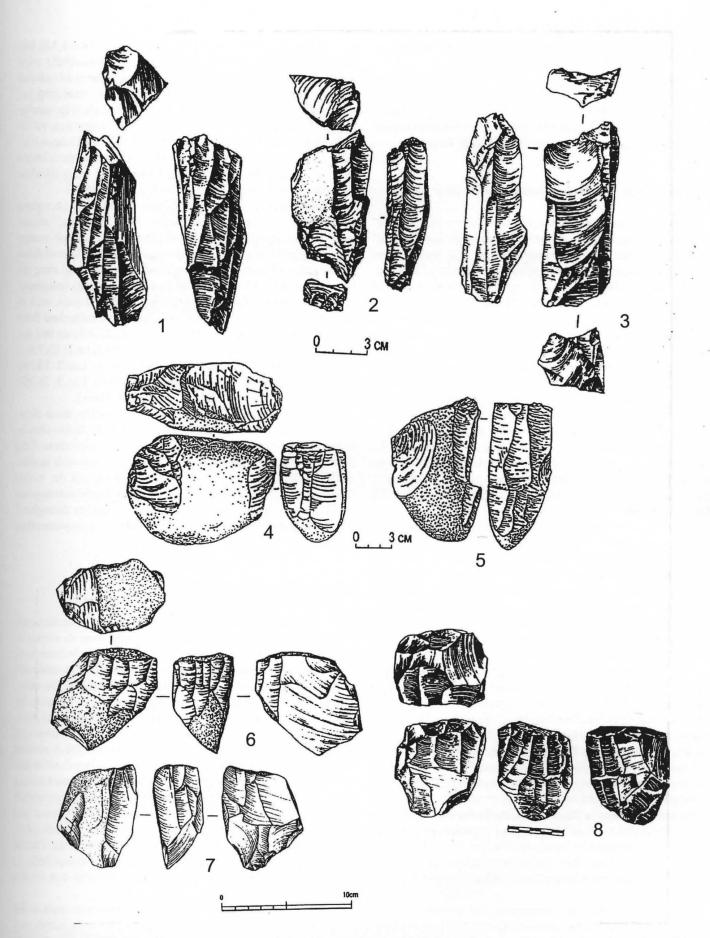


Figure 1. Sub-wedge shaped core in Northeast Asia: Kara-Bom site in Altai (1-3), Selemdja Upper Paleolithic Complex in Amur River in Russian Far East (4-5), Dangga Site (6), and Chongok Site (7) in Jeonnam, Korea, and Usauri Site (8) in Jeonnam, Korea.

tools found at the Glenrose Cannery Site located near to the delta of the Fraser River, in southwest British Columbia.

From this trans-regional comparison of lithic assemblages, important affinities will be demonstrated. We argue that evidence from corresponding lithic assemblages supports the hypothesis of a shared technological heritage between archaeological cultures researched on opposite sides of the North Pacific Ocean.

Blade technology and the Sub-wedge shaped core²

From the Asian Palaeolithic, the "sub-wedge shaped core" (торцовый нуклеус) is one of the most important "core groups" that assists archaeologists in understanding lithic technologies practiced by cultures living in Northeast Asia (Derevianko, Markin, and Vasilev 1994), although its importance has not been well analyzed by researchers. The sub-wedge shaped core group represents a blade-making technology, reliant upon and characteristic of locally abundant raw materials rather than scarcer resource materials (e.g., cryptocrystalline rock) that often would have required both long distance travel and trade to obtain. This sub-wedge core technique shares a very similar chaîne opératoire to microblade core reduction strategies. For example, the technological method used during the core reduction process, in both instances, is the removal of blades from the narrow lateral face or side using its long striking platform. Due to parallel strategies of blade removal it has been suggested by several Asian archaeologists that the origin of microblade culture in Northeast Asia is closely correlated to the techno-typological core reduction process (Derevianko 1994; Petrin 1994; Lee 1998, 2004).

The sub-wedge shaped core has a technical feature that is useful for optimizing raw material and capable of producing a great number of blade tools from each core. In this context, the sub-wedge shaped core is regarded as a strategic technological innovation. Notably, when comparing this blade-making technique to other techniques, it demonstrates a maximization of blades produced from locally available raw materials. In effect, this indicator of technological adaptation is likely to reflect both ecological and economic behaviours by populations utilizing this strategy.

The sub-wedge shaped core first appears in the early Upper Palaeolithic deposits in Northeast Asia 40 - 50 kya at the following sites: Kara-Bom, Ust-Karakol', Denosiva cave, Anui in the Mountain region of Southern Siberia, Tolbaga from Trans-Bikal region, and the Osinovka complex in the Russian Far East (Derevianko, Volkov, and Lee 1997; Choi, Lee, and Kang 2003) (Fig. 1). During the period following 25,000 years BP, there were many Palaeolithic cultural complexes that continued using the technique of the sub-wedge shaped core. A few of these cores appear in the Malta and Buret sites in Bikal region, the Sememdja Palaeolithic site in the Amur region, and in both the Ustinovka and Suborovo Palaeolithic complexes in the maritime region of the Russian Far East (Lee 1997). These Palaeolithic complexes once comprised the only evidence for understanding Northeast Asian Microblade cultures.

For the past ten years, archaeological evidence on subwedge shaped cores has been amassed from several sites in South Korea. These diagnostic artifacts have been assigned a temporal context through absolute dating. For example, in the second Another recently discovered Korean Palaeolithic site, named Jeongjangri, containing three distinct "use locations," shows large frequencies of pebble tools, all of which include sub-wedge shaped cores (Kyungnambaljeonyeonguwon 2006). One of these use locations (Number 3) is interpreted as a workshop area, inferred from the evidence of more than 25 individual specimens of conjoining cores, flakes, and other manufactured tools, such as polyhedron choppers, chopping tools, and large retouched flake tools of quartz and quartzite. AMS dating results indicate this site was occupied between 25,000-30,000 years BP [Loc.1: $25,700 \pm 150$ (SNU 03-001) (E29,200 \pm 900 (SNU03-002); Loc.2: 29,760 \pm 300 (SNU03-003), 28,600 \pm 300 (SNU03-004); Loc.3: 26,300 \pm 1,100 (SNU03-005), 29,340 \pm 700 (SNU03-006).]

Sub-wedge shaped cores are not restricted to these sites. This core type is also found at several other Palaeolithic sites in Korea, including: Sorori, Usanri, Byongsanri, and others (Lee 2004). Evidence obtained from archaeological research to date suggests this core type is widely spread throughout the whole Korean Peninsula. In summary, the sub-wedge shaped core appears simultaneously with a blade technology that persists throughout the Upper Palaeolithic period in Northeast Asia, complimenting various other regional industries.

Sub-wedge shaped core at Glenrose site

The Glenrose Cannery site (DgRr 6) is situated on the south bank of the Fraser River delta, 21 km inland from its mouth in what is an estuarial, riverine environment. However, because over 8,000 years of sedimentary deposits have added to the landmass of the river's delta, it is more appropriate to visualize the early, Old Cordilleran component of the Glenrose site to be spatially situated in equal relation to ocean subsistence activities as to those conducted on the river (Matson 1995; 1996). The Glenrose site is recognized to be amongst a principal group of North American archaeological sites containing important evidence on settlement and life patterns of early populations. Other sites occupied during the Late Pleistocene - Early Holocene interface with comparable tool assemblages include: Namu (ElSx 1) at 9,700 BP (Hester and Nelson 1978, and Carlson 1979, 1991b, 1996 and Cannon 1991, 1996); Milliken (DjRi 3) at 9,000 BP (Borden 1960, 1961, 1968b, and 1975, Mitchell and Pokotylo 1996); and Bear Cove (EeSu 8) at 8,000 BP (Carlson 1979; and see Dixon 2000:286-286 for list of others).

The objective for this section of the paper is to analyze the lithic assemblage of the Glenrose site in relation to its pebble tool propensity. Accordingly, our analysis will be restricted to stone tool technologies associated with the Old Cordilleran component.

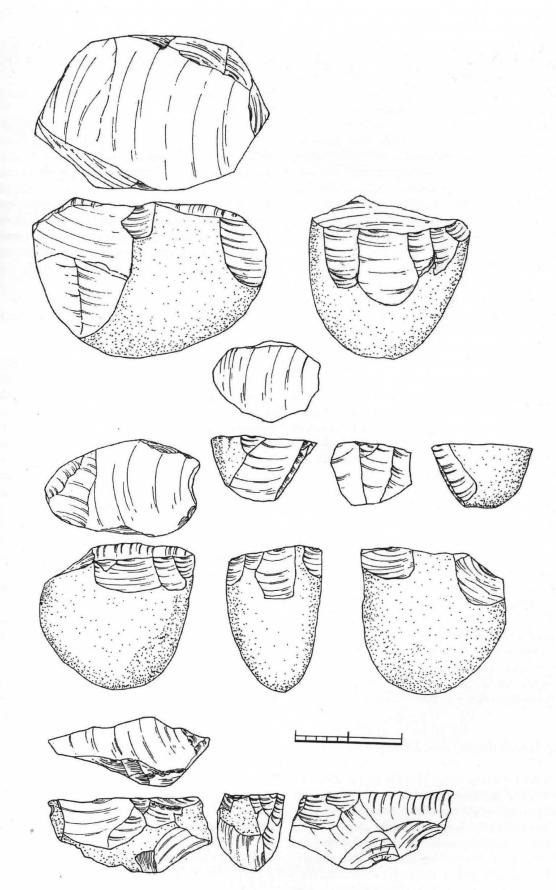


Figure 2. Sub-wedge core Type I at the Glenrose site (Single flake striking platform core).

At the Glenrose site, cultural components have been divided up temporally into the Old Cordilleran (8,400 – 4,750 BP), St. Mungo (4,400 - 3000 BP), and Marpole (2,600 - 1,600 BP) phases, as identified by Matson (1976). The Old Cordilleran component of Glenrose is dated reasonably securely, using charcoal samples, with four out of five assays dating in sequential order relative to their depth below surface (Matson 1976:15-20). Unique to the site are the appearance and preservation of bone and antler artifacts, revealed in the Old Cordilleran component. Also, well-preserved faunal material found at the site provides a revealing picture of prehistoric subsistence patterns. Five thousand years of continuous deposition shows a slowly increasing adaptation to riverine and foreshore resources. It then seems the Old Cordilleran component was occupied during the summer and that land mammal hunting dominated subsistence activities.

Exploratory excavations were conducted at the Glenrose Cannery site in 1969 by Richard Percy of Simon Fraser University (SFU; Percy 1972), with subsequent minor excavations occurring in 1971 under the direction of Richard Pearson of the University of British Columbia (UBC), and in 1972 under the direction of T. Loy (UBC) and Knut Fladmark (SFU). In 1973, a large-scale archaeological project took place under the direction of R.G. Matson from UBC. From the 199 artifacts recovered during the 1969 field season, only two bifacial choppers were identified in the lower portion of the upper three (Marpole-age) components. One core and another core fragment were recovered in the same components with only one core fragment in the lowest (Old Cordilleran) component (Percy 1972:164-168). From excavations conducted during the 1973 field season, the Old Cordilleran component at Glenrose revealed a total of 611 lithic tools, 44% of which constitute some form of cobble tool, including: unifacial chopping tools (35%), bifacial choppers (7%), cortex spalls (24%), scrapers (6%), and hammerstones (5%). Some of the non-cobble lithic artifacts consist of leafshaped points, large crude bifaces, and unifacial-retouched flakes, with a minimal number of ground stone tools and abrasive stones (Matson 1996:112).

Among the lithic assemblage at Glenrose categorized as 'core type tools', four sub-classifications can be distinguished by the shaping process of the striking platform. The majority (~ 90% of sample) of these flake-producing cores are of the non-sub-wedge shaped variety. Others, however, are strikingly characteristic of the sub-wedge shaped core type traditionally found in late Palaeolithic components in Asia (see Derevianko et al. 1994).

Technological Type I: Single Flake Striking Platform Core (Fig. 2).

This core type is characterized by the preparation of a striking platform from the narrow lateral face or side of the core. Also, this core type is generally made from a single heavy blow, caused by the removal of one large flake in the preparation for the striking platform. Some cores of this type exhibit detached flakes around the edge of this striking platform. This phase of detaching not only helps the general shaping process of the cores lateral front side but also assists in fastening or fixing the core to a stationary work surface. The bottom ridge of this core type is not commonly treated with bifacial flaking methods. This core type is characterized by a striking platform that has been prepared by the removal of multiple flakes.

Technological Type III: Natural Surface Striking Platform Core (Fig.3-3)

Cores of this type are characterized by use of the cores natural surface as the striking platform. For instance, available striking platforms exist in flat and thin pebbles that can be utilized as cores. Indications of multiple perpendicular striking around the edge of a pebble core signify shaping of the core was completed. Using the long and narrow natural surface of the pebble core, reduction process occurs with the removal of several blade-like-flakes by a perpendicular striking technique. Quantitative analysis of lithic artifacts located at Glenrose site determined that this method of flake removal was that most frequently utilized.

Technological type IV: Chunk core (Fig.3-4)

This core type uses the flat surface of the chunk core for the striking platform.

These different sub-wedge core types are defined based on consistent technological attributes with Types I and III being the predominant types found at the Glenrose site. Selection of Type IV cores appeared to be related to opportunistic finds — technologically correlated with high quality raw material. Evidence from research on both Northeast Asian and Northwest coast of North American archaeological sites, in addition to our own experimental work demonstrate that the sub-wedge shaped core was a successful process for the production of blades, elongated flakes and blade-flakes. Still, blade-making techniques are not predominant in the Glenrose assemblage. An absence of access to quality raw materials well suited to blade-making techniques during the Old Cordilleran phase is interpreted as the limiting factor for this phenomenon.

The appearance of the sub-wedge shaped core in the Glenrose assemblage is integral to understanding the persistence of Upper Palaeolithic human populations' retention of Northeast Asian technological lithic manufacturing systems. After analyzing the tool assemblage from the Old Cordilleran component at the Glenrose site, it is inferred that populations utilizing this location for their subsistence strategies possessed blade-making capabilities. However, it is suggested that various cultural adaptive processes, such as changes in economic activities, access to raw material, adaptations to new tool technologies, amongst numerous other factors, were restrictions in the tool manufacturing techniques utilized during the early Holocene period. Paleoenvironmental characteristics were likely another element restricting the increase manufacture and utilization of blade making techniques at the Glenrose site. While not dominant, there exists evidence for the persistence of an Asian Palaeolithic technological tool manufacturing system by a cultural apparatus utilizing the Fraser River estuary of the Pacific Northwest Coast during the early Holocene.

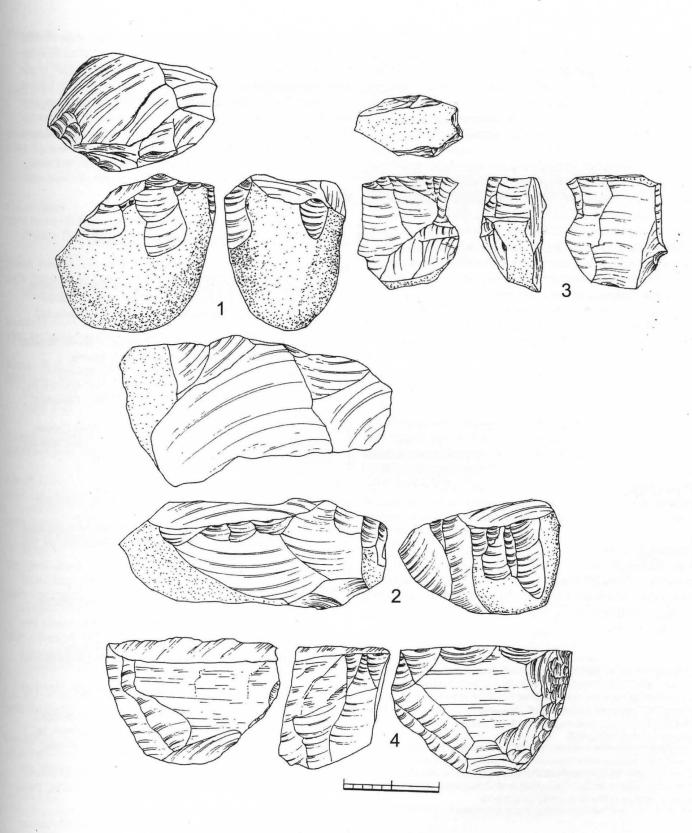


Figure 3. Sub-wedge core Type II (1, 2), Type III (3), and Type IV (4) at the Glenrose site.

Conclusion

This study concludes that sub-wedge shaped cores discovered in the Old Cordilleran cultural component at the Glenrose site are technologically related to a core blade-making technique derived from Northeast Asia. Having compared the Glenrose core assemblage to Upper Palaeolithic sites in Northeast Asia containing similar assemblages, a certain techno-typological relationship is revealed that represents a continuity of lithic technologies between cultures. This exchange of blade-making techniques appears to have originated with the Upper Palaeolithic cultures occupying the Northeast Asian steppe (45-30 kya), succeeding in situ until the end of the Palaeolithic (10 kya). Through human interaction, diffusion, and migrations, this technology spread widely throughout Northeast Asia and simultaneously into North America (see West 1996), where it persisted through the Early Holocene. Evidence from the Glenrose site indicates a notable technological relatedness in blade-making techniques between analyzed assemblages. These observances support the inference that populations settling in new environmental contexts on the Pacific Northwest coast had retained a tool technology from a Northeast Asian ancestry.

Populations who utilized the Glenrose site during the Early Holocene period were able to sustain a techno-typological tradition of blade-making through certain characteristics of blade tool techniques. These include: the microblade technique, bifacial technique and foremost, the pebble tool tradition that flourished in the region of the Lower Fraser River. The sub-wedge shaped core type persisted along with other artifacts of the pebble tool tradition in a region far removed from its place of Northeast Asian origin. This core type is an "Asian cultural-fact," providing evidence for a cultural sequence, connecting populations across a vast spatial and temporal context through a sharing of pebble tool tradition.

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Heonjong Lee received his PhD from a Russian National University for research on the Middle Paleolithic in the Russian Far East. He now teaches at the Department of Archaeology at Mokpo National University in South Korea. This article resulted from work undertaken during a yearlong visit to UBC and the Museum of Anthropology in 2005-2006.

Adrian Sanders graduated from the Department of Anthropology at the University of British Columbia and is currently pursuing a Master's degree at the University of Victoria.

Notes

1. "Asian microlism" is reference to the Asian microlithic culture.

2. From an typological perspective a 'blade' is a long, flat and narrow flake with parallel sides struck from a prepared core, usually by various percussion including direct, indirect and pressure flaking. Traditionally, blades are defined as measuring greater than twice as long as they are wide, with shorter, narrower blades being classed as "bladelets." If flakes are not twice as long as they are wide, the terminology "blade-like flake" is used. Blades were occasionally manufactured during the Middle Paleolithic, but Upper Paleolithic industries show a great increase in blade production and the development of specialized blade tools (see Inizan et al 1992, Bahn 2001, and Lee 2004 for further reference). This period of technological and cultural transition saw the shift from a 'wedge shaped core' towards 'sub-wedge shaped core' industry, with the major difference being an increase in size of blades removed (see Lee 2004).

Bibliography

Bahn, Paul, ed.

2001 The Penguin Archaeology Guide. Penguin Books.

Borden, Charles

- 1960 "DjRi 3, an Early Site in the Fraser Canyon, British Columbia." In Contributions to Anthropology 1957, pp. 101-118. Anthropological Series 45, National Museum of Canada Bulletin 162. Ottawa.
- 1961 Fraser River Archaeological Project: Progress Report. National Museum of Canada Anthropological Papers 1. Ottawa.
- 1968 "A Late Pleistocene Pebble Tool Industry in Southwestern British Columbia." In *Early Man in Western North America*, by C. Irwin-Williams, pp. 55-69. Eastern New Mexico University, Contribution in Anthropology 1(4).
- 1975 Origins and Development of Early Northwest Coast Culture, to About 3000 B.C. Canada. National Museum of Man. Mercury Series. Archaeological Survey Papers 45. Ottawa.

Cannon, A.

- 1991 *The Economic Prehistory of Namu*. Simon Fraser University Department of Archaeology Publication 19. Burnaby.
- 1996 "The Early Namu Archaeofuana." In *Early Human Occupation in British Columbia*, R. Carlson and L. Dalla Bona, eds., pp. 103-110. UBC Press, Vancouver.

Carlson, C.

1979 The Early Components at Bear Cove. Canadian Journal of Archaeology 3:177-194.

Carlson, Roy L.

- 1979 Early Period on the Coast of British Columbia. Canadian Journal of Archaeology 3: 211-228.
- 1983 The Far West. In Early Man in the New World. Sage, New York.
- 1991b "Appendix B: Namu Periodization and C-14 Chronology." In *The Economic Prehistory of Namu*, by Aubrey Cannon, pp. 85-95. Simon Fraser University Department of Archaeology Publication 19. Burnaby.
- 1996 "Early Namu." In Early Human Occupation in British Columbia, R. Carlson and L. Dalla Bona, eds., pp. 183-102. UBC Press, Vancouver.

Choi M. R., H. J. Lee, and I. U. Kang

2003 Prehistoric Archaeology of Siberia. Juruseong, Seoul.

Derevianko, A. P., S. V. Markin, and S. A. Vasilev 1994 *Paleolitovedenie*. Novosibirsk.

Derevianko, A. P., P. V. Volkov, and H. J. Lee 1997 *Selemdja Upper Palaeolithic Culture*. IAE Press, Novosibirsk. Derevianko, A. P. A. K. Agadjanian, G. F. Baryshnikov, M. Dergacheva, T. A.Dupal, E. M. Malayeva, S. V. Markin, V. Molodin, S. V. Nikolayev, L. A. Orlova, V. T. Petrin, A. V. Postnov, V. A. Ulianov, N. Fedeneva, F. Foronova, and M. V. Shunkov

1998 Arkheologia, geologia i paleogeografia pleistotsena i golotsena Gomogo Altaia. Nlzd, IAE SO RAN, Novosibirsk.

Derevianko, A. P.

1994 "Formation and Development of Microblade Industry in Southeastern Part of Far East." In *The Origin and Dispersal of the Microblade Technique in Northern Eurasia*. Sapporo.

Dixon, James

2000 Human Colonization of the Americas: Timing, Technology and Process. *Quaternary Science Reviews* 20:277-299.

Hester, James J., and Sarah M. Nelson, eds.

1978 Studies in Bella Bella Prehistory. Simon Fraser University. Department of Archaeology Publications 5. Burnaby, BC.

Inizan, M. L., H. Roche and J. Tixier

1992 Technology of Knapped Stone. CREP, Meudon.

Kiryak, M.A., O.Y. Glushkova, and T.A. Brown

2003 Upper Paleolithic Sites in the Tytylvaam Valley (Polar Chukotka). Archaeology, Ethnology and Anthropology of Eurasia 3(15): 2-15.

Kyungnambaljeonyenguwon

2006 Geochang Jeongjangri Palaeolithic Site, Kyungnam.

Lee, H. J.

- 1997 The Origin of Microblade Culture in Northeast Asia. *Bakmulg-anyeonbo* 5, Mokpo University Museum, pp.1-19.
- 1998 A Study of Cultural Character and Changing Process of the End of Late Palaeolithic in Northeast Asia, *Hangukgogohakbo* 39: 53-88.
- 2002 Preliminary excavation report of Dangga Palaeolithic site in Naju, Donggukasia Guseokgi Yeongu.
- 2003 The Middle to Upper Palaeolithic Transition and the Tradition of Flake Tool Manufacturing on the Korean Peninsula, Archaeology, Ethnology and Anthropology of Eurasia N1(13). IAE Press.
- 2004 A Study of Technological Context Between Sub-wedge Shaped Core and Blade Tool Culture of Upper Palaeolithic in Korea, Gomunhwa, pp. 65-82.

Lee, H.J., C. G. Han, A. P. Derevianko, and Hwang Weiwen 2003 *Pebble Tool Tradition in Northeast Asia*. Hakyeon, Seoul.

Lee, H.J., S. H. Noh, and H. Y. Lee

2004 Naju Dangga and Chongok Palaeolithic site. Mokpo University Museum.

Matson R.G.

- 1976 *Glenrose Cannery Site*. Canada. National Museum of Man. Mercury Series. Archaeological Survey Papers 52. Ottawa.
- 1981 Prehistoric Subsistence Patterns in the Fraser Delta: The Evidence from the Glenrose Cannery Site. In *Fragments of the Past: British Columbia Archaeology in the 1970s*, Knut R. Fladmark, ed. *BC Studies* 48 (Winter): 64-85.
- 1996 "The Old Cordilleran Component at the Glenrose Cannery Site." In *Early Human Occupation in British Columbia*, R. Carlson and L. Dalla Bona, eds., pp. 111-122. UBC Press, Vancouver.

Matson R. G., and Gary Coupland

1995 The Prehistory of the Northwest Coast. Academic Press, San Diego.

Mitchell, D., and D. Pokotylo

1996 "Early Period Components at the Milliken Site." In *Early Human* Occupation in British Columbia, R. Carlson and L. Dalla Bona, eds., pp. 65-82. UBC Press, Vancouver.

Percy, Richard

1972 "Miscellaneous Archaeological Work, 1971." Salvage '71, Publ. No. 1 of the Department of Archaeology, Simon Fraser University. R.L. Carlson, ed., pp. 157-176. Burnaby, British Columbia.

Petrin, B. T.

1994 "The Origin of the Microlithic Tradition in the Altai – butt cores and Burins in the Kara-Bom Site." In *The Origin and Dispersal of the Microblade Technique in Northern Eurasia*. Sapporo.

West, Frederick, ed.

1996 American Beginnings: The Prehistory and Paleoecology of Beringia. University of Chicago Press, London.

Qwu?gwes Prepares for 9th Field Season

Submitted by: Dale Croes, Rhonda Foster and Larry Ross

We have finished our 8th season of the Qwu?gwes wet/site field school program and once again we were blessed with basketry, netting, and wooden artifacts within the 1 x 1 m excavation units. One of the highlights of the field school happened at the end of the season, when, at the very bottom of an excavation unit, we began uncovering a large piece of basketry rim Rhonda Foster, Director, Cultural Resources Department, Squaxin Island Tribe and site co-manager and Cultural Resource Technician and weaver Margaret Seymour Henry joined us that day, as did Ed Carrier, master Suquamish basket weaver. But, instead of a basketry fragment, the rim has looped rope handles extended across the whole square, is flattened, or double layered, and measures 6 feet (2 m) around the mouth! This basket or fish trap rim is woven of splint cedar boughs and the open twined body extends some distance into the bottom of the next unexcavated square. Rhonda and I had to decide whether to cut it off or leave it for next summer. We agreed to cover it with porous cloth and back fill the squares with clean sand, as is the usual procedure for the winter. After all, it had been there for 700 years and one more year would not make much difference. It awaits the those participating in the 2007 field school!

Please alert your students of this field school opportunity. Rhonda and I assure that all students will have a part in the excavation of the two 1 x 1 m squares that the fish trap or basket might extend into. It will be quite an experience for everyone. The fish trap or basket will be conserved for eventual display in the Squaxin Island Tribe's museum.

The Qwu?gwes archaeological project has just been featured in two new archaeological textbooks for 2007. If you'd like to see the articles, recent published research papers, and the application form for our 2007 field school (please share with your students), go to our web site at:

http://www.library.spscc.ctc.edu/crm/crm.htm

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