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Nunataks and valley glaciers: Over the mountains and through the ice

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ABSTRACT

Models of the first peopling of the Americas characterize arrival routes either along the coast or through the ice-free corridor following the Last Glacial Maximum. While the pendulum has currently swung somewhat towards the coastal route, archaeological evidence for either entry is lacking. In this paper we introduce a third option, an icy corridors entry route. We argue that the traditionally envisioned corridor is an unnecessary feature for the terrestrial arrival of Clovis or Clovis predecessors below the ice sheets. The recent genomic data is fully compatible with a re-envisioned peopling route.

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1. Introduction

The timing and the mechanism of the peopling of the Americas is one of the big unanswered questions of American archaeology, a question that scholars already asked soon after the European discovery of the continent. To the best of our knowledge and as is often repeated in books on North American prehistory, Acosta (1880) was the first to propose a northern entry route for the First Americans. Acosta theorized that the ancestors of both the human inhabitants and the native animals of the Americas must have walked across dry land that connected the Old World to the New World somewhere to the north. Other scholars also proposed entry from Asia on the basis of the physical and temperamental similarities of contemporary Asian and Native American peoples (see Wilmsen, 1965: 173; Willey and Sabloff, 1993: 18); this was essentially a less sophisticated precursor of today's genomic approaches. In Acosta's time, some European maps depicted a narrow waterway, called the "Strait of Anian" separating northeastern Asia from North America. Russian explorations (Dezhnyov in 1648, Bering in 1728 and 1741) confirmed the actual existence of a strait between Chukotka and Alaska. After geologists' recognition in the 1870s of multiple ancient glacial episodes, they realized that sea levels dropped whenever the great ice sheets formed. When the sea level

fell, a vast land bridge connected Siberia to North America. In 1937, Swedish botanist Eric Hulten called this now-submerged land mass, "Beringia." Late Pleistocene Beringia and its eastern and western margins were a grassy steppe teeming with mammoth and other Pleistocene megafauna that attracted human hunters (Guthrie, 1990). Since the early 20th century acceptance of Pleistocene occupation of North America (Figgins, 1927) and the subsequent discovery of an earlier Clovis culture, the condition of Beringia and northern North America (Canada) became critical to the timing and entry routes for the peopling of the Americas.

The association of humanly made artifacts with late Pleistocene fauna demonstrated the earliest evidence of people in the Americas. To account for this human presence in the southern American Plains, entry scenarios suggested that the First Americans walked from western Beringia across a terrestrial landscape through what is now Alaska and Canada. Subsequent models of peopling by groups with Clovis diagnostics essentially elaborated Acosta's proposal (Wormington, 1957; Haynes, 1964, 1966). Two features along that route were frequently, and we think erroneously, perceived as obstacles to this movement and thus received, and continue to do so, inordinately large amounts of attention in the literature: the Bering Land Bridge and the ice-free corridor (IFC). The very ice age conditions that caused the sea level to drop, allowing terrestrial access from western to eastern Beringia, also presented an obstacle in the form of two massive ice sheets that straddled the continent and periodically prevented access to the south. In this paper we: 1) review and debunk the traditional view

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of the IFC; 2) review the archaeological evidence of this region; and 3) propose the “icy corridors” as a viable alternative entry model. We approach the IFC through the current understanding of the paleoenvironments between Beringia and unglaciated North America to the south, including an evaluation of the resource base and transportation potential of this area. In our review of the archaeological evidence, we include the Canadian Rockies, adjacent Plains, and associated northern ranges and valleys. Finally, we ask how our perspective relates to the new genetic data about the First Americans.

2. A traditional perspective on the corridor and peopling

Models of peopling of the Americas regard the ice-free corridor as an especially important and formidable feature. Of the many available examples we mention a few below. In an early study of the First Americans and the peopling of North America, Marie Wormington tells us:

Although the crossing could have been *accomplished by means of very primitive watercraft* and with little knowledge of navigation, or by *walking across on the winter ice*, it is difficult to see what the incentive would have been for such movement, at least for hunters of grazing animals. It seems more *probable that such people would have crossed the Strait at a time when it was possible for the animals* on which they depended for food to cross. They would have been able to do so when the two continents were joined by a *land bridge*. At the height of a glaciation much water was abstracted from the sea to feed the ice sheets, and there was some rise of the ocean floor. A general lowering of sea level resulted, and shallow portions of the ocean became land surfaces. (Wormington, 1957: 250; emphasis added)

Interestingly, Wormington acknowledges the possibility that the Bering Strait does not pose an obstacle, but opts to create a scenario that requires a land bridge. With regard to the corridor, Wormington continues:

There is also the problem of how men reached the areas farther south in which evidence of their presence at an early date has been found. During glacial stages there were ice sheets covering large parts of North America. These would have *presented a barrier* to the movements of men and animals. (Wormington, 1957: 250; emphasis added)

Subsequent statements continue this line of logic with respect to both the Bering Land Bridge and the ice-free corridor:

Lower ocean levels exposed shallow continental shelf, including that beneath the Bering Sea, thereby forming a land bridge – Beringia – that connected Asia and America ... When Beringia existed, it was possible to walk from Siberia to Alaska. Of course, once people made it to Alaska, those same glaciers *presented a formidable barrier to movement further south* – depending, that is, on precisely when they arrived in this far corner of the continent. (Meltzer, 2009: 3; emphases added)

Here Meltzer not only places importance on the Bering Land Bridge, but also links the lowering of sea level with the buildup of continental ice sheets. And in another publication Meltzer continues:

As we envision it, sometime before 12,500 years ago, a band of hardy Stone Age hunter-gatherers headed east across the vast steppe of northern Asia and Siberia, into the region of what is

now the Bering Sea but was then grassy plain. Without realizing they were leaving one hemisphere for another, they slipped across the unmarked border separating the Old World from the New. From there they moved south, *skirting past vast glaciers ...* (Meltzer, 2009: 1; emphasis added)

Most recently, Madsen (2015) presents a typical perspective on the nature and timing of the corridor's closure and reopening. Of course, from Wormington to Madsen and many others in between, the data on the nature of the corridor have grown exponentially and Madsen's data are far richer than those available to his intellectual predecessors:

An ice-free corridor between the two ice sheets was probably closed off by ~20 ka (Jackson and Duk-Rodkin, 1996), ... When the ice-free corridor was again opened following the LGM remains an open question, particularly if one distinguishes between when the *glacial seal was broken* and when the corridor actually became passable to humans. (Madsen, 2015: 223; emphasis added)

Madsen clearly perceives the corridor as well as the specific conditions in the corridor as relevant or even critical to when people could traverse this landscape. Madsen (2015) further discusses the timing of ice melt, rising of sea levels, and dating of specific punctuations in this process:

Based on directly dated materials, Dyke (2004, see also Tarasov et al., 2012) suggests that a narrow corridor between the Laurentide and Cordilleran ice sheets opened between ~14.5 and 14 ka ... however, the corridor *between the walls of ice* was extremely narrow and filled along much of its length by proglacial lakes (Fig. 4), and it may not have become passable by human foot traffic until after ~13.5 ka. Even then, there remains the question when the glaciated terrain in the *corridor became biologically productive enough to support human populations*. Mandryk et al. (2001) suggest that did not occur until after ~12 ka ... I employ an age of ~14 ka as the maximum age for the availability of an ice-free corridor, with the caveat that it may have been a thousand years or more after that *before human foragers could use the route*. A coastal route from interior Beringia was probably only closed to human foot traffic for a few thousand years between ~18 and 15 ka and the *presence of numerous refugia along the coast* of northwestern North America would have supported leapfrog movements by boat in a relatively simple manner. (Madsen, 2015: 224–225, emphasis added)

In this quote Madsen presents the widely held view that the coast presented less of an obstacle than the severe conditions within the corridor that hindered its use by humans. He characterizes the glacial fronts as walls of ice, therefore reinforcing the notion that they are essentially impenetrable. Should someone successfully squeeze between these walls, this was no place to live. These are the views we specifically confront in the rest of this paper.

In the preceding we have emphasized the IFC, the focus of our study. However, with respect to the Bering Strait we only note that it is frozen every winter and that ancient people, apparently long before occupation of North America, had watercraft (Bednarik, 1997 and elsewhere). Thus, a human crossing could have taken place any time and thus exposure of the land bridge is largely irrelevant. In this paper, however, we address the somewhat more complicated issue of the Alberta Corridor.

Dozens of corridor studies have contributed to this discussion.

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