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Emergence of a microlithic complex in the Transbaikal Region of southern Siberia

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ABSTRACT

Upper Paleolithic stone artifact microlithization embodied a change in tool design and production that noticeably impacted northeast Asian prehistory. Here we trace the process of microlithization in the Transbaikal Region of southern Siberia using core reduction event-trees and morphometric analysis of cores and their by-products. Microtechnology emerges in the Transbaikal in the Middle Upper Paleolithic just prior to the Last Glacial Maximum (LGM) in the form of highly variable microcores with small flakes and blades, and possibly sporadic pressure flaking and slotted tools. This variability indicates an experimental period in microlithic technology. After a 2000-year gap in the occupational record, a highly standardized microblade technological complex consisting of wedge-shaped microblade cores, pressure flaking, microblades, and slotted osseous tools appears in the Transbaikal as a fully adopted system. This evidence suggests that microtechnologies developed within the Transbaikal just prior to and during the LGM, underwent refinement outside of the region for roughly 2000 years, then was brought into the region during the LGM with flintknappers as a fully adopted system.

1. Introduction

Microliths mark the Middle Stone Age in southern Africa (Ambrose, 2002, p. 9; McCall, 2007, p. 1739), the Upper Paleolithic in Europe (Fisher, 2002, p. 173), East Asia (Goebel, 2002, p. 117; Seong, 2008, p. 871; Derevianko, 2010, p. 9), India (Clarkson et al., 2009, p. 327; Petraglia et al., 2009), and the Paleoarctic Tradition in subarctic North America (Dumond, 2009). In the Transbaikal region of Siberia, microlithic technology appeared during climatic cooling ~26,000 uncal BP (~30,000 cal BP) of the Last Glacial Maximum (LGM, ~22,500–16,100 uncal BP [~26,500–19,500 cal BP]) (Mix et al., 2001, p. 633–641; Clark et al., 2009, p. 710) as small microcores (Terry et al., 2009, p. 259; Terry, 2010, p. 46; Buvit et al., 2015b). At around 18,500 uncal BP (~22,740 cal BP), some of the earliest, well-dated microblades and wedge-shaped microblade cores in Siberia appeared in the Transbaikal at the Studenoe 2 site (Goebel et al., 2000, p. 574; Buvit et al., 2015b) (Fig. 1).

The main problem we address here is the development of microlithic technology in the Transbaikal Region. We evaluate core reduction strategies through event-tree analysis to examine how these Upper Paleolithic technologies were developmentally related. Our primary focus is on reduction techniques originating during the LGM that may have bridged microcore technology of the middle Upper Paleolithic (MUP) to late Upper Paleolithic (LUP) microblade technology (Terry et al., 2005).

1.1. Background

Two explanations account for microblade technology in the Transbaikal and Siberia in general. One is that humans who lacked microblades depopulated the region at the LGM after an initial early Upper Paleolithic (EUP) colonization. Proponents of the abandonment model see a sharp decrease in radiocarbon dates from archaeological sites between 22,000 and 18,000 uncal BP (~26,500 and 21,700 cal BP) (Tseitlin, 1979, p. 260; Goebel, 1999, p. 218; Goebel et al., 2000, p. 574; Dolukhanov et al., 2002, p. 603; Goebel, 2002, p. 122; Graf, 2005, 2008, p. 404, 2009a, pp. 705–706; Buvit et al., 2015b). Abandonment of Siberia (or a substantial population reduction) occurred ~19,500 uncal BP (~23,000 cal BP) (Tseitlin, 1979, p. 260; Goebel, 1999, p. 218; Goebel et al., 2000, p. 574; Goebel, 2002, p. 127; Hoffecker and Elias, 2003, p. 38; Graf, 2008, p. 404, 2009a, pp. 705–706, 2009b, p. 496), and between

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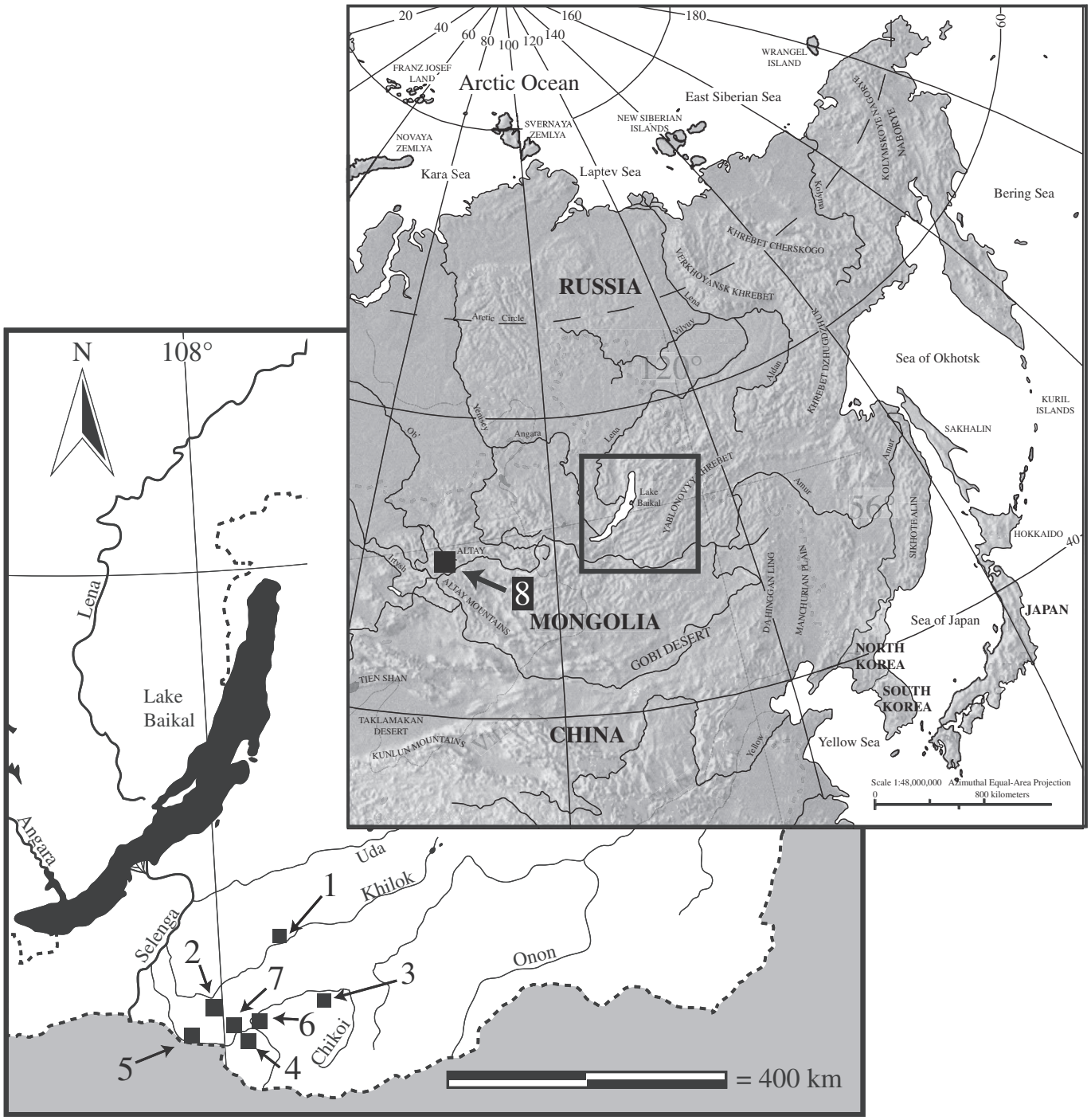

Fig. 1. Map of Siberia showing the Transbaikal Region and the study sites: 1 Tolbaga, 2 Kunalei, 3 Priiskovoe, 4 Melnichnoe 2, 5 Chitkan, 6 Ust' Menza 1 and 2, 7 Studenoe 1 and 2, 8 Ust'-Karakol 1 and Anui 3.

21,080 and 18,830 uncal BP (~25,000 and 22,730 cal BP) (Buvit et al., 2015b). After 18,830 ± 300 uncal BP (~22,730 cal BP) (AA-26739) (Goebel et al., 2000), humans with wedge-shaped microblade cores began reoccupying southern Siberia, first in southwestern Transbaikal (Goebel et al., 2000, p. 572), and then in most areas of unpopulated northeast Asia.

The contrasting hypothesis ascertains that microblade technology was present in Siberia before the LGM from at least 23,000 uncal BP (~27,500 cal BP) (Mochanov, 1978; Mochanov and Fedoseeva, 1996, pp. 158–159; Kuzmin and Orlova, 1998, pp. 34–37), and stable human populations continuously occupied the region (Kuzmin et al., 2004; Kuzmin and Keates, 2005, pp. 782–785; Fiedel et al., 2007; Kuzmin, 2008, p. 207). Kuzmin (2008, p. 174) identifies at least 18 Siberian sites, including Studenoe 2 in the Transbaikal (Fig. 1), with unequivocal LGM dates. Additionally, work directed by Derevianko (2005, p. 195), Derevianko and Markin (1998, p. 98), Derevianko and Shunkov (2005, p. 195)and Derevianko and Volkov (2005, p. 230) may extend the earliest microliths, including microblades, to 35,000 uncal BP (~40,000 cal BP) at the Ust'-Karakol 1 and Anui 3 sites in the Altai (Fig. 1) (see

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