Quaternary International xxx (2016) 1–14

Contents lists available at ScienceDirect

Quaternary International

journal homepage: www.elsevier.com/locate/quaint

The relationship between microblade morphology and production technology in Alaska from the perspective of the Swan Point site

Yu Hirasawa [a, *], Charles E. Holmes [b]

[a] Department of Archaeology and Ethnology, Graduate School of Letters, Keio University, Japan
[b] Department of Anthropology, University of Alaska, Fairbanks, United States

ARTICLE INFO

Article history:
Available online xxx

Keywords:
Lithic technology
Yubetsu technique
Hunting technology
Beringia
Peopling North America

ABSTRACT

Microblades are one of the stone tools that spread toward the northeast with wide range human migration after the Last Glacial Maximum in Beringia, and are key to understanding the first migrants to the New World. The Yubetsu method was one of the most widely spread techniques in western Beringia. In Eastern Beringia, Swan Point is the only archaeological site bearing microcores from the East Beringian tradition phase I (here after EBt-I) layer which were produced by the Yubetsu method. There are three archaeological complexes in interior Alaska following EBt-I: the Nenana, Chindadn, and Denali. The former two complexes bear distinctive Chindadn points and the latter has Campus type microcores. Cultural continuity of the local complexes has been argued for decades in discussing the peopling of the Americas. However, because the distinctive Yubetsu microcore is only found at the Swan Point site, discussing cultural connection among these complexes based on microcores is difficult. The Chindadn point was also considered to have roots in the Old World, but no candidate yet has been confirmed. In contrast, large numbers of microblades have been found in EBt-I, Chindadn and Denali complexes, and also in the Northern Archaic tradition, although their production methods are different. In this study we use microblades from EBt-I and Northern Archaic tradition components at Swan Point to elucidate co-occurrence of microcore technological and microblade morphological changes. Results from this study show continuous production of microblades for slotted osseous point weaponry was stable through time. Given that cultural change occurred, the results provide a framework to discuss the continuity of hunting weapon technology and its relationship with hunting prey, indirectly, and with zooarchaeological studies.

1. Introduction

Microblade technology has been important for a long time because it spread in vast regions after the Last Glacial Maximum in Beringia (Graf and Bigelow, 2011; Dixon, 2013; Shott, 2013). Notable characteristics of microblade technology are portability and high productivity from a small size core. In addition, according to Elston and Brantingham (2002), osseous points with inset microblades are more durable than lithic points in cold environment (Bever, 2006). Because this specialized tool production was found all across Northeast Asia, many scholars attempted to reveal the migrant's economy, cultural continuity, and migration history (West, 1967, 1981; Anderson, 1968; Dumond, 1977, 1980; Ackerman, 2007). These studies tended to focus on microcore technology because core attributes were excellent markers for grouping isolated assemblages.

Alaska has seen almost 80 years of microblade study because of its geographical importance as an entrance gate for the first migrants to the American continents. Soon after the discovery of Folsom points associated with extinct mammoth remains in New Mexico (Cook, 1927), the first microblade assemblage was found at the Campus site in Fairbanks (Fig. 1-2). This sparked interests in lithic technological connections between the Old and New World (Nelson, 1937). However, additional firm microblade assemblages were not confirmed until the 1960s in interior Alaska (Rainey, 1953).

In 1967, West (1967) proposed the Denali complex and pushed Alaskan microblade study forward with his microcore techno-morphological analysis using four sites including the Donnelly Ridge (Fig. 1-7) and Campus sites. At the same time, Cook (1969)

* Corresponding author.
E-mail address: beringia@keio.jp (Y. Hirasawa).

http://dx.doi.org/10.1016/j.quaint.2016.07.021
1040-6182/

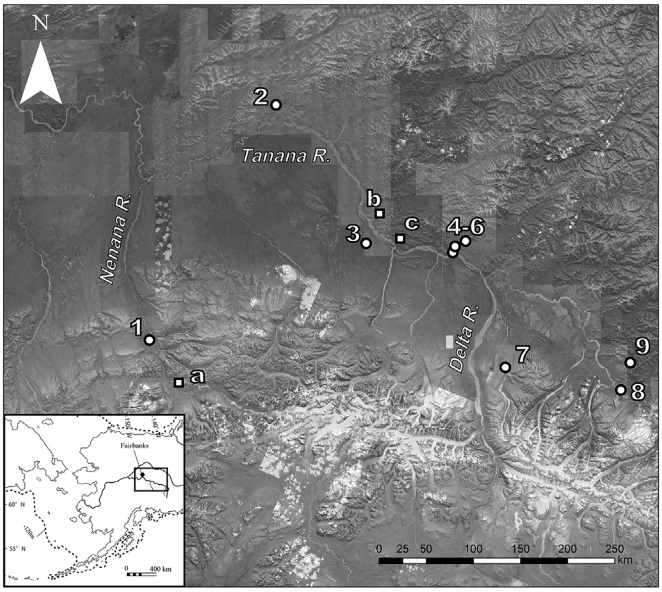

Fig. 1. Archaeological sites and lakes in interior Alaska discussed in this paper. 1. Dry Creek, 2. Campus, 3. Upward Sun River, 4. Broken Mammoth, 5. Mead, 6. Swan Point, 7. Donnelly Ridge, 8. Gerstle River, 9. Healey Lake Village, a. Windmill Lake, b. Birch Lake, c. Harding Lake.

excavated notable triangular and teardrop shape bifacial points associated with microblades at the Healy Lake Village site (Fig. 1-9) in the Tanana Valley. The assemblage, with bifacial points (named Chindadn) and microblades, was defined by Cook as the Chindadn complex. Both West and Cook identified microblade technology as the oldest hunting tool technology in Alaska and that it was an Old World industry.

Archaeological sites discovered in the Nenana River valley during the 1970s and 1980s brought another archaeological context. The Dry Creek site (Fig. 1-1) had large numbers of lithic artifacts with hearths buried within thick loess (Powers et al., 1983). There were two distinctive components based on the presence of Chindadn points from the lower stratum (component I) and microcores from the middle stratum (component II). Because this phenomenon also occurred at other sites in the region, Powers and Hoffecker (1989) stated that the Nenana complex assemblage contained Chindadn points with unifacial scrapers and no microblades and suggested that the Nenana complex is older than the Denali complex. This interpretation has led a few scholars to connect the Nenana complex with the Clovis complex, based on a presence of bifacial point technology and absence of microblade technology (Goebel et al., 1991). However, no comparative predecessor bifacial points have been found yet in Siberia or in North America (Goebel et al., 2003, 2010, 2013).

Discussions of microblade and non-microblade complexes have become more entangled after the finding of Yubetsu microcores at the Swan Point site cultural zone (here after CZ) 4b, in the middle Tanana valley (Fig. 1-6). The well stratified site, located on a hilltop in Shaw Creek flats, has four major cultural zones. The oldest, CZ4b, was dated to about 14,200 years ago, making it the oldest radiocarbon dated component with microblades in North America. On the basis of the techno-typology and chronology, Holmes (2001, 2008) has classified the CZ4b lithic assemblage into the East Beringian tradition Phase I (EBt-I). This new cultural framework for interior Alaska generated two important problems pertaining to the early human migration to Eastern Beringia: (1) is there a cultural continuity between EBt-I and the Denali complex; and (2) is the Nenana complex a part of microblade complexes, e.g., Chindadn or Denali.

One of the most important topics for prehistoric archaeology is documenting cultural continuity throughout the archaeological record. In the context of the peopling of Americas, it has been the center of argument with migration timing and routes from the Old World to the southern tip of South America. To evaluate several different migration hypotheses, late Pleistocene archaeology in North America has emphasized the study of the Clovis complex; because it was the most widely distributed and regarded as the oldest lithic industry. Because of this history, Alaskan archaeological evidence has been compared with both Old World and Paleoindian sites to discover the most accurate and logical model (Powers and Hoffecker, 1989; Goebel et al., 1991; Bever, 2001; Meltzer, 2009). However, Alaskan sites radiocarbon dates explicitly show “the Alaskan record does not fit neatly with any particular peopling scenario” (Bever, 2006: 597). This means that Alaskan archaeology should be discussed without compulsive comparison with the larger peopling America scenario − Clovis.

Nevertheless, the small geographical scale study here suggests that techno-morphological comparison of microcores gives fruitful results for chronology in interior Alaska. The difference in microcore technology has been recognized and discussed by Holmes (1998, 2001, 2008, 2011) and Gómez-Coutouly (2012). Technotypological comparison is the most effective method to differentiate microblade assemblages (Hayashi, 1968), and this classification stands on two distinctive manufacturing methods (Fig. 2). The Yubetsu method uses a bifacially prepared blank. The platform is formed by reduction of the first (ridge) spall and then secondary (ski) spalls. Microblade reduction starts after detachment of the first microblade, and this reduction sequence produces highly consistent microblades. The Campus method (based on a unifacially prepared flake blank) has been confirmed in sites from the Denali complex and later periods. The platform is formed with the initial unifacial retouch from the ventral side, and the core tablet (platform preparation flake) is removed from the core face. Detachment of the primary and secondary microblades follows the platform formation. Platform rejuvenation occurs more frequent in the Campus method than in the Yubetsu method, and its technique is differentiated by the platform flaking direction and its partial rejuvenation. Thus, the microcore technology can be used to distinguish two microblade assemblages. The most important points are the application of various analytical methods to consider the technological and population change while avoiding too much reliance on the diagnostic tool or microcore morphology.

In interior Alaska, beyond the microcore typological discussion, detailed quantitative lithic raw material data have been used to identify the difference in technological organization among Denali, Nenana, and EBt-I (Graf and Goebel, 2009; Goebel, 2011; Potter et al., 2013). Goebel (2011) demonstrated that Nenana complex people knew and exploited local raw materials, and Denali complex people brought more remote raw materials for specific tool production. This study might be interpreted to say that Nenana people were pre-adapted to the local environment even though they were early occupants. To the contrary, Yesner and Pearson (2002) regarded the concentrated use of local raw material indicates lack of resource distribution knowledge. Gómez-Coutouly (2012) also tried to explain the technological change between EBt-I and the Denali complex by adaptation to local raw material limitation. His argument assumed that the Old World microblade industry positively selected obsidian and flint. Based on this insistence, the earliest microblade producers changed their production method to compromise on available raw material size (Mobley, 1991; Graf and Goebel, 2009) and lesser quality tool stone in the Nenana and the Tanana valleys. He also mentioned that the single possible Campus type microcore from Swan Point CZ4b could be classified as a burin in terms of its size and facet morphology, a conclusion we agree

Please cite this article in press as: Hirasawa, Y., Holmes, C.E., The relationship between microblade morphology and production technology in Alaska from the perspective of the Swan Point site, Quaternary International (2016), http://dx.doi.org/10.1016/j.quaint.2016.07.021