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THE ARCHAEOLOGY OF MOBILITY

OLD WORLD AND NEW WORLD NOMADISM

EDITED BY
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CHAPTER 8

COLONIZATION, STRUCTURED LANDSCAPES AND SEASONAL MOBILITY

AN EXAMINATION OF EARLY PALEO-ESKIMO LAND-USE PATTERNS IN THE EASTERN CANADIAN ARCTIC

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WHEN DISCUSSING NEW World archaeology, the word *colonization* conjures images of Paleo-Indian sites and Clovis points because these were the first peoples and lithics to enter the North American continent from an Asian/Beringian origin, some 12,000 years ago. Several thousand years later, a second and apparently unrelated pioneering population followed the same entry route into the New World, but instead of moving southward, these peoples came to occupy the previously uninhabited Arctic regions of Canada and Greenland (Figure 8.1). These peoples are known archaeologically as the Paleo-Eskimos.

[1] Many thanks to Aubrey Cannon and Chris Ellis for reading earlier drafts of this chapter and for offering many helpful comments and suggestions. I am grateful to Chris Ellis for his encouragement over the last few years to undertake such comparative analyses of Paleo-Eskimo and Paleo-Indian material culture. His insights and expertise on Paleo-Indian lithics helped me to formulate several of the ideas presented in this chapter. Thank you also to Lisa Hodgetts for providing another critical northern perspective on Paleo-Eskimo culture and to Robert Park for allowing me to reproduce the map illustrated in Figure 8.1. This chapter was written during my tenure as a postdoctoral Research Fellow in the Department of Anthropology at the University of Western Ontario. Support for this fellowship is generously provided by the Social Sciences and Humanities Research Council of Canada Post-Doctoral Fellowship Program. Funding for my doctoral research, on which part of this chapter is based, was provided by the Social Sciences and Humanities Research Council of Canada Doctoral Fellowship Program, the Association for Universities for Northern Studies Studentship Awards Program, the Northern Scientific Training Program and the McMaster University School of Graduate Studies. It was inspiring to meet, at the Cotsen Institute of Archaeology at UCLA, where this chapter was first presented, with colleagues studying such a unique diversity of cultures, from different periods, centering on issues of human mobility.

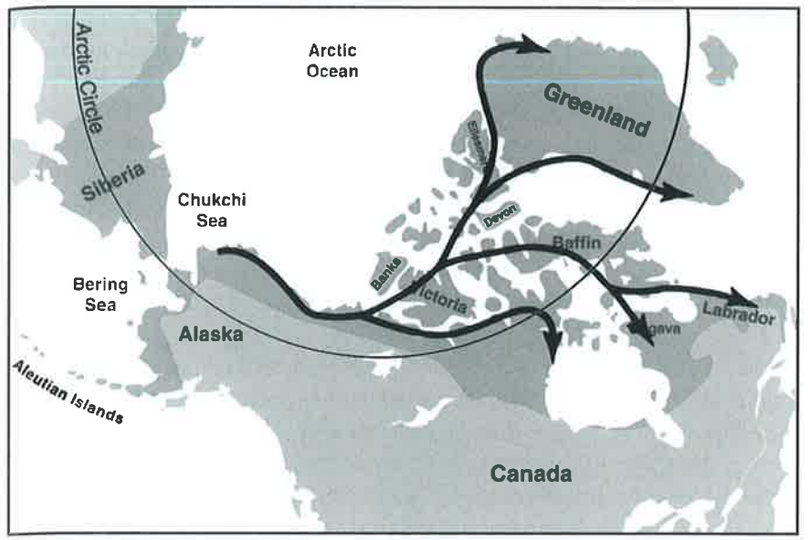

Figure 8.1. Map of the Canadian Arctic and Greenland, showing the route of the Paleo-Eskimos (courtesy of Robert Park).

This movement effectively represents a second discrete colonization of people into a pristine environment in the New World. Despite some obvious similarities between the Paleo-Indians and Paleo-Eskimos in terms of culture origins, small population size, lithic technology and mobility, comparatively little consideration has been given to these early Arctic pioneers when addressing universal archaeological questions of human colonization and adaptation in unfamiliar environments (Ellis 1998). Given the contributions that research on the Paleo-Eskimos can make in addressing questions on these topics, it seems fitting to raise the profile of this culture in the wider field of archaeology. That said, I am in no way implying we presently know all there is to know about these peoples. We can state that the Paleo-Eskimos thrived in the eastern Arctic for roughly 3000 years. We cannot say, though, exactly how they did survive in what initially would have been unfamiliar surroundings. Moreover, how did the Paleo-Eskimos stay in contact with one another given that the average group size is estimated to have been between 10–30 people at any given time of the year (Maxwell 1985:98)? Some archaeologists have argued that to maintain basic biological viability in a population, group size needs to be

larger than 25 (for instance Kelly 2003:51). If it is not, frequent and repeated contact with outside groups must be established and maintained, no matter the distance to be traveled (Wilmsen 1973, 1974; Wobst 1974; Mandryk 1993; MacDonald 1998, 1999; MacDonald and Hewitt 1999). With this in mind, social factors take on a more significant role than they have been previously given, especially among small-scale nomadic peoples like the Paleo-Eskimos. In this chapter I consider how colonization, lithic raw material procurement, social contact and landscape learning articulated over time to shape Paleo-Eskimo land-use patterns, particularly those on southern Baffin Island.

To situate this discussion, I begin with an overview of Paleo-Eskimo culture and current interpretations for what sparked their eastward migration from Alaska. To highlight some of the flaws with these cultural characterizations, I draw on Rockman's (2003:4–7) concepts of environmental knowledge and landscape learning. I argue that the establishment of habitual land-use patterns among the Paleo-Eskimos may have been more significantly influenced by demands for lithic procurement and social contact than by subsistence needs. The Paleo-Eskimo migration into the eastern Arctic was fairly rapid, and one of the driving forces structuring this movement may well have been the motivation to secure an adequate and reliable tool-stone supply. As all Paleo-Eskimo groups would have shared similar locational priorities on entering this pristine landscape, a coincidental opportunity for social interaction likely resulted at these tool-stone sources since there would exist a need to acquire locational knowledge regarding their distribution in an unfamiliar landscape. As nomadic peoples, the Paleo-Eskimos did not exist at the mercy of their surroundings, and interpretations of these peoples living a tenuous existence must be reconsidered. As Mandryk (2003:xiii) notes, hunger, cold or adventure can no longer be thought of as the principal driving forces behind human colonization into new lands.

PALEO-ESKIMO CULTURE

Because of poor preservation conditions created by climatic fluctuations, annual freeze-thaw cycles, and moist acidic soils, organic materials generally do not survive in Paleo-Eskimo sites. Consequently, much of what we know about the Paleo-Eskimo culture derives from its lithic remains. The stone tools made and used by these peoples are very distinctive. Typological and morphological similarities, particularly among burins, microblades, microcores and endblades, have led to widespread speculation among Arctic archaeologists that the Paleo-Eskimos originated somewhere in the Old World, most likely Siberia (Giddings 1967). Perhaps the most striking characteristic of Paleo-Eskimo stone tools is their small size (Figure 8.2).

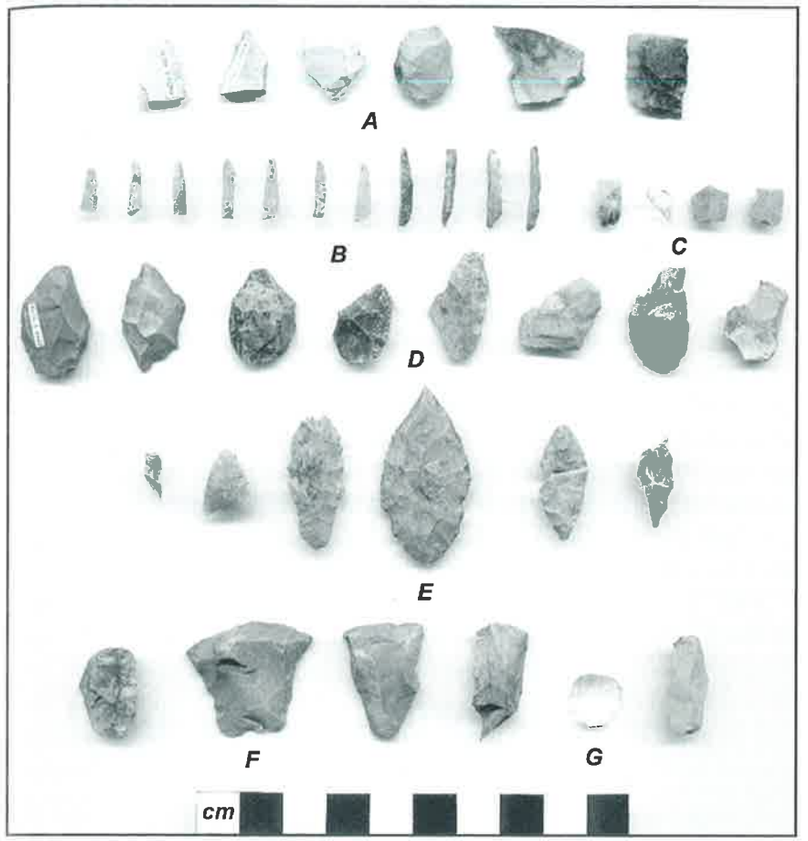

Figure 8.2. Examples of Paleo-Eskimo lithic artifacts illustrating their tiny size. This assemblage is from the Tungatsivvik site (Frobisher Bay, southern Baffin Island) and includes (A) informal tools; (B) burin spalls; (C) microblade fragments; (D) burins; (E) bifaces and biface fragments; (F) scrapers; and (G) core fragments.

Among the Inuit, oral histories claim that the makers of these tools must have been dwarfs precisely because of their small size (Maxwell 1985:40). Several isolated finds, however, indicate that these tiny lithics were mounted into larger hafts, handles and shafts. Given the value of these organic implements in an environment where such materials are often difficult to come by in large pieces, they were rarely discarded with the lithics, thus leaving the impression that only small hands could have used the isolated stone parts. Irving (1957) coined the name Arctic Small Tool tradition (ASTt) and applied it to all Paleo-Eskimo sites from Alaska to Greenland where these tiny stone tools were found. He believed, based on this trait, that they all belonged to a single parent culture.

When exactly the Paleo-Eskimos entered into the New World is a matter of debate largely because of problems with radiocarbon dating Arctic sites.[2] The point of entry, however, is generally accepted as having been on the north shore of Alaska. McGhee (1996:73), Maxwell (1985:37, 39) and Schledermann (1996:39) all speculate that this movement began when several small bands of people crossed the Bering Strait from the nearby Chukchi Peninsula into Alaska via the Seward Peninsula some 5000 years ago. Soon after crossing into Alaska, these people began moving into the eastern regions. Earlier immigrants into the New World, the Paleo-Indians, had not previously colonized the eastern Arctic because the area remained glaciated until roughly 6500 years ago, making it uninhabitable (Maxwell 1985:37; Schledermann 1996:15). Once the ice retreated, human expansion occurred rapidly, with full colonization from Alaska to Greenland being estimated at having been accomplished in 500 years or less (McGhee 1996:73). There remains the question of why the Paleo-Eskimos moved eastward to colonize the last uninhabited region in the New World. As Maxwell (1985:45–47) notes, there is no definitive evidence to explain the impetus for this movement, but there are several theories.

First, it is thought that with the retreat of the glacial ice sheets there occurred a biotic explosion in which plants as well as marine and terrestrial animals thrived in this new environment. Human hunters would have been attracted to these abundant subsistence resources, which would have been easy to hunt, having never seen human beings before. Second, population pressure in Alaska is proposed as a catalyst for colonization. To date, however, there is no direct evidence indicating that population numbers had exceeded the carrying capacity of the local Alaskan environment. Third, it is thought that intergroup tensions or disputes may have resulted in band fissioning, in which those peoples who were shunned or cast out left in search of a new 'homeland' (McGhee 1996:74). Last, the rapid colonization of the eastern Arctic has been closely tied to musk ox hunting. Steensby (1917) proposed that the Paleo-Eskimos followed eastward migrating herds of musk ox from the western subarctic Barrenlands to Greenland. Because of the defensive

[2] The debate in Arctic archaeology surrounding the use of radiocarbon dates deriving from sea mammal fat and bone has spanned several decades (McGhee and Tuck 1976; Arundale 1981; Park 1994). Because of problems with the marine reservoir effect, dates obtained from marine mammal samples are considered less reliable than those obtained from terrestrial sources. Even though efforts have been made to devise correction factors for these marine dates, most researchers still consider them suspect, opting instead for dates obtained from terrestrial species.

tactics of musk oxen, which form a circle or line to protect the herd, all of the animals could be killed at once. Over time this would invariably put pressure on local populations because of their slow reproductive rates (McGhee 1996:55). Therefore, the Paleo-Eskimos would have had to move further and further eastward in search of new herds. Evidence from sites in Greenland, where middens have been found indicating a focused exploitation of musk ox, seems to support this theory. The ethology of musk ox, and their potential for population collapse, suggests that a dependence on this animal as a primary resource would have been extremely risky. Because of this, the musk ox theory remains questionable.

Whatever the catalyst was for the colonization, we know that it was rapid. A plausible explanation for the speed of this process is that the environment, although uninhabited, was not drastically different from the one the Paleo-Eskimos left in Siberia and Alaska. In other words, the Paleo-Eskimos would have been pre-adapted to living in the eastern Arctic environment, having already established sophisticated marine and terrestrial hunting strategies in their place of origin. Despite the probability that the Paleo-Eskimos were pre-adapted to this pristine environment, archaeological interpretations of these peoples' way of life tend to reinforce an idea that Paleo-Eskimo existence was frequently tenuous or 'stressed' (Maxwell 1997:206). They lived year-round in skin tents and snow houses (Ramsden and Murray 1995), enduring winter temperatures of below -40°C. To heat these structures, it is thought that the Paleo-Eskimos burned animal bones and fat in open fires, contained in box hearths, rather than using soapstone lamps (Maxwell 1984:361; Schledermann 1996:8–9). Soapstone lamps are far more efficient as sources of heat and light than open fires are, but few of these items have been found in archaeological sites, leading to speculation that they were not widely used by these earliest Arctic inhabitants (Maxwell 1984:361). Existence in these dwellings would not only be cold but also unpleasantly smoky.

Paleo-Eskimo camps are interpreted as ephemeral given the low density of material remains that characterizes many of them, suggesting that their inhabitants were constantly on the move, most likely in pursuit of animal resources (Andreasen 2000:91; Nagy 2000:144–145). The winter darkness would complicate efforts to hunt, particularly in the highest Arctic regions. Knuth (1967) proposed that to mitigate the long winter months of darkness and isolation, these pioneers may have passed the winter in a kind of semihibernation, during which time little activity of any kind occurred. Presumably, the Paleo-Eskimos cached food outside their skin tents, gathered as much fuel, in the form of musk ox bones, as possible, and crawled underneath heavy skins to sleep the winter darkness away (McGhee 1996:64–65). What reflects the insecurity of this kind of existence are the population estimates

for this culture.[3] McGhee (1996:65) states that in the High Arctic, there may have been only 200–300 people scattered over one million km^2. If these same densities apply to the Low Arctic, then the total Paleo-Eskimo population may have merely comprised 500–1000 people throughout this massive region.[4] When these people were dispersed in winter camps of 10–15 individuals, the loss of any one person, particularly a hunter, could spell disaster for all (Schledermann 1996:101). Moreover, with numbers this small, the loss of a single regional group could seriously hinder the biological viability of the entire population (Park 2000:201).

ENVIRONMENTAL KNOWLEDGE AND LANDSCAPE LEARNING

In the Arctic it is easy to explain away certain patterns of human behavior in the archaeological record, given the sharp seasonal changes experienced in this environment and their effects on the ecosystem. But the Paleo-Eskimos would not have survived long if this was their sole reality. To link these peoples' existence so intrinsically to seasonal shifts in the environment and resource base undermines their ability to think, act and adapt. It denies them agency as human beings and makes them appear as automatons that merely wandered about the landscape, weather permitting, in search of food (Wobst 2000:40). Rockman (2003) recently proposed that to truly understand the process of human colonization in pristine environments, archaeologists must consider how existing knowledge (from a place of origin) and landscape learning (the knowledge that is acquired in a new location) shaped and reinforced the behavior of pioneering populations in unfamiliar surroundings. This kind of analysis facilitates a

[3] Population estimates for the Paleo-Eskimos are highly speculative because large parts of the Arctic landscape remain unexplored. This makes it difficult to devise accurate assessments of Paleo-Eskimo occupation densities. Despite these difficulties, ethnographic accounts by Boas (1964:18, see table for individual settlement numbers) for the southern Baffin Inuit indicate that the overall population numbers for the entire region did not exceed several hundred. Settlement size ranged from 20–82 individuals, and these numbers were wholly dependent on the seasonal availability of subsistence resources. It is acknowledged that the Paleo-Eskimo population was smaller than that of the Inuit (Maxwell 1985). Therefore, it is not unreasonable to speculate that a need for social interaction would have been of critical importance to these earliest peoples both on a cultural level and on a purely biological level (Park 2000:201).

[4] The Low Arctic is loosely defined as the region south of the Parry Channel. The areas north of the channel are considered High Arctic as this is where the conditions that define the Arctic are at their most extreme (McGhee 1996:44–45).

greater appreciation for how past populations knew and used their environment, and it works to dispel the image of a perilous existence.

Rockman (2003:4–7) acknowledges that "knowing the environment can mean many things," and to simplify discussion, she outlines three basic types of knowledge. *Locational knowledge* includes information relating to the spatial and physical characteristics of particular resources. It also includes the ability to relocate such resources after their discovery. Locational knowledge is considered the easiest form of information to acquire. *Limitational knowledge* refers to familiarity with the usefulness and reliability of various resources, including the combination of multiple resources into a working environment. Development of limitational knowledge depends on the periodicity of the given resource and its intended use. *Social knowledge* is the collection of social experiences that serves as a means of transforming the environment or a collection of natural resources into a human landscape.

Two important factors that must be considered when discussing the process of landscape learning include the means by which knowledge is acquired and the time it takes to acquire that knowledge (Rockman 2003:12). For the Paleo-Eskimos we know that the process of landscape learning occurred rapidly. The way this knowledge was acquired, however, has not been explicitly considered by Arctic archaeologists. Rockman (2003:13–19) proposes four approaches through which knowledge and landscape learning can be incorporated into archaeological investigations. For this chapter I draw on the Resource Modeling Approach, which focuses on the ability of a colonizing population to take information acquired in its original environment and effectively apply it in a new area. The success of transferring this knowledge depends wholly on "the similarity of necessary resources in terms of location and distribution, the limitations in terms of carrying capacity, and the social organization required to access them" (Rockman 2003:18).

In the Arctic the range of subsistence resources is comparatively limited in terms of terrestrial (such as caribou, musk ox, hare, fox, birds) and marine mammals (such as seal, polar bear, walrus, whale). The Paleo-Eskimos would most likely have encountered the same range of species in the eastern Arctic as they would have in Siberia and Alaska. Accordingly, established hunting techniques and knowledge of animal ethology would have been transferable from their old environment to this new one. The social organization required to hunt and process these resources would have been equally applicable. Archaeologists studying Paleo-Indian culture (among which Kelly and Todd 1988; Meltzer 1995; Amick 1996; Kelly 1996) have, over the decades, built on Mason's (1962:243–246) seminal statement that subsistence systems based on the exploitation of large fauna are transferable across long distances and that this transferability would invariably have facilitated the expansion of the

Paleo-Indians throughout the North American continent. This transference of hunting strategies would appear to apply in the Arctic for the Paleo-Eskimos as well. It should be noted that contingent situations, where local faunal resources experienced periodic crashes, would occur. As the same situations would have happened previously, the Paleo-Eskimos likely had existing limitational knowledge on how to deal with them. In effect, the Paleo-Eskimos would have been moving through an environment where the seasonal availability and types of resources would have been similar.

This model posits that information related to nonorganic resources, such as lithic raw materials, may be the least transferable from an old environment to one that is newly colonized (Rockman 2003:19). Lithic raw materials should be considered an exploitable resource in the same sense as plants and animals (Rick 1978:4; Ellis 1984:12; Bamforth 1986:40; Daniel 2001:261; Beck et al. 2002:482). Lithic source areas are not mobile, they are easily manipulated when encountered, and they can be exploited repeatedly once they have been identified on the landscape (Nelson 1991:77). Source areas, however, are directly affected by seasonal conditions where ground cover, such as ice and snow, will reduce their availability (Rolland 1981; Kuhn 1991; Wenzel and Shelley 2001). Lithic raw materials are also not always evenly distributed across the landscape, and their quality can vary greatly among source areas (Andrefsky 1994a, 1994b). With these factors in mind, Paleo-Eskimo toolmakers would have needed to quickly locate tool-stone sources and to assess and access them directly. Consequently, the need to acquire locational and limitational knowledge on lithic source areas in the eastern Arctic would be critical, particularly since the geological distribution of this material resource would be entirely unknown to the Paleo-Eskimos in this pristine environment.

In cases where lithic source areas are highly variable in distribution, quality and seasonal availability, individuals will make every effort to acquire high quality tool stone even if it means having to travel considerable distances to do so (Andrefsky 1994a; MacDonald 1998, 1999). To find lithic sources in a new environment would require exploration, and given the logistical challenges involved in moving a large group of people across the landscape, it would not make sense for the entire group to participate on such journeys. We might expect social organization to change to accommodate long-distance raw material procurement (Binford 2001:465–466). Those individuals most capable of such journeys would include the young and physically fit. These are also the persons who would be looking for prospective mates in other distant groups.

MOBILITY, SOCIAL INTERACTION AND LITHIC PROCUREMENT

For decades archaeologists studying small-scale nomadic hunter-gatherer cultures have speculated on how these groups survived given their low population densities and the massive territories they came to occupy (Wobst 1974; Kelly and Todd 1988; Mandryk 1993). Wilmsen (1973, 1974) proposed that among such small-scale societies archaeologists should expect to find a reliance on long-distance mating networks to maintain basic biological viability. MacDonald (1998:228–230) recently revisited this issue and, building in part on Wilmsen's (1974:118–119) ideas, he applied this proposition to Folsom Paleo-Indian sites located in the northern and central plains. He found, by tracing the distribution of exotic tool stone throughout these areas, that these Paleo-Indian people not only used mobility as a critical strategy for finding mates but that, in the process of doing so, they were also able to maintain strong social ties with otherwise distant groups, all of whom were living in a recently colonized region. Early land-use patterns among the Folsom Paleo-Indians appear to have been structured in large part by the demands for social contact. And the apparent rendez vous spots were at or near distinct lithic source areas that were, on average, 330 km away (MacDonald 1999:152). In the process of learning the landscape, the Paleo-Indians in this region acquired locational and limitational knowledge relating to tool-stone distribution. Over time this translated into specific social knowledge in which the local environment, or a collection of resources (such as lithics), was transformed into a human landscape where socially determined patterns of activity (such as finding a mate) occurred within and amongst the inhabitants (Rockman 2003:6). Drawing on this example for comparative purposes, I believe that Paleo-Eskimo colonization and the establishment of habitual land-use patterns in the eastern Arctic could have occurred under similar conditions.

In the extreme north, procurement of lithic raw materials is complicated not only by geological patchiness but also by pronounced seasonal restrictions on accessibility. On southeastern Baffin Island, Maxwell (1973:10–11) notes that sources of chert and other stones used in lithic tool production are scarce and that the available sources consist of small, weathered pebbles on the ocean floor. These pebbles can only be obtained during the Arctic warm season, when the shore-fast ice is gone and when the tide recedes to expose the ocean floor. Patchiness and accessibility would have added to the challenges of finding tool stone in this new environment. Stone would have been a highly valued resource, and it is certain that the Paleo-Eskimos were able to find sufficient source locations. Once identified, a source area was likely used repeatedly simply because it was known, not necessarily because it was the best (Kelly 2003:51). With this in mind, all Paleo-Eskimos in the eastern Arctic would have been exploring the landscape in

search of tool stone and, in the process of doing so, may have encountered other people exploiting the same source areas. According to MacDonald (1999:152), Folsom Paleo-Indians traveled 160–500 km in search of tool-stone sources. Considering that the population density of Paleo-Eskimos in the eastern Arctic was probably far lower than the estimated figure of 1 person/1000 km^2 for the Folsom Paleo-Indians (MacDonald 1999:154), the former would have had an even greater need for external social contact than the latter.

It is highly unlikely that it would have taken the Paleo-Eskimos a long time to learn the locations of tool-stone source areas. This ties back to Rockman's (2003) concepts of locational and limitational knowledge. As I have mentioned, locational knowledge is considered the easiest form of information to acquire because it can be gathered rapidly in a matter of days, weeks or months (Rockman 2003:4). Limitational knowledge relating to lithic raw materials would not be that different in a new environment because periodicity would be directly linked to the same seasonal restrictions relating to ground cover that would have been previously experienced in Siberia and Alaska. Moreover, the intended use of tool stone, no matter where it was procured, would be the same, since lithics were such an integral component of the Paleo-Eskimo technological inventory. Rockman (2003:4) suggests that it would take roughly a generation to become familiar with such resources in a new environment in terms of "their fluctuations, their potentials, and their carrying capacity." Widely dispersed groups of Paleo-Eskimos would soon locate lithic source areas throughout the eastern Arctic and, in so doing, would invariably encounter other groups or at least see evidence of their existence in the region. This may have provided incentives for these widely dispersed groups to make contact with one another, which in turn may have provided the basis for them to establish long-distance social networks where technological needs would be satisfied, reproductive interests secured, and culture continuity maintained.

Framing the process of Paleo-Eskimo colonization using concepts of knowledge and learning dispels the idea that life for these peoples was perilous. Instead, it acknowledges their unique adaptation to a polar environment and their ability to act on the basis of informed decisions. This approach also looks at how factors other than those tied to subsistence influenced people's behavior and interaction. But how did these patterns change once the Paleo-Eskimos became established throughout the eastern Arctic? Generally speaking, the next phase of colonization involves increasing regionalization, where adaptation takes on a more local or regional focus (Speiss et al. 1998; Mandryk 2003:xiv). Land-use patterns among Paleo-Eskimo sites on southern Baffin Island indicate, however, that these peoples continued to make long-distance journeys to acquire tool stone (Figure 8.3), and it appears that social factors were a major motivation to maintain these long-established patterns.

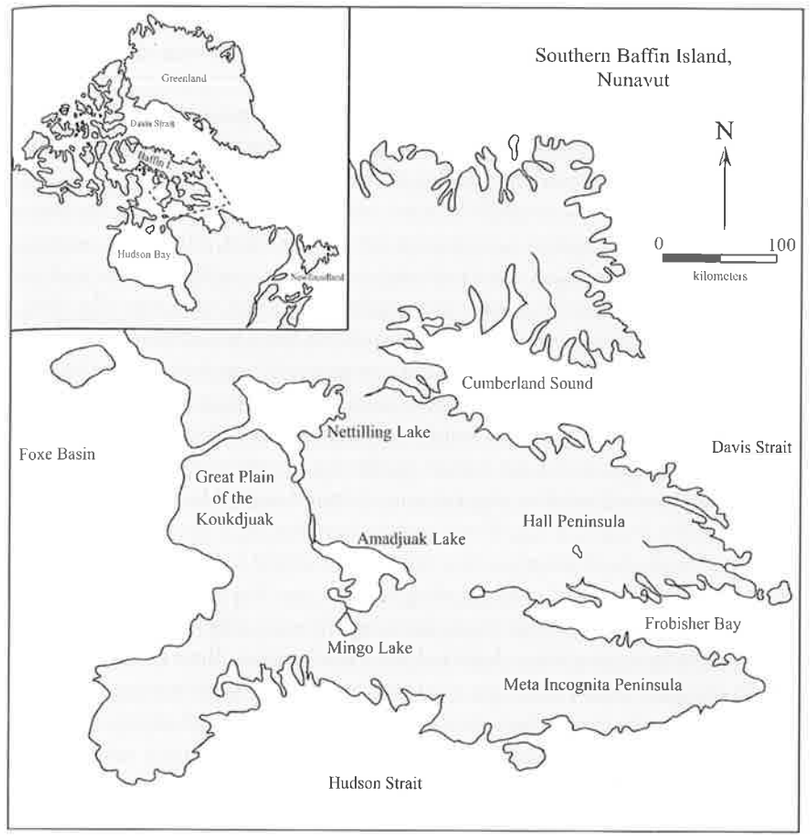

Figure 8.3. Map of southern Baffin Island, in the Canadian Arctic.

THE VIEW FROM SOUTHERN BAFFIN ISLAND

On southern Baffin Island, tool stone is geologically and seasonally restricted (Maxwell 1973, 1985; Odess 1998). In the coastal regions chert occurs in the form of weathered pebbles that can be found only when the shore-fast ice is gone and the tides recede, exposing the ocean floor and coastal headlands. This material is of poor quality and the size of the pebbles restricts the kinds of tools that can be made from them. Fortunately, the interior of the island has a rich and reliable supply of stone fit for tool making in the form of secondary deposits of chert left by retreating glaciers that scoured the inland plains (Stenton 1991; Milne and Donnelly 2004; Milne 2005a). These secondary deposits consist of nodules of varying sizes and are highly variable in quality, color and texture. Amadjuak Lake, one of the large lakes found in the interior,

is considered an especially important location for acquiring chert. *Amadjuak* is an English corruption of the Inuktitut word *amaaq* or *angmalik*. *Amaaq* means 'chert,' and 'amaaq lake' means, loosely translated, 'the place chert comes from' (Stenton and Park 1998:25). This attests to the known presence of chert in the interior, and recent archaeological investigations in this area further underscore its abundance and accessibility (Milne 2005a, 2005b).

The most ideal time to acquire stone for tool making is during the warm season when the ground is not covered by ice and snow. Moreover, seasonal food resources like nesting waterfowl and caribou are readily available and can be reliably procured in large quantities with ease (Milne and Donnelly 2004). This would have permitted toolmakers to focus their attention on renewing their tool kits and procuring sufficient raw material supplies to take back to the coast to meet their technological needs for the remainder of the year. Settlement-pattern analyses on southern Baffin Island indicate that the Paleo-Eskimos, like Inuit, spent the winter on the sea ice and outer coastal regions, where they hunted resident populations of ringed seals (Maxwell 1973, 1985; Stenton 1989; Milne 2003a). The distances between the coast and the interior, combined with the challenges of winter travel, would have curtailed frequent trips inland to get tool stone during the winter. Furthermore, procuring terrestrial subsistence resources at this time of year is difficult because migratory species have long since departed for warmer areas. Boas (1964:22) notes that in the past some Inuit have wintered in the interior; however, they only did so for a single season because securing an adequate food supply appeared tenuous. Based on these seasonal factors, procurement of lithic raw material undoubtedly was a planned event during the warm season, and inland travels to get it would have been scheduled accordingly (Milne 2003a, 2005a).

The interior of southern Baffin Island is easily reached from every coastal location via the coastal uplands (Stenton 1989:112). There are major river systems draining from each of the interior lakes out to the coast. As Kelly (2003:48) notes, when foragers are in an unfamiliar area, they rely heavily on prominent landmarks to navigate their way. Following river systems is perhaps the simplest way to explore the unknown "because if one goes upstream on the way out, one simply has to go downstream to return home" (Kelly 2003:48). Parties of explorers sent out to look for lithic source areas could easily find their way to the interior of Baffin Island, and the abundance of local chert there, by following the prominent inland river systems that connect the interior lakes to the outer coastal regions. If distant Paleo-Eskimos in the Cumberland Sound, Hudson Strait and Frobisher Bay regions all ventured inland at the same time, they would most certainly find one another. Ethnographic records document the importance of the interior of southern Baffin Island as a place where the Inuit traveled during the Arctic warm season (Bilby 1923; Soper 1928; Boas 1964).

The southern Baffin Inuit occupy several widely separated coastal districts. During the winter these people experienced a pronounced degree of isolation. Given the centrality of the interior region, it appears to have served as a focal point for seasonal interactions on an interregional level (Stenton 1989:335). Although Inuit populations were larger in the eastern Arctic during the contact period than those estimated for the Paleo-Eskimos, the Inuit were still widely distributed over a large geographic region. Therefore, these warm season interactions were equally critical for maintaining biological viability because during these meetings prospective mates were given opportunities to interact, and group alliances were renewed and strengthened (Stenton 1989:119). It is easy to imagine that the Paleo-Eskimos would have used the interior region for similar social purposes in addition to lithic acquisition, and five inland sites on southern Baffin Island provide archaeological evidence to support this idea. These five sites are variously located along the shores of Nettilling and Mingo Lakes and the Mingo River, which connects Mingo and Amadjuak Lake, and all of them have produced radiocarbon dates associated with the early Paleo-Eskimo period (Milne, in review). These sites are known as Sandy Point, Mosquito Ridge, LdFa-1, LdFa-12, and LeDx-42 (Stenton 1989; Milne 2003a, 2005a, 2005b, in press, in review; Milne et al., in review).

Sandy Point and Mosquito Ridge are located 10 km from one another on the western shore of Burwash Bay, which forms the southern margin of Nettilling Lake (Figure 8.4). Sandy Point is a single-component Paleo-Eskimo site and was excavated by Stenton in 1985. At the time, the site was being negatively impacted by forces of mechanical erosion. Consequently, it is not possible to determine how much of the site was disturbed or how much information may have been lost as a result. Of those artifacts that were recovered, 1176 are lithic debitage and 101 are informal and formal tools. Mosquito Ridge is a large multicomponent site occupied by the Paleo-Eskimos and the later Thule and Inuit cultures. Partial excavation of the Paleo-Eskimo component at Mosquito Ridge yielded a lithic assemblage of more than 20,000 artifacts, of which 97% is lithic debitage (Milne 2003a).

LdFa-1 and LdFa-12 are located 1 km from one another on the northwestern shore of Mingo Lake, which is approximately 250 km south of Nettilling Lake (Figure 8.5). LdFa-1 is a large site containing at least 23 well-defined tent-ring structures, suggesting this location was repeatedly occupied over time. Few Paleo-Eskimo sites on Baffin Island contain this many intact structural features, making this site unusual. Because the topography of southern Baffin Island is characterized by large bedrock outcrops, finding suitable camping spots near favorable hunting locations can be difficult. As a result, more recent populations tend to settle on top of existing site remains, thereby obscuring these earlier occupations. Older tent-ring structures are also occasionally

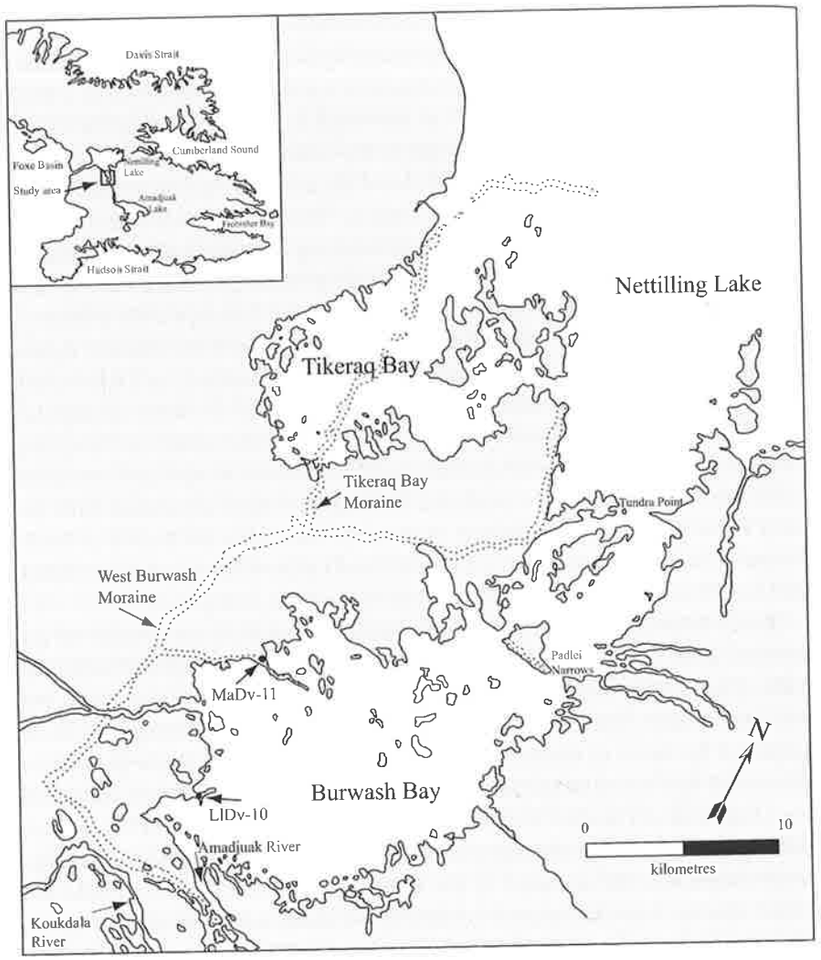

Figure 8.4. Map of Burwash Bay, part of the southern littoral of Nettling Lake on Baffin Island, showing the locations of Sandy Point (LlDv-10) and Mosquito Ridge (MaDV-11) (after Stenton 1989).

dismantled since more recent peoples scavenge perimeter rocks to build new dwellings (Milne 2003b).

Limited testing at LdFa-1 yielded large quantities of lithic and faunal material, which is almost exclusively caribou. Caribou are concentrated in the interior lakes region during the summer and early autumn, and they represent a rich and reliable food source in this area. The incredibly dense concentration of lithic debitage at LdFa-1 made for very slow digging. A total of 13.25 m² were excavated, yielding a lithic assemblage of 18,743 artifacts, 99.7% of which is

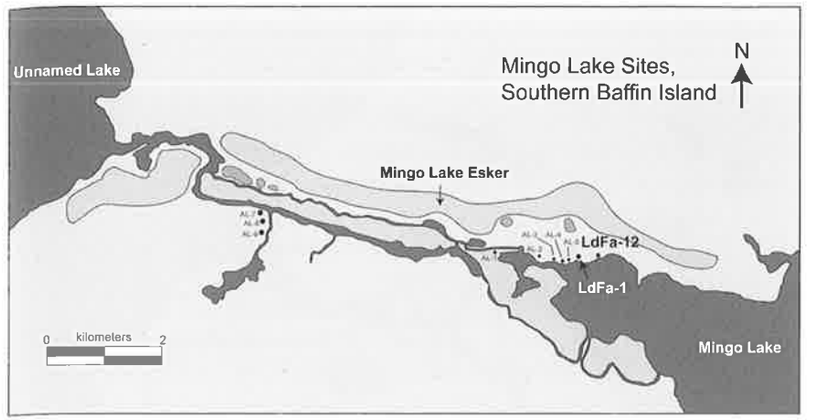

Figure 8.5. Map of the northwest shore of Mingo Lake, showing the locations of LdFa-1 and LdFa-12.

debitage. LdFa-12 is a small single-component Paleo-Eskimo site and it has no visible surface features. The site consists entirely of a 115-meter linear scatter of lithics. LdFa-12 was found serendipitously during a field survey. A well-worn caribou path runs through the center of the site and numerous artifacts and flakes were visible on the surface as a result. While ephemeral sites like LdFa-12 are more difficult to locate given their extremely low archaeological visibility on the Arctic tundra, postdepositional processes, like caribou trampling and frost heave, churn up the surface vegetation to expose underlying deposits. In some instances Paleo-Eskimo deposits are found by accident during the excavation of more recent sites. Despite the ephemeral nature of LdFa-12 and the limited number of units tested (about 5 m²), it also yielded a comparatively large lithic assemblage of 3743 artifacts, of which 99.5% is debitage. Again, caribou dominate the recovered faunal remains, further indicating the importance of these animals as a subsistence resource in the area.

Last, LeDx-42 is another large Paleo-Eskimo site located on the shores of the Mingo River, approximately 10 km from LdFa-1 and LdFa-12 (Figure 8.6). Like LdFa-12, numerous caribou paths run through the central portion of LeDx-42, and scattered along them were diagnostic lithic artifacts indicating a Paleo-Eskimo cultural affiliation. There is only one possible dwelling structure visible at the site; however, it has yet to be investigated. Extensive testing yielded another large lithic and faunal assemblage, containing caribou remains. The lithics comprise 29,648 flakes, and 87 informal and formal tools.

My analysis of the Sandy Point and Mosquito Ridge lithics was conducted as part of a larger study to assess whether the Paleo-Eskimos followed a seasonal round, similar to that recorded for the southern Baffin Inuit, where winters

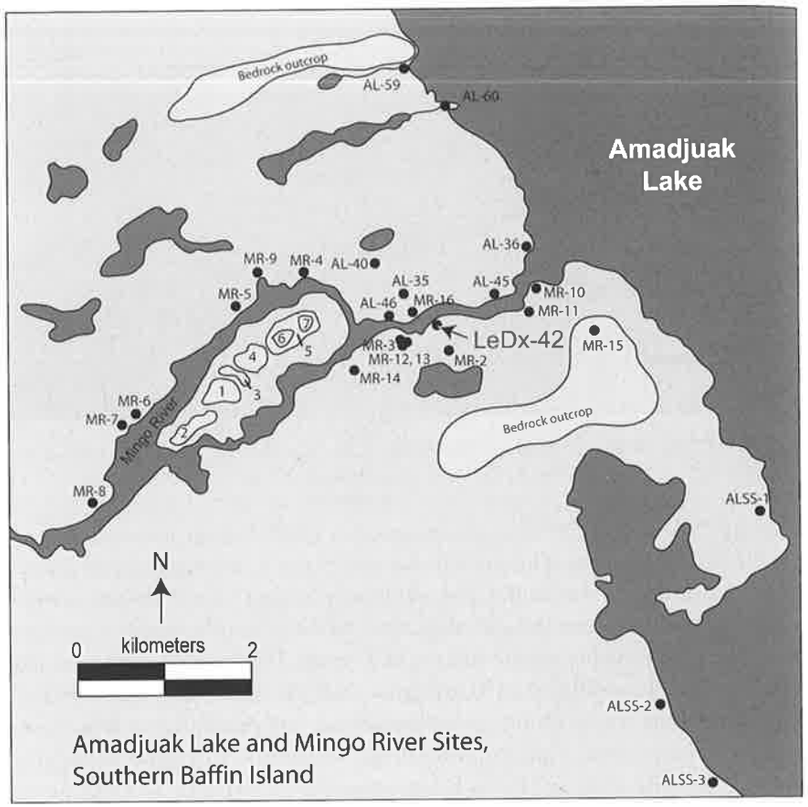

Figure 8.6. Map of the Mingo River, where it drains into the southwest shores of Amadjuak Lake, showing the location of LeDx-42.

were spent in the coastal regions and summers were spent in the interior (Milne 2003a). More than 24,500 lithic debitage and tool artifacts from these two inland sites and four southern Baffin coastal sites were compared. Patterns of tool reduction and use isolated among the inland sites indicate that they were principally used for raw material acquisition. The broad functional interpretation of the Sandy Point site is that it was used for raw material testing, early stage core reduction, and the limited production of tool preforms and blanks (Milne 2005a). These activities would have enabled task groups exploring the area for tool stone to assess its quality and abundance and, in the process, acquire locational and limitational knowledge. By comparison, Mosquito Ridge was used as a lithic acquisition site; however, there is no evidence of raw material testing, just intense early stage reduction (Milne and Donnelly 2004; Milne 2005a).

Stenton (1989) believes that Mosquito Ridge was a focal place in the interior region where later Neo-Eskimo populations would meet and interact for social purposes. I believe that the site had the same significance for the Paleo-Eskimos, in addition to raw material procurement. Mosquito Ridge was occupied very early on in the Paleo-Eskimo occupation of the eastern Arctic given the site's radiocarbon date of 3800 ± 40 BP (Milne and Donnelly 2004:96–97). This date makes Mosquito Ridge one of the oldest Paleo-Eskimo occupations on Baffin Island (Milne and Donnelly 2004:97). While raw-material acquisition may have been the primary incentive leading to the initial occupation of Mosquito Ridge during the colonization of the island, its centrality in the interior and its significance as a meeting place would have further increased its attraction as a place for continuous use. Mosquito Ridge is located beside the Great Plain of the Koukdjuak, one of the largest nesting grounds for snow geese in the world. The faunal assemblage recovered from Mosquito Ridge indicates that the site occupants were intensively hunting snow geese during the Arctic warm season, most likely during the bird's annual molt in early to mid-July. This subsistence resource would have been easy to acquire with little planning or energy investment, and it would have enabled the Paleo-Eskimos to focus more of their time on socializing and tool production rather than hunting (Milne and Donnelly 2004).

Investigations of LdFa-1, LdFa-12, and LeDx-42 were undertaken in 2004. Analysis of the recovered lithic materials is ongoing, but preliminary results do complement those from Sandy Point and Mosquito Ridge, further attesting to the importance of the island's interior as a place for warm season aggregations by the Paleo-Eskimos. Lithic raw-material acquisition was also the principal focus at these three sites. This is most clearly illustrated using flake-to-tool ratios (Milne and Donnelly 2004; Milne 2005a, in press). Flake-to-tool ratios are simple measures used to examine the extent to which lost tool utility at a site was being replaced through tool production activities (Ricklis and Cox 1993:450–451). Ratios are calculated here using all complete and fragmented burins, microblades, cores, bifaces, scrapers, retouched informal tools and burin spall tools. Unretouched flake tools, burin spalls, and bifacial edges were not included since they lack postdetachment modification and, therefore, do not contribute any by-products to the debitage assemblage.

Ratios for LdFa-1, LdFa-12, and LeDx-42 are extremely high (Table 8.1), indicating that tool utility was being replaced by intense tool-stone reduction. Although the ratios for Sandy Point and Mosquito Ridge are low to moderate, the reduction strategies identified through the formal debitage analysis do indicate that acquisition was the focus. In other words, the same reduction and use strategies were employed at all five sites. An obvious reason for these lower figures at Sandy Point and Mosquito Ridge can be attributed to the

Table 8.1. Flake-to-Tool Ratios Identified for Five Inland Paleo-Eskimo Sites on Southern Baffin Island:

Site	Flake/tool ratio	Number of artifacts	Intensity of reduction
MaDv-11	40:1	19,800 flakes | 495 tools	Moderate
LlDv-10	14:1	1176 flakes | 84 tools	Low
LdFa-12	207:1	3725 flakes | 18 tools	High
LdFa-1	406:1	18,691 flakes | 46 tools	High
LeDx-42	593:1	29,648 flakes | 50 tools	High

fact that LdFa-1 and LeDx-42 are extremely large sites that were intermittently occupied for millennia, resulting in larger deposits of reduction debris. Moreover, it is impossible to know how much of the assemblage at Sandy Point was lost as a result of site disturbance. Given the obvious absence of late stage finishing flakes at all five sites, it appears that formal tools were not being made in the interior from start to finish. Rather, reduction strategies isolated in the assemblages indicate that site activities were focused on early and middle-stage reduction, which is more commonly associated with the production of preforms and blanks. Because there are so few finished and intact artifacts in these assemblages, it appears that those implements that were being roughed out were taken away from the site for completion elsewhere. These patterns are entirely consistent with those identified in my earlier study (Milne 2003a), further supporting the inference that the Paleo-Eskimos were traveling inland to procure raw material during the Arctic warm season and then transporting back to the coast sufficient supplies to last them throughout the remainder of the year.

The presence of well-preserved faunal assemblages from LdFa-1, LdFa-12, and LeDx-42 also provides seasonality data in the form of caribou tooth thin sections, indicating these sites were also occupied during the warm season. Last, radiocarbon dates from these three sites further support that seasonal travels to the interior were established early on in the Paleo-Eskimo occupation of southern Baffin Island (Table 8.2). Even more interesting is the fact that additional dates from LdFa-1 and LeDx-42 indicate that these two sites were continuously occupied throughout the entire Paleo-Eskimo period, spanning at least 2400 years (Milne, in review). These dates are important because they coincide with a marked period of climate change experienced in the Arctic beginning around 2600 BP, which impacted the local environment. Winters became longer and harsher, and the extent and duration of the sea ice increased. In response to this the Paleo-Eskimos adopted a more maritime-oriented way of life, focusing on hunting sea mammals, mostly seals. As a result, it can be inferred that the importance of the terrestrial ecosystem decreased in significance to these peoples' way of life and that they spent more of the year in the

Table 8.2. Radiocarbon Dates for Five Inland Paleo-Eskimo Sites on Southern Baffin Island:

Site	Material	Date BP	Designation
MaDv-11	Caribou bone	3800±40	Early Paleo-Eskimo
LlDv-10	Peat	2785±115	Early Paleo-Eskimo
LdFa-12	Caribou bone	3670±40	Early Paleo-Eskimo
LdFa-1	Caribou bone	3530±40	Early Paleo-Eskimo
	Caribou bone	3490±40	Early Paleo-Eskimo
	Caribou bone	3210±40	Early Paleo-Eskimo
	Caribou bone	1230±40	Late Paleo-Eskimo
LeDx-42	Caribou bone	3480±40	Early Paleo-Eskimo
	Caribou bone	2320±40	Middle Paleo-Eskmo
	Caribou bone	2460±40	Middle Paleo-Eskmo
	Caribou bone	2450±40	Middle Paleo-Eskmo
	Caribou bone	1380±40	Late Paleo-Eskimo
	Caribou bone	1330±40	Late Paleo-Eskimo

outer coastal regions. Therefore, finding occupations dating to the middle and late periods in the inland proper of southern Baffin Island is somewhat unexpected. Certainly, the Paleo-Eskimos would continue to need tool stone for their technological needs, but this could be acquired in the coastal regions given the presence of chert pebbles there. The fact that these people continued to travel inland and that they reoccupied the same sites for 2400 years strongly suggests that other factors influenced their seasonal settlement patterns. I believe that social factors and the need for group interaction were among the driving forces that maintained these long-established interior land-use patterns. The Paleo-Eskimos were familiar with this interior landscape and the locations of these specific sites, which were ideal for raw material acquisition and in close proximity to ideal caribou and waterfowl hunting grounds.

The coastal areas of Baffin Island do have accessible sources of chert, although these are in the form of weathered pebbles of inferior quality, and there is also an abundant supply of food resources in these locations throughout the Arctic warm season (Jacobs and Stenton 1985; Stenton 1989). Therefore, the Paleo-Eskimos did not have to keep making these journeys inland purely for subsistence and material needs, particularly during the later periods given the arduousness of adapting to an increasingly colder environment. They would seemingly need to do so for social purposes, however, since the interior remains the most central place to meet. This strongly suggests that a pattern of seasonal mobility and land use, which was established very early on in the Paleo-Eskimo colonization of southern Baffin Island, soon became a habitual part of this culture's seasonal round, in spite of local food and material abundances in the coastal regions. The Paleo-Eskimo cultural landscape on southern

Baffin Island became highly structured by this unique confluence of geese, caribou, stone and social interaction in the interior. This early adaptation to an unfamiliar landscape appears to have helped secure the reproductive success of this population and its cultural continuity over the millennia. Moreover, an abundance of food and people during the warm season would have created a very relaxed atmosphere for social interaction (Milne and Donnelly 2004:108). This stands in sharp contrast to the image of Paleo-Eskimo life being balanced between a constant search for food and a state of semihibernation.

DISCUSSION

The Paleo-Eskimos were the first peoples to occupy one of the most arduous environments in the world. Given their knowledge of the Siberian and Alaskan landscapes, these peoples were essentially pre-adapted for their eastward migration into the pristine eastern Arctic. In this chapter I have argued that the Paleo-Eskimos transferred their existing locational and limitational knowledge from their place of origin to this new environment, which enabled them to successfully colonize it in a short period of time. Moreover, I suggest that the need to find suitable tool-stone sources and to establish social contact were equally if not more important than subsistence in shaping the early exploration of the eastern Arctic and the establishment of subsequent land-use patterns. Tool-stone sources are fixed on the landscape and seasonally restricted in their accessibility. All groups of Paleo-Eskimos would have required this resource to maintain their tool kits. Traveling distances of up to 500 km to access good-quality lithic raw material is not unheard of among Paleo-Indian groups (MacDonald 1999). It is therefore not unreasonable to speculate that Paleo-Eskimos made similar journeys in search of this resource. Once reliable source areas were found, it is highly probable that other distant groups would have been encountered at these locations. This would provide the basis to establish long-distance social and reproductive networks in this massive geographic expanse. Evidence from sites located on southern Baffin Island further indicates that these early land-use patterns were maintained over time, and a significant motivation to do so was a need for social interaction. By shifting my interpretive perspective away from a traditional environmentally deterministic paradigm focused on climate and subsistence, I have presented here a very different interpretation of the Paleo-Eskimo lifestyle from that which pervades the literature. It is not necessary to reduce early hunter-gatherers to the state of automatons to learn about their archaeological past. They knew their environments, and they moved across the landscape making knowledgeable decisions.

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