

The Bow and Arrow in Northern North America

HERBERT MASCHNER AND OWEN K. MASON

There were at least four waves of bow and arrow use in northern North America. These occurred at 12000, 4500, 2400, and after about 1300 years ago. But to understand the role of the bow and arrow in the north, one must begin in the eighteenth century, when the Russians first arrived in the Aleutian Islands. At that time, the Aleut were using both the atlatl and dart and the bow and arrow¹ (Fig. 1). This is significant for two particular and important reasons. First, there are few historic cases in which both technologies were used concurrently; second, the bow and arrow in the Aleutian Islands were used almost exclusively in warfare. The atlatl was a critical technology because the bow and arrow are useless for hunting sea mammals. One cannot launch an arrow from a kayak because it is too unstable and requires that both hands remain on a paddle. To use an atlatl, it is necessary only to stabilize the kayak with a paddle on one side and launch the atlatl dart with the opposite hand. The Aleut on the Alaska Peninsula did indeed use the bow and arrow to hunt caribou there. However, in the 1,400 km of the Aleutian Islands, there are no terrestrial mammals except humans and the bow was reserved almost exclusively for conflicts among them. The most significant event in the history of the bow and arrow is not its early introduction, but rather the Asian War Complex 1300 years ago, when the recurve and backed bows first entered the region, altering regional and hemispheric political dynamics forever.

We will show that there is a direct functional relationship between the bow and arrow and particular focal species, as well as a strong relationship between elaboration of the bow and arrow and armed conflict. We will argue that in periods where the primary focal species was caribou, the bow and arrow was present in the north. When the focal species was moose, bison, or sea mammals, the atlatl was the dominant choice of technology. This holds true until the self-bow was replaced by the Asian War Complex,^{2–5} entering North America across the Bering Straits after 1300 BP.^{6,7} With introduction of the backed and recurve bows, armor, wrist guards, and other features, the bow became the dominant and resilient technology except within the context of hunting sea mammals.

PHASE 1: 12,000–8,000 BP

Sometime in the early Holocene, approximately 12,000 years ago,

evidence of the bow and arrow appeared in the north. In the Kuskokwim Hills of southwest Alaska, at the Inluk and Lime Hills Cave 1 sites, Robert Ackerman excavated small bone arrow points with slots for microblades.^{8–14} Direct dates on the points, as well as associated charcoal, set them between 10,410 \pm 40 ¹⁴C BP (12,250 cal BP) and 8150 \pm ¹⁴C BP (8,800 cal BP), marking the time range of the earliest use of the bow in the New World. The points are similar to bone points identified many years ago by Larsen at Trail Creek Caves on the Seward Peninsula, which date to 9,000 years ago,¹⁵ and are of a size, weight, form, and style of bone arrow points made along the coast of Alaska 8,000–9,000 years later, but which did not have microblade slots^{16,17} (Fig. 2e). Ackerman directly associated the use of microblades in the Denali Complex with early Holocene bow use. His argument is compelling, especially with regard to recent data indicating that the bow and arrow was in use on the Columbia Plateau by the end of this same time range.¹⁸

What makes these finds interesting is that they occur during a period between the extinction of the remnant late ice age fauna and before the expansion of bison and moose across the western subarctic. At the time of their use, caribou, sheep, and perhaps elk would have been the dominant species harvested. Furthermore, they occur just before the massive dart end-blades that dominate the Northern Archaic Tradition, which coincide with the expansion of larger ungulates in the region between 7,000 and 4,000 years ago. There is little evidence of the bow

Herbert Maschner is Professor of Anthropology and Director of the Idaho Museum of Natural History, Idaho State University. Among his 100 publications, he recently co-edited, with Owen Mason and Robert McGhee, *The Northern World AD 900–1400* at the University of Utah Press.

Email: maschner@isu.edu

Owen K. Mason is a Research Affiliate at the Institute for Arctic and Alpine Research at the University of Colorado, owner of GeoArch Alaska, and Editor of the *Alaska Journal of Anthropology*. Among his many publications in archeology, geology, and paleoecology, he co-edited with Herbert Maschner and Robert McGhee, *The Northern World AD 900–1400*.

Email: owen.mason@colorado.edu

Key words: bow; Asian war complex; Northwest; Aleutian Islands; warfare

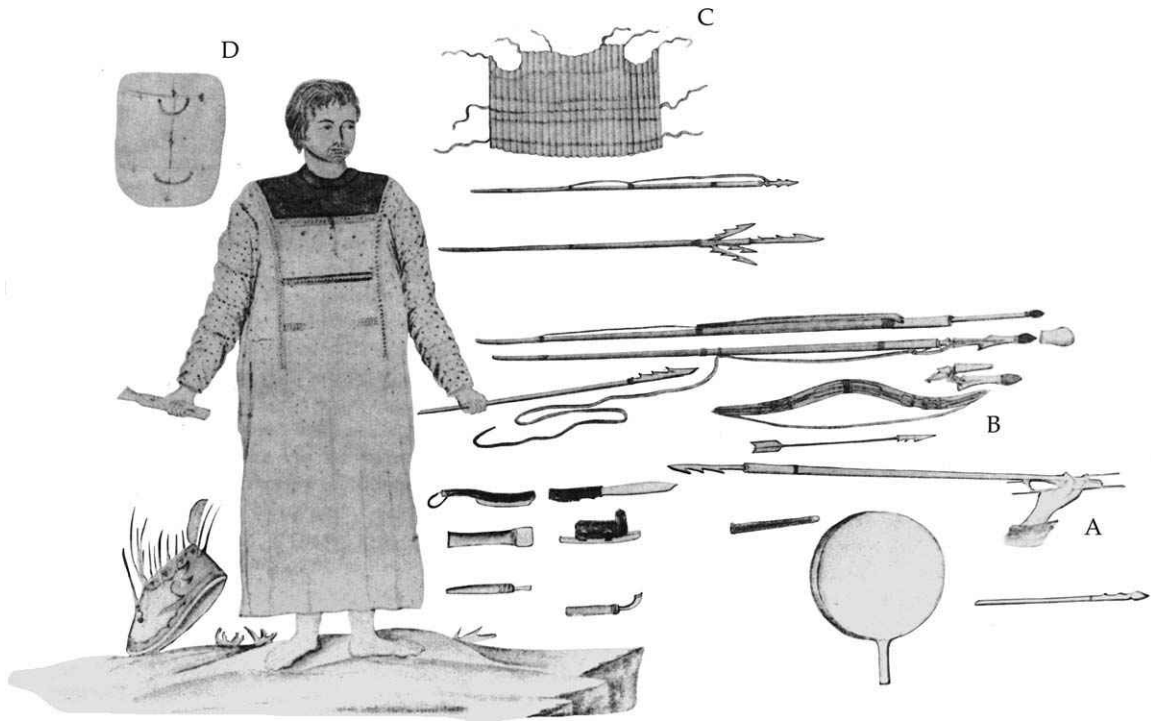


Figure 1. Aleut male as shown in Liapunova⁵⁰ Figure 2, remastered and edited by Maschner. A) Atlatl and darts, B) the recurved bow, C) armor, and D) shield. Drawing by M. C. Levashov, 1764–1769, original in the Central State Archives of the Navy, Russia.



Figure 2. Arrow points from the north Pacific region. A) Arctic Small Tool tradition points from Sapsuk River, Alaska Peninsula dating to 4400 BP⁵¹; B) fishtail points dating to 2400-1900 BP⁵²; C-D) Ram's Creek and Hot Springs Points dating to 1900-1300 BP⁵²; E) barbed bone arrow points from Hot Springs dating to 1300 BP (unpublished). (Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.)



Figure 3. Defensive fortification on Sanak Island, 1200 BP. (Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.)⁵³

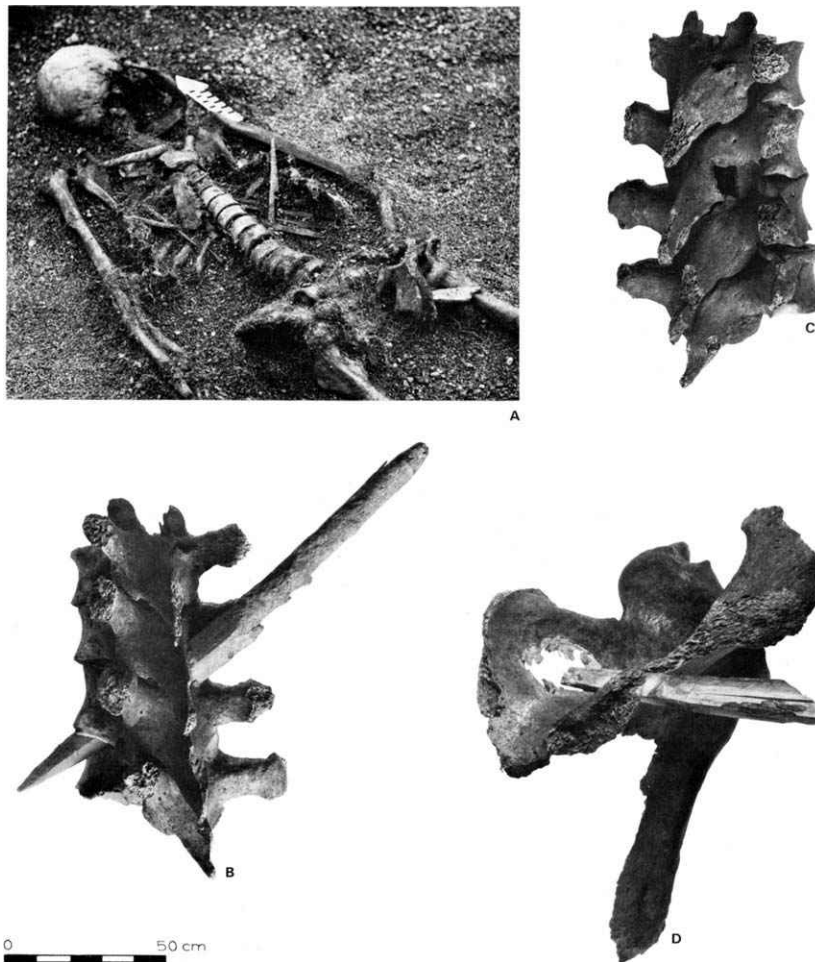


Figure 4. A) Punuk burial impaled with 15 bone arrow points, undated, from near Gambell, St. Lawrence Island, Alaska. B-D) Other physical evidence of conflict: barbed bone arrow points impaled in vertebrae from Punuk period burials also near Gambell, Alaska (complete image adapted from Bandi and Bürgi⁵⁴). Slat armor from adjacent village sites dates to before 1000 BP.

and arrow during the period of the Northern Archaic Tradition, although Esdale¹⁹ has stated that microblades are found in about 30% of Northern Archaic sites, many of which date to the same period as the bow-using Arctic Small Tool tradition. However, no arrow points of stone or bone have been identified in the more than 200 sites known from this tradition. Many of these sites are associated with caribou hunting,²⁰ but there is also evidence that bison and moose were hunted. We conclude that the self bow of the early Holocene did not have enough power to bring down the large ungulates of the middle Holocene such as bison and moose, and terrestrial mobility patterns made the use of both technologies inefficient.

PHASE 2: 4500 BP

After 4,000 years with little evidence of the bow and arrow (and scholars have tried to find it), the entire arctic was colonized by peoples simultaneously using both technologies. The Arctic Small Tool tradition (ASTt) is a well-described early arctic manifestation^{21–23} that spread eastward from Bering Strait around 4,500 years ago.^{24,25} Most evidence of the bow and arrow during the ASTt is in the form of micro-lithic end blades²¹ (Fig. 2a), but in a few well-preserved sites, such as Qeqertasussuk, a frozen site in western Greenland, bow fragments have also been found.^{26,27} These are often associated with caribou or musk ox hunting. But from the North Pacific to Greenland, in all cases where there is evidence of both caribou hunting and sea mammal hunting, the atlatl was also used,^{27,28} with large sealing harpoons and atlatl parts found in many contexts.

By 3,500 years ago, the bow and arrow were no longer used in Alaska. This was a period when there appears to have been a reduction in terrestrial fauna, especially caribou, and interior sites are rare. There are also few sites on the northern and western coasts, and the few that do exist were used by sea mammal hunters. The northern Archaic

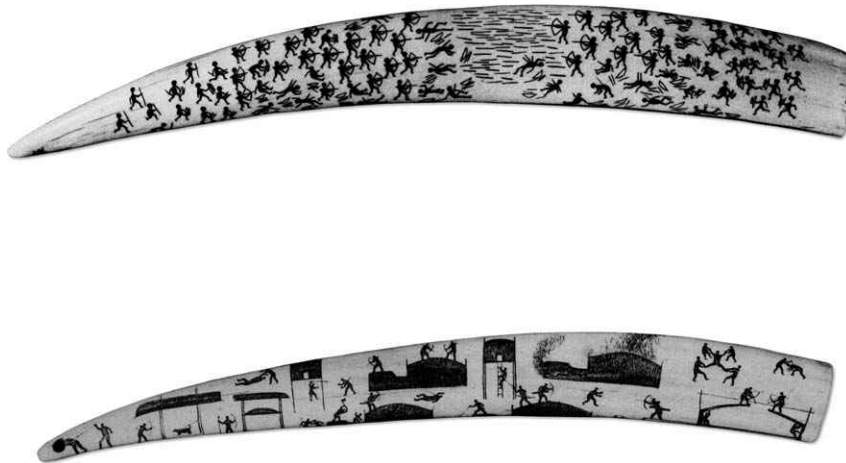


Figure 5. Battle scenes carved on walrus tusks, eastern Bering Sea. The bow is the key element in both the village attack and the open battle (from Dorothy Jean Ray, 1977, *Eskimo Art: Tradition and Innovation in North Alaska* pp. 230-231; Courtesy of the Phoebe A. Hearst Museum of Anthropology and the Regents of the University of California, upper cat. no. 2-146, lower cat. no. 2-144; both collected by Charles L. Hall, 1894-1906. Scans edited for resolution and tone from photographs taken by Alfred A. Blaker).

tradition had now expanded to the coast of Alaska and replaced the ASTt, with no evidence of the bow and arrow in any context.²³ Even on the Alaska Peninsula, where there is evidence of caribou hunting, the bow is absent from the regional technologies. When the pre-Dorset tradition evolved out of the ASTt in the

eastern arctic, the bow may possibly have been present, as there is a continuation of some microlithic end-blades, but by Dorset times, 2,500 years ago, the bow was gone from the eastern Canadian Arctic and Greenland as well.^{29,30} As in Alaska, this was a transition to a sea mammal-based economy.

PHASE 3: 2400 TO 500 BP

There is no evidence of the bow and arrow between 3,600 and 2,400 years ago in Alaska, but several remarkable transformations took place after this time. For one, the “fishtail” point was developed on the Alaska Peninsula.^{31,32} These long, thin, narrow projectiles (Fig. 2b) appear to have been used for conflict. As Workman stated 45 years ago, these fragile end blades would not have been useful for any large mammal except people. These are fairly large end-blades, which were common until about 1,900 years ago. Afterwards, the projectiles became very small (Fig. 2c,d) and a series of arrow end-blades were made for the next 600 years. This is true for the southern Bering Sea and north Pacific in particular.

By 1,300 years ago, there was a change. From the eastern Aleutian Islands eastward to Kodiak and south to the Northwest Coast, defensive landforms were occupied in substantial numbers (Fig. 3). Something clearly had shifted both technology and social dynamics, and all evidence points to the introduction of the Asian War Complex, highlighted by the recurved bow and other compound varieties. The relationship between the recurved bow, warfare, and fortification can be seen from Alaska to the Columbia Plateau and to Mesa Verde and beyond.

The earliest Bering Straits armor fragments date to ca.1100 BP.³³ The fact that armor was introduced from East Asia³⁴ and was being constructed to counter the effects of this powerful weapon is notable, and end-blade technologies were changing to match it (Fig. 4). On the Northwest Coast, small, straight bone points were being used. In various experiments, Nathan Lowry found that stone endblades shatter against leather and wood armor combinations, but bone endblades puncture straight through this defense.³⁵ The bow and arrow, and particularly barbed bone points (Fig. 2e), appear to be predominately weapons of conflict, as seen in the burials at Ipiutak site at Point Hope in northwest Alaska, at Deering^{6,7} on the Seward Peninsula, and in Punuk burials

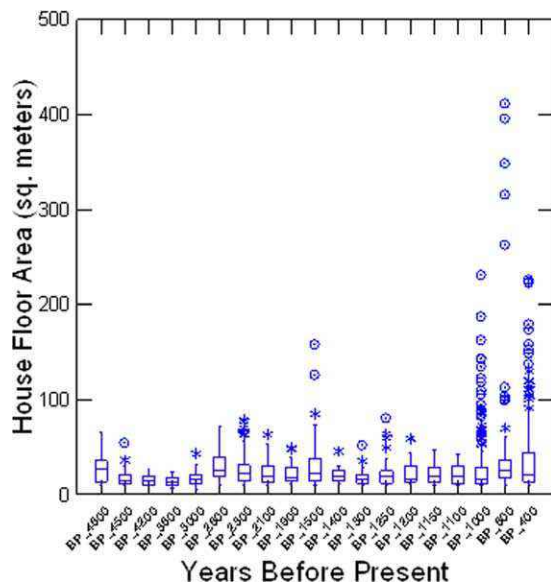


Figure 6. House floor areas for western Alaska Peninsula Aleut sites spanning 4,800 years. The rise of large corporate groups occurs at 1000 BP with introduction of the Asian War Complex, but the reintroduction of the bow and arrow can be seen earlier at about 2500 BP with the rise of the first larger households (adapted from Maschner and Hoffman⁴²). (Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.)

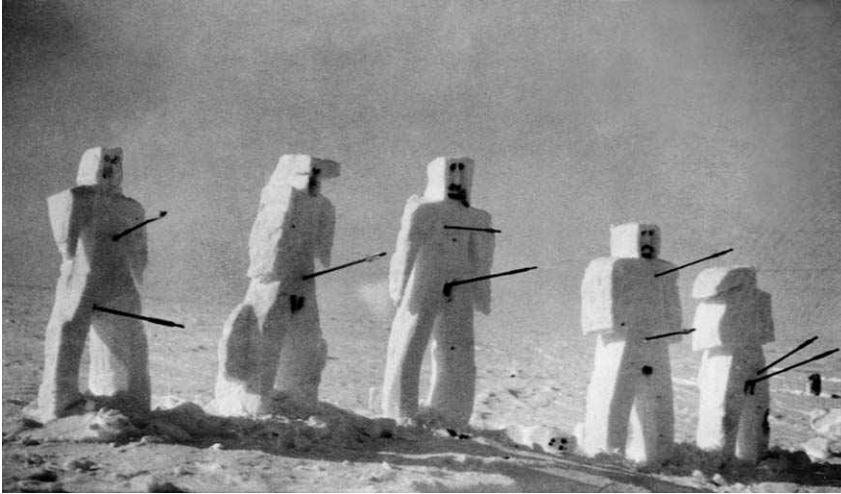


Figure 7. Snow men as targets for Netsilik bow and arrow practice.⁵⁵ ©The National Museum of Denmark, Ethnographic Collection, used with permission.

from St. Lawrence Island (Fig. 4). Certainly there is a temporal, and probably functional relationship between the recurved bow and the construction of defensive fortifications.

The adoption of the bow and arrow in interior Alaska, where it was used for the first time on moose, also occurred about 1300 BP. This is an interesting transformation in ancient NaDene technologies, with the production of stone tools in interior Alaska being almost abandoned, replaced by bone and copper arrow points.^{36,37} Multiple dates on ice-field-discovered arrow shafts, along with well-dated copper and bone arrow points, all date to about 1300 BP and after.³⁸ The fact that the bow and arrow were now being used on moose is testament to the development of a much more powerful bow capable of taking the largest mammals. This is the first time this occurred.

By 1,000–200 years ago, there is extensive evidence of conflict from the Bering Sea to arctic Alaska and across Canada to Greenland (Fig. 5). This co-occurred with the transition to large corporate households on the north Pacific rim (Fig. 6), where social complexity arose before any evidence of economic complexity. This is seen primarily in house-floor areas, which serve as a proxy measure for differential household size, the first archeological measure of social differentiation.^{39–42} The photograph

of Netsilik practicing their archery, not with snow targets made to look like caribou, but rather, with targets made to look like humans (Fig. 7), is a clear sign that conflict played a key role in the structure of northern societies until historic contact.^{3,4,43–48}

HEMISPHERIC IMPLICATIONS

The implications of these patterns are profound. First, we must assume that the bow and arrow were always part of the Eurasian forager tool-kit. Thus, we might expect to see a continuous sequence of arrow forms from the Late Pleistocene through the Neolithic in Siberia. While Siberia and Alaska had clear contacts throughout the Holocene, there were particular times in the prehistory of northern North America when this already known but little-used technology became a critical component of the tool-kit. But there clearly were long periods when the bow was little used or completely forgotten in particular regions, such as in the eastern Arctic during Dorest times. If bow and arrow use expanded southward during any of these earlier periods, we would expect to see it in the context of hunting deer, for example, but not bison. This may have been the case with the purported use of the bow and arrow in western North America about 8,000 years ago.¹⁸

We also should fully expect the bow to have spread rapidly across

North America after 1300 BP with the introduction of the Asian War Complex. It should come as no surprise that this is the period of a major expansion of warfare down the coast of California,⁴⁹ a transition from images of the self-bow to the recurve bow on Mimbres pottery, the collapse of Chaco and the rise of defensive fortifications in massive rockshelters, the expansion of the Numa across the Great Basin, the collapse of Cahokia and the reorganization of Mississippian society, and the spread of the Thule from Alaska to Greenland, all beginning about 1,300 years ago in California, but with the greatest impact between 900–750 years ago everywhere else.² By 700 years ago, this new technology resulted in the rise and success of the bison-hunting peoples of the plains, and had fully transformed every society in North America.

ACKNOWLEDGMENTS

This paper was written while Maschner was in residence at the Santa Fe Institute, September 9–15, 2012. He would like to thank SFI President Jerry Sabloff and SFI Professor Jennifer Dunne for making this a success. Nick Clement worked on the graphics and the Pheobe Hearst Museum of Anthropology and the National Museum of Denmark gave permission for the use of images. Some of the research presented in this paper was funded by multiple NSF awards to Maschner, although NSF is not responsible for any of the conclusions.

REFERENCES

- 1 Liapanova RG. 1996. Essays on the ethnography of the Aleuts (at the end of the eighteenth and the first half of the nineteenth century. In: Shelest J, translator; Workman W, Black LT, editors. Rasmuson Library Translation Series. Fairbanks: University of Alaska Fairbanks.
- 2 Maschner HDG. 2000. Catastrophic change and regional interaction: the southern Bering Sea in a dynamic world system. In: Appelt M, Berglund J, Gullov HC, editors. Identities and cultural contacts in the Arctic. Copenhagen: Danish National Museum and Danish Polar Center. p 252–265.
- 3 Maschner HDG, Reedy-Maschner KL. 2007. Heads, women, and the baubles of prestige: trophies of war in the Arctic and Subarctic. In: Chacon R, Dye D, editors. The taking and displaying of human body parts as trophies by Amerindians. Springer Interdisciplinary Contribution to Archaeology. p 32–44.

- 4 Maschner HDG, Reedy-Maschner KL. 1998. Raid, retreat, defend (repeat): the archaeology and ethnohistory of warfare on the north Pacific rim. *J Anthropol Archaeol* 17:19–51.
- 5 Maschner HDG, Jordan JW. 2008. The southern Bering Sea and North Pacific in a dynamic global system. In: Papagianni D, Maschner HDG, Layton RH, editors. *Time and change: archaeological and anthropological perspectives on the long term*. Oxford: Oxbow Press. p 95–113.
- 6 Mason OK. 1998. The contest between the Ipiutak, Old Bering Sea, and Birnirk polities and the origin of whaling during the first millennium A.D. along Bering Strait. *J Anthropol Archaeol* 17:240–325.
- 7 Mason OK. 2009. Flight from the Bering Strait: did Siberian Punuk/Thule military cadres conquer northwest Alaska. In: Maschner, H., Mason OK, McGhee R, editors. *The northern world, AD 900–1400*. Salt Lake City: University of Utah Press. p 76–128.
- 8 Ackerman RE. 1964. A final report to the Arctic Institute of North America: prehistory in the Kushokwim-Bristol Bay region, Southwestern Alaska. Pullman, WA: Washington State University. Report of Investigations No. 26. 48 p.
- 9 Ackerman RE. 1996. Spein Mountain. In: West FH, editor. *American beginnings: the prehistory and palaeoecology of Beringia*. Chicago: University of Chicago Press. p 456–460.
- 10 Ackerman RE. 1996. Ilnuk site. In: West FH, editor. *American beginnings: the prehistory and palaeoecology of Beringia*. Chicago: University of Chicago Press. p 464–470.
- 11 Ackerman RE. 1996. Lime Hills, Cave 1. In: West FH, editor. *American beginnings: the prehistory and palaeoecology of Beringia*. Chicago: University of Chicago Press. p 470–477.
- 12 Ackerman RE. 2001. Spein Mountain: a mesa complex site in southwestern Alaska. *Arctic Anthropol* 38:81–97.
- 13 Ackerman RE. 2011. Microblade assemblages in southwestern Alaska: an early Holocene adaptation. In: Goeber, T, Buvit I, editors. *From the Yenisei to the Yukon: interpreting lithic assemblage variability in Late Pleistocene/Early Holocene Beringia*. College Station: Texas A&M University Press. p 255–269.
- 14 Dixon EJ. 2011. Arrows, atlats, and cultural-historical conundrums. In: Goebel T, Buvit I, editors. *From the Yenisei to the Yukon: interpreting lithic assemblage variability in Late Pleistocene/Early Holocene Beringia*. College Station: Texas A&M University Press. p 362–370.
- 15 Larsen H. 1968. Trail Creek: final report on the excavation of two caves on Seward Peninsula, Alaska. Kobenhavn: Ejnar Munksgaard.
- 16 Larsen H, Rainey F. 1948. Ipiutak and the Arctic whale hunting culture. *Anthropol Papers Am Museum Nat Hist* 42:1–102.
- 17 Stanford D. 1976. The Walakpa site, Alaska: it's place in the Birnirk and Thule cultures. Washington, D.C.: Smithsonian Institution.
- 18 Ames KM, Fuld A, Davis S. 2010. Dart and arrow points on the Columbia Plateau of western North America. *Am Antiquity* 75:287–325.
- 19 Esdale JA. 2008. A current synthesis of the Northern Archaic. *Arctic Anthropol* 45:3–38.
- 20 Ackerman RE. 2004. The Northern Archaic tradition in southwestern Alaska. *Arctic Anthropol* 41:153–162.
- 21 Giddings JL. 1964. *The archaeology of Cape Denbigh*. Providence: Brown University Press.
- 22 Irving WN. 1970. The Arctic small tool tradition. VIIIth Congress Anthropol Ethnol Stud 3:340–342.
- 23 Anderson DD. 1988. Onion portage: the archaeology of a stratified site from the Kobuk River, northwest Alaska. *Anthropol Pap University of Alaska* 22:1–163.
- 24 Harritt R. 1998. Paleo-Eskimo beginnings in North America: a new discovery at Kuzitrin Lake, Alaska. *Etudes Inuit Stud* 22:61–81.
- 25 Slaughter D. 2005. Radiocarbon dating the Arctic small tool tradition in Alaska. *Alaska J Anthropol* 3.
- 26 Gronnow B. 1996. The Saqqaq tool kit-technological and chronological evidence from Qeqertasussuk, Disko Bugt. In: Gronnow B, editor. *The Paleo-Eskimo cultures of Greenland: new perspectives in Greenlandic archaeology*. Copenhagen: Danish Polar Center. p 17–34.
- 27 Grønnow B. 1994. Qeqertasussuk: the archaeology of a frozen Saqqaq site in Disko Bugt, West Greenland. In: Morrison D, Pilon J-LP, editors. *Threads of Arctic prehistory: papers in honour of William E. Taylor, Jr*. Hull: Canadian Museum of Civilization, Archaeological Survey of Canada. p 197–238.
- 28 Maschner HDG, Jordan JW. 2001. The Russell Creek manifestation of the Arctic small tool tradition on the western Alaska Peninsula. In: Dumond DE, editor. *Archaeology in the Aleut zone of Alaska: some recent research*. Eugene, OR: University of Oregon. p 151–172.
- 29 Maxwell MS. 1984. Pre-Dorset and Dorset prehistory of Canada. In: Damas D, editor. *Arctic*. Washington, D.C.: Smithsonian Institution. p 359–368.
- 30 Maxwell MS. 1985. *The prehistory of the eastern Arctic*. Orlando: Academic Press.
- 31 Workman WB. 1969. Contributions to the prehistory of Chirikof Island, southwestern Alaska Vols. 1 and 2. MA thesis. Madison: University of Wisconsin.
- 32 Maschner HDG. 2008. Fishtails, ancestors, and old islanders: Chirikof Island, the Alaska Peninsula, and the dynamics of western Alaska prehistory. *Alaska J Anthropol* 6:171–183.
- 33 Mason OK. 2012. Memories of warfare: oral history and archaeology in assessing the conflict and alliance model of Ernest S. Burch. *Arctic Anthropol* 49:72–93.
- 34 Laufer B. 1914. Chinese clay figurines: prolegomena on the history of defensive armor. Chicago: Field Museum of Natural History.
- 35 Lowrey N. 1999. An ethnoarchaeological inquiry into the functional relationship between projectile point and armor technologies of the Northwest Coast. *N Am Archaeol* 20:47–73.
- 36 Clark DW. 1991. *Western subarctic prehistory*. Hull: Canadian Museum of Civilization.
- 37 Dixon EJ. 1985. Cultural chronology of central interior Alaska. *Arctic Anthropol* 22:47–66.
- 38 Hare PG, Greer S, Gotthardt R, et al. 2004. Ethnographic and archaeological investigations of alpine ice patches in southwest Yukon, Canada. *Arctic* 57:260–272.
- 39 Maschner HDG. 1991. The emergence of cultural complexity on the northern Northwest Coast. *Antiquity* 65:924–934.
- 40 Maschner HDG, Patton JQ. 1996. Kin selection and the origins of hereditary social inequality: a case study from the northern Northwest Coast. In: Maschner HDG, editor. *Darwinian archaeologies*. New York: Plenum Press. p 89–107.
- 41 Maschner HDG, Bentley RA. 2003. The power law of rank and household on the North Pacific. In: Bentley RA, Maschner HDG, editors. *Complex systems and archaeology: empirical and theoretical applications*. Salt Lake City: University of Utah Press. p 47–60.
- 42 Maschner HDG, Hoffman BW. 2003. The development of large corporate households along the north Pacific rim. *Alaska J Anthropol* 1:41–63.
- 43 Burch ES Jr. 1998. *The Inupiaq Eskimo nations of northwest Alaska*. Fairbanks: University of Alaska Press.
- 44 Burch ES Jr. 1974. Eskimo warfare in northwest Alaska. *Anthropol Pap University of Alaska* 16:1–14.
- 45 Burch ES Jr. 1988. War and trade. In: Fitzhugh WW, Crowell A, editors. *Crossroads of continents: cultures of Siberia and Alaska*. Washington D.C.: Smithsonian Institution Press. p 227–240.
- 46 Maschner HDG. 1997. The evolution of Northwest Coast warfare. In: Martin D, Frayer D, editors. *Troubled times: violence and warfare in the past*. New York: Gordon and Breach. p 267–302.
- 47 Maschner HDG. 2004. *Historic warfare*. In: Nuttall M, editor. *The encyclopedia of the Arctic*. Chicago: Fitzroy Dearborn Press. p 2152–2154.
- 48 Reedy-Maschner KL, Maschner HDG. 1999. Marauding middlemen: western expansion and violent conflict in the Subarctic. *Ethnohistory* 46:703–743.
- 49 Lambert P, Walker PL. 1991. Physical anthropological evidence for the evolution of social complexity in coastal southern California. *Antiquity* 65:963–973.
- 50 Liapunova RG. 1996. *Essays on the ethnology of the Aleuts*. Fairbanks: University of Alaska Press.
- 51 Maschner HDG, Benson B, Knudsen GL, et al. 2010. The archaeology of the Sapsuk River. *Occasional Papers in Alaskan Field Archaeology*. Anchorage, AK: Bureau of Indian Affairs, Alaska Region, Branch of Regional Archeology.
- 52 Williamson AM. 2004. Analysis of stone tools from the Hot Springs site on the western Alaska Peninsula ca. 2000 BC-AD 1400. Pocatello, ID: Idaho State University.
- 53 Reedy-Maschner KL, Maschner HDG, editors. 2012. *Sanak Island, Alaska: a natural and cultural history*. Pocatello: Idaho Museum of Natural History.
- 54 Bandi H-G, Bürgi J. 1971. Gräber der Punuk-Kultur bei Gambell auf der St. Lorenz Insel, Alaska. *Jahrbuch des Bernischen Historischen Museums* 51 and 52:41–115.
- 55 Rasmussen K. 1931. *The Netsilik Eskimos: social life and spiritual culture*. Copenhagen: Gyldendalske Boghandel, Nordisk Forlag.