Arrows and Atl Atls

A Guide to the Archeology of Beringia

E. James Dixon

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation.

The Cultural Resource Programs of the National Park Service have responsibilities that include stewardship of historic buildings, museum collections, archeological sites, cultural landscapes, oral and written histories, and ethnographic resources.

Our mission is to identify, evaluate and preserve the cultural resources of the park areas and to bring an understanding of these resources to the public. Congress has mandated that we preserve these resources because they are important components of our national and personal identity.

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Dedication

To the Alaska Native people,
and all indigenous people of Beringia,
who have shared their knowledge and helped pioneer Beringian archeology.

To my teachers and mentors,
Douglas Anderson, David M. Hopkins, and Helge Larsen.
Each in his unique way honed my passion for Beringian archeology.

Preface

My hope is to share the excitement of discovery with all types of readers — students, avocational archeologists, indigenous people, Alaskan, Russian, and Canadian cultural resource managers, and people with a general interest in archeology, the arctic, and Beringia. Beringia is a fascinating place and the archeologists who have tried to unravel its past are a colorful and extraordinary assortment of pioneers.

It is challenging and humbling to try to communicate both the scientific process and culture history spanning more than 25,000 years for this huge area. This synthesis required making decisions about what are the most important archeological sites, their significant characteristics, the most reasonable estimates of their age based on the dating methods, the significance of their ecological settings, their context in relationship to climate change, and a variety of other factors. This necessitated omitting much of the detail and condensing enormous amounts of important work and complex concepts. In so doing, I have left out deserving sites and abbreviated the work of many dedicated scientists.

The literature describing Beringia's culture history is extensive. Archeological surveys and excavations to preserve and conserve cultural resources have created a vast "gray literature," a myriad of unpublished reports, manuscripts, and papers presented at professional meetings. In addition, large archeological collections, many of which have only been partially analyzed, are housed in museums, cultural centers, and universities all over the world. The sheer volume of the published literature, technical reports, gray literature, and unpublished collections makes it incredibly difficult to understand the archeology of Beringia.

The goal of this book is to take this complex information and reduce it to an understandable overview of the development of Beringia's culture history. To make it more readable, I have omitted specific references within the body of the text and have tried to keep technical terminology to a minimum. I have defined or explained terms and concepts in the text when necessary and provided a short glossary of select archeological and geological terms as they are applied in Beringian archeology. Each chapter is followed by suggestions for additional reading for those who may wish to learn more about chapter topics. The bibliography contains the references from which the book was derived.

Since the late 1800s, many people have contributed to the archeology of Beringia. It has been my pleasure to know and work with many of these remarkable people. The Pioneers in Beringian Archeology section at the end of this book describes the lives and careers of many of the robust and colorful characters that came before me and helped shape Beringian archeology. Some living individuals who were contacted declined to be included.

In writing this book I have been able to look at patterns, reflect on problems in archeology, and suggest some different ways of looking at cultural development and interaction in Beringia. Some of these ideas, hopefully, will provoke discussion among colleagues and stimulate future research by a new generation of Beringian archeologists.

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Technical Notes on Dates and Dating

There are many different ways to determine the age of archeological sites and the artifacts they contain. For example, sites can be dated using records such as historic journals or census records that document when people were living at specific places in the past. Sites can also be dated using a variety of other methods such as tree ring dating (dendrochronology), comparing artifacts with those from sites that are reliably dated elsewhere, using the layers of dirt within a site to determine which artifacts are older or younger than others, and a wide variety of other methods. However, the most common method used to date the sites discussed in this book is radiocarbon (^{14}C) dating.

Radiocarbon dating can be complex and few people realize that radiocarbon years are different than calendar years. Consequently, all the radiocarbon dates in this book have been converted to calendar dates employing *Radiocarbon Calibration Program (CALIB 4.3)* using the mean, or mean of means, at one standard deviation. For example, if the text says a site has been radiocarbon dated to 1,000 years ago, it tells the reader the site was dated using the radiocarbon method. Frequently, the calibrated dates have been rounded to the nearest 50 or 100 years for clarity and simplicity. However, for the sake of consistency, the date is presented in calendar years, not radiocarbon years. This book uses the term "years ago" in describing time throughout this book. This means calendar years prior to A.D. 2000. This was done to simplify the conflicting and confusing ways various researchers have chosen to describe the chronology of Beringia, such as B.P. (Before Present — actually meaning before A.D.1950), A.D. (after the beginning of the Christian era), B.C. (before the Christian era), and complicated phrases such as "late in the third millennium before Christ."

While the ability to convert radiocarbon years to calendar years is limited to approximately the last 24,000 years, there are radiocarbon dates that are older. These dates cannot be converted to calendar years and are reported as uncorrected radiocarbon years before present. Radiocarbon dates can be distorted if they are based on samples from marine organisms, which may have absorbed carbon from the air at a delayed rate. For example, this delay can result in radiocarbon dates derived from seal or whale bone being hundreds of years different than from animals or plants of the same age living on land. This is called the marine reservoir effect and it has been applied to the dates in this book when appropriate.

Readers should be aware of the limitations of radiocarbon dating that make all dates approximate. Scientific literature acknowledges this by placing prior to a date "circa" or "c." which means approximately, or qualifiers such as "about." This book has dropped that convention to make it more readable. All radiocarbon dates should be regarded as approximations. At times it has been necessary to make judgments about which dates are most accurate when several dates have been reported for a site, site component, or stratigraphic levels that are not consistent or when there are reasons to believe that some samples are problematic. When bracketing the beginning and ends of archeological traditions and complexes, maximum and minimum limiting dates have been rounded to the nearest 50 or 100 years. The historic dates drawn from written records, such as the purchase of Alaska by the United States from Russia in 1867, are reported according to the standard calendar.

CHAPTER 1
INTRODUCTION

The Bering Sea was named for Vitus Bering, an intrepid Scandinavian navigator hired by the Russian crown to explore Russia's Pacific frontier. After traveling overland from Europe, he founded the settlement of Petropavlovsk (Peter and Paul) on the Pacific coast of the Kamchatka Peninsula. With European shipbuilders, he established a shipyard, harvested timber, constructed vessels, and launched his exploration of the northern seas. On the return from his second voyage he died on the largest of the Komandorskie (Commander) Islands that now bears his name. His incredible feats are commemorated in names - Bering Sea, Bering Strait, and the Bering Land Bridge.

The geographic region known as Beringia received its name from botanist Eric Hultén. In the 1930s he determined from studying the plants on both sides of the Bering Sea that the vast areas of extreme northwest North America and northeast Asia had been connected by a land bridge in the past. Geologists had already suggested this based on the shallow depth of the Bering Sea and the fact that much of the region had not been covered by glacial ice during the last Ice Age. Hultén named this vast region Beringia after the Bering Sea that now separates the two continents.

During the height of the last Ice Age, the ocean floor lying beneath the Bering Sea was exposed as dry land stretching between Alaska and Siberia. This occurred because sea level was lower while much of the earth's water was trapped in massive continental glaciers. This land connection between Asia and North America is called the Bering Land Bridge and when the land bridge connected the two continents large glaciers covered much of the adjacent land (Figure 1.1).

It was geologist David Hopkins who most fully realized the importance of the Bering Land Bridge in shaping the modern world. Expanding our understanding of the Bering Land Bridge, he emphasized that it was part of a larger region referred to as Beringia. He divided Beringia into two parts: Western Beringia in Asia, and Eastern Beringia in Alaska, British Columbia and the Yukon Territory.

Based upon the environments, resources, archeology, and contemporary cultures, this book divides Beringia into three regions instead of two. The three regions are Western, Central, and Eastern Beringia (Figure 1.2). Western Beringia extends from Russia's Verkhoyansk Range to the Bering Strait, and from the Arctic

Ocean in the north to the Sea of Okhotsk in the south, including Kamchatka. Central Beringia includes the Bering and Chukchi Seas and adjacent parts of Asia and North America. During the Ice Age, the Bering Land Bridge was the core of Central Beringia. Eastern Beringia encompasses interior Alaska and adjacent areas of Canada that were not covered by the massive continental glaciers during the Ice Age. Eastern Beringia has been subdivided into three areas: 1) the interior, 2) Aleutian Islands and Gulf of Alaska, and 3) the northern Northwest Coast of North America extending south to the Strait of Juan de Fuca.

The boundaries between these areas are sometimes difficult to define, because over long periods of time the climate and environment has changed and cultural boundaries have shifted. However, each area typically shares common features in cultural development. Beringia is the only part of the Americas adjacent to Asia and connected to it in the past by a land bridge.

Figure 1.1 North polar projection illustrating the location of Beringia.

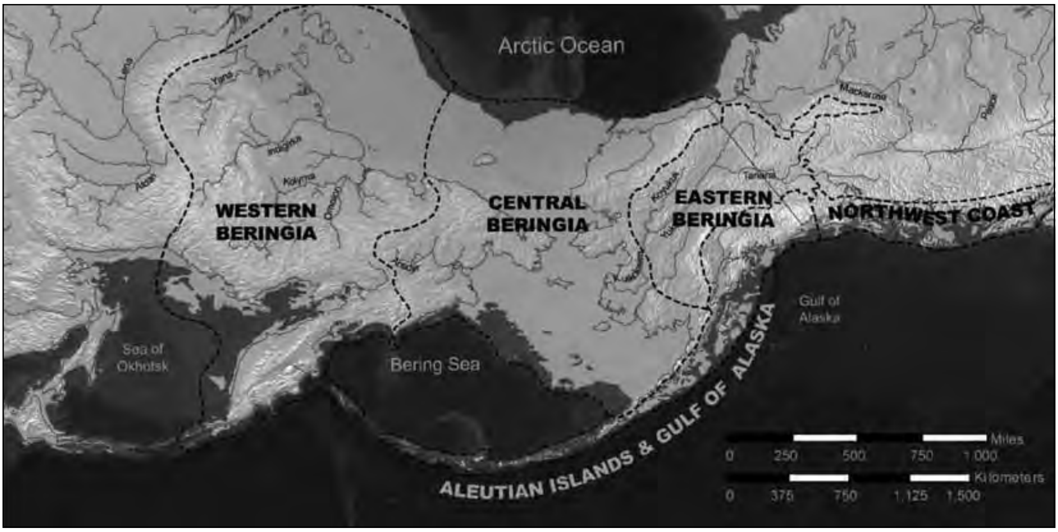

Figure 1.2 Map depicting three sectors of Beringia: Western, Central and Eastern.

The Aleutian Island chain is composed of approximately 100 islands. It extends more than 1,000 miles (1,600 km) from the end of the Alaska Peninsula westward into the North Pacific. While this may look like it is on the southern boundary of Central Beringia, it is actually a westward extension of Eastern Beringia. The archeological evidence indicates that the Aleutian Islands were colonized from the east and subsequent cultural interaction was with people living in North America, not Asia. The treeless islands are the peaks of volcanic mountains rising from the deep waters of the north Pacific. This deep water separated the Aleutians from the Bering Land Bridge during the Ice Age and they were not part of the Bering Land Bridge. When sea level was lower, the islands would have been larger and easier to see from a distance.

The Northwest Coast of North America forms a southern boundary of Beringia. Although traditionally it has not been considered part of Beringia, recent research has demonstrated that much of the coast was ice-free during the last Ice Age. These ice-free areas supported animals, such as caribou, brown bear, and ringed seals that are now regionally extinct. The Northwest Coast served as a corridor along which people may have first been able to colonize the southern areas of North America. In later times it served as a conduit for the exchange of ideas and technological innovations between Eastern and Central Beringia and southern areas of North America.

Beringia played an important role in the human colonization of the American continents. Most archeologists believe that humans first came to Beringia from Asia. Subsequently people settled the heart of Central Beringia and the Bering Land Bridge. They eventually colonized Eastern Beringia sometime between 17,000 – 14,000 years ago. There is good reason to believe that archeological sites await discovery on the continental shelf beneath the Bering and Chukchi Seas.

In the past, some scientists believed that an "ice free corridor" might have existed through Canada from Eastern Beringia during the height of the last Ice Age about 18,000 years ago. They thought this may have been a relatively narrow passage, perhaps only a few miles wide in places, that may have enabled people to move south from Alaska without having to attempt a dangerous crossing over the rugged continental glaciers. However, recent studies suggest that this passage did not exist until the end of the last Ice Age, about 13,000 – 14,000 years ago when glaciers melted sufficiently to expose enough land to sustain life and permit people to move south from Eastern Beringia to colonize the rest of the Americas.

It is possible that with the use of watercraft, people were able to move south along the Northwest Coast of North America possibly as early as 17,000 years ago. This coastal route may have enabled people to move southward a few thousand years earlier than the inland one. However, it is probable that once the continental glaciers had melted sufficiently both routes were important to humans moving south from Eastern Beringia.

People on both sides of Bering Strait maintained contact with one another for more than 14,000 years following the initial settlement of North America. It was through Beringia that people continued to exchange ideas and goods between the two great hemispheres of the earth, the Americas and the Old World. For thousands of years to come, it would be through Beringia that people obtained important resources such as iron from Asia and furs from North America. When ancient Beringians met, they exchanged news and advances in technology such as metallurgy, pottery making, and the invention of the bow and arrow. Until Europeans "discovered" America more than 10,000 years later, Beringia was the primary route for the exchange of knowledge between the Americas and the Old World.

The study of Beringian archeology has a rich history beginning more than a hundred years ago. Many individuals, academic institutions, and state and federal agencies have made contributions important to understanding the archeology of Beringia. Native people continue to take an active role in interpreting and presenting their cultures through the establishment of museums and cultural centers and as partners in archeological excavations. National and regional governments have had an important impact on archeology in Beringia and have introduced measures to protect and conserve archeological sites and other cultural resources. New discoveries provide new insights into the lives, art, beliefs, and economy of ancient Beringia. New research frontiers are providing amazing discoveries that continue to expand our knowledge, understanding, and respect for the people of Beringia.

Recent History of Beringia

The modern political character of Beringia is complex. For example, Alaska is a state of the United States of America, with boundaries defined largely on political considerations rather than natural physical features, environmental criteria, or even cultural boundaries. It is the largest state in the United States and the only one that shares its borders with two foreign nations, Russia and Canada. However, these political boundaries do not reflect the geographic distribution of past or present cultures. The Bering Sea region was ecologically and culturally a relatively cohesive area until the political divisions created by the United States and Russia divided the resident population. Athapaskan peoples living in the Interior also were divided by an arbitrary international boundary and became citizens of two nations, the United States and

Canada. The modern political boundaries are familiar to us and they create a point of reference that helps us communicate the location of archeological sites. However, these political boundaries were meaningless for the early inhabitants of Beringia.

Beringia has continued to be the source for materials that have influenced international economics. In historic times these have included furs, whale oil, gold, fish, and most recently oil and natural gas. These links to the international economic system brought rapid and irreversible change to the people of Beringia.

During the height of the international market for furs, the British Hudson Bay Company expanded from east to west overland across North America. At the same time the Russian American Company spread eastward from Asia into Alaska until the two economic giants met on Alaska's Yukon River. This type of interaction is typical of Beringia, creating a unique blend of Asian and European industrial goods and customs.

In the 1800s whalers from around the world were drawn to Beringia, bringing with them new technology and concepts, and returning with knowledge of the rich environment and diverse people. They also introduced diseases. Many of the people in Beringia had no immunity, and this contact resulted in large-scale epidemics and death.

By the late 1800s prospectors had begun looking for gold and other precious metals farther north because the mining boom that had occurred in the American west was declining. This led to the discovery of gold in Canada's Yukon Territory, which precipitated the Klondike gold rush of 1897–1898. This and subsequent discoveries brought a larger population of non-Native people deep into the interior of Eastern Beringia and to the coasts and river valleys of Central Beringia. In the early 1900s gold discoveries in Western Beringia led to large-scale mining largely directed by the Soviet government where political and criminal prisoners provided much of the labor. These events not only brought many non-Native immigrants to Beringia but also led to development of large-scale transportation along many of Beringia's rivers, road construction, and increased infrastructure including telegraph and later telephone communications.

The introduction of aircraft in the 1930s and the events of World War II had a major impact on Beringia. Aircraft were introduced in Alaska, Canada, and Northeast Asia prior to World War II. However, it wasn't until the onset of the war that they became common. Prior to that time, travel in summer was by boat along rivers and along the coasts of the Bering and Chukchi Seas. In the winter, it was by dog sled on the frozen rivers and trails or by wagon or horse-drawn sleds on rough roads. Later automobiles traveled on the very limited road systems.

During World War II, Canada and Alaska became a back door to Russia. Aircraft and other equipment built in the United States were flown through Canada and turned over to Russian pilots in Alaska. From there the planes were flown across Asia for service in the war in Europe. Following World War II, aircraft were more common and affordable, bringing vast areas of rural Beringia not connected to road systems into regular and dependable contact with the outside world.

The invasion of Alaska by the Japanese in World War II forced the United States and Canada to construct a road from Eastern Beringia to the larger population centers to the south. The Alaska Highway connected remote parts of British Columbia, the Yukon Territory and Alaska with the rest of North America. The 1,500 mile (2,400 km) road forever altered the lives of people living in interior Eastern Beringia.

With the onset of the Cold War in the late 1940s, North America and Asia were separated by an impenetrable political barrier, named the Iron Curtain by British Prime Minister Winston Churchill. The governments of the Soviet Union and United States forbade travel and communication between Eastern and Western Beringia. For the first time in thousands of years, it became virtually impossible to communicate across Bering Strait. The traditional contacts that existed between Asia and North America were severed more effectively than any glacier or ocean could have done. The Cold War divided the Native people who were related and shared a common language and history. Dissolution of the Soviet Union in the late 1980s reopened relationships between Russia and the United States. Once again Native people and archeologists are free to travel, study archeological collections, and even conduct field research on both sides of Bering Strait. These research opportunities strengthen knowledge of early human interactions and relationships between Asia and North America.

Beringia is the geographic and cultural hinge between Asia and North America. For thousands of years, it was the avenue through which ideas and technology were exchanged between the Old and New Worlds. This book is the story of the culture history of the resilient people who have inhabited Beringia for more than 10,000 years and the archeologists and Native people who have worked together for more than 100 years to unearth and share their rich past.

CHAPTER 2
BERINGIAN ARCHEOLOGY

Archeologists in northern regions face many challenges. Severe winters limit field work to three or four months during the summer, while long daylight hours in summer often allow work for 12 to 16 hours a day. It sometimes rains for days and even weeks without stopping in some areas. At times swarms of ferocious mosquitoes, black flies, and "no-see-ums" surround excavators, requiring them to use head nets and copious amounts of "bug dope." Field camps are occasionally damaged or destroyed by curious or hungry bears. Many excavations are in remote areas accessible only by boat, small plane, or helicopter. Field camps are sometimes primitive. Mail and supplies are delivered infrequently. Field work can be difficult and dangerous, so archeologists must be resourceful and careful.

Permafrost is both a blessing and a curse. Vast areas of Beringia contain permafrost, which is permanently frozen ground. Permafrost can result in excellent preservation of artifacts. For example, when gold miners in interior Alaska sprayed water on the frozen silts to help melt the permafrost and wash away the "muck" (Figure 2.1), they discovered artifacts and the remains of Ice Age animals including woolly mammoths. Some were preserved with the flesh, hide and even "wool" intact.

Unfortunately, it is almost impossible to conduct satisfactory archeological excavations in permafrost. When the ground is frozen, only about two inches (approximately 5 cm) of earth near the surface can be removed at a time. Excavators must wait for the sun to slowly melt the newly exposed layer and then remove a few more inches. As excavations in permafrost progress, the sides, or walls, of the excavation begin to melt. This creates a slurry of mud, which flows into the excavation, making work a nightmare in this slippery ooze. It is extremely difficult to locate artifacts and accurately record where they were found. Frequently, the exposed area will continue to enlarge as melting progresses, ultimately forcing the excavations to be abandoned.

Despite the difficulties and hardships, Beringian archeology has rewards. Early Beringians lived in places that have magnificent views. Consequently, many archeological sites are located on hills with panoramic vistas. Archeological sites are commonly located where the hunting and fishing is excellent, so excavators frequently

Figure 2.1 Paleontologist Ove Kisen collecting the bones of Ice Age animals at a hydraulic mining operation in interior Alaska (American Museum of Natural History, Photo Archives).

enjoy fresh salmon or caribou. Spending prolonged periods of time camping in remote areas provides archeologists with deep appreciation and respect for Beringia's people and their environments. This connection is stronger for Arctic archeologists than their more cosmopolitan colleagues who sleep in motels, eat in restaurants, and excavate near freeways.

Beringian Archeology Begins

The earliest documented historic preservation effort in Beringia occurred in 1869, when Chief Shakes moved four house posts and other important cultural objects from Old Wrangell to Shakes Island in Southeast Alaska to preserve them. Two years later in 1871, William Healy Dall began scientific excavations at several sites in Alaska's Aleutian Islands. Native people shared their knowledge with early scientists such as Edward W. Nelson, who worked in the Bering Sea region from 1877–1881, and John Murdoch, who worked in the Point Barrow area in 1877 and 1888. These early scholars drew and photographed artifacts and recorded how they were used based on the knowledge shared with them by Native people. Classic works such as these enable archeologists to identify artifacts and understand how they have been used for the past several thousand years.

As archeology began in Beringia, indigenous people were still making many of the tools used before the arrival of Euroamericans. When archeologists first began working in

Beringia, they recognized that these resourceful people were the descendants of those who left collapsed houses, household refuse, and other artifacts that they were finding. In fact, it was Alaska's Native people who often taught the archeologists and anthropologists what the artifacts were and how they had been used.

Some archeologists and historians use the term prehistory to refer to the time prior to written records. However, some Native people argue that this implies that they had no history until Europeans began recording events. History clearly does not have to be written; it can be passed verbally from one generation to another, as was done throughout the world by people who did not have a written language.

When Europeans first arrived in Beringia they learned that the indigenous people were not all the same. The cultures of Beringia are diverse and people speak many different languages (Figure 2.2). Iñupiaq and Yupik-speaking people occupied the Bering, Chukchi and Beaufort Sea coasts, adjacent inland areas, and some areas in the Gulf of Alaska. In the interior of Alaska, Athapaskan-speaking people lived in small groups in the boreal forest and generally moved each season in a subsistence lifestyle. Along the Northwest Coast of North America, the Tlingit and Haida carved magnificent totem poles and canoes, and largely relied on salmon fishing. In the Aleutian Islands, the Aleuts (or Unangan people) depended almost entirely upon the sea for their needs. In Asia the Chukchi herded reindeer, while the Koryak and Itelmen hunted and fished along the shores of the Okhotsk Sea. Each group spoke a distinctive language and had its own social organization. This rich cultural and ecological diversity had a long history that was preserved in the earth, soon to be revealed through excavations by archeologists.

Native people freely shared their knowledge with scientists who carefully recorded, sketched and described tools, and how they were made and used. Because the functions

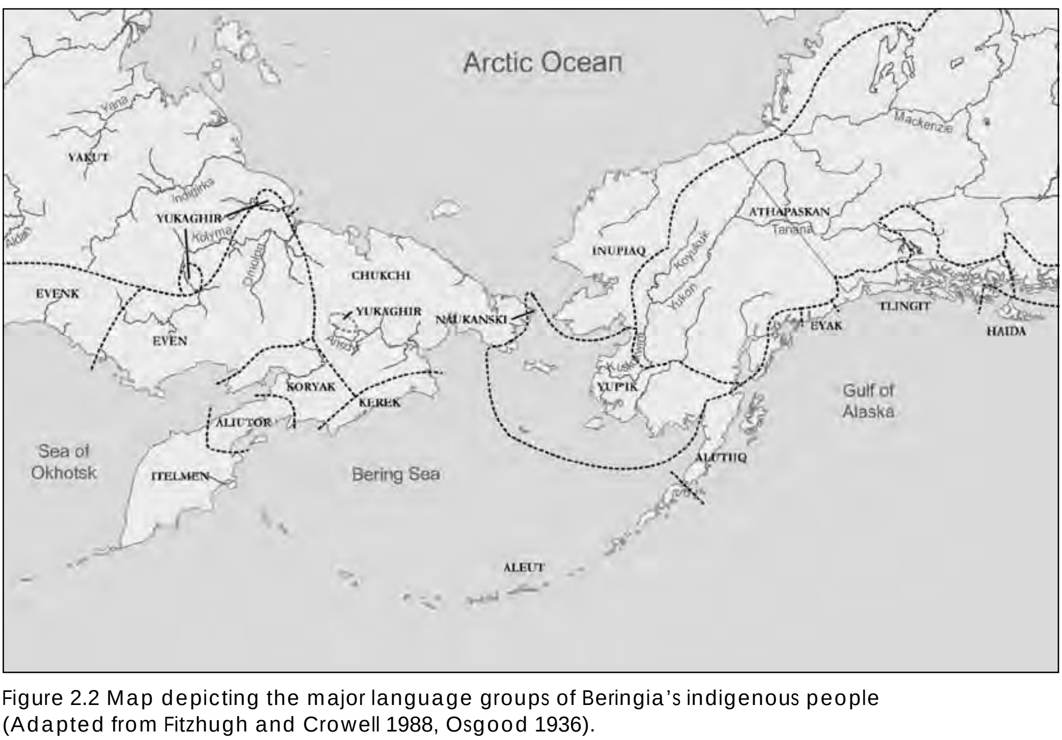

Figure 2.2 Map depicting the major language groups of Beringia's indigenous people (Adapted from Fitzhugh and Crowell 1988, Osgood 1936).

of these tools were clearly understood, archeologists immediately began naming them according to their use. For example, an ivory harpoon head used to hunt seals was simply called an ivory "sealing harpoon head". This way of describing artifacts became known as functional typology. Typology is the method by which archeologists classify, or group, artifacts and cultural traits. Functional typologies classify or lump various artifacts into groups based on how they were used. For example, all the tools used for fishing might be lumped into one group. This larger group of fishing implements might then be subdivided into smaller sub-groups, such as tools used for net fishing versus tools used for spear fishing.

By working with Native people and beginning excavations at the most recently abandoned village sites, archeologists quickly gained an understanding of the artifacts they were finding. Native people were still using tools virtually identical to the ones archeologists found buried in the ground. This was a starting point from which to unravel the mysteries of the past. By excavating archeological sites that could be ascribed to modern groups, it was possible to trace specific cultures back through time. This approach was subsequently called the direct historical approach by archeologists working in southern regions of North America. However, in the north this method was used long before it was given this formal name elsewhere. These two concepts, functional typologies and the direct historical approach, were applied early in Beringian archeology. They are used today by archeologists all over the world and remain important contributions to the foundations of modern archeological science.

How Archeologists View the Past

Most indigenous people refer to themselves as the "real" or "true" people in their own language. The names used today were often given to them by Europeans and frequently borrowed from their neighbors. The names given by Europeans refer to both the culture group and the language they speak. On the Asian side of Beringia, the predominant Native people are Even, Itel' men, Chukchi, Koryak, and Yupik (southern Eskimo). In North America they are the Yupik (southern Eskimo), Iñupiaq (northern Eskimo), Aleut, Athapaskan, Tlingit, Haida, and others. These names are useful in identifying modern groups of people, but it is difficult, perhaps impossible, for archeologists to trace unwritten languages back in time. Archeologists must rely on what has been preserved in the earth and, unfortunately, spoken language is not preserved.

Consequently, archeologists tend not to use the current names of groups of indigenous people that are related to their language. Instead, the term tradition is used to describe groups of artifacts that are similar over a large geographic area and persist for long periods of time. The concept of an archeological tradition implies that a common way of life and economic pattern was passed from generation to generation throughout long periods during the past. This implies a cultural group, but normally archeologists do not label these traditions in a way that links them to contemporary cultural groups and their languages. For example, archeologists might use the term American Paleoarctic tradition to refer to certain types of artifacts and tools found in archeological sites in an area that is today occupied by Iñupiaq-speaking people, but this does not necessarily mean that the peoples who made and used these tools spoke the Iñupiaq language.

The beginning and end of a tradition is marked by a major change in the types of artifacts used by early people, as well as a change in their economy. For example, one tradition might end and another begins when people who primarily hunted seals and caribou begin to hunt whales. When this occurs, there is a dramatic change in the types of tools that are used. Much larger harpoon heads and cutting implements are required to kill and butcher whales compared to seals. At the same time, the size of villages might be larger because this new economy would be able to support a larger population. People might also choose new places to live where whales pass close to the shore, rather than locations where seals and caribou might be more readily hunted. If these types of changes occur at about the same time over large regions, such as much of coastal Alaska, and persist for several hundred years or more, archeologists would call it a new tradition. Cultural transformation can result from a variety of causes such as adapting to environmental change, adopting technological innovations, social change, or learning new concepts from other people.

When archeologists use the term tradition, they make an assumption that the people who made and used similar artifacts were part of a larger population that shared a similar way of life and economic system. Archeologists also use the terms complex and phase to express a concept similar to that of tradition, but which is more restricted geographically and persists for shorter periods of time. Complexes or phases can be part of a tradition and may be used to subdivide traditions. The term culture is rather carelessly used interchangeably with any of the above terms.

Different types of artifacts are used to define different traditions. At any given time, people tend to make and decorate their pottery, tools, and houses in a similar way in the same region. When archeologists find sites that contain these similar types of artifacts in the same region, they generally consider them to be from the same tradition, or culture.

The indigenous people of Beringia lived close to the land and sea. They depended on hunting and fishing for a living. Understanding the distribution of animals and fish at different periods of time is important because the distribution of these resources largely determined where people were most likely to live in the past. Knowing how the environment has changed is essential to understanding how these sophisticated cultures adjusted their ways of life to cope with these changes. The importance of the environment and its effects on culture has been a traditional focus in interpreting the archeology of Beringia. This approach to understanding the past has involved scientists from a variety of disciplines, including geology and biology. These specialists assist archeologists in their attempts to determine how old archeological sites are, what past environments were like, and how and when they changed.

Dating

Today archeologists rely on radiocarbon dating to determine the age of archeological sites and artifacts. This sophisticated way of measuring the ratio of carbon molecules was not invented until 1948. Prior to that time, archeologists used different methods to estimate how old things were.

In the 1870s William Healy Dall was the first to apply the principle of stratigraphic superposition in Beringian archeology. This fundamental geologic principle states that the artifacts and sediments deposited at the bottom of an archeological site will be older than the ones on top. This is like placing one sheet of paper on top of another — by looking at the pile you can tell which piece of paper was set down first and which one was last. When archeologists recognize that one group of artifacts is found above another in an archeological site, they can tell that the artifacts near the surface are younger than the ones below. Of course, nature is not as controlled as a pile of paper. There are many things that can jumble the layers in an archeological site, such as burrowing animals or disturbances caused by the wind and sea.

While working on St. Lawrence Island during the 1920s, Henry Collins observed that storm surges and waves pile up beach gravel and sand along the coast when the water is high. Over time these accumulations of sand, gravel, and drift wood would form a ridge along the shore. He recognized that successive beach ridges provided a means of relative dating of the archeological sites. Relative dating does not tell archeologists how old the artifacts or settlements are. However, like the principle of stratigraphic superposition, it enables them to determine which ones are older, or younger, relative to each other.

People living on the coast would move to new land, or a beach ridge, to live closer to the ocean where they could fish, hunt marine mammals, and be close to their boats. Each time a new beach ridge formed, people would move on to it and abandon the old beach ridge where they used to live. In areas where beach ridges formed, such as St. Lawrence Island, the archeological sites that were younger were located closer to the ocean and the sites that were oldest were located the furthest inland.

With the help of his friend and boatman, Almond Downey, J. Louis Giddings applied the concept of beach ridge dating to a spectacular series of sites along the shores of the Chukchi Sea in northwest Alaska in 1956. At first they surveyed the Choris Peninsula where they discovered large oval houses and the earliest pottery known from Alaska. They then focused on Cape Krusenstern, north of Kotzebue Sound, where an enormous sequence of beach ridges has been accumulating for thousands of years. Cape Krusenstern provided the time depth to outline cultural development along the coast of northwest Alaska from the time sea level had stabilized about 4,500 – 6,000 years ago until the present time.

J. Louis Giddings had also applied tree ring dating, or dendrochronology, to a series of archeological sites along the Kobuk River in northwest Alaska in the late 1940s. Each year a tree grows a new layer of wood. When a log is cut and viewed in cross-section, the annual growth over the life of the tree can be seen as a series of rings. The oldest is in the center and the youngest on the outside. The growth of trees within a region varies every year depending on the weather. During a year when the weather is warm and there is abundant water, most of the trees within an area will have large rings. During exceptionally cold or dry years, they may have narrow rings. By overlapping these patterns of growth from old living trees to logs and wood found in archeological sites, scientists can determine, or closely estimate, when a tree was cut to build a house or when a piece of wood was used to make a tool. In the Kobuk river area, Giddings was able to provide the first absolute dates for the last 1,000 years of Eskimo culture.

Archeological sites can also be dated using volcanic ash. When a volcano erupts, it frequently spews volcanic ash, called tephra, into the atmosphere. The tephra ultimately falls to the earth and forms a layer of ash that may eventually become buried by other sediments. This provides the record of an event (volcanic eruption) that occurred at one point in time. By radiocarbon dating organic remains, such as wood, above and below the ash, archeologists can tell when an ancient ash was deposited. Once the age of an ash is known, it can be used to help date artifacts buried in the earth. For example, if artifacts are found below a tephra that is 500 years old it is reasoned that the artifacts are older than 500 years. If the artifacts are above the ash, then they were probably deposited less than 500 years ago. These tephras have been used to date archeological sites over large regions. This method of dating is called tephrochronology and has proven particularly useful in Western Beringia where volcanoes are common.

Atl Atl

A fascinating and unusual weapon used by ancient hunters was the atl atl. The term atl atl is an Aztec word that has been adopted by North American archeologists. It means spear thrower and was used widely in Central America for warfare when the Spanish conquistadors arrived in the New World. An atl atl is an artificial extension of the human arm, which utilizes the simple principle of the lever to increase the ability of a person to throw a spear. It allows a hunter to throw a spear, or slightly smaller atl atl "dart," several times farther and with greater force than the human arm alone.

Spear throwers are generally made from pieces of wood about the length of the user's forearm. Typically they have a hand grip at one end and a shallow grove running their length to the opposite end in which the shaft of a dart, or harpoon, can rest. A peg is sometimes inserted near the end opposite the hand grip. The base of the dart or harpoon rests against the peg so that when the dart is thrown the full force of the throw will be transferred to the dart or harpoon. Darts will frequently have a dimple at their base that fits into the peg. The atl atl was a major innovation in hunter-gather societies and was probably invented more than 40,000 years ago. The spear thrower increases the distance and force with which a dart or harpoon can be thrown. These factors increase safety and success for hunters. It also has other advantages. Because it can be used to propel darts with one hand, it frees the other hand for other tasks such as holding a paddle to stabilize a kayak or holding a shield during combat (Figure 2.3).

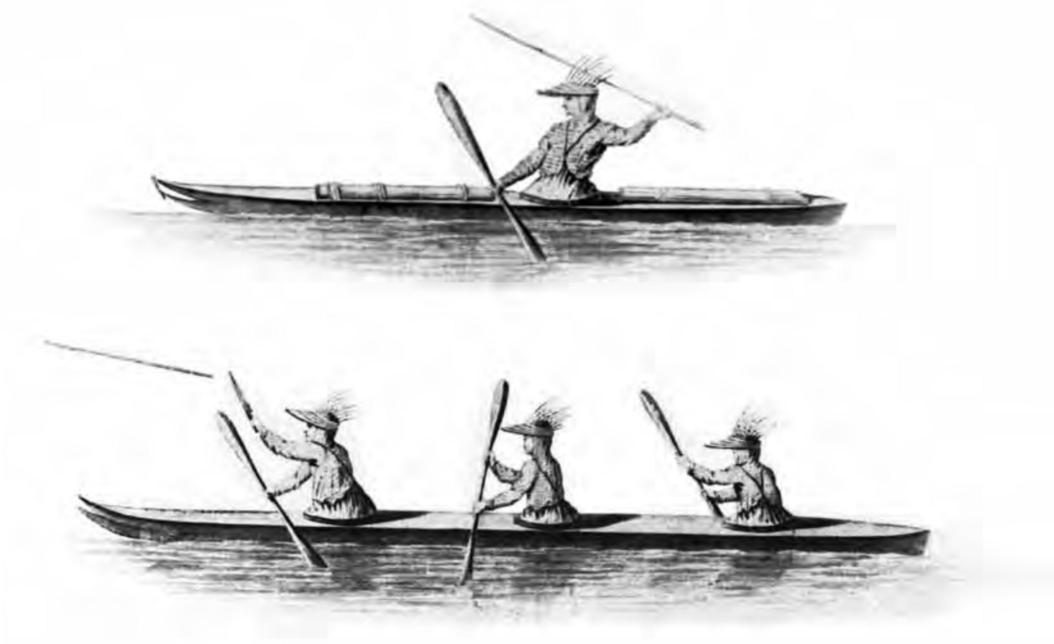

Figure 2.3 Marine mammal hunting using an atl atl from Aleut skin boats (baidarkas) 1790 - 1792 (Sarychev 1802, Alaska State Library: P20-056, Alaska Purchase Centennial Commission Photograph Collection).

The atl atl came to the New World from Asia with the first people to colonize the Americas. After colonizing regions south of the continental glaciers near the end of the last Ice Age, these first Americans developed distinctive types of stone points different from the ones used in Beringia. These points were attached to the ends of atl atl darts and archeologists call these types of stone artifacts Paleoindian projectile points. These distinctive and uniquely American stone tools invented south of the ice sheets did not appear in Beringia until after the end of the last Ice Age. The atl atl was the premier weapon used to propel projectiles in North America until the bow and arrow was adopted. Even after the bow and arrow was in use, the atl atl continued to be used in specialized hunting situations and in warfare.

The Genius of Microblade Technology

Unlike other animals, people must make and use tools because they lack claws and teeth suitable for killing, dismembering, processing, and consuming large mammals. During the Paleolithic, or Old Stone Age, people solved this problem by using tools made of stone and bone to meet their cutting needs. However, in high latitudes access to stone is greatly restricted because it is frozen in the ground beneath the snow during winter. Consequently stone is inaccessible much of the year. Without an adequate supply of sharp stone necessary to make clothing, weapons, and other tools, people could not survive.

Microblades are tiny stone blades, usually less than a quarter of an inch (.5 cm) wide. They are parallel sided flakes that have been struck from a stone core especially prepared to produce them. Microblades appear to have been used in a variety of ways, and in some cases they were inset in slots carved in the sides of bone or antler projectile points. The projectile points were then lashed to the end of spear or arrow shafts. Inset in a line, they formed tiny razor-like rows of stone to create a continuous cutting edge (Figure 2.4).

Microblade technology originated in Eurasia possibly as early as 40,000 years ago as a miniaturization of larger parallel sided stone blades commonly used during the Upper Paleolithic (later stage of the old stone age). Although there is some evidence to suggest that it may first appear in Western Beringia as early as 35,000 years ago, their use does not become wide spread until the last Ice Age sometime around 20,000 years ago. People stopped making microblades in most parts of the world shortly after the end of the last Ice Age. However, they continued to be made and used in Eastern Beringia until possibly as late as a thousand years ago, because they were an essential solution to year round survival in the far North.

Gutorm Gjessing, a Swedish anthropologist and archeologist, recognized the importance of what he called "cultural conservatism" among circumpolar people. He believed that this conservatism resulted from the fact northern people were very closely linked to the land and environment. People living in circumpolar regions were reluctant to give up traditional ways of doing things until new methods or materials could be reliably counted upon to replace them. In other words, they were reluctant to abandon one thing until they were absolutely certain it could be reliably replaced by something else. Consequently, the use of microblades in Beringia was longed-lived because they could not be abandoned completely until a reliable alternative could fully replace them.

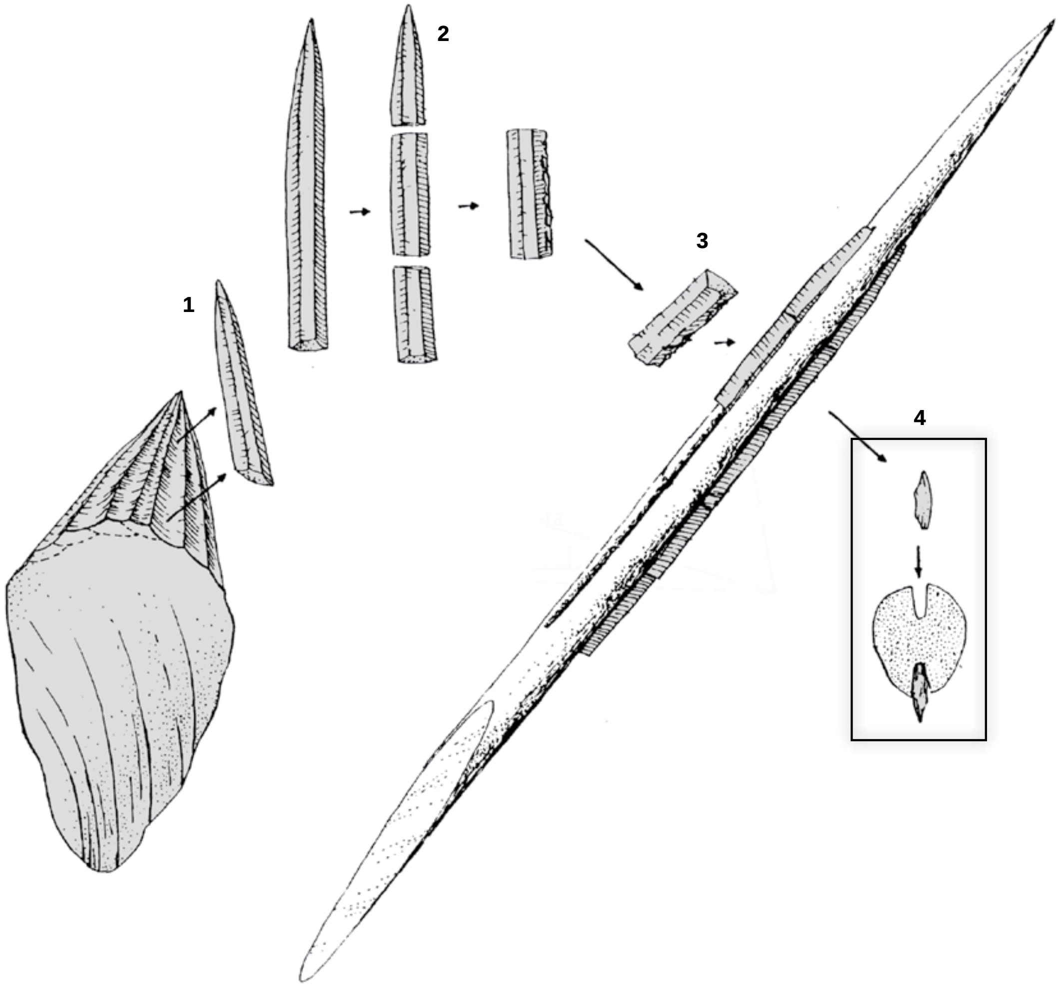

Figure 2.4 Idealized presentation illustrating how microblades were manufactured from wedge shaped cores and used as insets along the sides of bone or antler projectile points: 1 microblade was struck from prepared core; 2 microblade was segmented; 3 blade inset was inserted into slotted projectile paint; 4 cross section of projectile point showing mounting of blade insets into slots (modified from University of New Mexico Press, Dixon 1999: 159).

The ability to harvest large mammals for clothing and food is key to survival in the Arctic. The development of microblade technology was an ideal solution to the lack of access to stone during the winter months. It enabled people to easily carry a small compact stone core. The core could be struck repeatedly to produce long sharp slivers of stone that could be inserted into antler projectile points or hafted into handles. This multiplied the cutting edge of a small amount of rock. This invention was a critical technological breakthrough enabling people to permanently colonize the circumpolar north.

Unlike temperate environments where loose-fitting clothing and footwear such as robes and sandals are adequate for survival, the Arctic requires tailored clothing that must be warm and strong. Microblades hafted in handles are excellent tools for

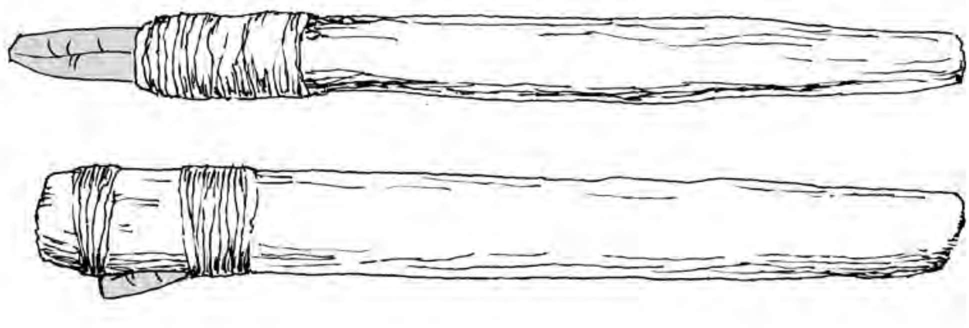

Figure 2.5 Examples of how microblades may have been hafted in handles like razor knives for use in fine craft work.

making fine accurate cuts in hide and other materials (Figure 2.5). Used like Exacto knives or scalpels, they are exceptional tools for delicate craft work. They were probably used to make the precision cuts necessary to match seams and custom fit garments such as parkas, mittens, and muckluks (calf-high skin boots made of animal hide and fur). Along with bone needles and sinew used as thread, microblades would have provided a large supply of sharp-edged precision cutting tools necessary to make and mend the clothing (Figure 2.6) essential for survival through long severe winters.

Figure 2.6 Hafted microblades may have been excellent tools for delicate tasks such as making tailored skin clothing.

Microblade insets along the sides of bone or antler arrow heads also improved the success of hunters. The sharp stone cutting edge created by microblades makes arrows more deadly because they enlarge a wound and increase bleeding by internally severing organs, arteries, and veins. When a wounded animal runs or moves, the sharp microblades continue to lacerate tissue. This makes a projectile point armed with microblades, or chipped stone side blades, more effective than one without them.

In other situations, microblades may have been hafted in handles, simply held in the hand, or possibly set in handles and used like modern razor knives. Microblades are commonly found in association with microblade cores (the larger pieces of rock from which they are struck) and burins. Burins are generally made on a thick stone flake or blade by removing a distinctive chip to create a tool useful to cut and shape bone, antler, and ivory. This is another remarkable adaptation that enabled people to permanently occupy the high latitudes of North America and Eurasia for the first time in human history.

Some archeologists believe that the presence or absence of microblades is not related to use by a particular groups of people, but may result from other factors such as the specific activities at the site or the season during which an archeological site was occupied. For example, some have suggested that microblades may have only been used in the winter when it was difficult to obtain stone for making stone tools. Others believe that microblades may have only been used for specialized activities, such as fine craft work, and are only found at sites where these types of activity took place. In either case, they may not have been made and used at all sites. At many sites hundreds of microblades have been found. In these cases they appear to have been mass produced, because the sheer numbers far exceed what would be needed for use in composite projectile points or other tools associated with hunting sites. People continued to make microblades until there were adequate and reliable sources of metal to fully replace them. They continued to be used in some areas of Beringia as late as 1,000 years ago.

Bow and Arrow

It is not clear when the bow and arrow were first invented. The earliest evidence suggests that they may have been in use in northern Africa by at least 14,000 years ago. The oldest bow that has been found, called the Stellmoor bow, is about 11,000 years old and was discovered in a bog in northern Germany.

The bow is essentially a spring. When the bow string is drawn, energy is stored in the spring, or bow. When the bow string is released, energy is also released. It is focused at the base of a light weight arrow where a notch (called a nock) is made to receive the bow string. The bow and arrow has greater range and accuracy than the atl atl, but less shock on impact than an atl atl dart.

As early as the 1940s and 50s archeologists Helge Larsen and Louis Giddings recognized distinctive antler artifacts in Beringia as arrow heads. They were able to identify them as arrow heads because of their striking similarity to similar arrow heads used by people in the Bering Sea region at the time they came in contact with Europeans. Some of these artifacts had been preserved for thousands of years. The earliest examples had carved grooves, into which sharp microblades had been inset on the side of the arrow head.

Archeological evidence suggests that the people who made microblades used both the atl atl and the bow and arrow. They introduced the bow and arrow into Eastern Beringia very early, possibly some time near the end of the last Ice Age. The earliest antler arrow heads are dated to about 11,500 years ago. Stone shaft smoothers sized to shape arrows have been found at numerous sites throughout Beringia dating from the end of the last Ice Age until the people of Beringia came in contact with Europeans. The earliest preserved wooden arrow shafts found in the Bering Sea region are at least 3,000 years old. These discoveries suggest that the bow and arrow was used in Beringia for a very long time. However, this sophisticated weapon appears to have remained restricted to the Arctic and sub-Arctic areas of North America until about 1,500 years ago, when people living farther south finally adopted the bow and arrow.

Summary

The practice of archeology in Beringia is different than archeology in other areas of the world because of the remoteness of many archeological sites, the occurrence of permafrost, short field seasons and long daylight hours. Beringia spans three nations: Russia, the United States, and Canada. These political divisions have split some Native groups into citizens of different countries and led scientists from many nations to share a common interest in Beringia's history.

Beringian archeology began at the time when archeology was an emerging science and indigenous people lived in traditional ways. Native people shared their knowledge with early archeologists, teaching them how various artifacts were made and used. Based on this knowledge, archeologists have been able to trace Beringia's past back more than 14,000 years to reveal its role in world archeology.

Additional Reading:

Damas, David (editor)
1984 *Arctic.* Handbook of North American Indians, Vol. 5, W.C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

CHAPTER 3
THE LAST ICE AGE
AND THE FIRST AMERICANS

There have been many ice ages, during which the earth's temperature becomes very cold. Instead of rain, there is more snow accumulating in areas of high elevations, resulting in the formation of glaciers. Glaciers are powerful geologic forces that change the face of the earth. At the end of an ice age, global warming melts most of the glaciers. By looking at the patterns of the landscape, scientists can tell where the glaciers have been in the past. Geologists call the last series of glacial advances and retreats the Pleistocene Epoch. It began 1.8 million years ago and ended about 12,000 years ago. The last major advance or ice age has been called the Wisconsin after the state in which it was first clearly identified and described. It began sometime before 25,000 years ago and ended about 12,000 years ago.

Bering Land Bridge

As early as the late 1500s it was believed that there must have been a land connection between Asia and North America in the high northern latitudes. However, it wasn't until the 1890s that enough factual information had accumulated for scientists to show that the Bering and Chukchi Seas were relatively shallow, less than 600 ft (180 m) deep. This fact demonstrated that the ocean floor between Alaska and Siberia was physically part of the continental plateau stretching between Asia and North America and not part of the deep ocean basins. It was an important observation because it meant that during times in the past when sea level was much lower that it is today, a wide terrestrial plain connected North America and Asia. This has become known as the Bering Land Bridge.

The broad land connection between Alaska and Asia came into existence and disappeared during the Pleistocene. During the Pleistocene vast amounts of snow fell on the continents. The snow was derived from water evaporating from the oceans and caused sea level around the world to drop almost 400 ft (about 120 m). The snow gradually accumulated as glacial ice in the northern regions of the Northern Hemisphere (Figure 3.1). When the continental glaciers melted, due to warming climate at the end of an ice age, the water was transported back to the oceans by the earth's rivers, and sea level rose.

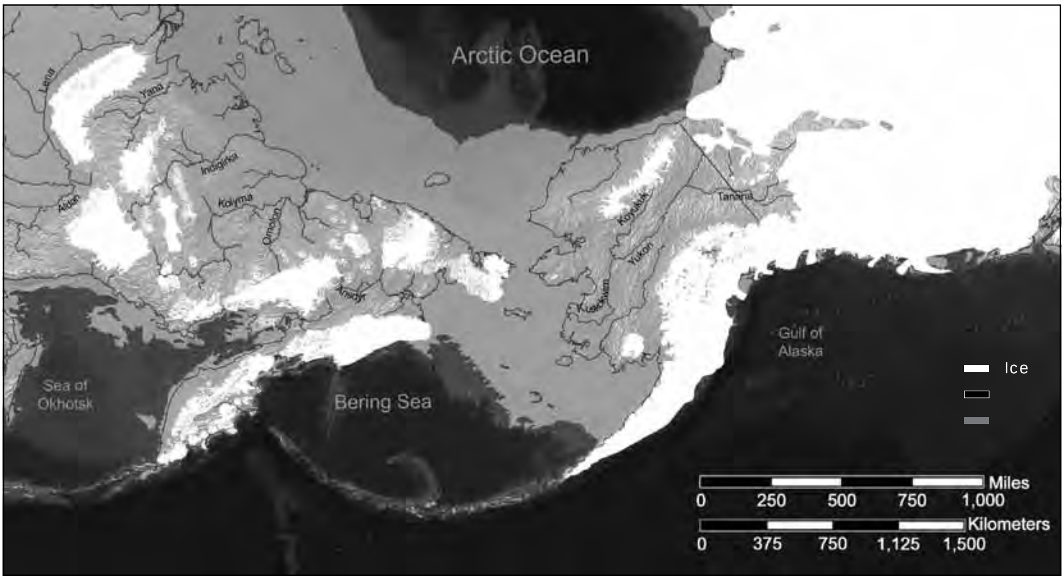

Figure 3.1 Map showing distribution of glacial ice circa 18,000 BP. (Manley 2002, Ehlers and Gibbard 2004 a and b).

Some people think of the Bering Land Bridge as a narrow strip of land connecting Alaska and Siberia in the area that is now Bering Strait. However, this is not true. It is now known that the Land Bridge was more than 620 miles (1,000 km) from north to south. At the height of the last ice age about 21,000 years ago, it was a vast region of low topography stretching between North America and Asia. A few mountains, which are today islands in the Bering Sea, were widely spaced across the land and rose abruptly above the flat landscape.

The unique and complex Beringian environment of the last ice age was cooler and probably drier than today. Vast areas of the land were grassier and mixed with tundra plants. In general there was probably less vegetative cover, and windswept sand dunes formed in some areas. It is believed that plants and animals moved across the Bering Land Bridge in the early ice ages, but human migration from Asia to North America came much later. There is abundant evidence that proves the existence of the former land bridge. The remains of extinct animals have been dredged from the ocean floor (Figure 3.2). Ancient river channels that could only have formed by water flowing across the surface of the land have been documented on the sea floor. Sediments beneath the Bering and Chukchi seas contain peat and insects, which could only have been present when the continental shelf was exposed as dry land.

The climate of the last ice age began to change about 17,000 years ago and grassy tundra was replaced by a shrub tundra dominated by dwarf birch. The climate and environment during this period of time, called the Birch Interval (17,000 – 9,500 years ago), was different from Alaska's modern climate. The first firmly documented evidence of human occupation in Beringia occurs during this time. The interval between 17,000 – 9,500 years ago marks a period of dramatic climatic change that irreversibly altered the geography and environment of Eastern Beringia. During this time glaciers receded rapidly and sea level rose, severing the land bridge connection between Asia and North America for the last time shortly before 11,500 years ago.

Figure 3.2 Ice Age animal bones from the Bering Land Bridge (Quaternary Research, Dixon 1983: 116-117).

Last Ice Age in Eastern Beringia

People living on the Bering Land Bridge would have found Eastern Beringia to be a cul de sac blocked to the east and south by the continental glacier. However, much of Alaska was not covered by glaciers during the last ice age. The Laurentide ice sheet formed in eastern Canada and flowed westward. Cordillera glaciers in the areas that are today Alberta and northern British Columbia grew toward the east and met the Laurentide glacier moving west. The merged Cordilleran and Laurentide ice created an impenetrable barrier stretching from the Atlantic Ocean to the Canadian Rockies and Alaska Range. From north to south it was more than 500 mi (800 km), stretching from the Canadian Yukon (Eastern Beringia) to southern Alberta. For people who survived by hunting, gathering, and fishing, the rough and steep continental glaciers would have formed a lifeless and dangerous barrier so severe that it would have been impossible for humans to cross.

During the Last Glacial Maximum (LGM), the time at which the glaciers of the last ice age reached their maximum extent (24,000 – 17,000 years ago), the climate of Beringia was colder and drier than it is today. Eastern Beringia was an environmental mosaic of diverse environmental zones influenced by elevation, moisture, temperature, and topography. Local and regional environments included wetland meadows and ponds on river floodplains, mixed grasslands and tundra occupying river terraces, tundra on pediments and foothills of mountain ranges, and unvegetated mountain tops. These may have been the types of environments encountered by the first people to settle Eastern Beringia.

Several species of very large animals, called megafauna, that were characteristic of the Pleistocene became extinct at or near the end of the LGM. Large elephant-like creatures called mammoths and smaller Ice Age horses appear to have been extinct by about 13,000 years ago. However, isolated groups of mammoths persisted on Wrangel Island, the Pribilof Islands, and possibly other islands as late as 5,700 – 5,000 years ago. Bison, elk, caribou, musk ox, moose, mountain sheep, mountain goats, and bears occupied Beringia throughout the Pleistocene. Marine mammals along the coast of the Arctic Ocean were probably limited to a few species such as polar bear and ringed seal, because the sea ice was more extensive. However, the southern Beringian coast was warmer and probably supported large populations of seals, whales, sea cows, fish, and marine birds.

By 14,000 – 13,000 years ago rising sea level greatly reduced the area of the Bering Land Bridge. The connection between Asia and North America was completely severed sometime shortly before 11,500 years ago. However, extensive regions of the continental shelves remained above sea level. The climate began warming again about 11,500 years ago and flooding of the continental shelf continued between 11,500 and 9,500 years ago. Vast areas of the continental shelf between about 200 ft below sea level (–60 m) and 130 ft below sea level (–40 m) were rapidly flooded as sea level rose. The Bering Strait enlarged and St. Lawrence Island became separated from Eastern Beringia.

Computer modeling of rising sea level in relation to the depth of the ocean floor at the end of the Wisconsin glaciation by geologist William Manley provides a series of "snap shots" approximating the dramatic changes in geography and ecology that occurred between 15,000 and 9,000 years ago (Figure 3.3). This digital reconstruction suggests there may have been an island archipelago along the southern

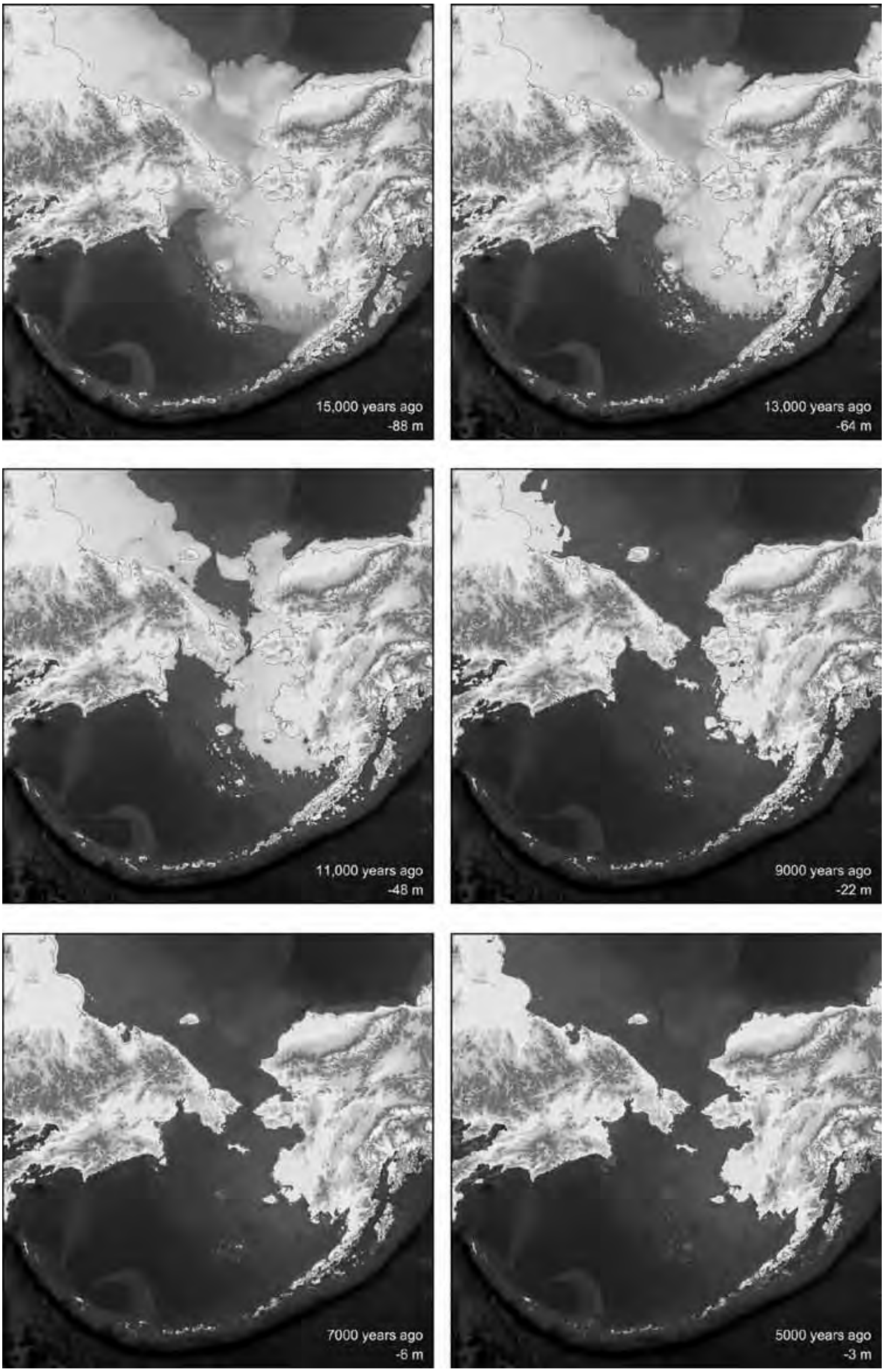

Figure 3.3 Digital elevation model of Beringia depicting flooding of the Bering Land Bridge at 2,000 year intervals from 15,000 B.P. to 5,000 years ago (Manley, W. F. Postglacial Flooding of the Bering Land Bridge: A Geospatial Animation: INSTAAR, University of Colorado, v1, http://instaar.colorado.edu/QGISL/bering_land bridge

coast of the Land Bridge that may have existed for several thousand years. This was a challenging time for people to adapt to new environments because the changing distribution of resources presented dangers and opportunities for people making their living by hunting and gathering from the land and sea.

Human Migration to the Americas

Physical anthropologists who study people's biological characteristics tell us that Native Americans began their migration to the Americas from Asia. They believe this because Native Americans share many traits, such as blood types and other physical and genetic features, with northern Asian peoples. Many languages were spoken in North America prior the arrival of the Europeans and some linguists (scholars who study languages) believe that the last group of people to move from Asia to the Americas spoke a language similar to that spoken by Eskimos and Aleuts today. They also believe that the Athapaskan-speaking people who today live in various areas of northern and western North America arrived before the Eskimos and Aleuts. They think the first to arrive were the ancestral speakers of all the other American languages, called Amerinds. This, coupled with the many diverse Native American cultures, indicates that Native peoples must have resided in the Americas for a very long time prior to the arrival of Europeans.

Most archeologists agree that the first people to enter the Americas came via the Bering Land Bridge more than 14,000 years ago. They theorize that people from Asia gradually moved along the southern coast of the land bridge with the use of watercraft and over land into new territory. Eastern Beringia, including what is now much of Alaska, was ice-free during the Pleistocene, but glaciers formed a barrier that prevented people from moving south to colonize the rest of the Americas. One of the most controversial issues in North American archeology is the debate over when people first colonized the continent south of the continental glaciers. A variety of migration theories have been suggested, but the archeological evidence is not conclusive. To resolve the issue of when the first people came to the Americas, scientists draw on data from several disciplines, including archeology, geology and biology. Beringia is center stage in this ongoing debate. Two routes have been suggested – one over land through Canada and the other by sea along the coast. These routes were not mutually exclusive and people probably began moving along both these corridors soon after they were deglaciated.

Interior Route

During the last Ice Age, the Cordilleran ice sheet joined the massive Laurentide glacier to form a barrier so severe that it would have been impossible for humans to cross it. By about 13,000 – 14,000 years ago these glaciers had melted enough to form a "deglaciation corridor." About 13,000 years ago plants and animals had colonized this corridor to support people and enable them to move through the corridor. Some archeologists believe that humans first entered the southern areas of North America by moving south from Beringia through this new environment. Their gradual movement would ultimately have allowed them to emerge south of the continental glaciers. If this scenario is correct, the North American continent south of Eastern Beringia could not have been occupied until after the glaciers had melted enough to permit people to pass between them sometime after about 13,000 years ago.

However, evidence from archeological sites south of the ice sheets indicate that people were living there much earlier than 13,000 years ago.

The term “ice-free corridor” is confusing. It is commonly used to refer to a hypothetical narrow strip of land between the Laurentide and Cordilleran glaciers that some scientists believed might not have been covered by glaciers during the last Ice Age. If this were correct, there would have been an overland route between Eastern Beringia and the southern regions of North America during the last Ice Age. Theoretically, the existence of an “ice-free corridor” would allow people to migrate to the more southern parts of the Americas prior to 13,000 years ago. Although the “ice-free corridor” was a popular concept throughout most of the 1900s, it is now clear that it did not exist until a deglaciation corridor formed about 13,000 – 14,000 years ago. Some scientists incorrectly use the term “ice free corridor” when they are actually referring to a biologically viable deglaciation corridor that did not exist until about 13,000 years ago.

Paleontologists are scientists who study fossil animals and plants. Their work in central Canada has revealed no animal bones that date between about 25,000 to 13,500 years ago in the region formerly believed to be the ice-free corridor. Along with the geological studies, this demonstrates fairly conclusively that glaciers prevented the area from being inhabited by animals during the last Ice Age. A land route for human entry into southern regions of North America from Eastern Beringia was not possible before about 13,500 – 13,000 years ago.

It is clear that by 13,000 years ago the continental glaciers had withdrawn sufficiently to create a wide ice-free passage extending from Eastern Beringia to interior North America. The importance of this event for Beringian archeology is not only about the southward movement of people from Beringia into the Americas. From 13,000 years ago onward, cultural developments that occurred in more southern North America could be transmitted over land northward. Many of these developments had profound impacts on the people of Beringia.

Coastal Route

A number of well dated archeological sites indicate that people were living south of the continental glaciers prior to the opening of the deglaciation corridor in interior Canada. This has led many archeologists to conclude that people using water craft, possibly skin boats, may have moved southward from the southern coast of Beringia along the Gulf of Alaska and the Northwest Coast of North America possibly as early as 16,000 or 17,000 years ago (Figure 3.4). Until the early 1970s, most archeologists did not consider the Northwest Coast a possible migration route into the Americas because geologists originally believed that the entire Northwest Coast was covered by glacial ice during the last Ice Age. It had been assumed that the ice had extended westward from the Alaskan and Canadian mountains to the edge of the continental shelf.

During the 1970s, Canadian archeologist Knut Fladmark championed the idea that the first human colonization of America occurred by boat along the Northwest Coast during the late Pleistocene. He further theorized that with the use of watercraft, people gradually colonized pockets of land not covered by glacial ice and parts of the continental shelf exposed by lower sea level. Research now indicates that sizable areas of the continental shelf along the Northwest Coast were not covered by

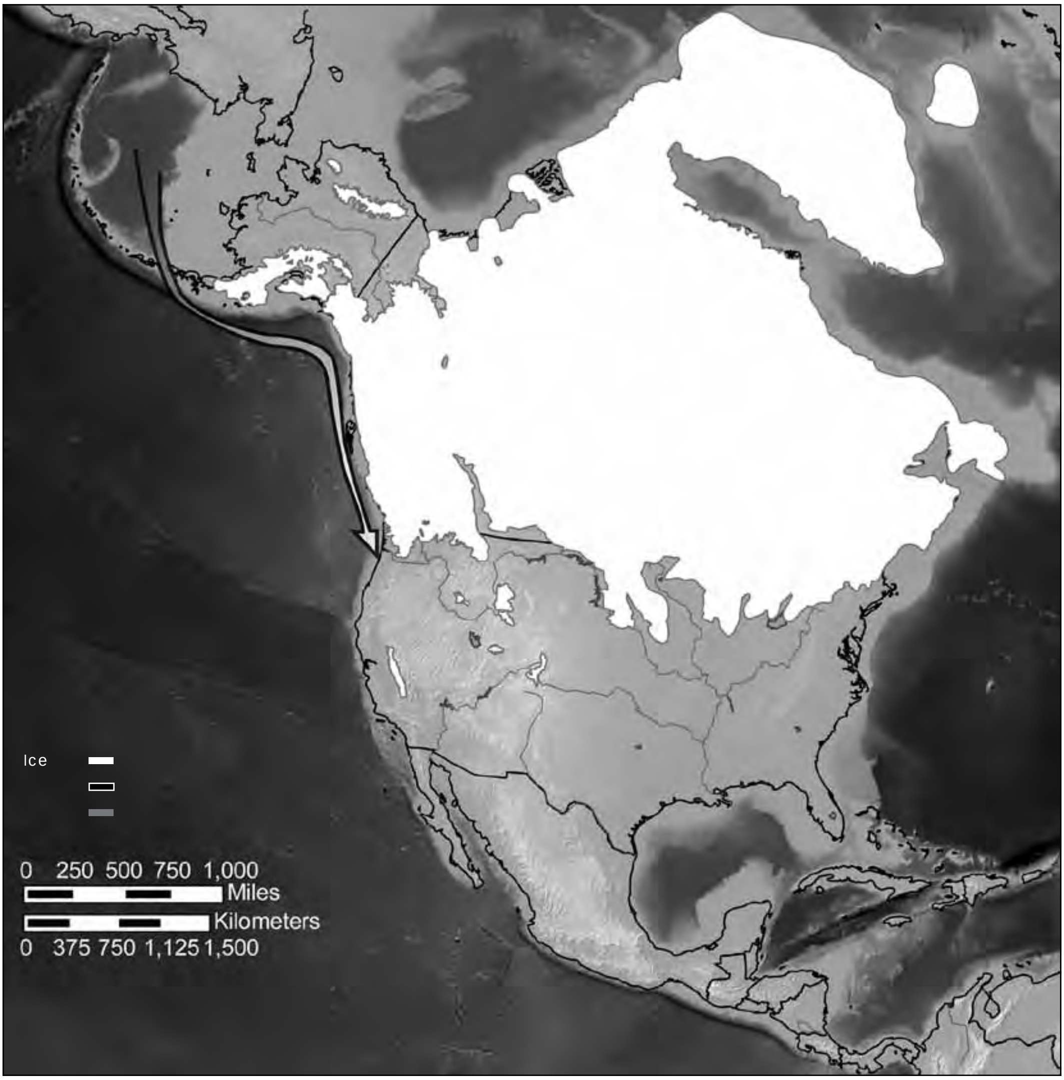

Figure 3.4 Glaciated North America showing possible coastal route about 19,000 years ago. A land route through the interior is blocked by glacial ice at this time.

ice during and toward the end of the last Ice Age. Vast areas along the coast may have been deglaciated beginning about 19,000 years ago, possibly providing a coastal corridor for the movement of plants, animals and humans. Subsequent work by geologists suggest that except for a 250 mile (400 km) coastal area between southwest British Columbia and Washington State, the Northwest Coast was largely free of ice by 17,000 years ago.

The southern coast of Beringia probably supported large populations of seals, walrus, whales, sea cows, fish, and marine birds because it was warmed by the Pacific Ocean. Many islands may have existed along the Pacific coast of the Land Bridge during the period between about 16,500 – 11,500 years ago, providing a rich habitat for fish, marine mammals, and possibly people. Jon Erlandson and his colleagues have called the zone of productivity along the north Pacific Rim the "kelp highway." They persuasively argue that it could have facilitated early migration from Asia to North America along the southern Bering Sea coast.

The coastal theory has gained increased support in recent years because the remains of large land animals, such as caribou and brown bear, have been found in Southeast Alaska dating to more than 30,000 years ago. The brown bear appears to have survived until about 14,500—11,500 years ago when the species was replaced by black bear. Caribou persisted until about 8,000 years ago in many areas along the coast and until the time of contact with Euroamericans on Haida Gwaii (Queen Charlotte Islands). This is the time period that most scientists formerly believed the area to be inhospitable for humans. It has been suggested that if the environment was capable of supporting bears, there would have been enough food and other resources to support humans. Many archeologists now believe that the first human colonization of America may have occurred by boat along the Northwest Coast during the late stages of the last Ice Age, possibly as early as 17,000 years ago. Geological evidence indicates that it may have been possible for people to colonize ice-free regions along the continental shelf, which were still exposed by lower sea level as early as 19,000 years ago.

Archeological Sites on the Land Bridge?

It is likely that people camped and left archeological remains on the Bering Land Bridge before it was flooded at the end of the last Ice Age. The evidence is clear that people occupied Alaska at least 14,000 years ago, about 2,500 years before rising sea level separated Asia and North America. It is possible that the earliest evidence of humans in Central Beringia is now under water. There is debate about whether that evidence has been preserved or destroyed by geologic forces.

In high latitudes sea ice is an important agent in moving sediments and causing erosion on the continental shelf. As sea ice driven by wind comes in contact with shallow areas, the submerged ice keels appear to "bulldoze" the ocean floor, annually gouging between 2 per cent and 6 per cent of the upper 3–6 ft (1–2 m) of the surface of the sea floor. Some scientists argue that theoretically the entire 3–6 ft (1–2 m) of the ocean surface on the continental shelf could be homogenized in less than 50 years. The result would be that any archeological sites related to former human occupation of the Bering Land Bridge and adjacent submerged coastlines would be destroyed by sea ice.

There are other lines of evidence that suggest that artifacts and archeological sites are preserved on the continental shelf. For example, even if sites were gouged and plowed by sea ice, artifacts might be moved around and redistributed on the ocean floor, as supported by the discovery of the animal remains found there (Figure 3.2). Submerged valleys, visible on the ocean floor, also suggest that not all surface features have been obliterated. Furthermore, if sea level rose rapidly, only a narrow shallow coastal zone would be exposed to this type of erosion for a relatively short period of time.

Some archeological sites on the continental shelf could be deeply buried and protected from erosion by overlying sediments. Some village and camp sites on land have been occupied for thousands of years. Accumulated debris from human occupation results in thick archeological deposits, or middens. These middens contain the remains of abandoned structures, food refuse, broken and discarded tools, and all the other types of materials transported to a site and ultimately discarded by human beings. Over long periods of time archeological sites in Beringia can be as deep as 14 ft (4.25 m) (Figure 3.5). Although ice gouging may have altered the upper meter or two, it is probable that the more deeply buried portions of the sites may not be disturbed.

There are also sites that are not middens and have been deeply buried by geological processes. The Onion Portage site on Alaska's Kobuk River contains evidence of more than 9,000 years of cultural development buried within more than 14 ft (4 m) of sediment. This site is not a midden like those listed in Figure 3.5. Sediments deposited by the Kobuk River separate a series of cultural layers. Sites with deposition similar to Onion Portage but situated on Alaska's continental shelf could likely protect the lower levels of deeply buried archeological remains from ice gouging.

Site	Location	Depth of Cultural Deposits	Reference
Birnirk	Point Barrow	10 ft. (3.1 m)	Ford (1959:33)
Walakpa	12 mi. SW of Barrow	7 ft. (2.1 m)	Stanford (1976:13)
Old Tigara	Point Hope	10 ft. (3.1 m)	Larsen & Rainey (1946:20)
Kukulik	St. Lawrence Island	14 ft. (4.3 m)	Geist & Rainey (1936:54)

Figure 3.5 Midden depths accumulated in 1,000 – 3,000 years in Central Beringia. The lower portions of such deeply buried sites could survive marine transgression and ice gouging.

Oldest Archeological Sites in Beringia

In 1928 Taylor Moto and Alfred Karmun from the Alaskan Eskimo village of Deering sought refuge from a January snow storm in a "bear hole" on the Seward Peninsula. The fierce storm kept them trapped in the cave for four days. As they explored their surroundings, they discovered several antler arrow heads that were later sent to the University of Alaska. Although it took many years for the significance of their discovery to be fully appreciated, it ultimately led to excavations at Trail Creek Caves by Danish archeologist Helge Larsen in 1949-1950.

The Trail Creek Caves contained fractured animal bones and teeth that were once interpreted as evidence of human occupation between 15,300 and 18,300 years ago. Subsequent analyses of the Pleistocene bones indicate that they were probably not butchered or modified by people. The two excavated caves contained what Larsen thought were fractured dog canines. It was assumed that they represented teeth from domesticated dogs whose canines had been broken from their jaw by their human handlers to prevent them from gnawing their traces. Therefore, it was presumed that people had used the caves and that the canines were the same age as the bones of the Ice Age animals found in the caves. However, reanalysis of the teeth proved that they were actually deciduous bear canines shed by juvenile bears just like human children shed their baby teeth. Although the caves provided rare examples of stone and antler projectile points, none of the artifacts could be proven to date to the Ice Age.

In North America there are a number of intriguing sites that suggest that humans occupied Eastern Beringia during, or prior to, the Last Glacial Maximum (LGM). Dates for some of these sites have been refuted by subsequent research. Others sites are considered equivocal because it cannot be satisfactorily determined whether humans or geologic or biological processes produced the "artifacts." These controversial sites include the Fairbanks muck deposits, Old Crow, the lower levels of Trail Creek Caves 2 and 9, and Bluefish Caves.

In two separate placer mining incidents, mammoth remains and artifacts were found at the same locale in the Pleistocene-age silts (called muck) near Fairbanks, Alaska. In 1940 a mammoth calf foot was found on Fairbanks Creek, and the following day a chert biface was discovered at the same locale. In 1948 a chert scraper was found approximately 50 ft (15 m) from an exposure where the partial carcass of a mammoth calf was found the next day. Because of the circumstances surrounding these discoveries, it is impossible to establish a direct association between the artifacts and mammoth remains. An early human occupation associated with mammoth remains was also reported along the shore of Chinitna Bay, Alaska. However, reinvestigation of this locale demonstrated that this was not an archeological site. As it turned out, the deposits were only a few thousand years old and what had originally been identified as mammoth bone may actually have been whale bone.

Pleistocene-age animal bones eroded from the Old Crow, Bluefish, and Bell basins and subsequently were redeposited along the Old Crow and Porcupine Rivers near the Athapaskan village of Old Crow in Canada's northern Yukon. The specimens include bone artifacts and flaked, polished, striated, faceted, and altered bones suggesting human modification. These modifications may be explained by non-cultural processes such as carnivore fracture, rodent gnawing, trampling by large mammals, geologic pressure, and modifications resulting from the actions of rivers and river ice. The types of artifacts found with the Ice Age animal bones were originally believed to be Pleistocene in age; however, subsequent radiocarbon dating indicated that they were no more than a few thousand years old.

Bluefish Cave 1 is located approximately 34 mi (55 km) southwest of Old Crow. Excavations by Jacques Cinq-Mars discovered microblades, microblade cores, and burins in the upper two cultural levels. In the lower levels of the cave, he found a split caribou tibia, interpreted to be a fleshing tool dated to about 24,800 years ago, and a mammoth bone flake and core dated to 23,500 years ago. Cinq-Mars suggested that people had modified them. However, other bones from Bluefish Cave 1 suggest long use of the cave by carnivores, so some archeologists think the bones could have been modified by animals rather than people. The breakage patterns on many of the bones appear to be characteristic of gnawing by wolves and foxes, or possibly the result of rocks falling from the roof of the cave and limestone hill above. Scratch marks on bones that look like cut marks made by people using stone tools can be created by the movement of rocks and sediment against the bones, rather than human activity.

The Swan Point archeological site is located in central Alaska and was excavated by Charles Holmes. It was occupied about 14,000 years ago on a low rise where people had a camp fire and left stone and bone tools. It is possible that the microblades from Bluefish Cave 1 could be about the same age. The Little John site, also known as KdVo-6, excavated under the direction of Norman Easton is located in the Canadian Yukon. It is about the same age as Swan Point and contains similar types artifacts. Most archeologists think that if people were living in central Alaska by this time, there are older sites yet to been found.

After the Last Ice Age

The last Ice Age came to an end about 12,000 years ago. It was a time of global warming that brought about dramatic change in the climate, plants, animals, and geography of the world. Although there is evidence that the change in climate may have happened quite rapidly, it took some time for the environment to respond. The transition from the Ice Age to the environment in which we live in today took thousands of years. This new climatic period, called the Holocene, is the geologic period in which we currently live.

As the climate warmed, the vast continental glaciers melted. The water they discharged was carried by rivers to the oceans. As a result sea level began to rise rapidly. In the Bering Sea region it rose about 400 ft (120 m). Low-lying coastal areas, including the Bering Land Bridge, were flooded. Rising sea level also opened connections between oceans. When the Bering Land Bridge flooded, it permitted marine mammals, fish, and other marine organisms to pass between the Atlantic and Pacific Oceans via the Arctic Ocean. Mixing the nutrients from the warm Pacific and cold Arctic waters created a new and productive environment in which sea life thrived in the shallow waters of the Bering and Chukchi Seas. Most cultural groups, including people living in Beringia, have oral histories relating to a great flood (or floods). These histories may be cultural legacies of the dramatic sea level rise that took place at the end of the last Ice Age.

The rising sea forced people living along the coasts to move inland to escape the encroaching water. Large land areas were being exposed as glacial ice disappeared, creating new areas for people to live. As archeologist Donald Clark recognized, these forces created a "push–pull" effect on people. Those who were living along the coast were pushed inland by rising water, while those living in areas adjacent to glaciers were drawn, or pulled, toward land newly exposed by the melting ice.

This was also a time of dramatic change for plants and animals. Colonizing plants such as grasses took root in recently deglaciated terrain. As climate continued to warm, the vast forests of spruce, larch, aspen and birch spread northward to regions that had previously been tundra or covered by ice. Large Ice Age giants became extinct, including mammoth and mastodon, woolly rhinoceros, and short-faced bear. Many of the smaller animals, such as caribou, moose, and bison appear to have increased their range and numbers.

Climate continued to fluctuate during the Holocene. In the past 14,000 years, the earth has experienced periods of alternating warming and cooling. Although there was a brief cooling period about 12,000 years ago, climate continued to warm until about 8,000 years ago. About 5,000 years ago, sea level began to stabilize and intertidal zones productive in shellfish and other resources began to develop and mature. About this time there was another period of climate cooling during which there were minor glacial advances and expansion of tundra. The climate warmed again until about 1,250 years ago when there was a brief cold period known as the Little Ice Age. Afterward, the climate became warmer, followed by another cold snap between the 1500s and 1700s. As a consequence of the industrial revolution and increased atmospheric greenhouse gasses, the earth is experiencing another period of pronounced warming that is causing glaciers once again to melt and sea levels to rise. People living in Beringia have continuously adjusted their life ways to these types of changes for thousands of years.

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CHAPTER 4
WESTERN BERINGIA

Western Beringia is a geographic term used to describe an enormous area encompassing western Chukotka, Magadan, Koryakia, Kamchatka, and Sakha provinces extending west to the Verkhoyansk Range (Figure 4.1). It is the western portion of a huge peninsula protruding eastward from Asia and surrounded by ocean on two sides. The Arctic Ocean is on the north and the Pacific Ocean and the Sea of Okhotsk are to the south. Culturally it is sandwiched between central Asia to the west, China and Japan to the south, and the cultures of the Bering Sea to the east.

Western Beringia is the coldest region in the northern hemisphere with temperatures recorded as cold as -95.8° F (-71° C). Despite the extreme cold winter temperatures, the summers are frequently hot. It is a diverse geographic region with plains, plateaus, and mountain ranges. Taiga is the Russian term for the immense forest consisting primarily of larch, birch, pine, and other species that blanket lower elevations. Shrub tundra grows along the coastline of the Arctic Ocean southward, covering much of Chukotka and northern areas of Sakha. Alpine tundra predominates in areas of high elevation to the south.

Human skeletal remains found in Africa, Europe and Asia are more than 100,000 years old. However, the earliest reliably dated human remains in the Americas are less than 14,000 years old. This indicates that modern humans evolved in the Old World and subsequently migrated to the Americas. Although they do not contain human skeletal material, the oldest archeological sites containing artifacts found in Western Beringia are between 35,000 and 27,000 years old. This suggests that humans were established in the far western areas of Beringia long before moving eastward into Central Beringia and the Americas.

The oldest reliably dated human remains from Western Beringia are about 13,000 years old. They are from the Kamchatka Peninsula. Like the remains from North America, they date to the end of the last Ice Age, when human migration to the Americas most likely occurred. Based on this evidence it is logical that archeological sites in Western Beringia would be older than those in Central and Eastern Beringia. From Western Beringia, people were able to travel by foot over the Bering Land Bridge and by boat along the southern coast of the Land Bridge to North America sometime during the last Ice Age.

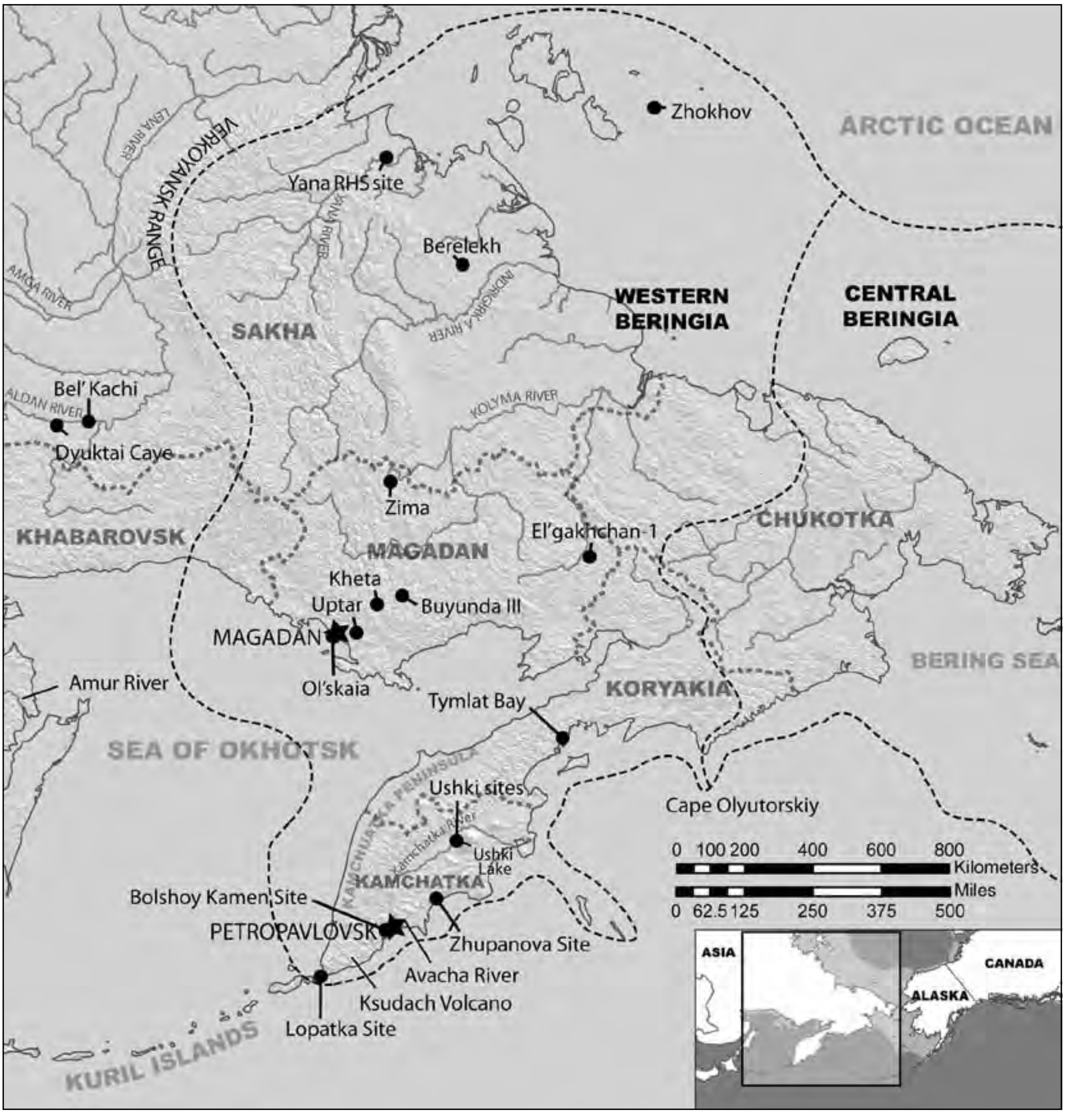

Figure 4.1 Map of Western Beringia illustrating geographic features and site locations.

Russian scholars generally use Old World terms when classifying archeological sites and artifacts. They commonly classify Russian sites into three periods: the Paleolithic (sites older than about 12,500 years), Mesolithic (sites between about 12,500 and 7,000 years), and Neolithic (7,000 years and younger). Paleolithic means old Stone Age and is a term used to describe stone tools characterized by long parallel-sided stone blades, bifacially flaked tools (chipped on both sides, or "faces"), and other types of artifacts that were in wide use until the end of the last Ice Age about 12,500 years ago.

The Mesolithic Period (middle Stone Age) spans the time between about 12,500 – 7,000 years ago. It is characterized by blades that have often been shaped for use as various types of tools, leaf-shaped points or knives, and scrapers. Stone adzes probably used for working wood are also common. Bone and antler arrow heads slotted to hold microblades were used along with a variety of other tools. The Mesolithic stone artifacts are characterized by blades struck from conical and irregular shaped stone cores. Other types of artifacts include scrapers, blades, and a variety of other stone tools. Sites dating to the Mesolithic period are commonly ascribed to Sumnagin culture (12,500 – 10,500 to 7,500 years ago). These sites are associated with Holocene fauna. People seem to have made and used fewer bifacially flaked stone tools than they did during preceding Paleolithic times. The Mesolithic period, transitional between the Paleolithic and the Neolithic, was a time of dramatic environmental change between the end of the last Ice Age and environmental conditions that are similar to those of today.

The Neolithic Period (new Stone Age) is characterized by the introduction of ground stone tools, ceramics, metal, and other types of artifacts that were in use when the Native people of the Russian Far East first encountered Europeans. Copper and bronze received in trade from central Asia reached the region possibly as early as 2,500 years ago. The Neolithic Period spans the time between about 7,000 years ago to contact with central and east Asian cultures, which brought about a dramatic change in the economy and types of tools used by Native people. The Neolithic period is divided into several cultures some of which can be traced to Native groups who still occupy the region.

Archeologists frequently assign sites to these periods based on the types of artifacts they contain. However, it may be incorrect to assume one site is the same age as another based on similar types of stone tools at both sites. In the formative years of archeology, such comparisons were often the only way to estimate the age of artifacts. Artifact styles did not change at the same time in all regions of Western Beringia. For example, people in one region may have begun making pottery before people in another region.

While radiocarbon dating is useful, it can only be applied to organic material —plants and animals that were once alive. Once an organism dies, the radiocarbon "clock" begins. Consequently, when radiocarbon dating is applied to material found in an archeological site, it is necessary to determine if the plant or animal died at the same time as the artifacts were deposited. For example, an early hunter may have found piece of mammoth ivory or collected wood from a tree that may have died hundreds or thousands of years before he brought it back to his campsite. A radiocarbon date on that material would not date the time he camped there, but instead it would date the time the mammoth or tree died. However, fresh grass collected to start the camp fire would provide an accurate date for the camp because it died at the same time the fire was built.

Great volcanoes dominate some mountainous areas of Beringia, particularly the region around the Sea of Okhotsk and along the Alaska Peninsula. Many of these volcanoes have deposited volcanic ash, or tephra, over enormous areas. This enables archeologists to date sites throughout the region using tephrochronology. Just as every person is unique, so is the tephra from every volcanic eruption. By examining the color, texture, and the type and amount of minerals in each deposit of volcanic ash, archeologists can tell one from another. Volcanic eruptions have also provided abundant sources of obsidian and basalt, which are prized materials for making sharp stone tools. Like tephra, obsidian can be traced based on its color and mineral content to a specific volcanic eruption. By analyzing the obsidian found in archeological site, archeologists can often tell from which volcano it came. This information is useful for identifying ancient networks of trade and possibly social interaction.

Paleolithic Period (before 12,500 Years Ago)

Using tephrochronology along with radiocarbon dating, archeologists have been able to determine the age of many sites. Only the Yana Rhinoceros Horn Site (Yana RHS), Dyuktai Cave, Berelekh, and the lowest level at Ushki I (Figure 4.1) have been reliably dated to 12,500 years old or older. The ages of these sites have been established by radiocarbon dating. They provide insights into the lives of some of the earliest people to occupy Western Beringia. These sites were occupied during the last Ice Age, a time when there were few trees and tundra, grasses and shrubs coved most of the land. Sea level was lower than it is today and the continental margins that are now underwater were exposed as dry land. Animals that are now extinct still roamed the landscape including mammoths, mastodons, short-faced bears, woolly rhinoceros, lions, and huge wolves.

The earliest evidence of human occupation of the Arctic is from a site called Yana RHS, named because it is located on the banks of the Yana River in central Siberia. The research of Vladamir Pitul'ko and his colleagues indicate that this amazing site demonstrates that humans occupied high latitudes in central Asia, probably during a period of warmer climate between the last two major glacial periods. Located in central Siberia west of the Verkhoyansk Range, the site lies in an exposed bank of the Yana River at 72° N latitude. It has been reliably dated to about 27,000 years ago. Artifacts from Yana RHS include a unique beveled foreshaft made from the horn of a woolly rhinoceros, two similar foreshafts made from mammoth ivory, bifacially and unifacially flaked stone tools, cores and core tools, and red ochre. Animal remains associated with the human occupation include not only the extinct mammoth and wooly rhino, but also Ice Age caribou, horse, and birds. Although the region was occupied during this interval of warmer climate, the climate cooled rapidly beginning about 23,000 years ago. This may have caused people living in the Yana-Indigirka lowlands to move southward toward warmer environments.

The Dyuktai (pronounced "duke-tie") culture is named for Dyuktai Cave, where distinctive types of artifacts were first firmly documented by pioneering archeologist Yuri Mochanov. Although Dyuktai Cave lies on the western side of the Verkhoyansk Range, outside the area defined as Western Beringia, it is the type site for artifacts found at many sites throughout Beringia. Dyuktai culture generally refers to Upper Paleolithic (late Ice Age) stone tools, characterized by wedge-shaped microblade cores, microblades, blades, blade cores, bifaces, and burins. Today, the term Dyuktai culture is used widely to describe and classify Paleolithic sites that are frequently characterized by microblades that are struck from distinctive wedge-shaped cores. The microblades and cores are commonly associated with leaf-shaped bifacially flaked knives or spear points. Where there is good preservation of bones, these sites frequently are associated with remains of Ice Age animals and generally date as early as 35,000 until about 12,500 – 10,500 years ago.

Berelekh is located on a tributary of the Indigirka River near the Arctic Ocean and consists of two localities. One locality is a Pleistocene bone assemblage sometimes referred to as the Mammoth Cemetery, which probably results from the accumulation of animal bone deposited by the river. The other locality is an archeological site 330 – 650 ft (100 – 200 m) from the bone accumulation created by the river. The archeological site contains the remains of animals dating to the Ice Age, including mammoth, horse, bison, caribou, hare, bird, and fish. Some researchers believe that the archeological site may be younger than the Cemetery. They suggest that it only appears to be as old because the early people who camped there carried the bones at the site to it from the nearby Mammoth Cemetery.

Some researchers have suggested that the artifacts from Berelekh should be classified with those from Dyuktai culture. However, others have cautiously suggested that there may be two occupations at the site. Three radiocarbon dates run on wood suggest there may be a 15,350-year-old occupation that does not contain microblades and a later one with microblades, dating to about 11,500 years ago. However, conflicting reports and interpretations make it difficult to assess Berelekh's significance and its relationship to other archeological sites.

Several other sites found in Western Beringia suggest that Dyuktai culture had spread throughout the region by the end of the last Ice Age. The Kheta site is located near the divide between the Kolyma and Okhotsk watersheds. The site has not been dated by the radiocarbon method, but the lower level contains distinctive Dyuktai artifacts including wedge-shaped microblade cores and bifaces. These artifacts are from below a layer of volcanic ash (the Elikchan tephra), which was deposited about 9,350 years ago. In addition to the Kheta site, there are several other sites reported from Western Beringia that contain similar types of artifacts characteristic of the Paleolithic, but that have not been datable using radiocarbon or other methods. This suggests that human occupation of Western Beringia was widespread near the end of the last Ice Age.

The Uptar site excavated by Sergei Slobodin is located approximately 25 miles (40 km) north of Magadan and the Sea of Okhotsk. Although the Uptar site has not been firmly dated, it lies beneath the same tephra as the Kheta Site, and consequently it is also older than 9,350 years. Some of the artifacts appear to have been heavily weathered prior to deposition of the volcanic ash that indicates that the site could be considerably older. A few microblades were recovered from the site, but the assemblage apparently does not contain microblade cores or core tablets. Core tablets, also called platform flakes, are flakes removed from the top, or platform, of the core from which the microblades were struck. The bifaces, possibly knives or projectile points, in the Uptar collection are lanceolate (lance-like) in outline. Some archeologists have suggested that they may be similar, or possibly even related in some way, to some types of projectile points found in North America. One specimen in particular has a large flake, or flute, removed from the base toward its point. This is similar to fluted projectile points of the Paleoindian tradition found in some areas of North America that date between 13,300 and 11,500 years ago. However, most archeologists believe that the flute may have been produced accidentally and resulted from an impact or that the artifact may not be a projectile point at all. They believe it has little, if any, relationship to fluted projectile points found in North America.

Another site, Druchak-Vetreniy, is located at the foot of the Okhotsk-Kolyma uplands inland about 100 km inland from the north coast of the Sea of Okhotsk. One radiocarbon date of 7,850 years ago stratigraphically above the cultural material suggests the site was occupied earlier. The artifacts include wedge-shaped microblade cores and bifaces similar to those from other Paleolithic sites in Western Beringia.

Russian archeologist Margarita Kiryak considers two sites (Bolshoy Elgakhchan 1 and 2) Paleolithic in age because they contain wedge-shaped microblade cores and bifacially flaked projectile points similar to other sites considered to have been left by people of the Dyuktai culture. Comparison of the artifacts to several sites located at Ushki Lake on the Kamchatka Peninsula suggest that the Bolshoy Elgakhchan sites are similar, and possibly slightly older, than several well documented Paleolithic sites discovered to the south on the shores of Ushki Lake in central Kamchatka.

The multiple sites at Ushki Lake were occupied during a number of different time periods, called horizons, which correspond to stratigraphic layers of sediment that have enabled archeologists to chronologically order the periods of human occupation at the sites. The archeological site named Ushki I contains a stratigraphic level (VII) that was radiocarbon dated in the 1970s to circa 16,700 years ago by the dynamic Russian archeologist Nikolai Dikov (Figure 4.2). The site has subsequently been reinvestigated and this level has been redated to 13,000 years ago. Level VII contains bifacial stone tools and stemmed projectile points (Figure 4.3). This spectacular excavation also revealed three large two-chambered dwellings, each more than 1,075 sq ft (100 m^2) in area. The houses had several hearths suggesting they may have been multi-family dwellings. Nearby were the remains of seven smaller houses.

Figure 4.2 Nikolai Dikov's archeological excavations at Ushki Lake.

The oldest known human burial from Western Beringia is also from Level VII at Ushki I. The burial pit had been sprinkled with red ochre (hematite), which Dikov described "as bright as fire and as scarlet as blood." The grave was interpreted to be that of a tribal chief or leader. It contained a large number of stone beads and pendants that probably ornamented the deceased's clothing. Level VII contained stemmed stone projectile points, but lacked microblades. These finds have led some archeologists to suggest relationships with early sites in western North America, where

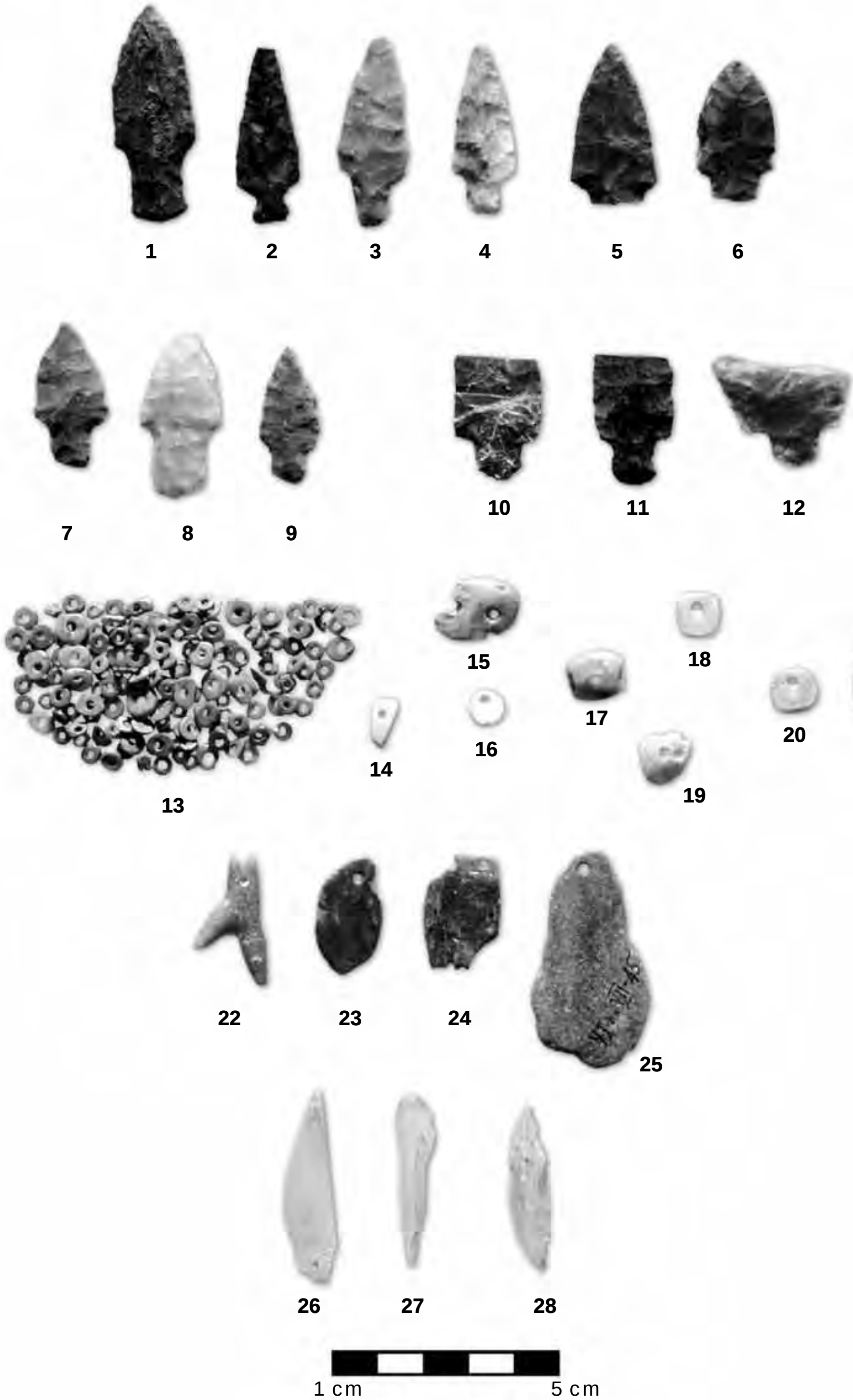

Figure 4.3 Artifacts from Ushki I, Horizon VII. 1-9 stemmed projectile points; 10-12 projectile point bases; 13-21 beads; 22-25 pendants; 26-28 microblade-like flakes.

red ochre is commonly associated with early burials and stemmed projectile points have been found. Although it is not certain that all the dwellings in Level VII were occupied at the same time, this early archeological site documents that people were organized in small settlements, or villages, in places where the resources were sufficient to support them.

Level VI at Ushki Lake is above Level VII and is clearly younger. There are several sites associated with these levels but the largest is the Ushki I site where Dikov excavated a huge area containing more than 40 different dwellings. They had entrance corridors, or passages, and were constructed using a framework of poles that were probably covered with animal skins. These were smaller than the double-chambered houses found in Level VII. The remains of a dog that had been buried in a shallow pit were also discovered in Level VI. This is the earliest evidence for domestication of the dog in Beringia. Level VI contained microblades, and leaf-shaped projectile points or knives, and stone labrets (Figure 4.4). These are the earliest known labrets from Beringia, about 12,500 years old. The differences between Level VI and Level VII suggest that dramatic technological and cultural changes took place in central Kamchatka between 13,000 and 12,500 years ago.

Ushki Lake is located in northern Kamchatka. There are no known Paleolithic sites from southern Kamchatka. This has led some archeologists to speculate that the Peninsula was originally colonized from the north by hunters who may have been discouraged from settling further south when they encountered more temperate environmental conditions. Kamchatka is a huge peninsula extending south from Chukotka to the Kuril Islands and Japan. It has massive volcanoes and a rugged coastline. The remains of extinct Ice Age animals, such as mammoth and woolly rhinoceros, have only been found along the Kamchatka River valley and northward, suggesting that the southern half of the peninsula had a more temperate climate during the last Ice Age. These findings appear to show that climate may have prevented cold-adapted animals, such as the woolly mammoth from occupying the southern regions. However, comparatively little archeological research has been conducted in southern Kamchatka and future research could lead to the discovery of Paleolithic sites there as well.

Mesolithic Period (12,500 – 7,000 Years Ago)

The term Sumnagin culture was introduced by the energetic Russian archeologist Yuri Mochanov to describe sites dating between about 10,500 – 6,000 years ago from the Lena River valley west of the Verkhoyansk Mountain Range. The term has subsequently been applied to sites in Western Beringia. Sumnagin is seen as transitional between Dyuktai culture and later economically and technologically complex Neolithic cultures. Sumnagin culture describes the type of tools and lifestyle of people living in Western Beringia during a time of dramatic environmental change following the end of the last Ice Age and the extinction of several species of large mammals, such as the woolly mammoth. Glaciers melted as the climate warmed and sea level rose rapidly flooding coastal areas. The boreal forest (taiga) expanded northward beyond its present limits into areas that are tundra today.

During this time of environmental transition, people stopped making the characteristic wedge-shaped microblade cores of the Paleolithic and produced

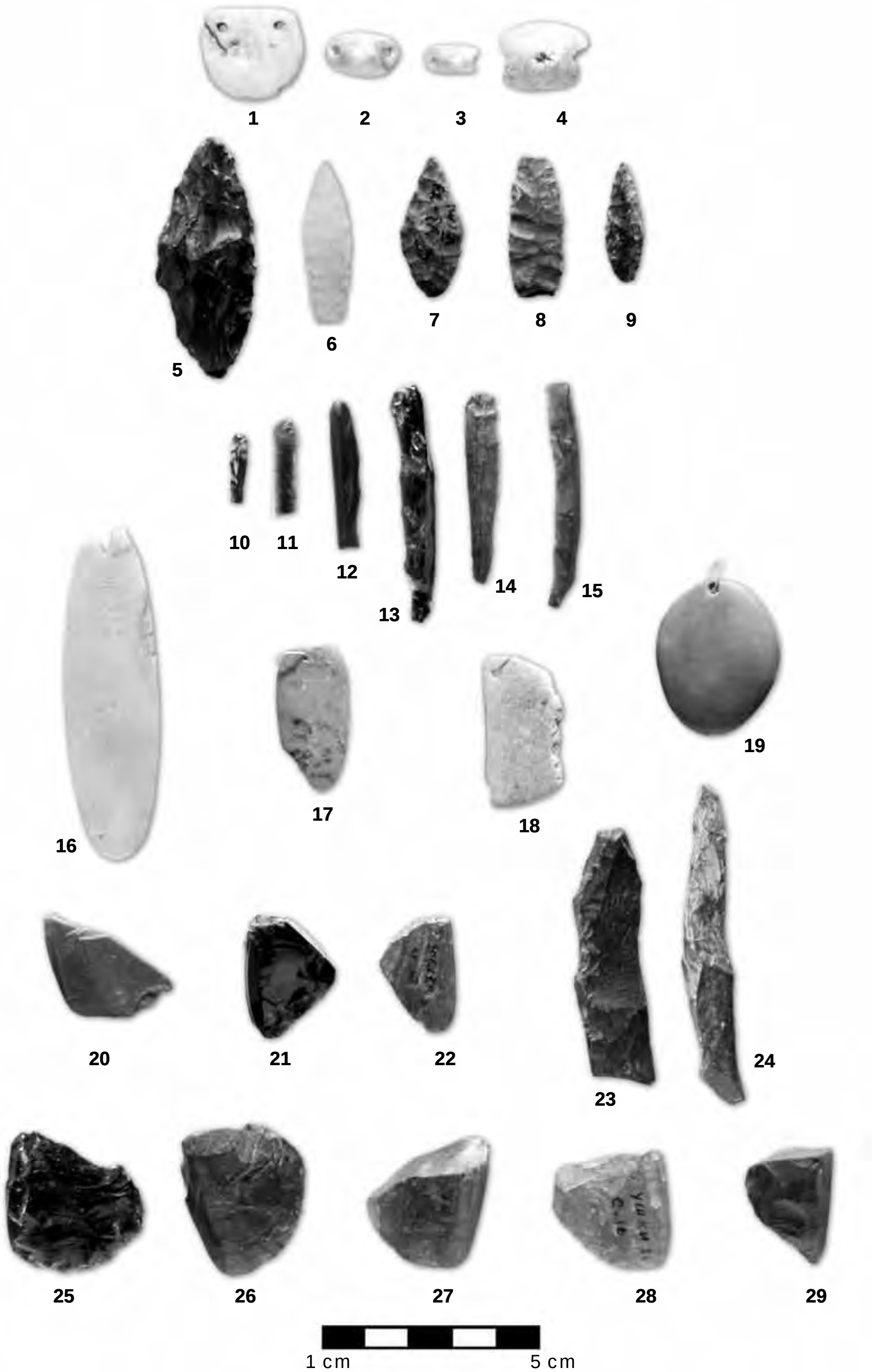

Figure 4.4 Artifacts from Ushki Lake, Horizon VI. 1-4 labrets; 5-9 leaf-shaped projectile points; 10-15 and 23, 24 microblades; 16-19 pendants; 20-22 and 25-29 microblade cores.

blades and microblades from a wider variety of prismatic cores (stone cores with faceted sides). During Sumnagin times the use of bifacial stone tools became less common. Unifacially chipped stone tools (flaked on only one side, or face) were commonly made from blades, which were also used to create end scrapers, burins, and knives. Microblade insets for bone and antler points continued to be used during the Mesolithic period. Chipped stone adze blades were made for the first time, and this probably indicates that wood had become more readily available as the taiga expanded. The sketchy archeological evidence from this time suggests that people hunted large land mammals, including moose, caribou, and bears. The location of some sites suggests that fishing and hunting waterfowl may also have been important. There is some evidence that walrus and seal may have been hunted occasionally along the coast.

People probably moved frequently during Mesolithic times, depending on the availability of food and other resources. There is little evidence for houses or settlements from this time period. At Buyunda III, an archeological site located in the upper Kolyma River valley, the remains of what was probably a tipi-like dwelling have been excavated. Birch bark from a circular stone hearth was radiocarbon dated to about 8,900 years ago. Other sites in the region suggest that people hunted caribou by intercepting them as they migrated through mountain passes.

The Zhokhov site, excavated under the direction of Vladimir Piltko, lies far to the north and contains spectacular examples of frozen artifacts. It is located at latitude 76° N on Zhokhov Island in the New Siberian Island chain. Because the site is in permafrost, there is exceptional preservation of bones, tools, and wood. Twenty-one consistent radiocarbon dates indicate the site was occupied 8,600 – 8,700 years ago. Approximately half of the individual animals identified from the animal bones at the site are those of polar bear and the other half are caribou. The site is important because it clearly demonstrates how microblades were used as insets to form razor-like cutting edges in bone tools (Figure 4.5). Polar bears are perhaps the most aggressive of all bears and are known to commonly hunt people. The Zhokhov site may provide very early evidence for a dangerous economic specialization — harvesting polar bears. The warm and beautiful white hides from these animals were probably highly prized and valuable.

There is little evidence of maritime adaptations at sites ascribed to Sumnagin culture. Igor Vorobey, an archeologist with the State Museum in Magadan, has excavated a site located on the shores of a narrow inlet known as Astronomicheskaya (Astronomical) Inlet where the artifacts suggest it may be about 7,000 years old. The site is adjacent to the coast where early people camped for short periods of time, possibly hunting marine mammals or fishing.

Russian archeologist Aleksey Ponomarenko and his colleagues have recorded spectacular artifacts on the Kamchatka Peninsula probably dating to the Mesolithic. The site is located on the flood plain of the Avacha River about 40 km inland from the coast. It contains large blade cores made from volcanic glass and large unifacial spear points, or knives, chipped from large blades. These dramatic artifacts were found at the location of an abandoned World War II airfield that is now a potato field. The artifacts are buried beneath three distinct layers of volcanic ash. The oldest tephra is from an eruption of Ksudach Volcano about 6,850 years ago. The artifacts occur above the sand and gravel deposited by the Avacha River and below the tephra. This suggests that the people who manufactured the stone tools lived on the flat plain adjacent to the

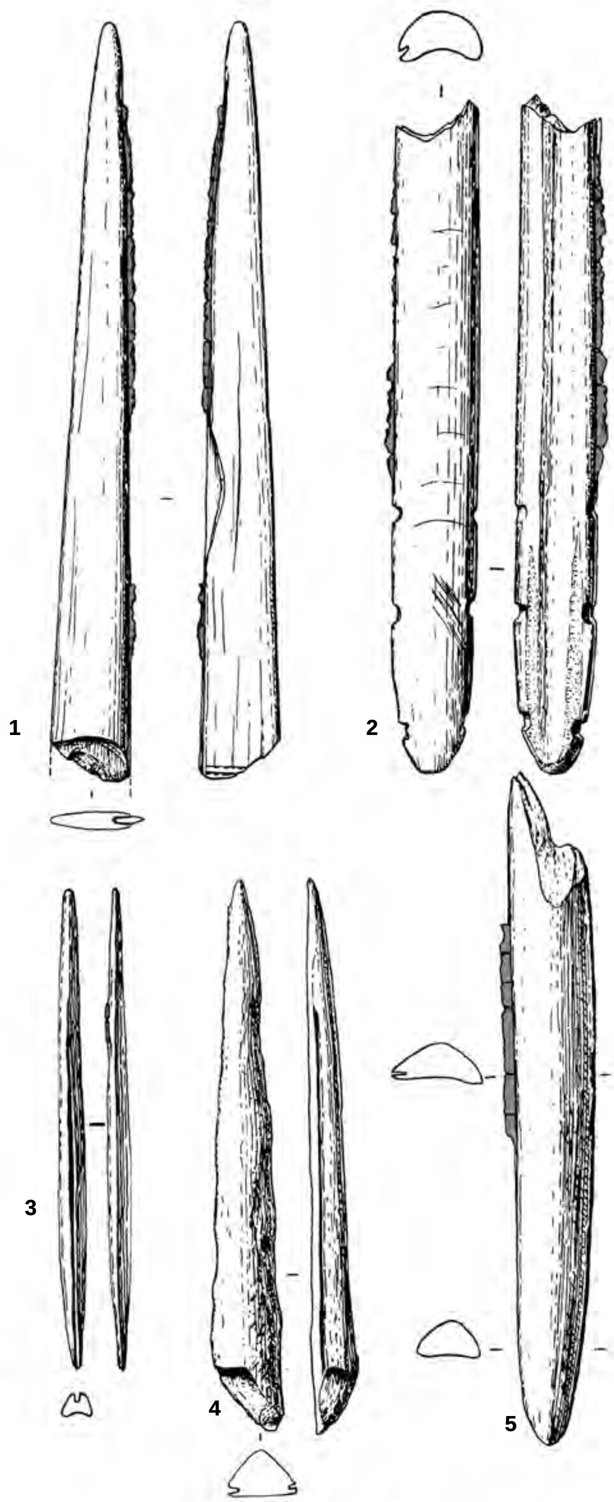

Figure 4.5 Artifacts from the Zhokhov site: 1-5 bone points with microblades inset in the side slots.

river about 8,000 years ago. The most significant technological characteristics are large obsidian blades and large blade cores. Similar artifacts have been found farther north in the Kolyma River drainage where they have been dated to about 7,800 years old at the Zima site.

Several sites have been documented along the Avacha River. An important Mesolithic site near the mouth of the Avacha River was excavated under the overall direction of Tamara Dikova. Named Avacha 1, it may be as much as 8,000 years old based on one radiocarbon date run on charcoal. The site contains blades and blade cores, chipped and partly ground stone adzes with tanged bases presumably for hafting, and grinding slabs (Figures 4.6 and 4.7). Delicately flaked notched tools and burins made on obsidian blades are present, as well as oval-shaped scrapers.

Neolithic Period (7,000 years ago to Historic Contact)

Literally hundreds of Neolithic sites have been excavated in both interior and coastal regions throughout Western Beringia. Excavations at many of these sites reveal the rich material and spiritual culture of the people living in Western Beringia. Their life ways and insights into their spiritual culture are known from the complex material culture they left behind including tools, dwellings, ornaments, pottery, and burials.

About 7,000 years ago the people began to adopt a new way of life. They began making and using pottery and started to manufacture stone tools by grinding and polishing stones, rather than chipping. People also became more sedentary, living for longer periods of time in camps and villages. The early Neolithic is probably best known from interior regions of Yakutia where these early cultures (Syalakh, Bel'kachi, and Ymyakhtakh) have be defined. Even though the Neolithic people of Western Beringia made stone tools by grinding, they tenaciously continued the practice of flaking stone. However, during the Neolithic they preferred to make "flake tools" primarily by removing stone chips from one side of large stone blades or flakes.

It is during the Neolithic that metal (copper, bronze and later iron) first appears. At first this valuable material was used sparingly to make knife blades and other cutting implements, but over time it filled a wider array of needs as it became increasingly available. However, metal did not entirely replace stone tools, which continued to be made and used for thousands of years after metal was introduced. The Neolithic is the period during which contemporary cultures developed and the cultural patterns and artifacts from this time can be traced to the people who occupied Western Beringia at the time the first European explorers reached the region.

The Sea of Okhotsk lies tucked between Kamchatka and the mainland. It is one of the world's richest fisheries. Russian scholars have proposed that maritime adaptations began as a result of people employing their land mammal hunting and river fishing skills to hunting marine mammals and fishing along the coast between 6,000 – 3,000 years ago. If this theory is true, there should be archeological evidence showing a transition from these land-based to ocean-based economies. However, there is little evidence to demonstrate this transition, perhaps because rising sea level has inundated sites of this age.

On the west and north coasts of the Sea of Okhotsk and the northwest coast of Kamchatka, Russian archeologists have excavated several large prehistoric settlements. Tokareva culture is documented at numerous sites along the coast

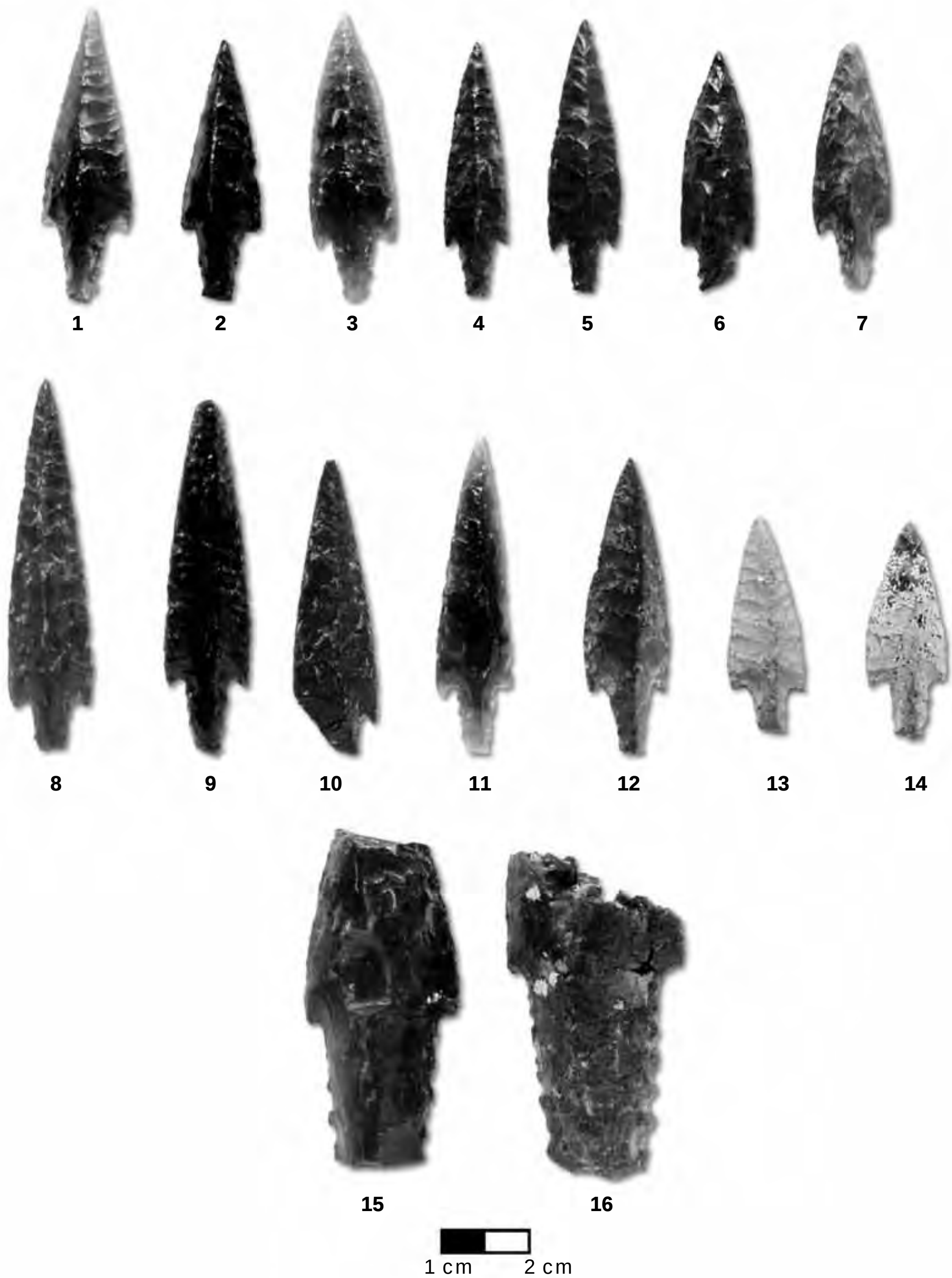

Figure 4.6 Artifacts from the Avacha 1 site: 1-14 chipped stone projectile points; 15, 16 chipped stone projectile point bases.

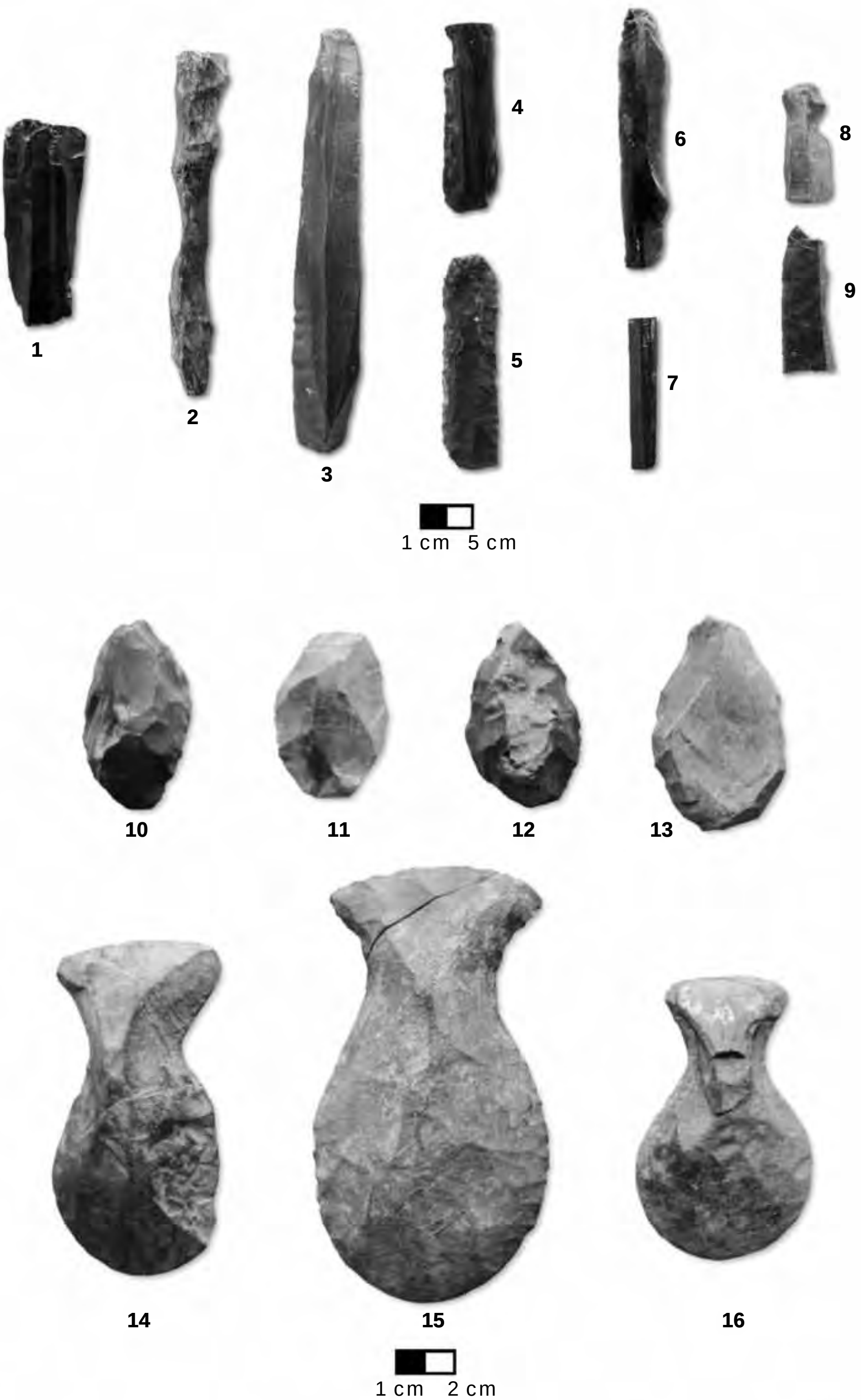

Figure 4.7 Artifacts from the Avacha 1 site: 1 microblade core; 2-9 microblades; 10–13 chipped stone scrapers; 14-16 adze blades.

and from extensive excavations at the Ol'skaia sites south of Magadan. Alexander Lebedintsev has defined the artifacts, houses, and other cultural traits discovered at these sites as belonging to the Tokareva culture, which spans the interval between 2,500 – 2,000 years ago. The Tokareva culture first appears on the coast as full-blown maritime adaptation beginning about 2,500 years ago, although there is some evidence to suggest it might be as early as 3,000 years old.

Artifacts associated with Tokareva culture include flat-bottomed ceramics (Figure 4.8) believed to be derived from the Amur River area to the south where similar styles are older. The pottery is decorated with incised lines and designs made by impressing the soft clay with objects, such as bird bones, fingernails, and small stamps. Hunting implements include arrows and weapons to hunt marine mammals

Figure 4.8 Reconstructed ceramic flat bottomed pot characteristic of Tokareva culture.

such as double and single-spurred toggling harpoon heads, sockets (some with stone end blades, others with carved barbed bone points), and barbed dart heads with line holes and tapering rectangular bases (Figure 4.9). Toggling harpoon heads were attached to a line and cleverly engineered to turn sideways in the wound to prevent an animal from escaping. Fish were caught using composite fish hooks and fish spears. Sites also contain decorated bone needles and needle cases, awls, and combs (Figure 4.10). Decorative objects include decorated pendants, perforated canines, large beads, chipped stone and ivory effigies, etched pebbles, and a magnificent human head carved from a pebble.

Some sites are located on islands and indicate the use of boats. Groups of people, possibly extended families, may have lived together in circular houses that were 54 – 97 ft (16.5 – 48.5 m) in diameter. Houses were clustered in small villages near the sea and some sites contain whale bone. This has led some archeologists to suggest that Tokareva people may have hunted whales or possibly scavenged whales that died from natural causes. As many as 20 – 30 house depressions have been recorded at several sites in the region, however, it is not clear if all of these were occupied at the same time. Some metal was being used, such as copper awls and knives with copper blades. Small amounts of iron, probably used as blades for knives and engraving tools, also have been recovered from Tokareva sites.

Some archeologists believe that the Tokareva culture developed when bands of inland hunters from the Kolyma River region settled on the coast and developed a new economy based primarily on harvesting ocean resources. However, there is little archeological evidence documenting this transition and the Tokareva culture seems to appear rather suddenly along the north and west shores of the Okhotsk Sea. It is possible that ancient archeological sites that had been located along the coast are now under water, or have been destroyed by rising sea level, or have not been discovered.

Russian archeologists frequently use the term Old to define the groups of artifacts that appear to be ancestral to contemporary cultures. For example, the term Old Koryak Culture is applied to the artifacts left by people who were believed to have been the ancestors of the Koryak people. The Koryak occupied the northern coast of the Sea of Okhotsk in the area between Magadan and the Okhotsk and Pacific coasts of northern Kamchatka. Most archeologists think Old Koryak culture developed from the Tokareva culture, possibly beginning as early as 2,300 years ago. Vladimir Jochelson undertook the first archeological research in this area in 1901, followed almost 60 years later by Ruslan Vasil′evskii. Based on their work, Old Koryak culture has been divided into several stages of cultural development that can be traced to modern times.

A major trend in this sequence of Old Koryak cultural development was the continued refinement and sophistication in marine mammal hunting. Over time economic activities increasingly emphasized marine mammal hunting over hunting reindeer and mountain sheep. Both nets and spears were used to harvest fish. Large piles of sea shells indicate that collecting shellfish also was an important economic activity in many areas. The older types of harpoons made from two or more pieces, called composite harpoons, used for marine mammal hunting evolved into toggling harpoons with metal end blades. By about 1,000 – 900 years ago Old Koryak people began regularly hunting whales, the largest of all marine mammals. Whale bone was used in constructing houses and for other utilitarian purposes. Iron reached the area

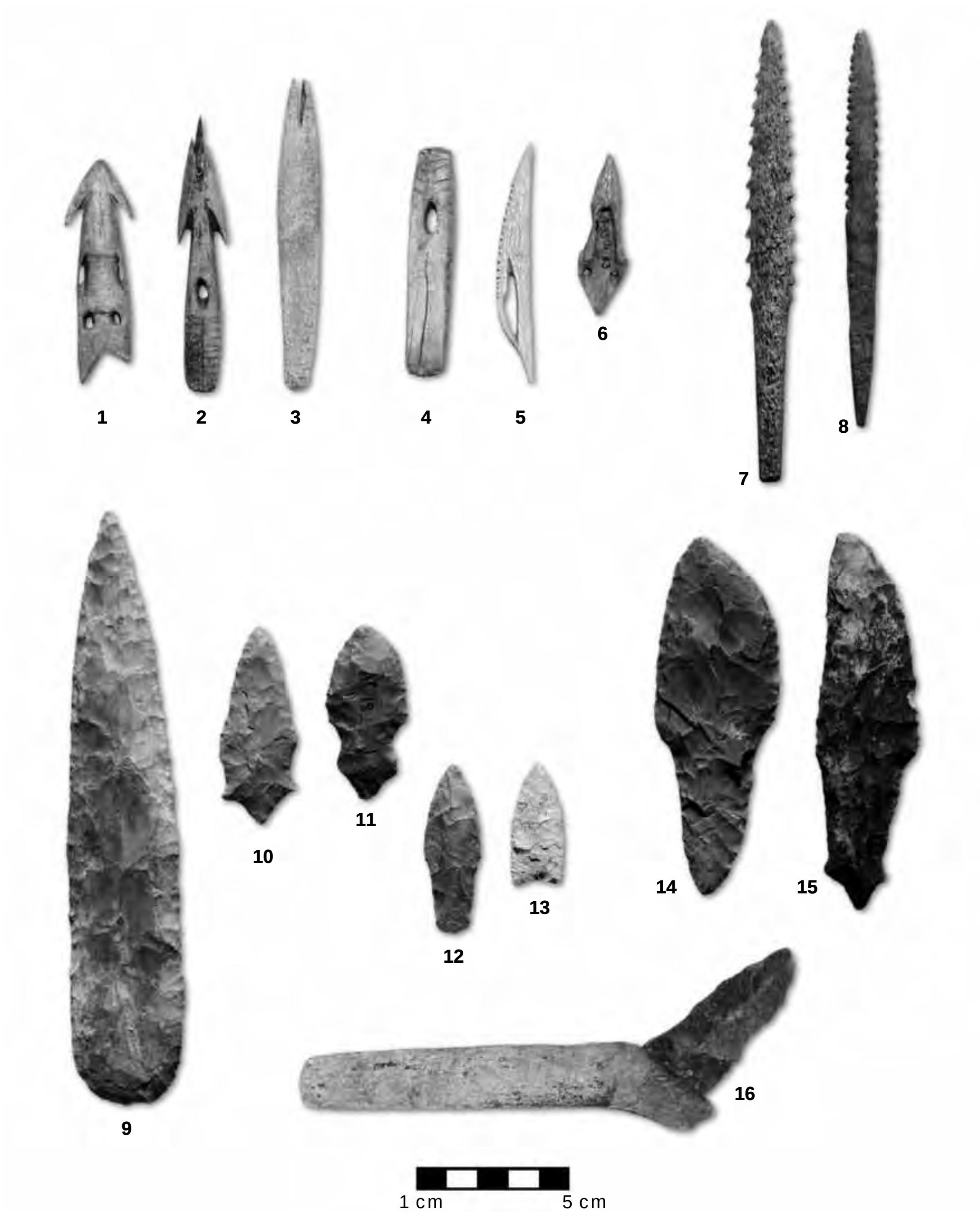

Figure 4.9 Tokareva artifacts: 1-6 barbed and toggling harpoon heads; 7, 8 bone projectile points; 9-13 chipped stone projectile points; 14, 15 chipped stone knives; 16 knife with bone handle and copper blade.

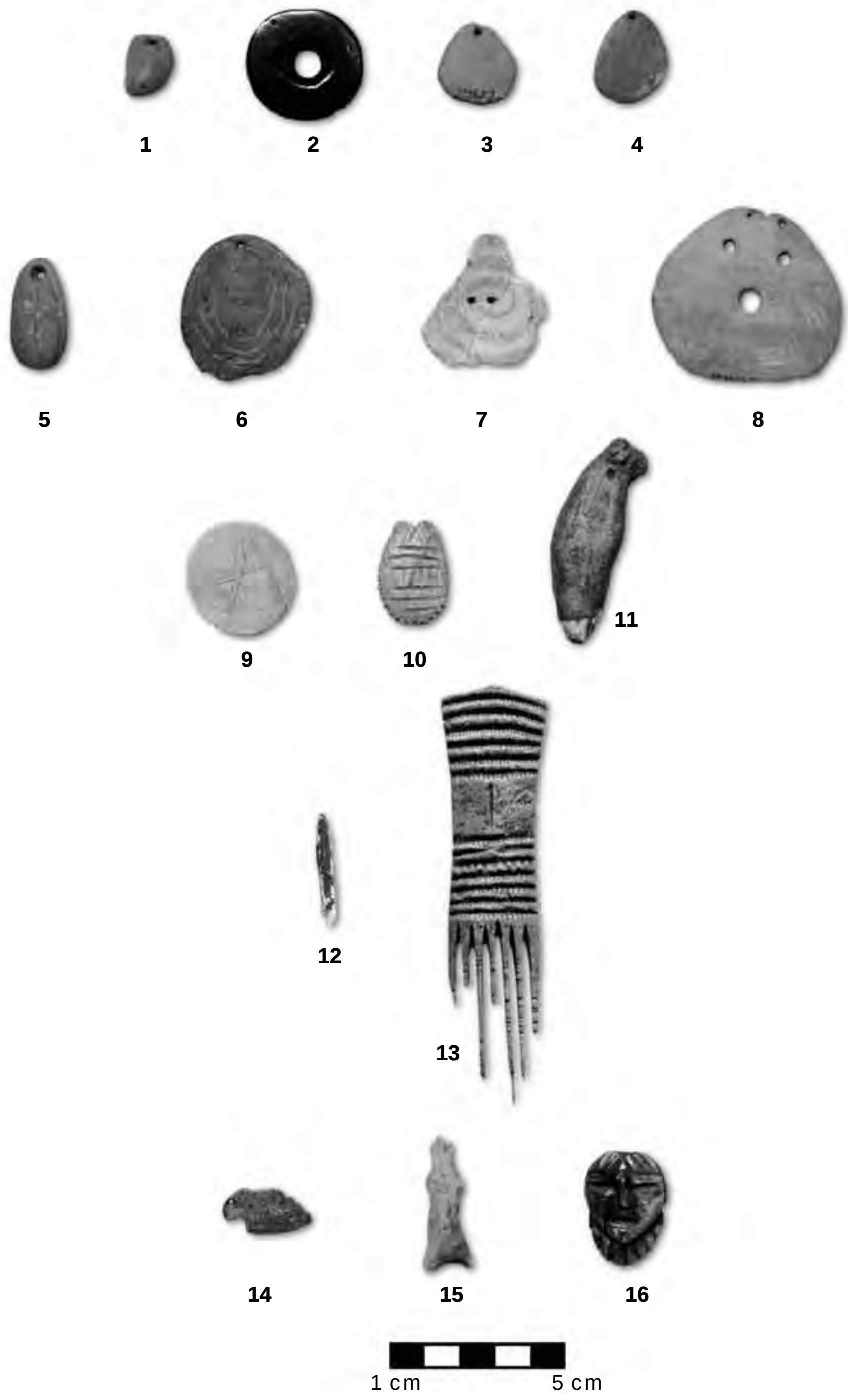

Figure 4.10 Tokareva artifacts: 1-8 pendants; 9-11 etched pebbles, 11 perforated canine; 12 awl; 13 comb; 14 ivory effigy; 15 chipped stone effigy; 16 human head carved from stone.

primarily through trade, possibly as early as 1,500 years ago and it largely replaced stone by 500 years ago. European Russians arrived in the early 1600s, and by the 1700s stone tools and locally made pottery had almost completely disappeared and had been replaced by iron tools and pots.

Along the southern coasts of Kamchatka, events took a different course. Several sites younger than Avacha 1 have been excavated along the Avacha River under the overall direction of Tamara Dikova. Her research in this region helped define Tarya culture, which was documented by excavations in the areas around Avacha Inlet, the Kamchatka River valley, and possibly at Ushki Lake. Tarya culture is believed to be the forerunner, or the first stage of Old Itel′men culture. There appear to be two variants of this culture, a northern one that used microblades and a southern one that did not.

The Tarya culture spans the time from roughly 6,000 to 2,000 years ago. During this time people manufactured large stone adzes by grinding and also had an emphasis on wood working. Common tools were stone scrapers, bifacially flaked stone knives, and gravers. During this time people chipped stone animal effigies, wore labrets, and used obsidian and fine-grained flint to manufacture prismatic blades struck from prepared cores. People lived in sod-covered semi-subterranean houses that were entered through a hole in the roof, probably using a log notched to serve as a ladder.

The Lopatka Site is located on Kamchatka's Lopatka Peninsula and is radiocarbon dated between 3,200 – 3,500 years ago. The site contains caribou antler and marine mammal bone. It exhibits a well-developed bone technology including awls, small spoon-like objects, bone adz-like objects (picks) probably used for digging, bone wedges, and bone projectile points (Figure 4.11). Stone tools include flake cores, stemmed projectile points, chipped stone knives, and stone adze blades made by both chipping and grinding (Figure 4.12).

Another important site for Old Itle′men culture is the Bolshoy Kamen Site or "Big Stone Site." The site is located at the mouth of the Paratunka River and has been radiocarbon dated to about 2,400 years old. The level containing artifacts is capped by a tephra derived from a later eruption of Ksudach Volcano that has been dated to 1,700 years ago. This site contains animal and possibly human effigies of chipped stone, thin polished whisker-like labrets, polished stone adzes, end scrapers, tanged chipped stone knives, gravers, side blades, stemmed projectile points, and adze blades (Figure 4.13).

Between 2,000 – 1,000 years ago, people continued to use semi-subterranean houses, and also began building houses on piers, or stilts. The semi-subterranean form was entered two different ways: either through a ground-level opening or a hole in the roof which led to a notched log or plank with ridges or boards used as steps. Birch bark was used for a variety of tasks, even to make quivers to hold arrows. People made their living primarily from the sea by hunting marine mammals, using non-toggling barbed bone darts with a line hole. Other tools included burnishing stones, borers, scrapers, drills, along with line and net weights. Extensive reliance on fishing is indicated by the large amount of fish remains recovered from archeological sites dating to this time. Fish were caught using composite and single piece fish hooks and probably nets. Bows and arrows armed with stone points were used to hunt land mammals and also probably in warfare.

The last stage of Old Itle′men culture began about 1,000 years ago and continued until the time of Russian contact and colonization. About this time the

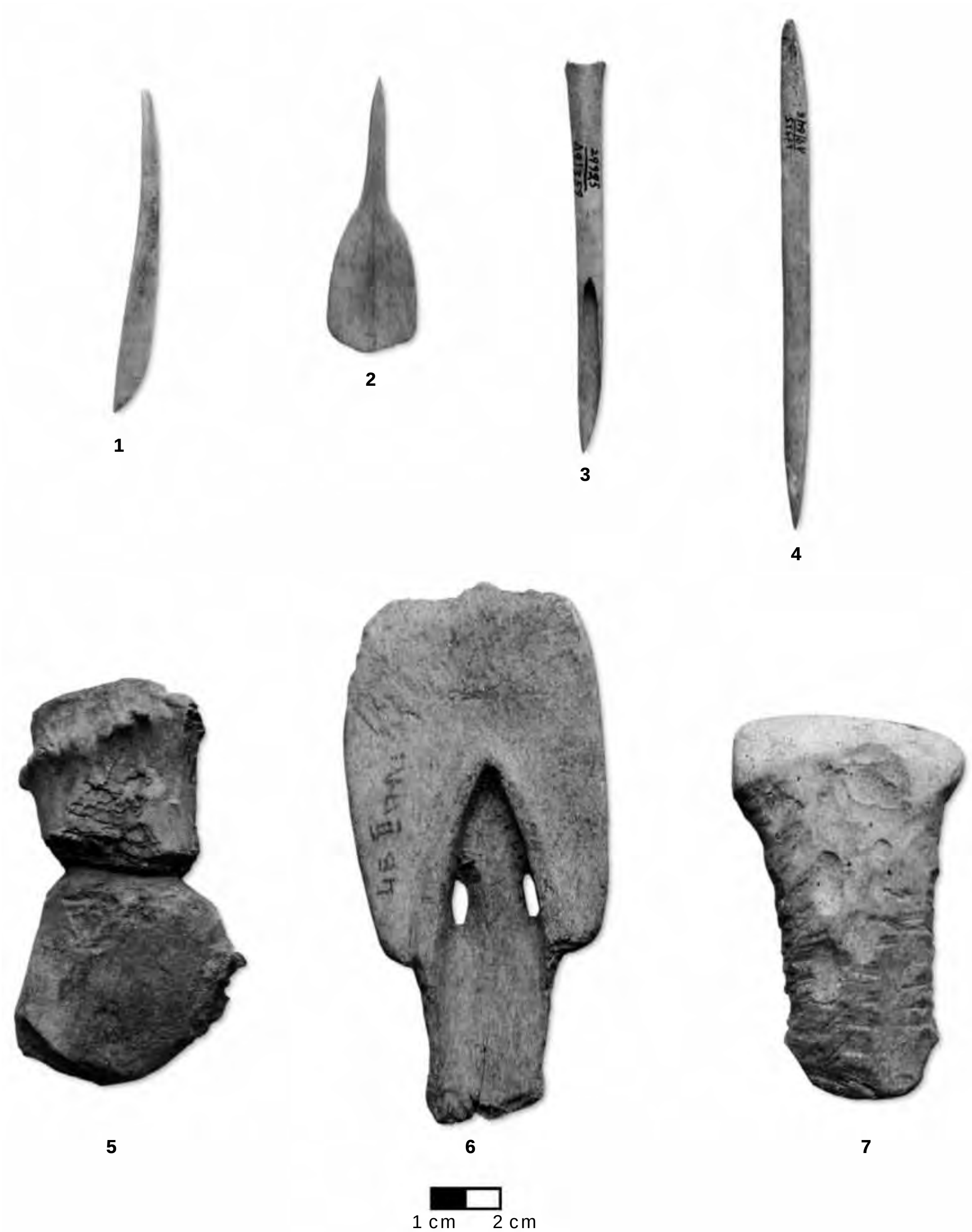

Figure 4.11 Artifacts from the Lopatka site: 1, 3, and 4 bone awls; 2 bone spoon-like object; 5-7 adze heads.

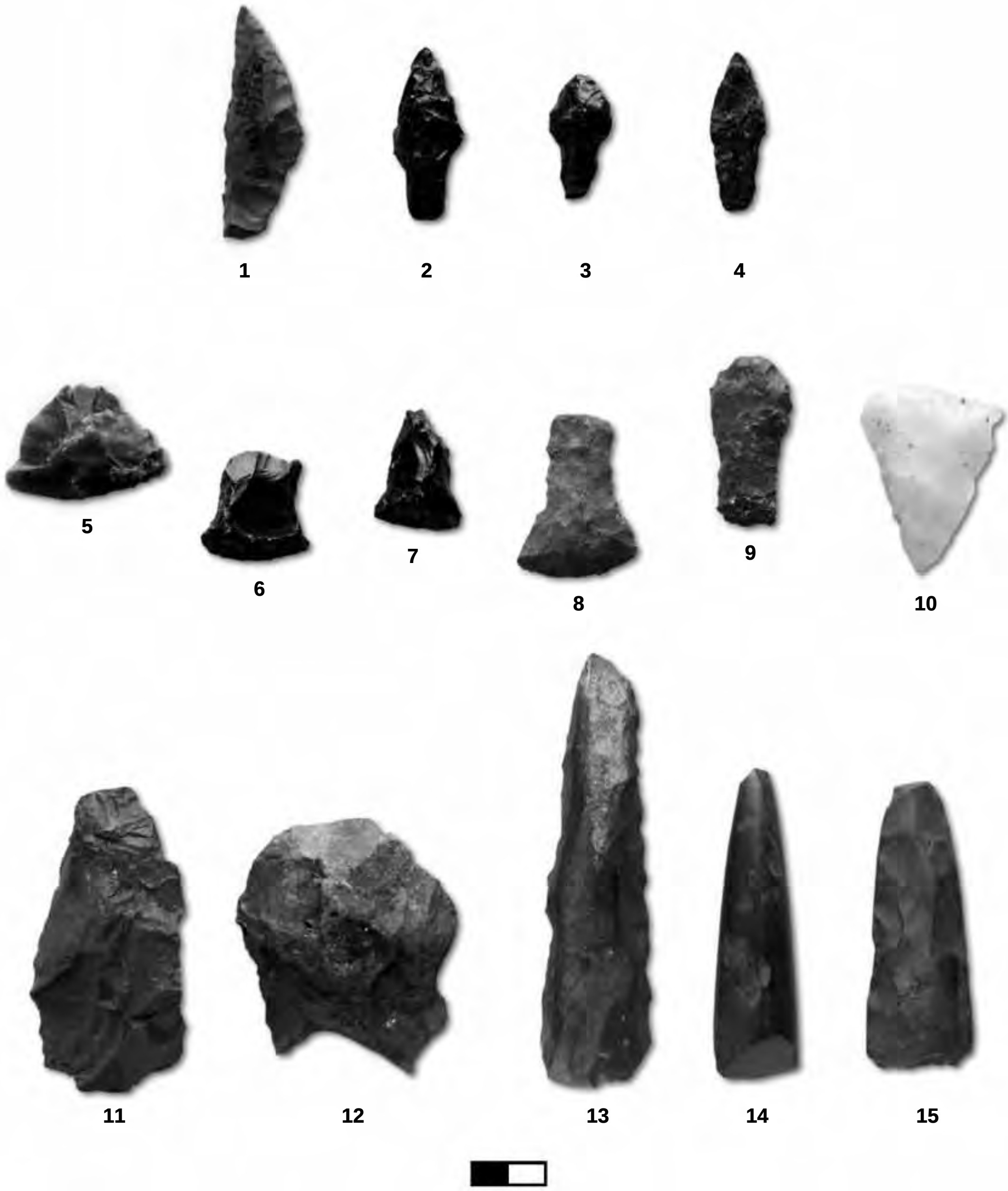

Figure 4.12 Artifacts from the Lopatka site: 1 chipped stone knife blade; 2-4 chipped stone projectile points; 5-10 chipped stone scrapers; 11, 12 flake cores; 13-15 adze blades.

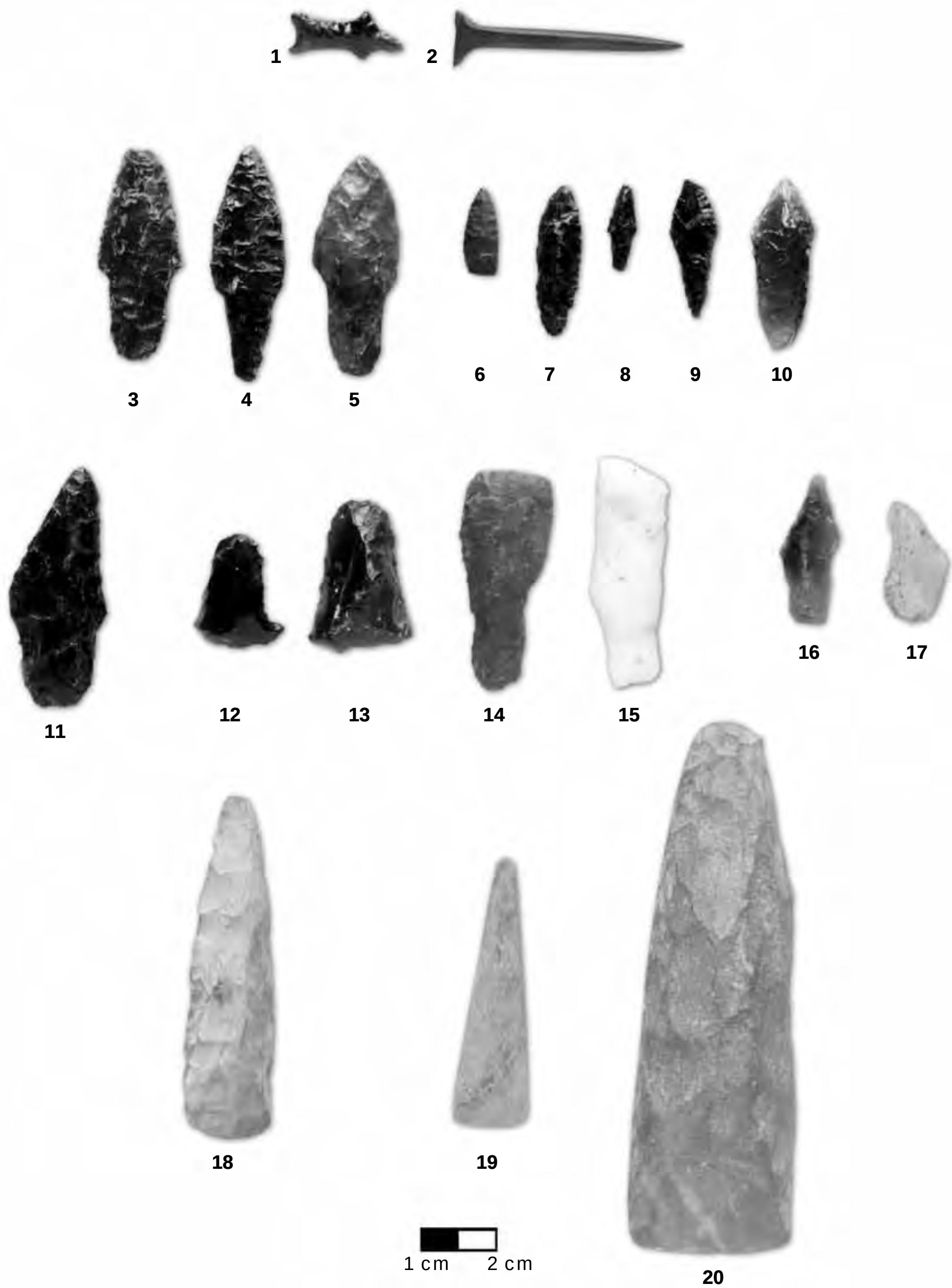

Figure 4.13 Artifacts from the Bolshoy Kamen, or Big Stone site: 1 chipped stone animal effigy; 2 whisker labret; 3-10 chipped stone projectile points; 11 chipped stone knife; 12-15 scrapers; 16, 17 gravers; 18-20 chipped and ground stone adze blades.

Old Koryak people appear to have pressed southward into Old Itle′men territory from the area of Tymlat Bay. This appears to be a time of increased conflict in southern Kamchatka and Old Itle′men settlements are often found in strategic defensive locations surrounded by palisaded fortifications. During this time dog traction and sleds were introduced from the north, and the use of iron acquired by trade became common. Two different types of houses, semi-subterranean and one constructed on piers, continued to be used during this time. Bone and antler arrow points with ground stone end blades, and non-toggling harpoon heads with and without ground stone end blades were used to hunt land and sea mammals. Projectile points, borers or awls, and adzes continued to be made from stone. Fishing continued to be an important economic pursuit and fish were caught using fish spears, nets, and hooks.

During the latter part of this period, the Ainu came north, seasonally occupying the southernmost tip of Kamchatka. The Ainu are native people who occupied northern Japan and the Kuril Islands. They were under pressure from the Japanese who were expanding northward into their territory. Evidence of their occupation includes Ainu and Japanese artifacts, such as coins, are commonly found in archeological sites dating to this time period (Figure 4.14). By about 1700 AD

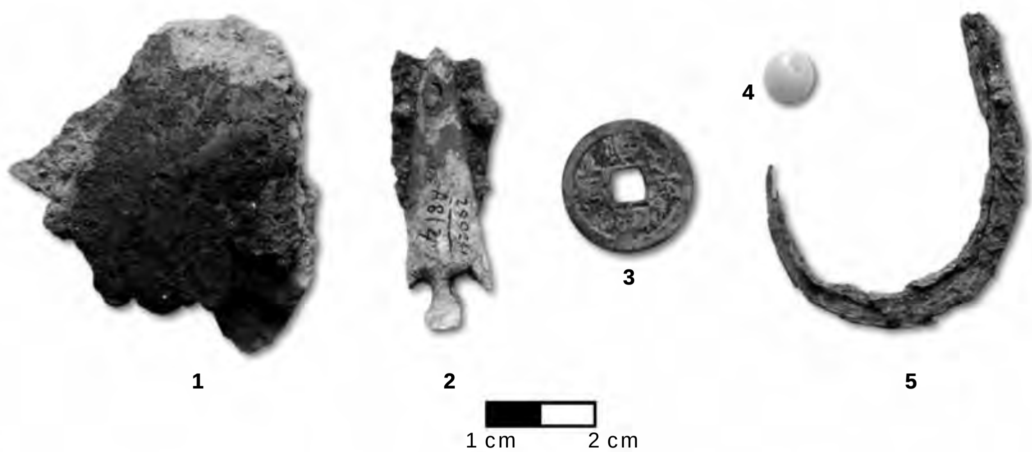

Figure 4.14 Artifacts documenting the Ainu incursion into Kamchatka: 1 ceramic fragment; 2 harpoon head fragment with iron end blade; 3 Japanese coin; 4 blue glass trade bead; 5 iron fish hook.

some Ainu had reached as far north as the Zupanova site, located approximately 200 km (125 mi) north of Petropavolsk on the Pacific coast of Kamchatka (Figure 4.1). Following the Russian colonization of Kamchatka, the Ainu withdrew to the Kuril Islands. The Ainu incursion into southern Kamchatka provides an example of the "forcing effect" that may have operated in the prehistoric past. Perhaps as the populations grew in regions adjacent to Western Beringia, such as China and Japan, pressure was exerted on their neighbors who were forced to move ever northward from population centers. This type of population pressure may have been a factor in producing a domino effect resulting in the movement and exchange of people, objects, and ideas throughout Beringia.

The Old Itle′men Culture was the last prehistoric culture to occupy central and southern Kamchatka. By the 1600s, Russian explorers and fur traders entered the region from the west and trading posts were established to trade in furs, for which there was strong demand in China and Europe. Between 1737 and 1741, Stepan Petrovich Krasheninnikov, a Russian scholar and historian, recorded the life ways of the Itle′men and Koryak, the descendants of Western Beringia's early settlers (Figure 4.15). Thirty

Figure 4.15 Interior of an Itel' men winter house as recorded by S.P. Krasheninnikov circa 1740 (Krasheninnikov 1964).

years later (1768–1769) a smallpox epidemic swept Kamchatka and decimated the indigenous population. The Russian expansion to Kamchatka laid the foundation for subsequent voyages and colonization of Alaska. The Russians were soon followed by European and American whalers, who intensively hunted whales off the coast of Kamchatka and in the Sea of Okhotsk during the mid-1800s, bringing with them new types of trade goods and new diseases.

During the Soviet era, the economy of the region was dominated by state-controlled industries for the extraction of raw materials. In various places in Western Beringia, entire cities were constructed around deposits of coal and other resources. However, the infrastructure was poorly developed. The primary economic base of the region today is mining for metals (primarily gold, silver, and platinum) and fisheries.

Summary

The early cultural history of Western Beringia is divided into three time periods: the Paleolithic (sites older than about 12,500 years), Mesolithic (sites between about 12,500 and 7,000 years), and Neolithic (7,000 years and younger) (Figure 4.16). People first settled Western Beringia during the Paleolithic. The earliest Paleolithic

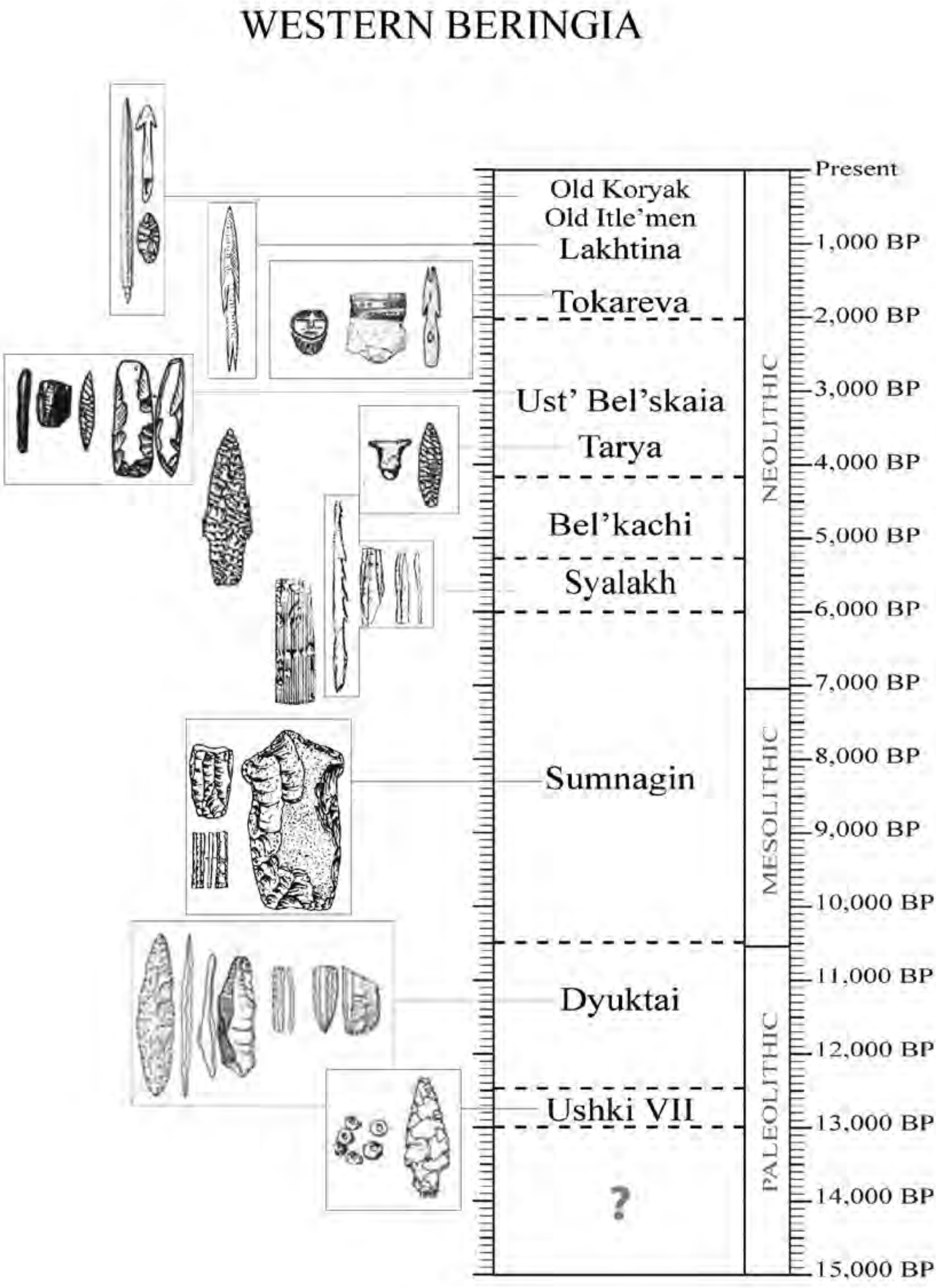

Figure 4.16 Cultural chronology of Western Beringia (Icons from Dikov 1979; Lebedintsev 1990, Slobodin 2005).

site is more than 25,000 years old, and was occupied during a brief period of warmer climate prior to the last Ice Age. It is possible that people moved southward during the last Ice Age as the climate became colder and perhaps did not occupy the region again until the climate began to warm up about 15,000 years ago.

Evidence from Ushki Lake on the Kamchatka Peninsula suggests that by 13,000 years ago people were living in settlements, or small villages, at locations where food and other resources were abundant. They hunted large land mammals and water fowl, and fished along inland lakes and rivers. At Ushki Lake the use of microblades was adopted by 12,500 years ago. These were used as razor-like insets in the sides of bone and antler spears and arrow points and may also have been used as cutting instruments for precision tasks such as cutting hides to make tailored clothing. The microblades were struck from wedge-shaped stone cores. These late Paleolithic people also used knives, spear points, and possibly arrow heads made by chipping stone. The term Dyuktai culture is used to describe these distinctive types of artifacts.

The Mesolithic was a time of dramatic climate change when the last of the glaciers were melting, sea level was rising rapidly, and the boreal forest advanced northward replacing shrub tundra throughout much of Western Beringia. People began to diversify their economy. While fewer bifacially flaked stone tools were used during the Mesolithic, a greater variety of tools were made on larger blades struck from stone cores.

During Neolithic times, people made pottery and lived in larger and more permanent settlements where resources such as fish, shellfish, and marine mammals were abundant. Their tools were made more often by grinding stone rather than chipping it. About 2,000 years ago people began using copper and iron obtained from neighboring groups to the west and south. By the 1600s, Russians began to colonize the region. European and American traders, explorers and whalers introduced devastating epidemics and forever changed the economy and cultures of Western Beringia.

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CHAPTER 5
CENTRAL BERINGIA

Central Beringia is the birthplace of Iñupiaq and Yupik Eskimo cultures and home of one of mankind's most remarkable adaptations to the environment. This geographic area includes the islands and coastal areas where Eskimos live today in Russia and Alaska (Figure 5.1). During the last Ice Age, it was all a vast plain bordered on the north and south by oceans. Over several thousand years it was transformed by rising sea level into a shallow sea dotted with islands and bordered by a land with plentiful caribou. These hardy people made their living primarily by fishing, hunting sea mammals along the coast, and hunting caribou in adjacent areas of the interior. As the marine environment matured following the last Ice Age, the sea mammal population in Central Beringia flourished and supported large communities.

The development of Eskimo culture is preserved in many spectacular sites throughout Central Beringia. In North America there is a sequence of traditions that are similar to the cultural developments that took place at the same time, or slightly earlier, in Russia. In Alaska these are the American Paleoarctic, Northern Archaic, Choris, Norton, Old Bering Sea, and Western Thule traditions. With each successive tradition, new inventions were introduced to the ever-evolving technology. Over thousands of years this process of innovation and cultural development ultimately resulted in a suite of cultural traits that is commonly associated with Eskimo culture at the time of European contact: semi-subterranean house types, kashims, toggling harpoons, oil lamps, kayaks, crampons, snow goggles, the dog sled, and many more. Many innovations were fashioned from bone or walrus ivory.

At the end of the last Ice Age, the Bering Land Bridge was submerged by rising sea level. As extensive shallow areas of the continental shelf continued to be flooded, large regions of Central Beringia that had experienced drier interior climates became increasingly maritime. At this time people living in Beringia became separated by Bering Strait. People living in the east became residents of North America and those in the west were living in Asia. Between about 10,000 and 9,000 years ago sea level rose rapidly and began approaching the modern shoreline. People living on the coast would have been forced gradually to relocate landward in response to the rising water and changing environment. However, large shallow areas such as Norton Sound continued to remain above water until about 6,000 – 5,500 years ago.

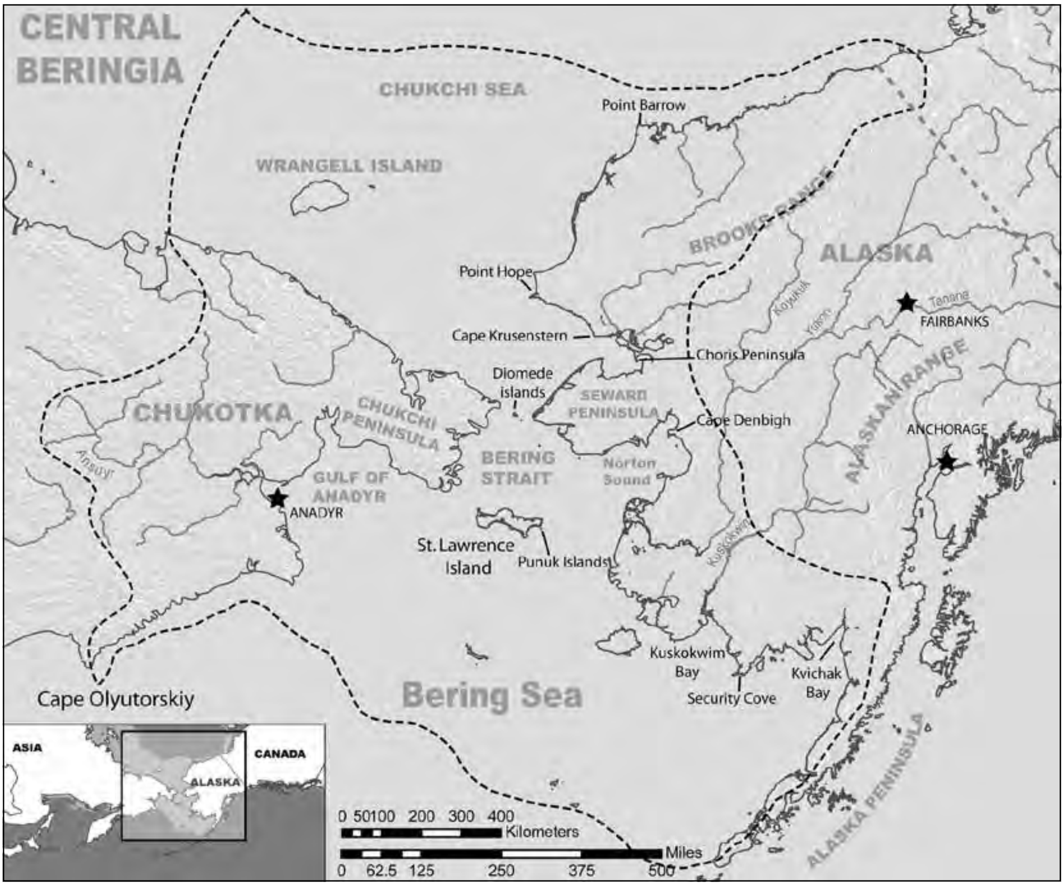

Figure 5.1 Map of Central Beringia.

The distance across Bering Strait is only about 58 miles (92 km) and on a clear day one can see across the Strait to land on the other side. When the weather was good people could easily travel by boat between the islands and the mainlands and from one continent to the other. Consequently, after the Bering Land Bridge had flooded, trade and social contact continued throughout the region.

Although rising sea level severed the land connection between Asia and North America, it created a connection between the Pacific and Arctic Oceans. For the first time in 65,000 years, fish and marine mammals were able to move through the Arctic Ocean and narrow Bering Strait connecting the Atlantic and Pacific Oceans in the northern hemisphere. Bordered by the coastal regions of two continents, the relatively shallow Bering Sea south of Bering Strait and the Chukchi Sea north of Bering Strait became rich in wildlife as sea level continued to rise. The types and abundance of marine mammals, fish, shellfish, and seabirds varies greatly throughout the region, depending on underwater habitats, currents, ice conditions, the configuration of the coastline, and a variety of other factors. People living along its shores soon learned which areas were most productive and when and where different types of marine resources could be harvested. People settled on the shore and islands where resources were abundant, or camped at locations where resources were temporarily concentrated.

The Bering Sea is home to more than 450 species of fish and shellfish. This rich environment supports at least seven species of whales, as well as sea lions, sea otters, many types of seals, and walrus that in turn support a large population of polar bears. These animals could be hunted at specific locations where they came ashore to bear their young, at sea from boats, and from sea ice near open leads and breathing holes. Sea ice hunting became what is perhaps the most sophisticated subsistence adaptation that has ever been developed. It involves an elaborate suite of technological innovations including tools, clothing, and transportation methods combined with a sophisticated knowledge of ocean currents, weather, sea ice, and animal behavior.

In the more southern areas, particularly favorable locations for human settlements were near streams and rivers that were rich in salmon. Fishing was an important economic activity everywhere fish were plentiful. Marine mammal hunting was also an important part of survival in northern regions and large permanent or semi-permanent villages developed where marine mammals or fish could be harvested and stored for later use. By harvesting whales, seals, and walrus, people were able to store large amounts of food, fuel, and materials for making tools and houses. The rich oil rendered from marine mammals provided fuel for stone and ceramic lamps, generating heat and light through the long winter months in areas where wood was scarce. These products from the sea and adjacent inland areas enabled people to live together in large settlements for long periods of time.

In a sense, Central Beringia can be compared to the Mediterranean Sea because it is a shallow body of water dotted with islands and bordered by land and settlements. People living around its margins tended to be more familiar with each other than with their neighbors farther inland. They harvested similar resources, traveled the same waters, socialized and intermarried, shared the same technology and innovations, and sometimes were in conflict with each other.

American Paleo-arctic and Dyuktai Traditions

Artifacts and camp sites left by the earliest Central Beringians indicate that their way of life was similar and they shared a similar technology. On the Asian side it is called Dyuktai culture and on the American side it is called the American Paleo-arctic tradition. Archeologist Fredrick Hadleigh West grouped these traditions together, calling them the Beringian tradition, while other North American archeologists refer to the American Paleo-arctic tradition as the Eastern Beringian tradition and Dyuktai culture as the Western Beringian tradition.

The American Paleo-arctic tradition was originally defined by Douglas Anderson based on the artifacts from the oldest occupations at the Onion Portage site on Alaska's Kobuk River, microblades from the Trail Creek Caves located on the Seward Peninsula, and similar sites from the Brooks Range (Figure 5.2). These sites all contained microblades that had been struck from wedge-shaped microblade cores that were virtually identical to those of the Dyuktai culture in Siberia. The stone artifacts included wedge-shaped microblade cores, microblades, blades and blade cores, core bifaces, antler arrow points slotted to receive microblades, and grooved stone abraders. Subsequent research has demonstrated that these types of artifacts are found along the coastal areas and adjacent inland environments on both sides of the Bering and Chukchi Seas.

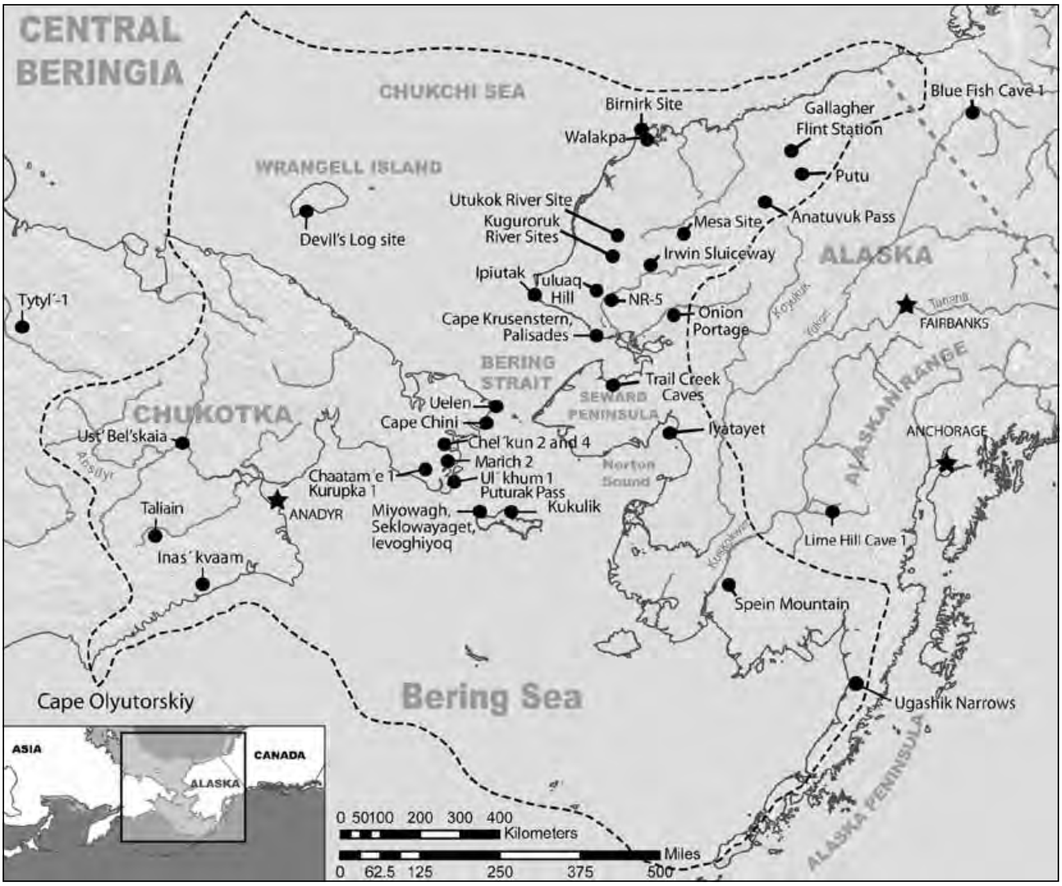

Figure 5.2 Map depicting the location of key archeological sites in Central Beringia.

The people who made and used these types of artifacts were probably living on the Bering Land Bridge when sea level began to rise and flood the land joining Asia and North America at the end of the last Ice Age. As sea level continued to rise, regions adjacent to the coasts became increasingly maritime. Many important inland sites have been discovered and excavated in North America from Alaska's Brooks Range in the north to the Alaska Peninsula in the south. Several similar sites in Chukotka have also been documented. Based on their ecological settings and preserved faunal remains, it appears that caribou hunting, possibly supplemented by fishing, were the most important economic activity at these inland locations in both Asia and North America.

In Russia, wedge- shaped microblades cores and microblades typical of Dyuktai culture have been reported from several sites in Central Beringia (Chel´kun 2 and 4, Chaatam´e 1, Kurupka 1, Ul´ khum 1, and possibly Inas´ kvaam, Taliain, and Marich 2). All but two of these sites appear to be located on river terraces and many are in ecological settings that suggest caribou hunting. Although the bone at most of these sites has decomposed, caribou bone was found at Kurupka 1 near what appeared to be hearth. It did not contain sufficient charcoal for radiocarbon dating. Two sites (Inas´ kvaam and Taliain) are located along the Bering Sea coast south of the city of Anadyr, but because sea level was probably still rising at the time the sites were occupied, their relative distance from the coast is not clear. Unfortunately, it has proven difficult to firmly date these sites, but based on the types of artifacts they contain — wedge-shaped cores and microblades — most archeologists believe they suggest the wide geographic range of the Dyuktai culture.

American Paleo-arctic tradition artifact types include distinctive antler arrow points slotted to receive microblade insets (Figure 5.3). These points provide rare insights into the use of microblades as insets to create cutting edges in bone and antler tools. The few bone points that have been preserved in Dyuktai and American Paleo-arctic tradition sites appear to be arrow heads. These distinctive projectile points armed with microblades are composite tools. In other words, they were made by combining several parts. First bone, antler, or ivory was carved into the shape of a long slender pencil-like arrow head or spear point. Antler carving was probably done using a special stone tool called a burin. Stone microblades were then inset in a slot(s) carved into the side of the point, forming a scalpel-sharp cutting edge.

Level III at Trail Creek Caves 2 and 9 and Lime Hill Cave 1 contain antler projectile points slotted to receive microblade insets. These points closely resemble antler arrow heads that were widely used by Eskimo hunters when Europeans first arrived in Central Beringia. Archeologists Helge Larsen and Robert Ackerman, who analyzed them, believed they were used as arrow heads. If this interpretation is correct, American Paleo-arctic tradition people introduced the bow and arrow into North America from Asia possibly as early as 14,000 years ago. In a layer designated as Band 8 at the Onion Portage site, microblades appear to have been used as insets in slotted points that have been reliably dated to 9,100 years ago.

The Alaska Peninsula is the interface between the people living in Eastern Beringia along the Gulf of Alaska (Pacific Ocean) and those living along the Bering Sea and non-coastal areas of Central Beringia. On the northwestern side of the Peninsula, the archeological record is essentially that of Central Beringia, while the southeast (Pacific) side of the Peninsula is more closely associated with the cultures that developed in the Gulf of Alaska. Important American Paleo-arctic tradition occupations are documented by Don Dumond from the lowest levels at the Ugashik Narrows site and at Kvichak Bay. The Ugashik Narrows site is adjacent to a river with a major salmon run, where large mammals such as caribou and moose may easily cross the river. This setting suggests that the people who camped at this site fished and probably hunted caribou. Similar undated sites have been found in other areas of the peninsula. Most archeologists believe that American Paleo-arctic people may have been the first to colonize the peninsula and that they occupied it until sometime about 7,500 years ago.

Numerous undated sites throughout Beringia have been ascribed to the American Paleo-arctic tradition and Dyuktai culture, based on their similarity with Dyuktai and American Paleo-arctic artifacts. These artifacts include burins, microblades, and core tablets associated with wedge-shaped microblade cores. The environmental settings of many of these sites suggest that one reason people were making and using microblades was to arm arrows for hunting caribou.

Most archeologists believe that in Asia there was gradual change from Dyuktai to the Sumnagin culture and that the Sumnagin culture gradually developed into the maritime Neolithic cultures that later flourished on the islands and coasts of Central Beringia. Although the evidence is not clear, the most popular idea among

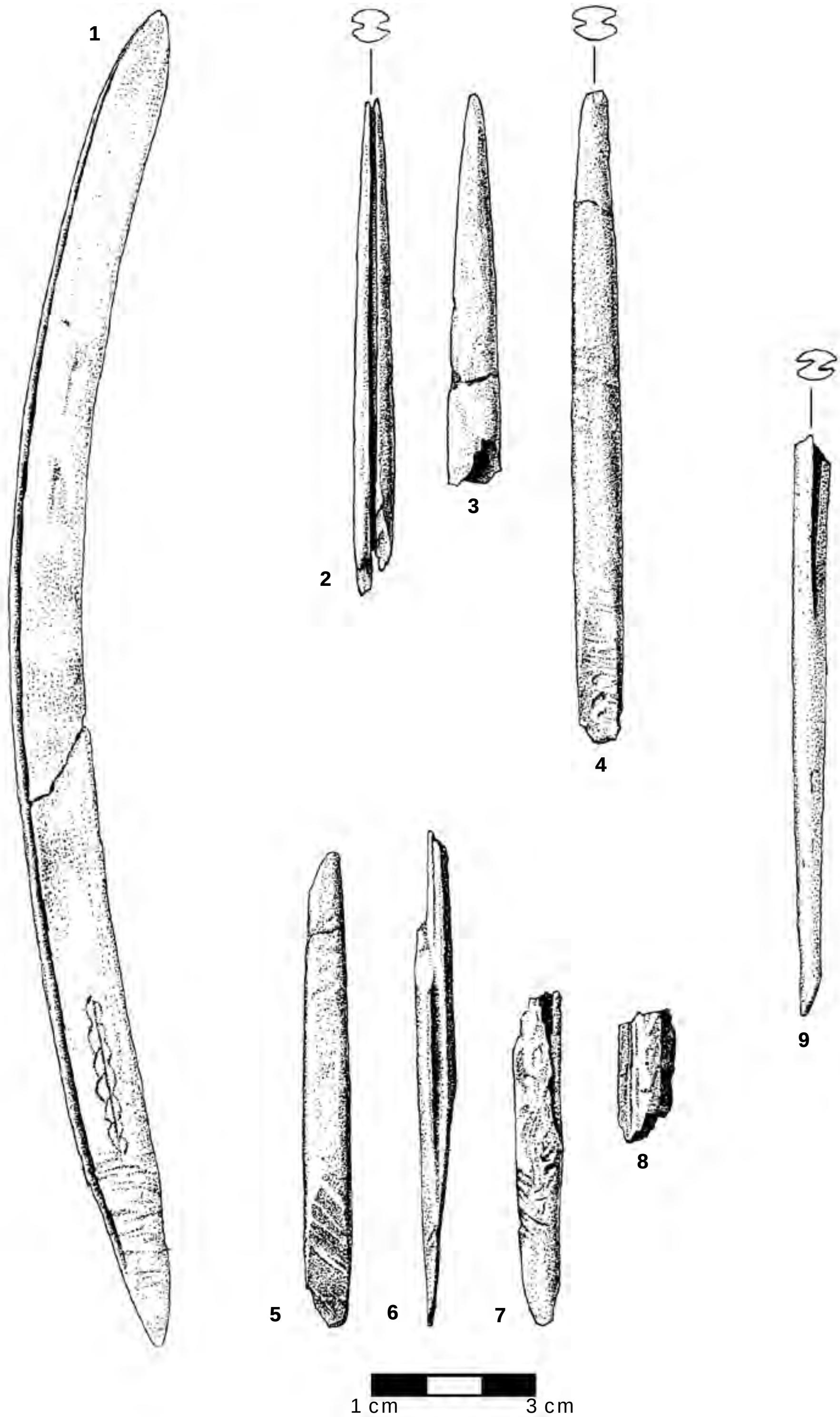

Figure 5.3 Slotted bone projectile points, Central Beringia: 1 atl atl dart head Canadian ice patch; 2-8 arrow heads Trail Creek Caves; 9 arrow head from Lime Hills, Cave 1.

Russian scholars is that Sumnagin people descended river valleys to the coasts where they settled and learned to make their living primarily from the sea. This migration is believed to have happened during the Mesolithic period (12,500 and 7,000 years ago). If people living in northeast Asia did make their living from the sea at an earlier time, the artifacts and remains of their settlements may be submerged beneath the sea as a result of rising sea level.

New People from the South (12,500 – 7,000 years ago)

Beginning about 12,500 years ago, distinctive types of artifacts, such as large lance-shaped (lanceolate) points, began to appear in Central and Eastern Beringia that clearly originated south of the continental glaciers. From the time they were first discovered and reported, scientists recognized their similarity to what archeologists call Paleoindian projectile points used to arm atl atl darts. These types of stone points are typically lanceolate in form. The earliest forms have a characteristic flute, or long narrow flake removed from around the midline of the point, extending from the base toward the tip. The flute allowed the maker of the point to securely bind it to a dart shaft. These types of stone artifacts are well known from southern regions of North America where they were made beginning about 13,000 years ago. They continued to be made until about 9,000 years ago. While some Paleoindian sites contain large blades and blade-like flakes, microblades were not manufactured or used as side blade insets by Paleoindians.

Most archeologists believe there are historical relationships between Paleoindian tradition projectile points from Central and Eastern Beringia and those from the Great Plains of western North America based on the fact that they are so similar. Over the years several theories have been offered to explain the relationships between the northern and southern Paleoindian assemblages, including: 1) the northern specimens were left by the first humans to reach Alaska from Asia, who subsequently spread south from Beringia when the continental glacier melted; 2) Paleoindian projectile points developed in the more southern regions of North America and spread northward to Central and Eastern Beringia after the glaciers melted; 3) Paleoindian projectile points were independently developed in Central and Eastern Beringia thousands of years after those to the south were no longer being made.

Marie Wormington, a pioneer in synthesizing Paleoindian archeology in the United States, was the first person to realize that this technology spread northward from the Great Plains following deglaciation. For many years this was an unpopular point of view because most archeologists believed that this way of making projectile points had originated in Asia and was used by mammoth hunters who crossed the Bering Land Bridge and were the first to colonize North America. A specific type of fluted projectile point, called a Clovis point, was frequently found with the remains of mammoths in western North America south of the glacial barrier.

However, Wormington and her colleague Richard Forbis recognized that the Northern Paleoindian points were stylistically similar to fluted projectile points from the American West and suggested that they were not as old in Central and Eastern Beringia as they were in the Great Plains. Subsequent excavations and radiocarbon dating in the 1980s and 1990s demonstrated that they were correct. Furthermore, this distinctive technology has not been discovered in Asia and appears to be a unique

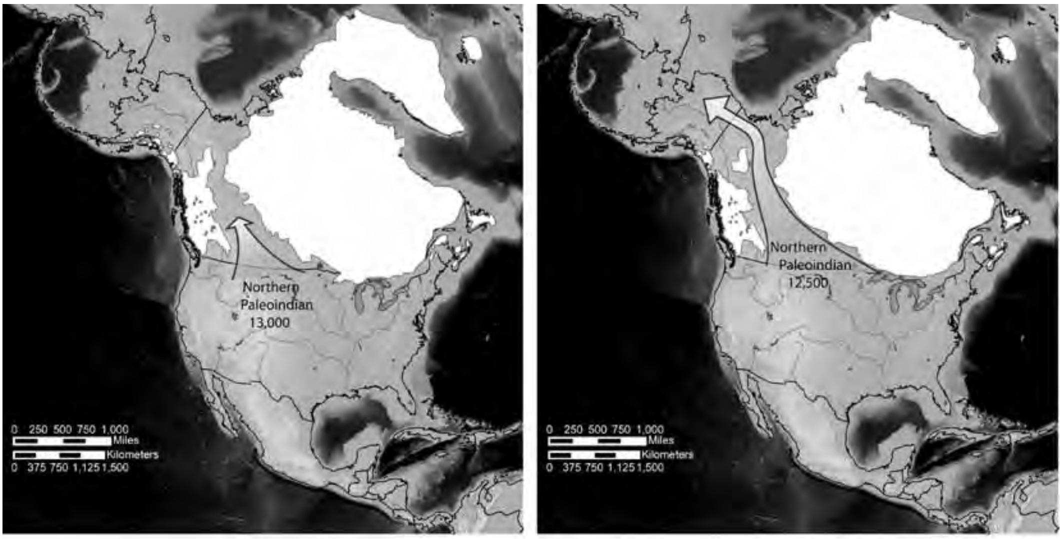

Figure 5.4 Maps depicting the northward movement of the Northern Paleoindian tradition and the limits of the melting continental glacier 13,000 and 12,500 years ago.

New World innovation, indicating that it developed independently in the Americas south of the continental glaciers. After the last Ice Age, melting ice exposed land between the Coridlleran and Laurentide glaciers in the form of a deglaciation corridor that previously had not been occupied by people. It connected Eastern Beringia in the north and areas south of the continental glaciers. Settlement of this deglaciated corridor occurred primarily from south to north. The presence of Paleoindian points suggests the people who colonized this corridor brought Paleoindian technology to Eastern Beringia as they moved northward (Figure 5.4).

These types of points were first found in Alaska's Brooks Range, and later found at other sites throughout the Central and Eastern Beringia. They include the Utukok River site, the Putu site, and the Mesa site. The earliest Northern Paleoindian points in Beringia have multiple flutes, concave bases, and edge grinding. However, later lanceolate and stemmed forms are common and similar to points from the Plains called Agate Basin and Hell Gap points. While some Paleoindian sites in the Lower 48 states are known to contain large blades and blade-like flakes, both the southern and Northern Paleoindian traditions lack microblades. Numerous fluted points also were found at the Batza Tena obsidian source south of the Brooks Range on the Koyukuk River by archeologist Donald Clark. Unfortunately, many of these sites were surface sites or sites with very shallow deposits with little organic preservation, which made dating difficult. However, enough dates now exist to determine that these sites range in age between roughly 12,500 and 11,500 year old.

One of the better documented Paleoindian sites is the Mesa site, located on the north flank of Alaska's Brooks Range and excavated by Mike Kunz. It is 11,500 years old and contains lanceolate projectile points with edge-ground, straight, constricting, and concave bases, as well as large thin bifaces. It also has spurred gravers made on flakes, unifacially flaked lithic tools, scrapers, retouched flakes, hammer and anvil stones using stream cobbles, waste flakes from tool production, quartz crystals, and possibly hematite. No faunal remains were recovered; however, the ecological setting suggests that the site was used as a lookout for large mammals where waiting hunters manufactured and repaired their projectiles and tools.

Spein Mountain is another Paleoindian site, excavated by Robert Ackerman and located about 37 miles (60 km) east of Bethel in southwestern Alaska. A single radiocarbon date from a hearth-like depression containing charcoal and burned bone suggests the site is about 11,560 years old. By studying the pollen found in the sediments, scientists can tell that there were no trees in the region when the site's inhabitants lived there. Grasses were the predominant plants growing near the site at the time of occupation. The site lacks microblades or evidence of microblade technology. The stone artifacts include flakes, bifacial adz blades, ovate (oval-shaped) bifaces, biface preforms, gravers, flake knives, scrapers, a whetstone/abrader, a notched flake, cobble spall scrapers, choppers, hammer stones, split cobbles, and bifacially flaked lanceolate projectile points with constricting bases.

Some of the earliest archeological evidence for lanceolate points in northwestern Alaska is from a series of sites with similar types of tools in the Noatak River region. They are characterized by comparatively thick constricting (sides tapering, or narrowing, toward the base) lanceolate projectile points and a variety of similar cutting and scraping tools. The projectile point bases from these sites were manufactured by regular flaking along their margins and grinding on their edges. Sites containing these types of artifacts have been ascribed to the Sluiceway complex, named after the Irwin Sluiceway site where artifacts of this type were first recognized. The Irwin Sluiceway site and a site MIS-495 have been radiocarbon dated between 10,200 and 11,500 years ago contain artifacts that share similarities in manufacturing methods with other Northern Paleoindian tradition sites. Based on the ecological setting of these sites, it is presumed that they were used primarily for caribou hunting or possibly bison. Tuluaq Hill, another Sluiceway complex site, has seven radiocarbon dates that suggest it was occupied between 13,100 – 13,000 years ago, and therefore older than other Sluiceway sites. The distinctive projectile points and absence of microblade technology at Tuluaq Hill and the Irwin Sluiceway site are further proof to some archeologists that they are related to a broadly defined Northern Paleoindian tradition.

Another site in northwest Alaska, simply called NR-5, is reliably dated to circa 10,900 years ago and its setting suggests that it was probably also used for caribou hunting. At this site, however, Sluiceway complex projectile points are found along with microblades. Sites such as NR-5 with Paleoindian-like projectile points associated with microblades are not typical. Presuming the artifacts are not mixed, there are several possible explanations for the association: 1) that these types of projectile points became incorporated into the American Paleo-arctic tradition about this time in northwest Alaska; 2) that the Northern Paleoindian tradition began to incorporate microblade technology in its tool kit; or 3) there is a functional or seasonal reason that microblades were used at this site and not the others.

Stone projectile points typical of the Northern Paleoindian tradition (fluted and related lanceolate forms) have been found throughout Central and Eastern Beringia. By including the northern examples within the larger tradition as defined for the rest of North America, it is assumed that people who made and used these tools in Beringia were part of a larger population, sharing a similar way of life and economic system. Some archeologists have suggested that initially this may have been predominantly bison hunting. As the environment gradually changed, bison populations appear to have declined and caribou populations probably increased in the interior of Alaska. Northern Paleoindians may have had to place increasing emphasis on caribou hunting to cope with these changing conditions.

The radiocarbon dates from Spein Mountain, Putu, and Mesa sites suggest that the Paleoindian tradition arrived in Central Beringia 12,500 years ago, shortly after the partition of the continental ice and the establishment of biological resources essential to sustain human subsistence in the newly deglaciated region. The southern origin of the Northern Paleoindian tradition is supported by the discovery of similar Paleoindian artifacts at a site called Charlie Lake Cave in northeastern British Columbia dated to about 12,600 years ago and another Paleoindian occupation at Vermilion Lake in Banff National Park in Alberta, Canada, probably about 12,800 years ago.

In the North American sector of Central Beringia, the archeological evidence is confusing during this time period. It appears that the region first was settled by people from Asia who made and used microblades and other tools similar to those ascribed to the Dyuktai culture in Russia. On the American side of Bering Strait this tool making tradition is called the American Paleo-arctic (or Eastern Beringian) tradition. The evidence also suggests that about 12,500 years ago a new group of people, called Paleoindians, arrived in Central and Eastern Beringia from the south. Apparently they did not occupy the Asian side of Central Beringia, because the distinctive types Paleoindian artifacts have not been found in Asia.

Most archeologists believe that the artifacts from these sites represent two distinct groups of people — one that used microblades and another that did not. The Northern Paleoindian tradition is best characterized by distinctive fluted and other types of lanceolate stone projectile points used to tip atl atl darts, while the artifacts used by the Dyuktai and American Paleo-arctic traditions relied more heavily on the manufacture of microblades set in projectile points made from bone, antler, and ivory. These technological differences should enable archeologists to define the geographic boundaries of these traditions based on the age and location of the archeological sites that contain these distinctive types of artifacts, but such an analysis has proven problematic because of the difficulty in interpreting the age of many sites.

Because microblade technology is older in Asia, archeologists can tell that the American Paleo-arctic tradition originated there and later spread to northwestern North America. On the other hand, the origin of the Northern Paleoindian tradition lies in southern areas North America, with the tradition spreading northward and reaching Eastern and Central Beringia about 10,500 years ago. It is possible that people of the American Paleo-arctic and Paleoindian traditions may have lived side-by-side, perhaps peacefully or in conflict, practicing different ways of life and possibly speaking different languages. It is also possible that Paleoindian people may have occupied interior regions of Alaska as they pushed northward, forcing Paleo-arctic people to focus more of their economic activities along the coast. If this were the case, most Paleo-arctic tradition sites would now be destroyed or underwater because the coast lay further seaward before it was flooded by rising sea levels at the end of the last Ice Age. Some archeologists suggest that the boundaries between these people may have overlapped, or perhaps were shared during different seasons of the year or periods of time. Although much remains to be learned about the character of these interactions, the northward movement of

Paleoindian people may document the first large-scale contact between Asian and uniquely developed North American cultural traditions.

Northern Archaic Tradition (7,000 – 4,500 years ago)

By about 7,000 years ago, people who lived along the shores of the Bering Sea began to manufacture their stone tools in a new way. On the North American side, microblade manufacture and use seems to disappear, being replaced by a different and uniquely American style of making stone tools. Stone projectile points with notches chipped into their sides and bases seem to replace bone or antler points armed with microblades. Like the earlier projectile points of the Northern Paleoindian tradition, these distinctive stone projectile points appear to have been used to tip the shafts of darts propelled with the use of a spear thrower (atl atl), rather than to tip arrows. It is difficult to tell whether late Paleoindian people living in Eastern and Central Beringia adopted this new technology or if it actually marks the arrival of new people in Beringia. The notched stone projectile points that characterize this tradition are commonly found along with other types of artifacts including end scrapers, elongated and semi-lunar bifaces, boulder-chip scrapers, large unifaces (large flakes chipped on one face), notched pebbles, hammer stones and choppers. In the southern regions of North America these types of artifacts signify the Archaic tradition. When similar types of tools were excavated at the Onion Portage site in Central Beringia, Douglas Anderson assigned them to the Northern Archaic tradition.

At some sites notched projectile points have been found with microblades. However, many archeologists believe that at the beginning of the Northern Archaic tradition people did not make or use microblades and that they may have added microblades to their tool kit later in time, possibly after prolonged contact with people who continued to make and use them. The uniquely different stone tools of the Northern Archaic tradition appear to have their origins in the more southern regions of North America where similar and older types of artifacts have been found. Some archeologists believe the Northern Archaic tradition may indicate an actual migration of people into Central and Eastern Beringia from the south. It is difficult to determine if the presence of these Archaic tools is actually a migration of people or the spread, or diffusion, of new ideas and technology from people already living in Central and Eastern Beringia.

During this time the boreal forest expanded beyond its present limits. Some archeologists have suggested the Northern Archaic people may have lived along the forest edge, or within the zone of transition, or ecotone, between the tundra and forest. In some cases Northern Archaic sites have been discovered in areas that were tundra at the time the site was occupied. There is some evidence suggesting people may have built shallow semi-subterranean tent-like houses. They also camped in circular tents with small fires in the center.

Alaskan archeologist William Workman suggested that people carrying the tradition spread northward from the southern areas of North America and entered Alaska along the Brooks Range where these types of artifacts have been dated to about 6,800 years old. They have been found on Alaska's North Slope and on the arctic coastal plain north of the Brooks Range. The Northern Archaic tradition extends to Central Beringia where it is well dated at the Onion Portage site and along the coasts of the Bering and Chukchi Seas. Subsequently groups spread south into central interior Alaska as indicated by a series of later radiocarbon dates.

Northern Archaic people camped next to the coast of the Bering Sea about 7,000 years ago. At least two Northern Archaic sites have been found on the coast, one at Security Cove near Kuskokwim Bay and the other at the upland Palisades region of Cape Krusenstern. They probably date to about 7,000 years ago. Even though they are located on the coast, there is little evidence that these were marine mammal hunting sites. However, at Security Cove, a number of notched pebbles were found that may have been used as net or line weights for fishing. The evidence suggests that the economic emphasis of Northern Archaic people was hunting large land mammals, primarily caribou, and probably fishing along lakes, rivers and possibly along the coast. Although the Northern Archaic tradition reached the shores of the Bering and Chukchi Seas, it does not appear that this distinctive North American lifestyle crossed to the islands of the Bering and Chukchi Seas or the Asian mainland.

By at least 6,000 years ago Northern Archaic tradition hunters using notched stone projectile points occupied the northern side of the Alaska Peninsula. Local names have been given to the phases of this cultural tradition to help define the types of artifacts as they changed over time. They are clearly similar to Northern Archaic artifacts found elsewhere and correspond to the larger Northern Archaic tradition recognized widely throughout Central and Eastern Beringia. By about 5,000 – 4,500 years ago, there is a transition from side-notched to corner-notched stemmed stone projectile points in this region.

Central Beringia Neolithic in Asia (7,000 years ago – present)

Although the Northern Archaic tradition entered Central Beringia from the south and east on the American side of Bering Strait, Northern Archaic artifacts have not been found on the Asian side of Bering Strait. It appears that the northwestward movement of this distinctive technology did not cross Bering Strait and remained restricted to North America. The archeological record on the Asia side of Central Beringia suggests a gradual transition from Dyuktai to Sumnagin culture. The Sumnagin people appear to have migrated along river valleys to the coast where they learned to make their living from the sea between 12,500 and 7,000 years ago. However, in Western Beringia the evidence for maritime economies does not become evident until sea level stabilized about 4,500 – 6,000 years ago.

Archeological evidence suggests that the Sumnagin adaptations developed from Asian Mesolithic cultures, possibly represented at such sites like Tytyl′-1 and Puturak Pass that emphasized the use of large blades and occasionally bifacially flaked stone artifacts. Beyond the western border of Central Beringia, Yuri Mochanov defined Syalakh culture, which flourished between about 7,100 and 5,900 years ago in the Lena and Aldan River valleys. The influences of the riverine adapted Syalakh culture extended as far east as western Chukotka. Syalakh culture contains microblades and slotted bone points to receive them, multifaceted (or polyhedral) burins, barbed (not toggling) harpoons, polished adze blades, and egg-shaped ceramic pots with round bases.

It appears that Syalakh culture influenced the development of the Neolithic cultures of Chukota and Western Beringia in both Asia and North America. The early evidence of ceramics and stone grinding suggests to some Russian archeologists that Syalakh culture could be a forerunner of the later maritime-adapted cultures that develop in Central Beringia. According to Yuri Mochanov, the Syalakh culture develops into the Bel'kachi culture in the same region. The Bel'kachi culture lasts from about 5,200 to 4,100 years ago during which time microblades continue to be used as side blade insets. There are also leaf-shaped and triangular bifacial projectile points, notched stone line weights, composite fish hooks, large steep-angled ground stone adze blades. The Bel'kachi culture had ceramic pots with distinctive round and pointed bases, decorated with a lineal stamp produced by a pottery paddle wrapped in cord.

Farther west along the Lena and adjacent river valleys in Yakutia, the Ymyakhtakh culture flourished. It was defined by Aleksyey Okladnikov and dated between 4,800 – 3,400 years ago. This complex, further defined by Svetlana Fedoseyeva, contains microblade cores, microblades, and bifacially flaked side blades, ground adze blades, and burins similar to the Arctic Small Tool tradition in America. The Ymyakhtakh culture is believed to have had a strong influence on cultures to the east in Chukotka. In addition to stone tools, Ymyakhtakh sites typically contain tools made from copper and bronze.

Nikolai Dikov has reported several undated sites from Chukotka that contain comparable types of tools, some associated with early ceramics. These sites indicate that a similar transition from the Mesolithic to the Neolithic cultures occurred throughout northeast Asia. In particular, Dikov speculates about possible relationships between the Okvik site at Chini with earlier artifacts from the Ust'-Bel'skaia cultural complex, located on the Belaia River at a caribou crossing on the Chukchi Peninsula. Ust'-Bel'skaia is estimated to have been occupied between 4,000 and 2,000 years ago and has been divided into two periods, or components. The early component apparently contains an open-socket toggling harpoon head with a line hole and linear cord-stamped ceramics. The later component, dating to about 2,000 years ago, contains copper or bronze engraving tools. Dikov suggested that the artifacts are similar to the well-documented Arctic Small Tool tradition and the later Norton complex on the Alaska side of Central Beringia. The Ust'-Bel'skaia cultural complex could possibly be a predecessor to the elaborate "Neo-Eskimo" cultures of Central Beringia.

In the southwest area of the Bering Sea along the Asian coast, Russian researchers have excavated and documented the remains of Old Kerek, or Lakhtina Culture. Russian archeologist Aleksandr Orekhov has explored the coastal and adjacent inland areas from the Gulf of Anadyr south to Cape Olyutorskiy. This research led Orekhov to propose that Lakhtina culture originated from a migration of Mesolithic hunters who settled on the coast and developed the distinctive Lakhtina adaptation of making a living primarily from the sea. The culture is divided into two periods, the earliest dating possibly as early as 4,500 years ago and continuing until about 2,350 years ago. The later period dates between about 2,350 until approximately 300 – 200 years ago, when the Kerek people living along the coast were in regular contact with Europeans. The first stage is characterized by the use of blades, blade cores and chipped stone tools, but most sites lack bone preservation. By about 3,800 years ago people began to make and use ceramics and artifacts made of polished slate become more common.

The second period of Lakhtina culture (2,300 – 200 years ago) is still poorly known. During this time people lived in circular semi-subterranean dwellings with interior hearths with upright slabs of stone and entrance passages. Some of the later houses appear to be connected to form multi-room structures. The soft clay of spherical-shaped ceramics was marked with comb-like striations, linear stamps, or cord. Some sites are described as shrines or altars where elaborately carved ritual wooden arrows and darts have been left, sometimes in association with animal bones or skulls.

Lakhtina artifacts made from antler, ivory, and bone are very distinctive. People did not use, or only rarely used, the toggling harpoons that were so successfully employed for marine mammal hunting in other regions of Beringia. Many of the weapons were armed with arrow and dart points elaborately carved from antler and ivory. They had sockets drilled in the base into which the wooden shafts were secured. The quantity and quality of the decoration on a variety of objects suggests a period of artistic development that occurs about the same time as it does in other areas in the Bering/Chukchi Seas region. Some of these types of Lakhtina artifacts have been found on St. Lawrence Island and suggest interaction with cultures to the north.

Arctic Small Tool Tradition in North America (5,000 – 4,000 years ago)

Beginning about 5,000 years ago and continuing until about 4,000 years ago along the North American coasts of the Bering and Chukchi Seas and adjacent inland areas, there is a resurgence of archeological sites characterized by the use of microblades and oriented toward marine mammal hunting and exploitation of adjacent interior regions, primarily for caribou hunting. Archeologist William Irving coined the term Arctic Small Tool tradition (abbreviated ASTt) to encompass a variety of archeological sites that contained microblades, blocky microblade cores, burins, and flake knives. Other artifacts include antler arrow points and grooved shaft smoothers for making arrows, indicating the continued use of the bow and arrow. ASTt sites are found on the North American side of the Bering and Chukchi Seas from the Alaska Peninsula north to the Arctic Ocean. The best dating for this tradition comes from the Onion Portage site, located in Northwest Alaska and excavated by Douglas Anderson and Louis Giddings.

At this time in northern Alaska, sea level had stabilized and people living along the coast of the Arctic Ocean began moving eastward across arctic North America. Beginning shortly before 5,000 years ago, early ASTt people rapidly colonized the recently deglaciated land of the eastern Arctic. The earliest tools they left in Canada and Greenland are very similar to those of the early ASTt that were in use in Alaska. However, in the eastern arctic they have been given different names; there they are called Independence I or pre-Dorset. They made and used microblades and other tools similar to those of their relatives in Alaska. The term Paleo-Eskimo is commonly used to describe the artifacts left behind by people of the Arctic Small Tool tradition. Most archeologists believe that these hunters and explorers were ancestors who laid the foundations for later cultures in the continuum of Eskimo cultural development that became fully developed in Central Beringia by about 2,000 years ago.

The Denbigh Flint complex is the classic period that defines the types of artifacts associated with the ASTt. A type site is the site of the original discovery to which all subsequent discoveries are compared. For the Denbigh Flint complex the type site is at Iyatayet on Cape Denbigh in Norton Sound. Louis Giddings excavated at

Iyatayet for four field seasons between 1948 and 1952 and called the unique artifacts he found there the Denbigh Flint complex. The Iyatayet site provides a fascinating glimpse into the evolution of the use of microblades.

The beautiful chipped stone artifacts from the Denbigh Flint complex are exquisitely crafted. Commonly made from obsidian and other exotic types of stone, they are delicately flaked by removing parallel chips that angle obliquely across the surface of the artifacts (Figure 5.5). Some of the artifacts include small scrapers, blocky microblade cores, microblades (Figure 5.6), distinctive "mitten-shaped" burins, ground stone adze blades, finely-flaked triangular end and side blades used to arm antler arrow heads. Some of the flaked side blades are so thin they appear to have been chipped from microblades. Many archeologists view this as a time of transition, when microblades are being replaced by bifacially chipped side blades.

The ASTt occupation at Iyatayet appears to have been a camp. There is no evidence of houses or semi-permanent dwellings. The site is a good location for caribou hunting and sealing. At Onion Portage, the remains of several relatively small, round houses with central stone-lined hearths were excavated. They all appear to have entrance passages below the sod to make them warmer. At other sites on the north side of the Alaska Peninsula, Don Dumond has excavated similar structures. In the Brooks Range, Denbigh Flint complex artifacts have also been found associated with similar structures that are square, rather than round.

An ASTt site located at Matcharak Lake in Alaska's Brooks Range contains well preserved organic remains. Excavated by Andrew Tremayne, the site provides exceptional evidence of the diet of ASTt people living in the interior. The site appears to have been occupied primarily in the fall and more than 81,000 bones were recovered from the excavations. Their analysis revealed that caribou were by far the most important animals hunted and probably comprised more than 90% of the diet. People also harvested other mammals including Dall sheep, porcupine, marmot, ptarmigan, and ground squirrel. Fish (burbot, grayling, northern pike) and a few migratory ducks were also recovered from the site. Based on animal bones and fish remains and the ecological setting of ASTt sites, it appears that people during this time probably hunted caribou using the bow and arrow, fished along streams and lakes, and hunted marine mammals, possibly with the use of boats.

Most archeologists see a historical relationship between the American Paleo-arctic and Dyuktai traditions and the later Arctic Small Tool tradition. While in some parts of Central and Eastern Beringia they are separated by the intervening Northern Paleoindian and Northern Archaic traditions, in Asia they are not. However, little is known about this time period on the Asian side of Central Beringia. Russian archeologist Nikolai Dikov suggested that these early cultures developed from the Mesolithic cultures of Northeast Asia.

Other archeologists have speculated that perhaps early proto-Denbigh developed from the Dyuktai culture on the Asian side. According to this theory, people from Asia may have crossed the Bering Strait and settled on the American side as the Northern Archaic tradition was abandoned on the North American coast. If these people were primarily oriented toward making their living from the sea, many sites dating to this period of transition may have been destroyed or flooded by the ocean that was rising rapidly at this time.

Figure 5.5 Exquisitely flaked stone artifacts from the Denbigh Flint complex, Alaska: 1–3 end blades; 4 unfinished end blade; 5–8 end blades; 9-11 side blades; 12, 13 drills or lancets; 14–17 side blades (Giddings 1964, plate 71-b).

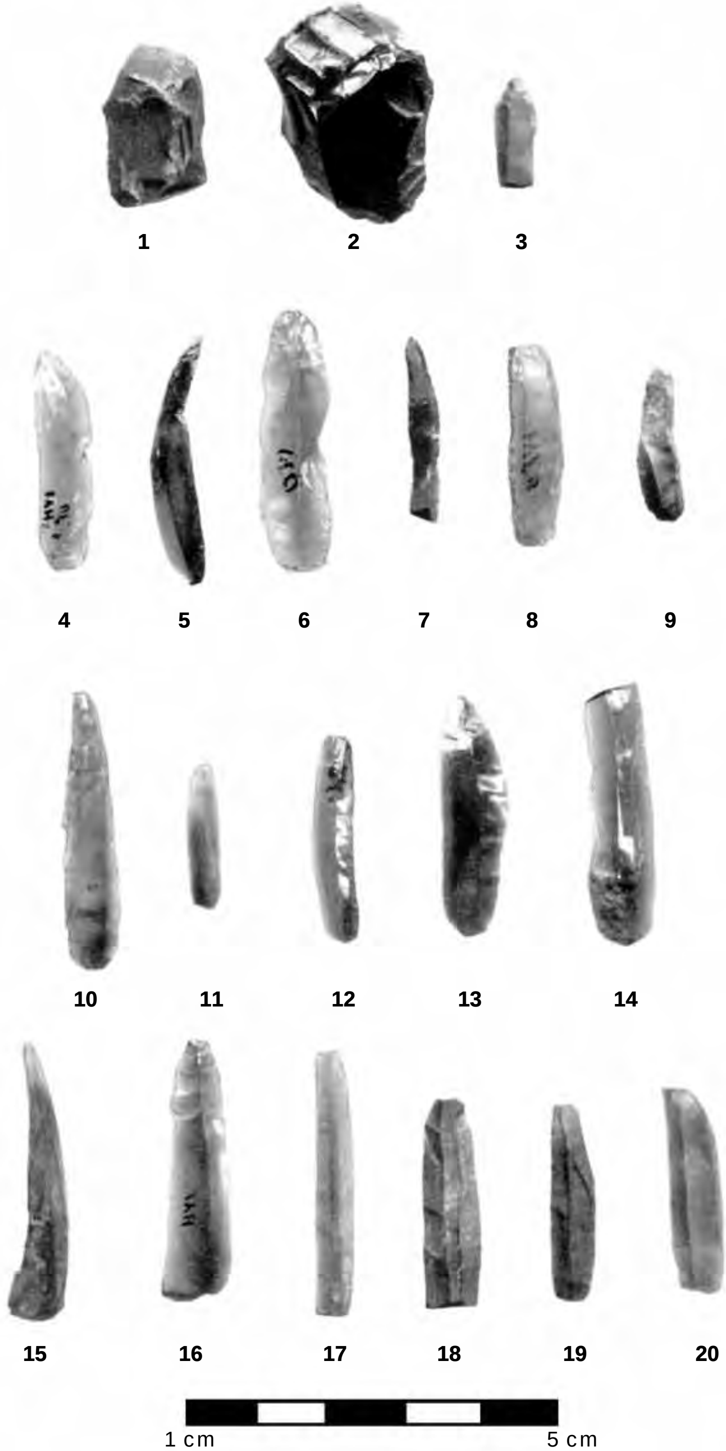

Figure 5.6 Microblades and other artifacts of the Arctic Small Tool tradition, Denbigh Flint complex: 1 core scraper; 2 microblade core; 3 burin struck on a microblade; 4–20 microblades (Giddings 1964, plate 65).

There is a surprising similarity among the archeological sites known from the ASTt extending from the Bering Sea drainage of the Alaska Peninsula northward along the coastal margin and eastward all the way to Greenland. These resilient people appear to have been able to move seamlessly between the coast and interior to make their living and were the very first humans to enter the vast regions of arctic Canada and Greenland. Once they settled there, they lived in relative isolation from the rest of the world. Over time they gradually developed their own unique customs and ways of making tools. Their way of life continued in northeastern Canada and Greenland until another wave of immigrants would come from Central Beringia thousands of years later.

Choris, Old Whaling, and Lakhtina (3,800 – 2,600 years ago)

At the end of the Arctic Small Tool tradition in Central Beringia, people stopped making microblades. Although they continued to be used elsewhere, the microblade technology that had served people well in Central Beringia for thousands of years was abandoned. Microblade insets were replaced with insets made by bifacially chipping stone. Other technological innovations were introduced at this time, including pottery.

In Central Beringia the Choris period spans the interval between about 3,800 and 2,600 years ago and is roughly contemporaneous with the early stage of Lakhtina culture in Asia. Choris culture is named after Alaska's Choris Peninsula, where the first artifacts of this type were found by Louis Giddings. Choris has been documented only on the North American shores of the Bering/Chukchi Seas. It occurs during a time of dramatic transition in the Bering Sea region. Although some archeologists regard Choris culture as the last stage of the Arctic Small Tool tradition, in many respects it is a watershed in cultural development. Although some of the fine craftsmanship used to make stone tools during ASTt times is evident, there is greater variability and possibly experimentation in making stone projectile points that include large lanceolate, stemmed, and notched forms. Other technological innovations appear for the first time, including fiber-tempered pottery with round or conical bases decorated with linear and checked stamped designs.

People lived in large semi-subterranean oval structures that probably housed more than one family. The preservation of bone and wood is better at Choris sites than at older sites and includes the remains of waterfowl, seals, and most commonly caribou. Some houses have central hearths where wood was burned, but others appear to have been heated using stone lamps that probably burned seal oil. Some Choris sites are situated along the coast where they appear to have been occupied year-round. Choris houses and tent-like structures have also been found in inland areas where they probably hunted caribou. People pierced their cheeks and lips, probably with sharp pointed lancets chipped from stone, and inserted labrets in the piercings. Drills were common and burins were made on bifacially chipped and sometimes notched stone tools and even projectile points. The trend to increasingly make stone tools by grinding, rather than chipping, continued. For instance, slate knives and ulu blades were made by grinding.

The ulu is a semicircular "woman's knife" widely used by Eskimo people and typically associated with Eskimo culture. The blades of the earliest forms were chipped from large stone flakes that were presumably hafted in a handle. Later types are made using ground stone, most commonly slate, to form the blade. When metal became common, the blades were made from iron. This type of knife is still popular and widely used by Eskimo and non-Eskimo people throughout much of Beringia.

At Onion Portage the remains of several tent-like features were discovered near a distinctive larger oval structure. The oval structure had a large square, stone-lined hearth located in the center and contained artifacts it that were mostly those traditionally associated with men's activities, such as making tools and weapons. The smaller tent-like features contained tools associated with domestic activities, such as hide and food preparation, and appear to be family dwellings. The larger structure has been interpreted to be the remains of a men's house, or kashim. Occupied by men, kashims were used for community activities by some Eskimo groups until historic times. In situations in which there was more than one kashim per community, they marked social factions and gender-linked divisions of society.

At Alaska's Cape Krusenstern, Giddings excavated several large oval houses with smaller attached rooms and entrance passages (Figure 5.7). Among the stone artifacts were large lance blades and projectile points. Based on the size of the artifacts and the presence of whale bone, Giddings suggested that the people who had occupied the site had hunted and butchered whales. He named the houses and associated artifacts the Old Whaling Culture. Other types of stone artifacts include small chipped stone arrow points, chipped stone side-blade knives, chipped sealing harpoon side blade, stone lamps, chipped stone ulus, and some ground slate implements. Organic artifacts include part of an arrow shaft, a shaft for thrusting or throwing spears, and eyed and notched sewing needles. Another important discovery was a toggling sealing harpoon that had a carved pointed tip rather than a stone blade. It also had a single spur, a gouged line hole, a square shallow open socket, a lashing grove and an opposing lashing slot. This type of harpoon head would continue to be used for another 2,000 years.

Just as the styles of stone projectile points and other tools can be classified based on their shape and how they were made, so too can toggling harpoon heads made from bone, ivory, or antler. A barbed spear (dart or harpoon) holds the animal by the barb catching in the flesh (Figure 5.8). However, a toggling harpoon works by the harpoon head detaching from the shaft and then turning sideways in the wound. The spur forces the harpoon head to turn sideways, or toggle, when it is pulled backward by the line that is attached to a drag, float, or hunter (Figure 5.9). By examining the various characteristics that go into making a toggling harpoon (Figure 5.10) and how they are decorated, archeologists can determine how old they are and how they have changed over time.

In Asia, Nikolai Dikov excavated several sites in the area of the middle Anadyr River that flows eastward into the Bering Sea. He recognized the similarity of the artifacts that were all about the same age and named them the Ust'Belskaia culture after one of the sites that best typified this time period. Artifacts included burins made of chipped stone as well as bronze, thin-walled ceramics marked with a linear stamp, stemmed and leaf shaped projectile points, and chipped side blades. Microblades and microblade cores are present, but they are irregular and less common than during earlier times. Although not well dated, the Ust'Belskaia culture is estimated to be between 3,500 – 2,500 years ago, and possibly slightly older. Most archeologists believe that it gave rise to technological innovations that appeared slightly later during the Choris period in North America.

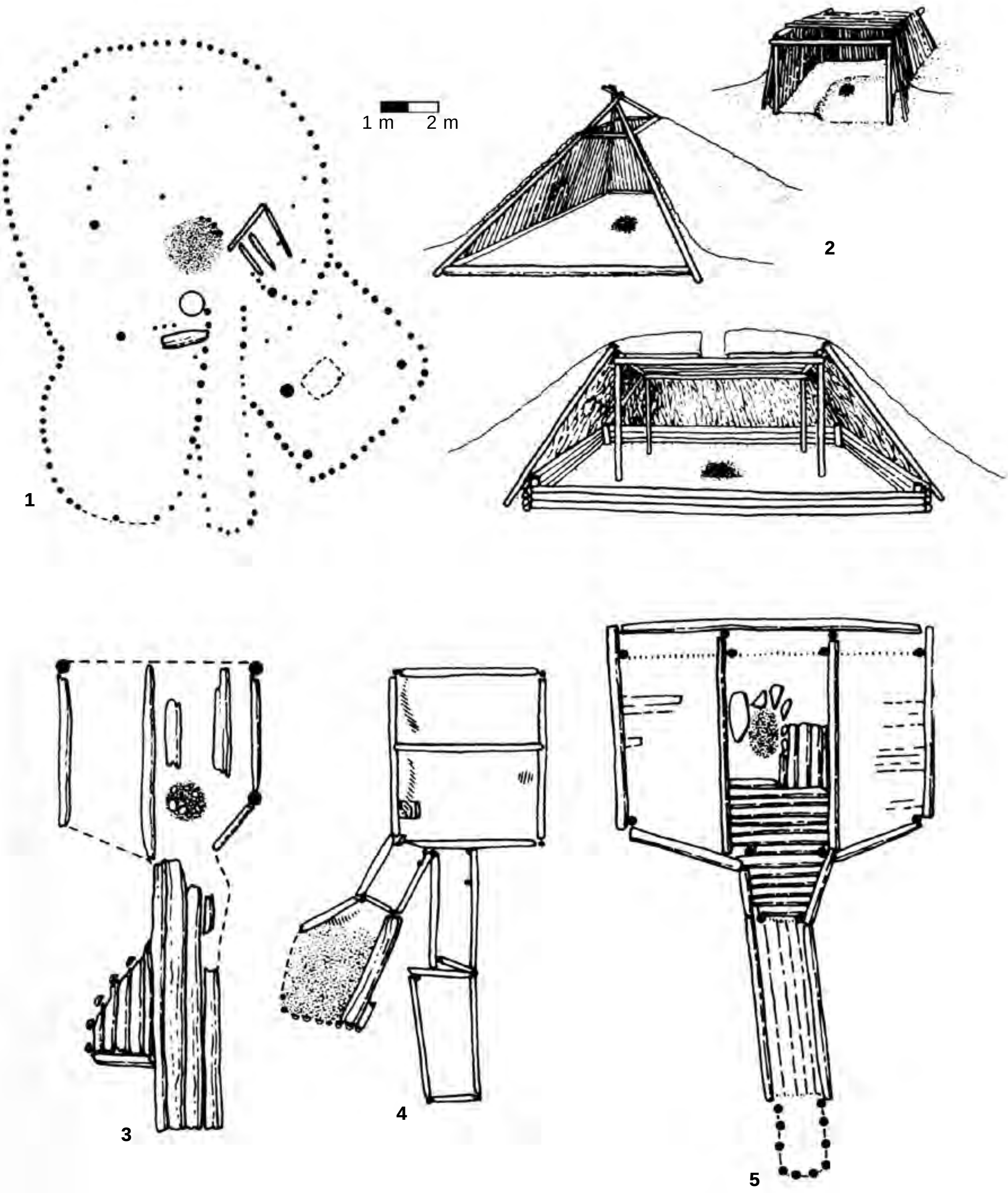

Figure 5.7 Central Beringia house plans from Cape Krusenstern, Alaska: 1) Old Whaling house; 2) Ipiutak house types; 3) Birnirk house; 4) early western Thule House; 5) fifteenth-century house, Kotzebue Sound (Anderson 1984:81).

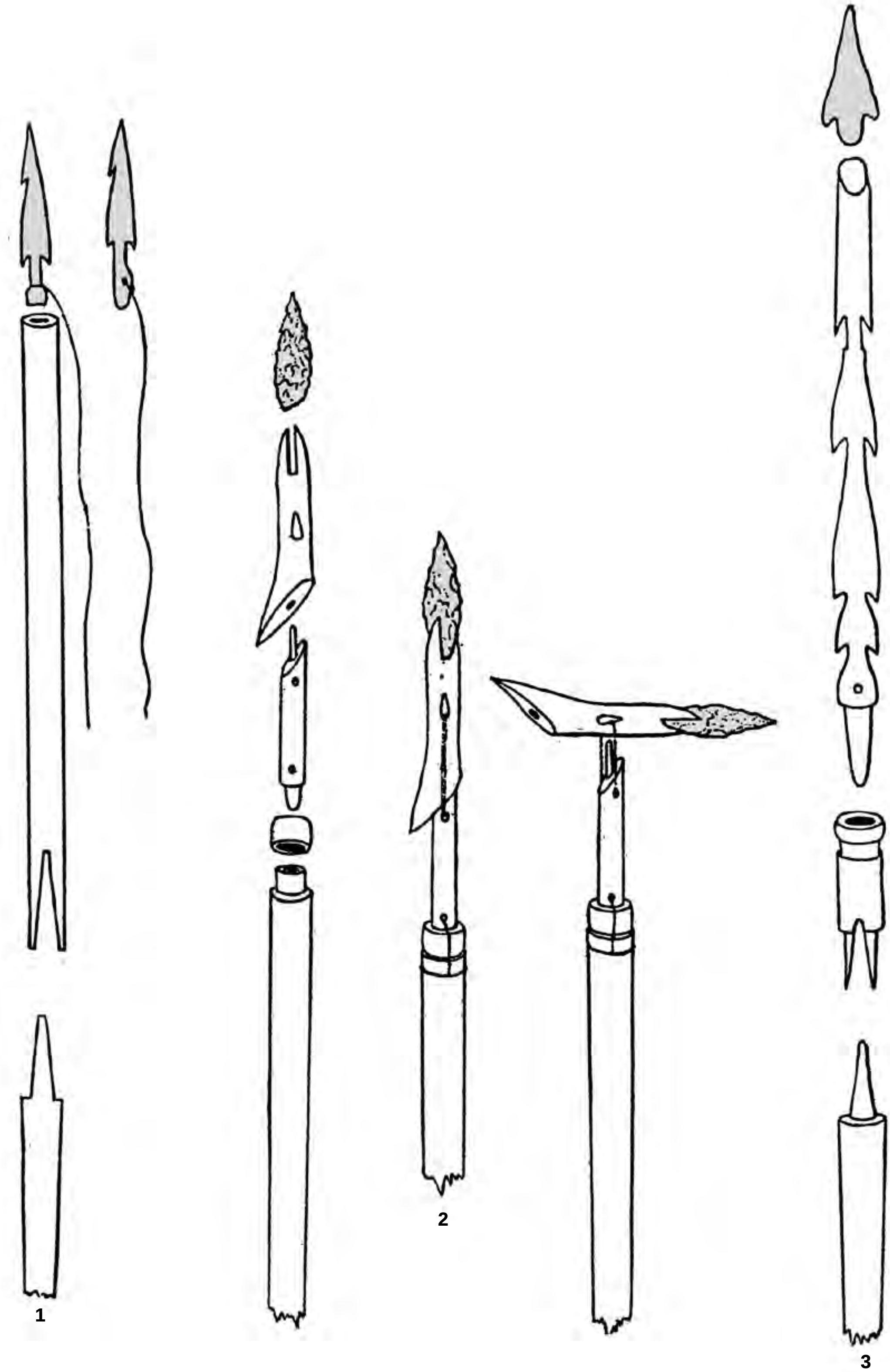

Figure 5.8 Types of harpoons: 1 simple barbed harpoon with detachable head with line to "neck" or line hole; 2 (center three images) compound toggle-head harpoon; 3 throwing lance (Modified from Jochelson 1925).

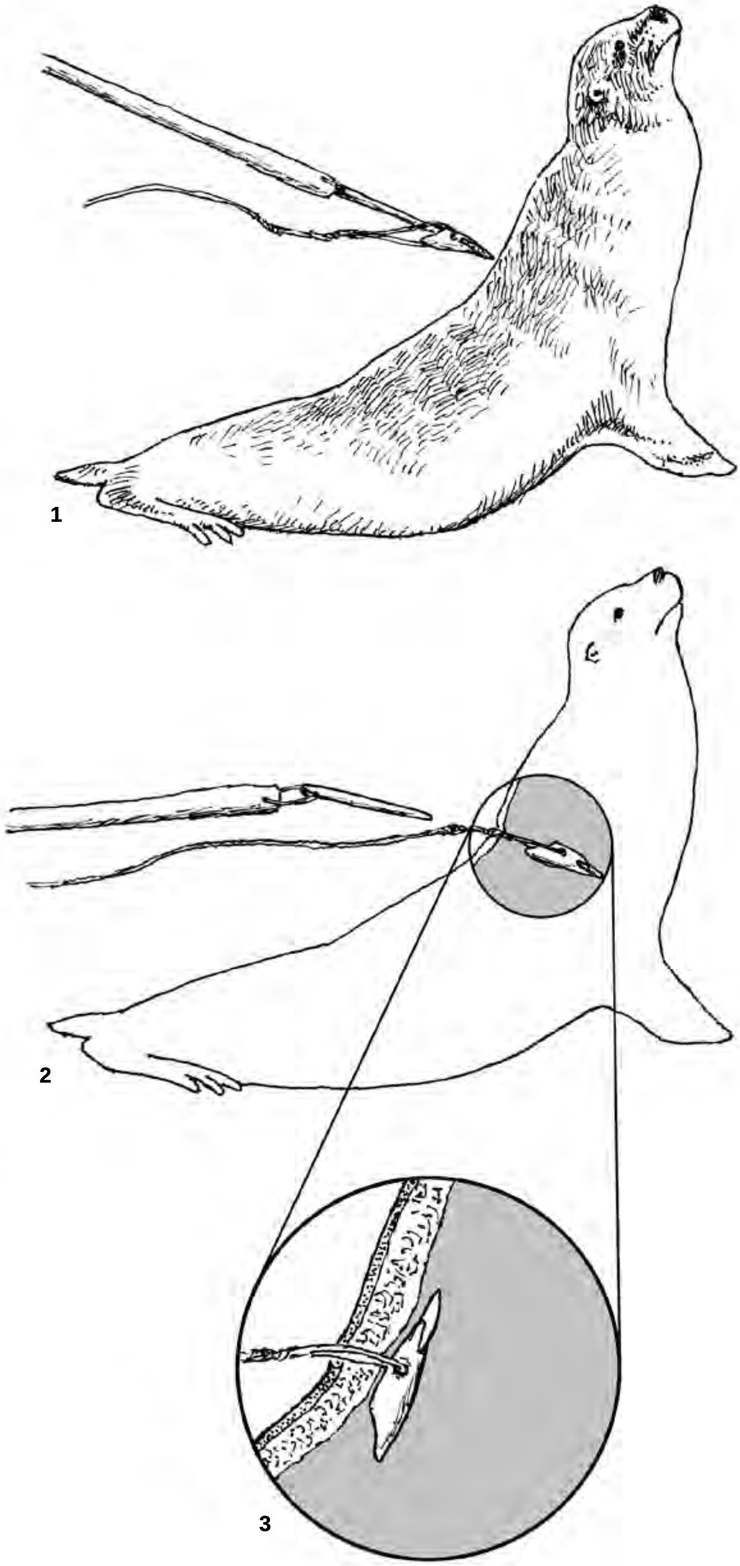

Figure 5.9 The principle of a toggling harpoon; 1 tip pierces hide enabling entry; 2 socket and foreshaft detach; 3 resistance forces the spur to turn sideways decreasing the chances for the animal to escape.

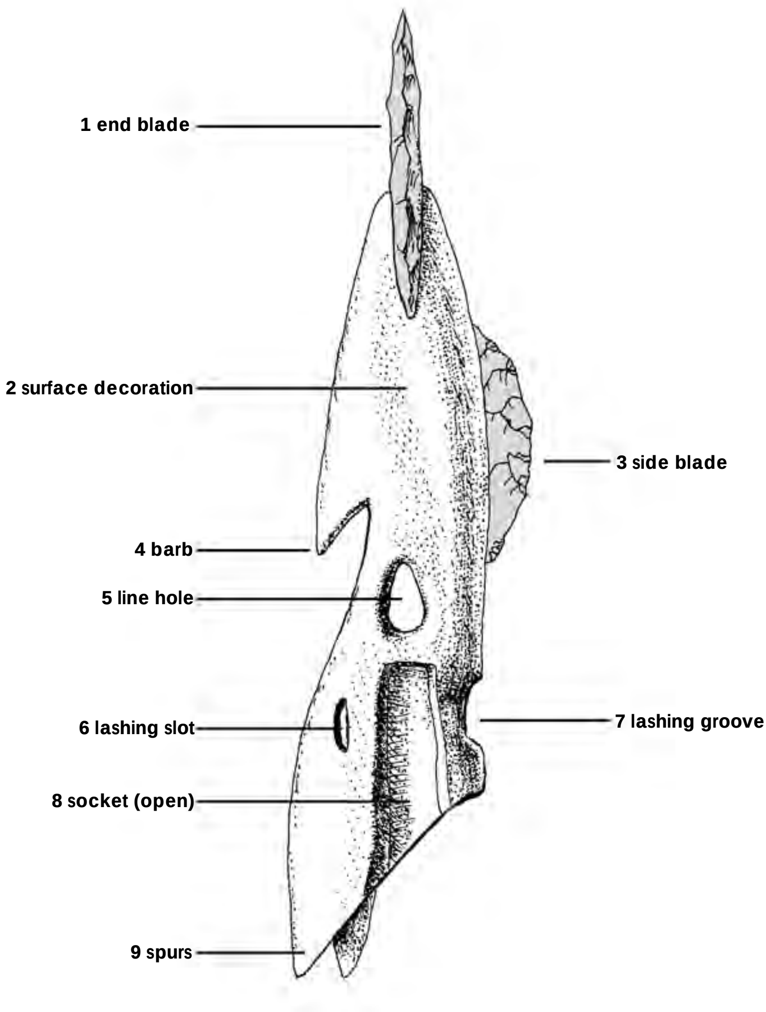

Figure 5.10 Attributes of a toggling harpoon head: 1 end blade; 2 surface decoration; 3 side blade; 4 barb; 5 line hole; 6 lashing slot; 7 lashing grove; 8 socket (open or closed); 9 spur(s) (modified from Bandi 1969 and Schledermann 1996).

In 1975 the energetic Nikolai Dikov discovered the Devil's Log site on Wrangel Island, and long-term excavations were undertaken by Tasyan Tein. The site is located on the south coast near abandoned walrus rookeries and contains numerous stone tools that are strikingly similar to those from the Old Whaling site on Cape Krusenstern (Figure 5.11). Several radiocarbon dates between about 3,600 and 3,000 years ago indicate that the Devil's Log site is approximately the same age as Old Whaling at Cape Krusenstern in Alaska. Evidence for sea ice hunting is suggested by several ivory ice picks and trash pits at the site containing the bones of animals that live around sea ice including walrus, seals, birds, and polar bears. A toggling sealing harpoon head was found that is strikingly similar to the one from the Old Whaling site. However, the Russian specimen is not self-pointed (carved to a point) and has a concavity, or bed, to receive a stone end blade. The finds on Wrangel Island are regarded by most Russian archeologists as the oldest evidence for a life-way similar to that of later Eskimo people and interpret it to be the earliest known Asiatic evidence of "Paleoeskimo" culture.

Archeologists can't help but wonder if the mammoths that had been trapped on Wrangel Island by rising sea level at the end of the last Ice Age may have survived until humans arrived. These elephant-like animals gradually became smaller to adapt to the ever-decreasing food supply and small size of the island. The last of these pigmy mammoths are believed to have died out about 6,000 – 4,500 years ago. Based on the work that has been done thus far, there is no archeological evidence to indicate that humans who lived at the Devil's Log site saw or hunted these unique small woolly animals, the last of the species.

Because the Old Whaling stone tools and houses were so distinctive and appeared to be unlike anything that had been found until that time, the origins and cultural relationships of the Old Whaling culture have been a mystery to many archeologists. Looking at it from the larger perspective of Beringian prehistory, the Old Whaling and Devil's Log sites share similarities with other sites from the Choris period. Throughout this time period there are similarities between sites, such as oval houses, chipped side blade insets, and stone lamps. Although the "small" disappeared from the tradition of making stone tools during Choris times, many of the concepts such as the use of the bow and arrow and side blade insets suggest cultural continuity. The Choris period may also mark a time of social experimentation. The earliest archeological evidence for the social institution of the men's house, or kashim, can be traced to this time at Onion Portage. Perhaps Old Whaling represents a unique interval of experimentation, and perhaps exploration, during the Choris period when people broke with some traditions while maintaining others.

Norton Complex (2,400 – 1,900 years ago)

In the Bering Sea region Norton culture became widespread during the period between about 2,400 and 1,900 years ago. The Norton complex is defined by excavations on Norton Sound by Louis Giddings. The original site was Iyatayet in Norton Sound. The Norton complex was found stratigraphically above artifacts that defined the Denbigh Flint complex at Iyatayet. In contrast to the earlier oval Choris houses, Norton houses were rectangular semi-subterranean houses with entrance passages sloping from the surface outside the house downward to the floor inside. The

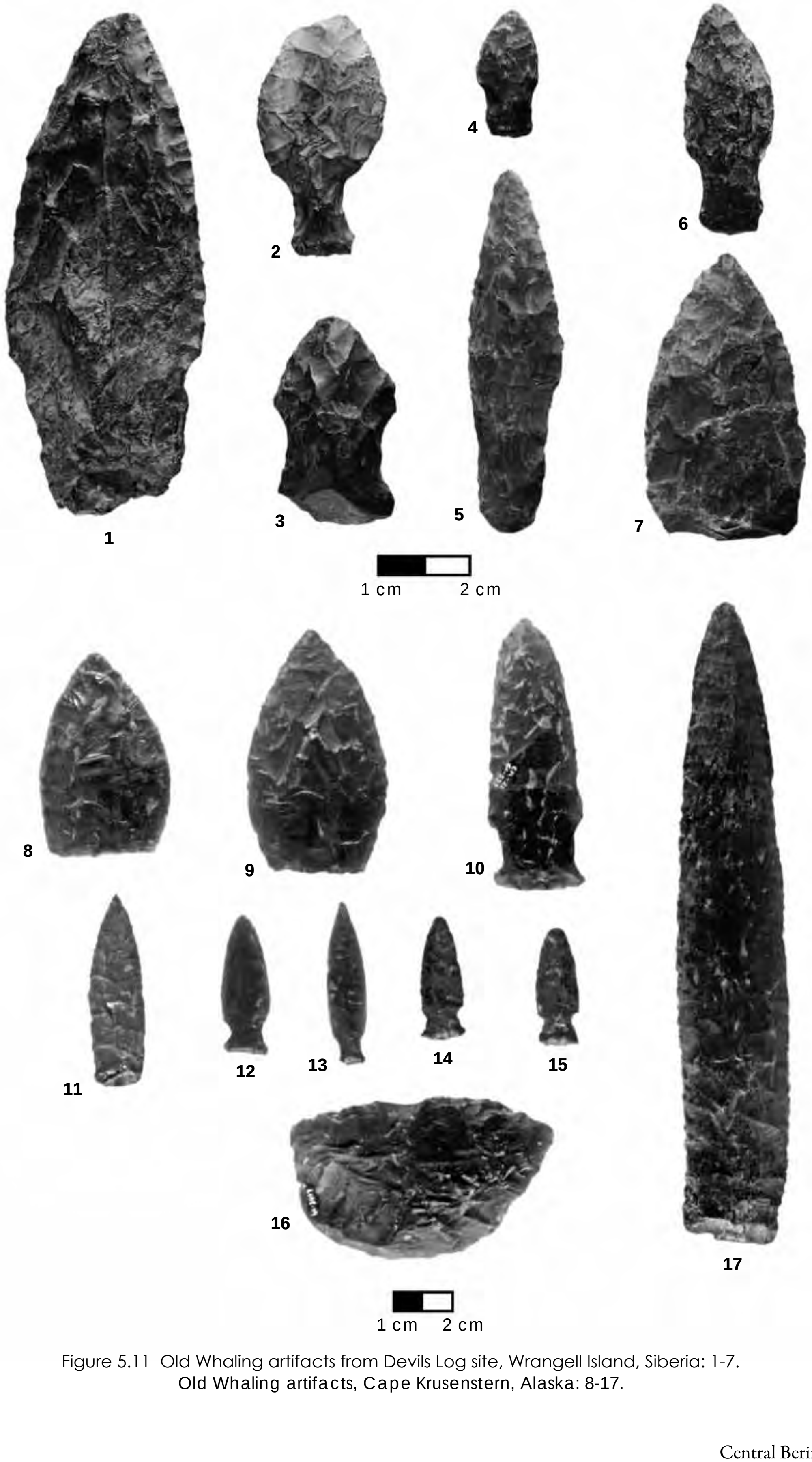

Figure 5.11 Old Whaling artifacts from Devils Log site, Wrangell Island, Siberia: 1-7.
Old Whaling artifacts, Cape Krusenstern, Alaska: 8-17.

use of pottery during Norton times becomes more common and the wet clay is most commonly impressed with a checked pattern stamp. Bifacially chipped disc-shaped scrapers, end blades and triangular side blades are common. Labrets are made from stone and are larger and more numerous than those used during Choris times. Chipped stone drill bits, chipped and polished adze blades, and stone oil lamps are associated with the Norton tradition. Ground stone burins for working bone, ivory and antler are common. Although many Norton cultural traits can be traced from Choris times, Norton also reflects influence from cultures to the south along the North Pacific rim, such as an increased emphasis on salmon fishing and slate grinding. Norton may have developed when the long technological tradition of the ASTt adopted influences and innovations from the North Pacific.

Norton period sites tend to be relatively large and have been found along the coast and adjacent inland areas from the north side of the Alaska Peninsula to the Chukchi Sea. Norton sites are frequently located on relative low coastlines backed by regions of expansive low tundra coastal plain. The economic base for Norton period sites located along the coast is seal hunting using toggling harpoons, and fishing along rivers primarily for salmon. In non-coastal areas, caribou hunting with the bow and arrow was important. During Norton times, fishing takes on increased importance and frequently sites contain relatively large numbers of notched pebbles that were used as weights for fish nets. Although the transition is not clear, most archeologists believe that the subsequent development of Old Bering Sea life ways and art probably developed from Norton culture.

Metal Age (2,500 – 1,000 years ago)

Metal (bronze and copper) was probably introduced into the Bering Sea region from Asia by 2,500 years ago or possibly earlier. Russian archeologists call this period the "paleometal epoch" and the period marks what many archeologist consider to be the beginning of Neo-Eskimo culture, or the time from which the same cultural patterns and life ways can be traced to modern Yupik and Iñupiaq people.

The use of microblades appears to be abandoned in most places when people began to use metal. Like stone, metal provided a sharp cutting edge needed to make clothing, weapons, and tools. Since metal is more durable than stone, small metal blades may have lasted for long periods of time, possibly even generations. Metal eliminated the need for finding suitable stone for tool making in winter and made the production of microblades no longer necessary. However, small pieces of oxidized and decomposed metal are difficult to recognize in archeological sites, so it is consequently difficult to determine when metal was first introduced into a specific area.

There are at least two sources for copper in Beringia, one in Asia south of Western Beringia and the other in Eastern Beringia along the Copper River in the Wrangell St-Elias region. At Cape Espenberg on Alaska's Seward Peninsula archeologists John Hoffecker and Owen Mason excavated two bronze artifacts, one of which appears to be a fragment of a buckle manufactured in Asia. A piece of leather attached to the object was dated to approximately 1,400 years ago, however the cast bronze artifact could be older. Although meteoritic iron and iron obtained from the Viking colony in Greenland (circa 1,000 years ago) was in wide use throughout the eastern North American Arctic, the iron used throughout Beringia appears to be from

Asia. It appeared later than copper and bronze and was obtained through exchange from Asian people living south and west of Western Beringia and then traded across Bering Strait. In later times it was also obtained from Pacific shipwrecks with nails, bolts, screws, and in other forms attached to driftwood. For the past 1,000 years the use of metal, particularly iron and copper, was widespread throughout all of Beringia.

By about 1,400 years ago, iron traded from Asia was being used to tip engraving tools and knives. Early archeologists, including Henry Collins and Helge Larsen, recognized that iron, although rare, enabled Old Bering Sea, Punuk and Ipiutak craftsmen to execute the delicate incised art characteristic of many of their tools and weapons. Evidence that people in Central Beringia were familiar with iron is reflected in ivory carving. Chains, swivels, spirals, and concentric circles are skillfully carved from single pieces of walrus tusk (Figure 5.12).

In 1926 Canadian archeologist Diamond Jenness found beautifully decorated harpoon heads and other objects at Cape Prince of Wales and Diomede Island in Bering Strait. He realized they were older than artifacts used by Eskimo people in more recent times and used the term "Bering Sea" to describe them. Subsequent research along the both the North American and Asian shores of the Bering and Chukchi Seas revealed a spectacular and elaborate artistry of Eskimo ivory carving that flourished between about 2,600 and 700 years ago.

In 1928 and 1929 Henry Collins, a young archeologist from the Smithsonian Institution, analyzed and compared the art styles and artifacts from several large sites he excavated on St. Lawrence Island and the Punuk Islands. This work laid the foundation for Eskimo archeology in the Bering Sea region. Collins realized that artifacts could be divided into periods that were distinguished from each other by distinctive art styles. Through his pioneering analysis he recognized that each style consists of a combination of unique design elements that could be used to define cultural periods. Artifacts from these early cultures were called Okvik/Old Bering Sea 1 (2,500 – 2,000 years ago), Old Bering Sea 2 and 3 (2,000 – 1,400 years ago), Ipiutak (2,000 – 1,400 years ago) and Punuk (1,400 – 700 years ago). These early maritime cultures have been found along the coasts of the Bering and Chukchi Seas, and to the south roughly to the limit of winter sea ice.

During this "golden age" of Eskimo art, the styles often incorporated drilled pits inlayed with jet, baleen, or wood. Engraved lines were often filled with white and red pigments. Remnants of these inlays and pigments are still preserved in some of the artifacts. These early artists skillfully followed the contours of the ivory, which has in many cases been transformed to a rich brown color from long burial in the earth. During Old Bering Sea 1 (or Okvik) times, tools were decorated with simple and restrained engraving carefully done to incorporate the surface shapes of the ivory (Figure 5.13). The term Okvik is derived from the Okvik site on one of the Punuk Islands where it was originally recognized. Stylized human figures were carved from ivory and depicted with pointed heads and long and narrow noses (Figure 5.14). Okvik carvers showed a strong preference for "fanciful and fantastic" animal forms. Collins described the elements of Okvik incised art as spurred lines in a variety of forms including short detached lines, usually in pairs, broken or dotted lines, radiating or converging lines which form tent-like figures, and various kinds of circles and ellipses.

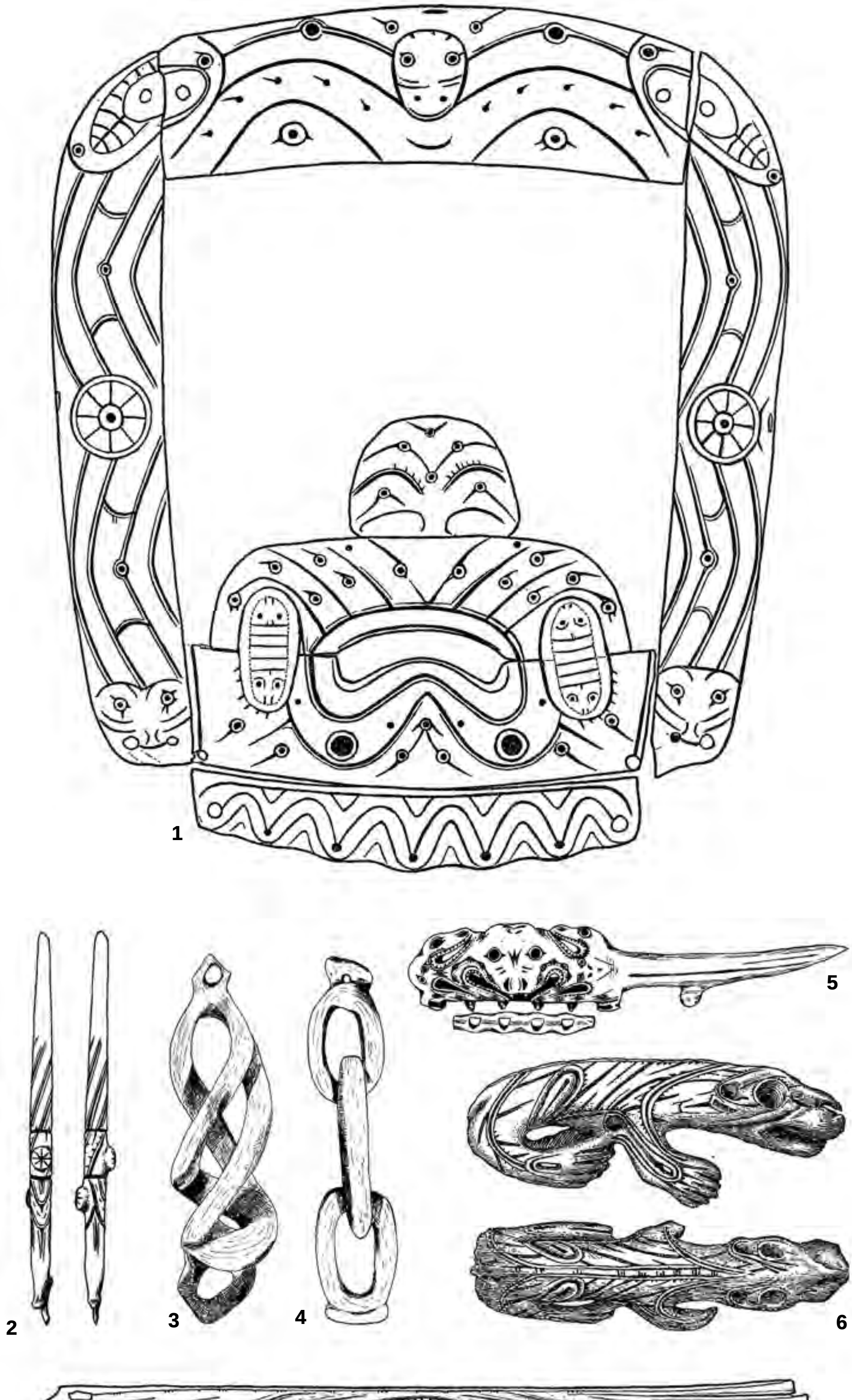

Figure 5.12 Examples of Ipiutak art: 1 a decoration on mask-like set of ivory carvings once attached by lashing through drilled holes; 2 engraving tools; 3 openwork ivory carving; 4 carved ivory chain links; 5 engraved composite ivory "comb" or "rake;" 6 ivory carving of young walrus; 7 decorated band (Larsen and Rainey 1948, Giddings 1964).

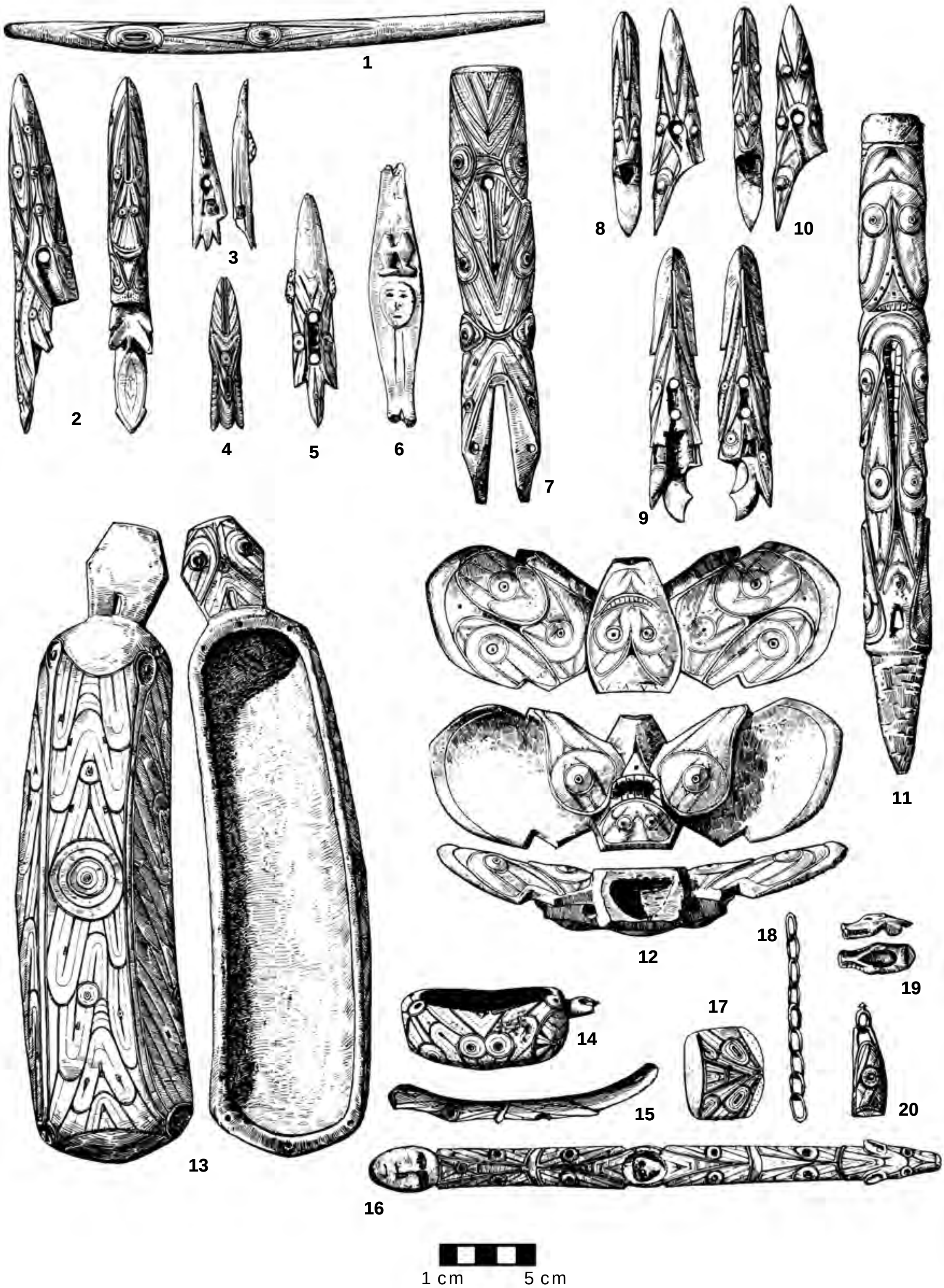

Figure 5.13 Examples of Old Bering Sea Art from the Ekven site, Chukchi Penninsula, Russia: 1 harpoon foreshaft; 2-5 harpoon heads; 6 kayak model; 7 socket piece; 8-10 harpoon heads; 11 harpoon socketpiece,; 12 winged object; 13, 14 decorated ladles; 15 bucket handle; 16 bow drill; 17 decorated masquette; 18 chain of walrus ivory; 19 bear's head, 20 handle for a burin. Length of 2 is circa 19 cm. All others are the same scale (Ackerman 1984:110–111).

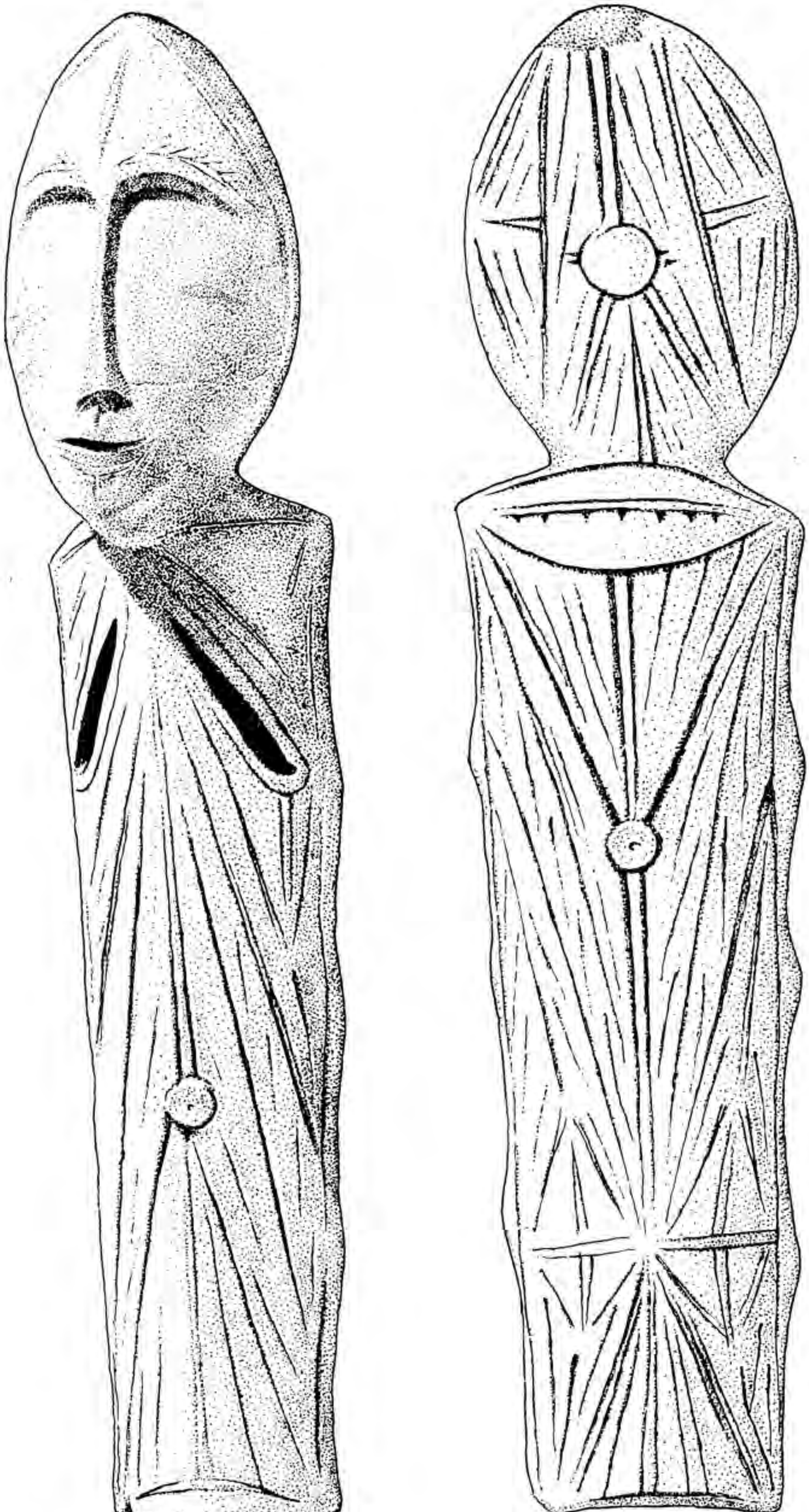

Figure 5.14 Okvik female figure carved from walrus ivory (redrawn from Wardwell 1986: 52–53).

Old Bering Sea 2 art differs from Okvik art because the straight lines with small triangular spurs that had dominated Okvik art were discontinued and emphasis was placed on curved lines and circles. According to Collins, there was also a strong tendency for the circular elements to be set in as panels, carefully placed in relation to carved surface contours, and for the decoration as a whole to display balanced symmetry.

The Old Bering Sea 3 style placed primary emphasis on elevated circles and ellipses, usually arranged to suggest the eyes of an animal. Collins identified the principle elements as straight and curved lines, broken lines, circles, and ovals. The spurred lines, circles and ovals and small circles set between converging lines prominent in Old Bering Sea styles 1 and 2 almost completely disappeared in style 3. The circles become larger and the curved lines bolder, resulting in a style of ornamentation that was smoother and more flowing and graceful.

Ipiutak art is primarily known from archeological sites excavated along the mainland coast of northwest Alaska, but sites have been found inland from the coast along rivers and near lakes. It is best known from the large Ipiutak site located at Point Hope, Alaska. The exceptional Ipiutak ivory carvers used their media to full advantage by creating elaborate open work carvings, ivory chains carved from single pieces of ivory, and unusual animal heads (Figure 5.12). Froelich Rainey and Helge Larsen described the surface ornamentation on Ipiutak art as an unusual combination of small spurred circles between converging lines, rows of connected nucleated circles, and a profusion of curving spurred lines, dotted lines, and rows of triangles.

The Punuk culture was partly an outgrowth of Old Bering Sea and partly the result of new influences from Siberia. Punuk Eskimos, like the Ipiutak ivory carvers, had limited quantities of iron, which was probably highly treasured and used only for the most delicate work, such as engraving. Punuk art is characterized by evenly incised lines that frequently tend to be shorter than the engraving of earlier periods, dots and spurs, and compass-made circles. Collins described Punuk circles as uniform in shape, not concentric, and made from bits with two fixed points rather than a compass with movable points. Perhaps because of the ease with which the lines could be engraved, the designs of the Punuk period became less complex and more rigid.

Henry Collins eloquently described the artistic elements of artifacts he collected while doing field work on the islands of the Bering Sea and compared them with artifacts from excavations conducted on St. Lawrence Island by self-taught naturalist and archeologist, Otto William Geist. Froelich Rainey later analyzed Geist's huge collections, and these collections were the foundation of the University of Alaska Museum. The pioneering research by Collins, Geist, and Rainey outlined a chronology of cultural development and established the foundation for Eskimo archeology that has remained fundamentally unchanged since that time.

After Collins' original work, radiocarbon dating became available and some archeologists suggest that the dates for these cultural periods may be slightly younger, depending upon where they have been found. Most archeologists believe they can follow a continuum in cultural development from Okvik times to contemporary peopling living in the Bering/Chukchi Sea region. Although a few Old Bering Sea artifacts have been found on the American mainland, no settlements have been found there. This distinctive and elaborate cultural complex appears to have developed on the islands of the Bering and Chukchi Seas and on the Asian mainland.

On the Asian side, Russian archeologist Sergei I. Rudenko began excavations at several sites along the coast of the Chukchi Peninsula in 1945. He discovered a series of sites that led him to conclude that the sequence of cultural development leading to modern Eskimo culture in Asia was similar to that in North America. On the north coast of the Peninsula, at the site of Uelen, he found Okvik/Old Bering Sea artifacts virtually the same as those reported by Collins, Geist and Rainey from the American Bering Sea Islands. Notably the Asian artifacts did not include labrets, suggesting some cultural differences. Several sites in Chukotka contain checked and linear stamped pottery similar to Norton ceramics in North America.

At Uelen the houses appear to have not been as deeply excavated into the ground as sites on the Bering Sea Islands. Instead they appear to have been oval structures that were above ground, or slightly excavated into the earth, with floors paved with stone. At several other sites located along the coast of the Chukchi Peninsula, Rudenko repeatedly documented a cultural sequence and way of life virtually identical to that of people living on the Bering Sea Islands and later on the Alaska mainland. Most of the sites he located were on the Asian mainland. Unlike the island sites, people were able to hunt land mammals as well as sea mammals, fish, and birds.

People living on the islands intensified their adaptation to using marine resources. The complex knowledge and elaborate technology associated with this maritime economy became widely adopted throughout Central Beringia. Whaling and open water marine mammal hunting became fully refined using float gear, kayaks, and larger skin boats (called *umiaks*). People were able to successfully and regularly harvest whales, seals, and walrus. They supplemented these large catches with other subsistence activities such as fishing, collecting wild vegetables and berries, and hunting birds. On the mainland they also hunted land mammals. Very specialized equipment such as snow goggles, ice creepers (crampons made from bone or ivory), and floats attached to harpoon lines increased hunting success. This sophisticated technology and knowledge of the environment provided dependable quantities of fuel, food, and materials that enabled people to live in large permanent settlements. In addition to driftwood, whale bone and baleen provided material for house construction and utilitarian objects. On the islands where caribou antler was not available, walrus ivory was most commonly used to manufacture tools that required strength to absorb impacts such as adze heads, harpoon and arrow heads, and ice picks.

This increased prosperity probably led to more complex societies and social interactions. There is some evidence that power and wealth may have become more concentrated in the hands of powerful umaliks, or captains of whaling crews, and shamans. Based on the sheer size of the archeological sites dating to this time, it appears that the population increased. Many of these sites are associated with large cemeteries located away from the villages, including Ipiutak at Point Hope, Alaska; Uelen and Cape Chini on the Chukchi Penninsula; and Miyowagh, Seklowayaget, and Ievoghiyoq and Kukulik on St. Lawrence Island. Most were extended burials in chambers lined with wood, rock or whale bone. Some burials contain grave goods and sometimes exhibit evidence of unusual mortuary practices.

A portion of the Ipiutak cemetery was excavated by Helge Larsen and Froelich Rainey at Point Hope, Alaska (Figure 5.15) where many of the graves contained

Figure 5.15 Froelich Rainey (left) and Helge Larsen (right) at Point Hope, Alaska, 1941 (American Museum of Natural History, Photo Archives).

elaborately carved lance heads or dagger-like knives with chipped stone side blade insets. In others, they found harpoon socket pieces carved in the shape of animals, finely executed carvings of human heads and animals, openwork ivory carvings of swivels, spirals and chains. In one burial an adult and child had been buried together. A slender ivory rod with a human hand carved on one end had been inserted through some of the vertebra and along the spine of the adult. This same grave also contained a carved ivory chain and the skull of a loon in which ivory eyes had been inserted. A few burials contained death masks and elaborately carved ivory mouth covers. In one case conical ivory eyes inlayed with jet pupils had been inserted in the skull of the deceased.

There is also widespread evidence for regional warfare. There is a dramatic increase in archery equipment such as arrow heads, bow braces, and wrist guards. More importantly, the use of slat armor is common. It is similar to the flexible armor that originated earlier in northern China. It was made by lashing flat overlapping rectangular pieces of bone or ivory together to provide a flexible protective vest or coat. Other indications of warfare are suggested from the excavations of an Ipiutak period house at Cape Krusenstern. Douglas Anderson and Louis Giddings found the remains of a woman and two children who had been trapped in a burning house. All had died while attempting to dig their way out using adzes and the woman had an arrow point imbedded in her body. This led them to speculate that the woman and children had been trapped and burned in the house by enemies.

Birnirk and Western Thule (900 years ago to present)

The Birnirk phase of Iñupiaq culture is best known from excavations by James Ford less than a mile northeast of Point Barrow, Alaska. Birnirk artifacts and houses have also been found at Cape Krusenstern, and other sites in Northwest Alaska and at Ekven and other sites in Chukotka. Although the age of these sites suggests that they are transitional between earlier Ipiutak and later Thule cultures, the technological transition between them is not clearly understood. For example, on St. Lawrence Island and elsewhere among the Bering Sea islands, late Punuk sites appear to be the same age as Birnirk, with a rather smooth transition from Punuk to Thule and little local evidence of the Birnirk phase. It is possible that life on the islands and the adjacent mainland coasts of Central Beringia led to the intensification of maritime adaptations, particularly whaling.

Birnirk houses were semi-subterranean rectangular sod-covered structures with entrance passages sloping upward from outside the house into the interior floor of the dwelling. In some cases translucent gut (animal intestine) was sewn together to create a skylight designed to bring sun light into the house. The earliest harpoon heads from Birnirk have multiple spurs similar to those of Old Bering Sea culture and some retain small bifacial side blades reminiscent of examples known from Ipiutak, Old Bering Sea, and Punuk.

The Walakpa archeological site is located about 12 miles (19.3 km) south of Point Barrow. The famous American humorist, Will Rogers, was killed there when his airplane crashed shortly after taking off from Barrow in 1935. Walakpa was excavated by Dennis Stanford who analyzed harpoon heads and the other artifacts from the site. Based on this research he concluded that there was a smooth, gradual transition from Birnirk to Thule. His work supported Ford's earlier interpretation that Thule was derived from Birnirk. Based on an analysis of the animal bones in the site, Stanford suggested that Birnirk people living at Walakpa primarily relied on seals.

By Birnik and late Punuk times, people were making most of their stone tools by grinding, rather than chipping stone. Pottery continued to be made using grit temper, but it was thick and generally poorly fired. Although still applied with the use of a pottery paddle, the external decoration was characteristically curvilinear (a repetitively circular pattern). The decoration on tools became more rigid and less fluid and elaborate and ivory engraving of complex animal forms began to be replaced with more geometric designs.

By about 900 years ago, Western Thule culture emerges in Central Beringia. Thule culture received its name from a site near Thule, Greenland, found and described by the extraordinary Danish archeologist Terkel Mathiassen in the early 1920s. The artifacts discovered there were clearly related to contemporary Inuit culture of Greenland and Canada. The Thule period was recognized as a direct predecessor of Inuit people living throughout the North American arctic. When similar artifacts from Central Beringia were excavated and studied, they were called Western Thule. The word western was added to indicate that they were found in the western, rather than the eastern North America arctic.

Although the origins of Western Thule are not entirely clear, many archeologists believe Thule developed from Birnirk in northern areas of Central Beringia. Thule spread rapidly from Central Beringia eastward along the coast and islands of arctic North America. The artifacts and life ways from northeast Asia to Greenland are amazingly similar. Most archeologists believe this rapid expansion eastward from Central Beringia was made possible by a period of climate warming, known as the Neo-Atlantic phase that occurred between 1,200 and 800 years ago.

Although it is still not entirely clear, it appears that Thule culture arose from both the Birnirk and Punuk cultural phases. Although Thule culture emphasized whale hunting in many areas, it remained diverse with people skilled and capable of harvesting the resources of the adjacent tundra and rivers. Don Dumond has suggested that the intensification of maritime pursuits in the northern areas of Central Beringia may explain the expansion of later Thule people — first around the Chukchi Sea and then east across northern Canada to Greenland, then south to the Bering Sea and across the Alaska Peninsula to the North Pacific and Kodiak Island. Thule settlements indicate that Thule people were capable of making a living in almost any type of environment. Artifacts from Thule sites reflect a broad array of economic activities ranging from caribou and bird hunting to sealing and fishing. However, whale hunting was a major economic mainstay and Thule settlements were commonly at good locations to take whales.

Although their tools were not as highly decorated as their ancestors', Thule people introduced important innovations. Thule houses were rectangular with lower areas, called cold traps, in the entryways that made houses warmer and more energy efficient. Abundant supplies of whale oil and meat made it possible to live in larger settlements. Artifact manufacturing became more sophisticated with some objects being fastened to others or held in place using rivets. This innovative technique involved drilling a hole through both objects and securing them with a pin made from ivory, wood, bone, or iron. It enabled Thule people to make stronger and more durable tools, sleds, and boats. As a result, they were able to travel long distances in winter by sled and in summer by boat.

Although the evidence is not entirely clear, it appears that it is during Thule times that dog traction was fully developed. This revolutionized winter transportation, vastly expanding the range for sea ice hunting and overland travel. This rapid and efficient form of transportation no doubt resulted in better and more regular communication and trade networks and may have contributed to the widespread similarity in artifacts and life ways of Thule people.

To a large degree Thule culture defined the artifacts and life ways that were ancestral to modern Yupik (southern Eskimo) and Iñupiaq (northern Eskimo) people. Thule culture spread rapidly eastward from Central Beringia along the islands and shores of the Arctic Ocean during a period of comparatively warmer climate. During this time (1,050 – 750 years ago) the pack ice of the Arctic Ocean allowed whales to migrate along the northern coast and islands of Canada. Coastal sites indicate that Thule people were skilled whale hunters and that they followed the whales eastward bringing their new ideas and technology with them. They traveled and hunted whales in large skin boats, called *umiaks,* and hunted seals from smaller single or double passenger *kayaks*.

Following the emergence of Thule culture, the artifacts and life ways across much of the Arctic, from northeast Asia to Greenland, are strikingly similar. Because the types of artifacts and language are so similar across the North American arctic, most people believe that the migration from Central Beringia to Greenland took place quickly. Once Thule families had reached Greenland, communication and relationships were maintained between communities. As they moved east they probably encountered the descendants of the ASTt people who had first colonized the eastern arctic thousands of years earlier. The archeological remains associated with these people are called Dorset, after the site at which they were first discovered. It is unclear whether the Dorset people intermixed with the later Thule arrivals or simply died out.

European Contact (1648 – present)

The earliest contact by people living in Central Beringia with Europeans came as a result of exploration by Russian Cossacks and traders entering the region from the west. Under the leadership of Semën Dezhnev, a party descended the Kolyma River to the Arctic Ocean in 1648. They then sailed eastward and south along the Asian coast to Bering Strait. After landing at the Diomede Islands, they sailed on to reach the Gulf of Anadyr where Dezhnev established a post on the Anadyr River. Dezhnev and his party were the first recorded European expedition to navigate Bering Strait. By this same time, Russian traders and explorers coming overland from the west had already reached the Sea of Okhotsk and Kamchatka. During the1600s, a lucrative fur trade had been established and European trade goods had begun to flood into Central Beringia.

By the middle of the 17th Century, a vigorous trade in European goods existed via the traditionally established economic chain from the Chukchi and Siberian Eskimo via the Diomede Islands to villages on Alaska's Seward Peninsula. By the late 1700s and early 1800s, explorers from other nations began charting the shores and islands of Central Beringia. In the mid-1800s commercial whaling was widespread throughout the region. These contacts led to the introduction of disease, and in the 1830s a smallpox epidemic swept the region.

During the 1700s, Russian expansion to North America had been primarily restricted to the Aleutian Islands and the Gulf of Alaska where a lucrative fur trade developed. However, by the early 1800s the number of fur-bearing animals had declined and the Russians were forced to look northward and inland to maintain the flow of fur to the Asian market. During the 1820s, Russian explorers began to push northward into Bristol Bay and Norton Sound and then upstream along the interior rivers. They established posts along the coast and on the Kuskokwim and Yukon Rivers. This period of Russian colonialism left a fascinating and rich archeological record, which commonly includes Russian trade goods.

Following the United States purchase of Alaska from Russia in 1867, the Russians withdrew to the Asian side of Central Beringia. Although Russian goods continued to enter North America via Bering Strait, the economic relationship of most people living in Central Beringia became linked to independent fur traders and whalers primarily operating from ships. In the 1890s, gold was discovered in Central and Eastern Beringia. This led to the "Rush of 98." Tens of thousands of Americans poured into Alaska and adjacent parts of Canada. They radically changed the culture on the North American side of Central Beringia.

Following the Russian revolution of 1918, the people on the Asian side of Central Beringia were organized into what were ultimately national districts or okrugs.

The okrugs are composed of mixed ethnic groups and designed to reorganize and direct economic and cultural development within the region.

The alliance between the Soviet Union and the United States during World War II resulted in renewed contact across Central Beringia. Large numbers of aircraft and goods were transported from the United States to Russian via Central Beringia. Following World War II, the Cold War intensified. In 1948 the international boundary between the Soviet Union and the United States was closed.

An aspect of the Cold War that had an impact on the archeological resources of Central Beringia was the expansion of military installations in Russia, the United States, and Canada. The construction of many of these installations destroyed or damaged many archeological sites. Furthermore, archeological sites were more accessible to collectors stationed at these military bases. Construction of the Distant Early Warning (DEW) Line, begun in 1954 as defense from Russian "over the pole" air attack, led to the excavation of some archeological sites.

Although Native people on both sides managed occasional clandestine encounters on the sea ice and by boat, it wasn't until the late 1980s that travel between the two sides of Central Beringia again became legal. Today the people of Central Beringia are working toward reducing the political and economic barriers that remain. They are seeking more open relationships like the ones that have traditionally existed throughout Central Beringia.

Summary

The earliest people to occupy Central Beringia arrived near the end of the last Ice Age at a time when the Bering Land Bridge connected North America and Asia and Ice Age animals such as mammoths, horses, and bison roamed the land. They made and used bone and antler tools with microblades set end to end to form sharp weapons and cutting tools. They also used chipped stone knives. In Russia these types of artifacts are referred to as Dyuktai culture and in North America they are called the American Paleo-arctic tradition. As the glaciers melted and sea level rose, people living along the coast were forced by the rising water to move inland. People living in areas adjacent to glaciers were able to occupy land newly exposed by the melting ice. The long and complex sequence of cultural development in Central Beringia is outlined in Figure 5.16.

Beginning 10,500 years ago stone projectile points that are distinctively North American begin to appear in Central Beringia. Although they have been found not far from the coasts of Beringia on the North American side, it appears that people living on the Asian side of Bering Strait did not adopt this distinctive Northern Paleoindian technology. People throughout Central Beringia also made and used large blades, microblades and other tools. In Asia, this period is referred to as Sumnagin culture.

In the North American side of Central Beringia distinctive side notched projectile points similar to ones found farther south in North America appear for the first time about 7,000 years ago. These distinctive artifacts are called the Northern Archaic tradition. About this same time people on the Asian side of Central Beringia begin to make tools by grinding stone as well as chipping it. This is called the Neolithic period. Russian archeologists generally interpret the evidence to show that there was a gradual transition from Dyuktai, to Sumnagin, and then to the Neolithic culture.

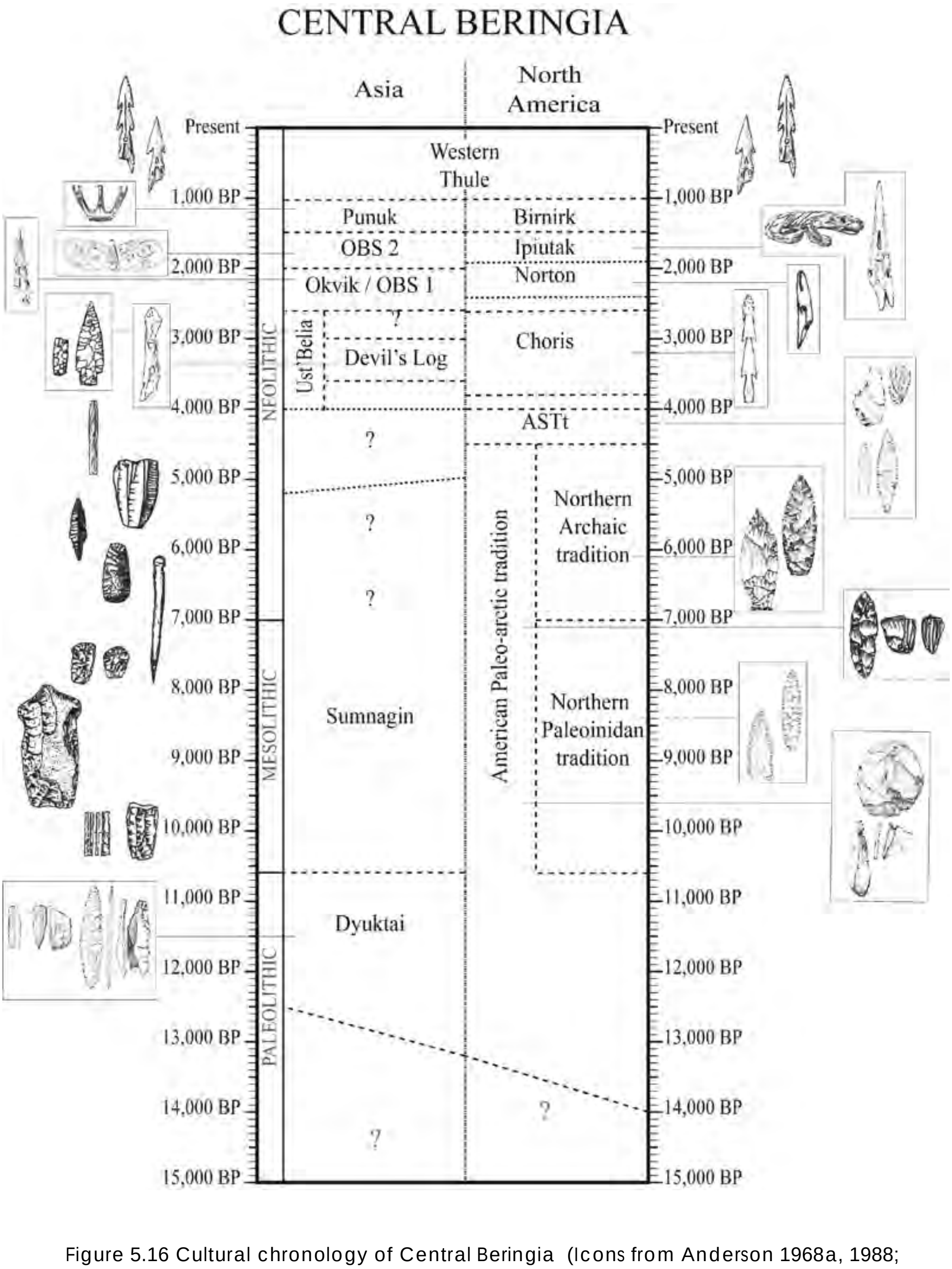

Figure 5.16 Cultural chronology of Central Beringia (Icons from Anderson 1968a, 1988; Bandi 1969; Dikov 1979; Dumond 1977; Giddings 1964, 1967; Orekhov 1999; Slobodin 2005, Stanford 1976).

Sea level stabilized throughout much of Central Beringia by 5,000 – 4,000 years ago. Archeological sites found along the coasts and adjacent inland area suggest people had developed an economy primarily based on coastal marine mammal hunting and inland caribou hunting. The residents of Central Beringia continued to make microblades and also made small delicately flaked stone tools that archeologists refer to as the Arctic Small Tool tradition. At this time the last of the glacial ice had melted in the eastern North American arctic and Arctic Small Tool tradition people rapidly colonized the northern coastal zone of Canada and Greenland from their stronghold in Central Beringia.

People stopped making microblades in Central Beringia 3,800 years ago and there is greater variability in the other types of tools they used. Pottery spread throughout Central Beringia from Asia to North America. It is during this time that there is the first evidence for whaling in Central Beringia. Metal (copper, bronze, and iron) artifacts made in Asia were traded to people living in Central Beringia by 2,500 years ago. Russian archeologists call this period the "paleometal epoch" and it marks the beginning of Neo-Eskimo culture, or the time from which the same cultural patterns and life ways can be traced to modern Yupik and Iñupiaq people.

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CHAPTER 6
EASTERN BERINGIA
INTERIOR

Interior Eastern Beringia extends from the Canadian Yukon in the east to the approximate limit of the boreal forest in the west and from the watershed of the Alaska Peninsula in the south to the Brooks Range in the north (Figure 6.1). By 14,000 – 13,000 years ago the melting Cordilleran and Laurentide ice exposed new land to the east and south of Eastern Beringia, connecting it to the rest of North America. Large rivers drain the interior Eastern Beringian region: the Yukon, Kuskokwim, Susitna, and Copper. Today this vast area is largely covered by boreal forest consisting primarily of white and black spruce, birch, and larch. Willow and alder grow in the valleys, while higher elevations are vegetated by birch, aspen, and alpine tundra. In some regions there are flood plains, extensive areas of muskeg, and small lakes and ponds commonly underlain by permafrost.

Interior areas of Eastern Beringian may contain the longest record of the cultural contacts and interactions that have taken place between North America and Asia because rising sea level and retreating shorelines at the end of the last Ice Age has flooded much of the record from Central Beringia. Many archeological sites in interior Eastern Beringia have been preserved in the sediments that have accumulated in river valleys, around lakes, and in areas that provide panoramic views of the surrounding terrain.

The archeology of the interior is complex and difficult to interpret because many sites have been found in relatively thin (less than 3 ft or 1 m) deposits of fine grained wind blown silt, called loess. The sediments at many sites in interior Eastern Beringia have accumulated very slowly. This makes it difficult to stratigraphically separate different periods of occupation and can result in mixing artifacts from different time periods together in the same deposit. Interpreting this record is even more difficult because often these sites lack organic material suitable for radiocarbon dating. Archeologists have been working diligently to understand the sequence of occupations at many of these sites since the 1920s.

Beginning in the 1980s an unusual number of ancient artifacts began to emerge from glaciers around the world as a result of global warming. In 1997 an artifact was found that had recently been exposed at the base of a small glacier, known as an ice patch, in the Canadian Yukon. It soon became apparent that many ice

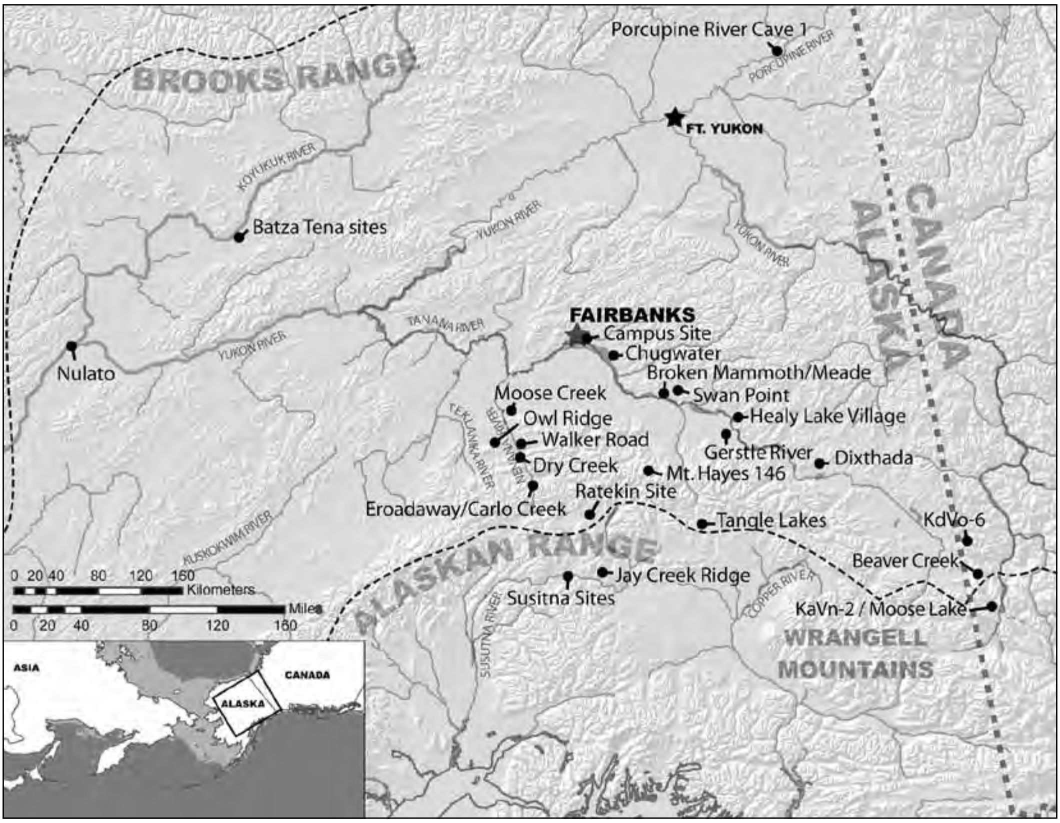

Figure 6.1 Map depicting archeological locations, interior Eastern Beringia.

patches in high altitude areas of Eastern Beringia were melting and that some of them contained rare perishable artifacts that had been preserved in the ice for thousands of years. Canadian archeologist Greg Hare immediately recognized the significance of these discoveries. He and other researchers partnered with the Champagne and Aishihik First Nations and began a systematic program of monitoring and collecting the artifacts that were emerging from the melting ice. As news of these discoveries spread, similar projects were begun in other areas of Canada and in Alaska. The ice patch discoveries provide an important glimpse of rare perishable artifacts made of wood, leather, and other materials seldom preserved in other types of archeological sites. Most artifacts found at ice patches are related to caribou hunting; however, others suggest a wide range of subsistence activities including bird hunting, berry picking, and snaring ground squirrels.

When people first occupied this region about 14,000 years ago, the Bering Land Bridge still connected Alaska to Asia. However, continental glaciers prevented human migration to the south and east. At this time interior Eastern Beringia was an unglaciated peninsula of Asia protruding into the vast continental glacier of North American ice. Shrub tundra consisting primarily of shrubs, grasses and sedges, covered much of the unglaciated landscape.

Archeologists have long speculated that mammoth hunters may have first crossed the Bering Land Bridge as they pursued these large animals onto land previously unoccupied by people. Based on radiocarbon dating of mammoth remains and the age of the earliest archeological sites, it is probable that humans and mammoths coexisted in Eastern Beringia between 15,000 and 13,000 years ago. However, there is no definitive proof that humans hunted mammoth in Eastern Beringia. Although mammoth ivory has been found at several sites, it is believed that it was scavenged from the remains of animals that had already died, and that humans had not hunted the mammoths.

However, there is a bit of tantalizing circumstantial evidence that was found deeply buried in a gold mine near Fairbanks. At this site, two stone projectile points were found near the partial jaw bone of a young mammoth about 65 ft (20 m) below the surface of the ground during gold mining activities in the 1920s. The mammoth bone was subsequently radiocarbon dated to circa 14,150 years ago. This could be the earliest archeological site in Eastern Beringia, but because the original discovery was not professionally excavated and documented, it will always be questioned.

Early Period (15,000 – 9,000 years ago)

No one knows when humans first came to Eastern Beringia, but Alaskan archeologist Charles Holmes has excavated and reported the oldest reliably dated archeological site found thus far. The site, called Swan Point, was first used by people about 13,950 years ago. The artifacts include microblades, microblade core tablets struck from wedged-shaped cores, burins (graver-like tools) made on thick stone flakes, the tip of an ivory peg, and scavenged fossil mammoth or mastodon ivory scrap.

The artifacts are strikingly similar to those of the Dyuktai culture described in Western Beringia. Holmes has ascribed them to the Eastern Beringian tradition, a term proposed earlier by Fredrick Hadleigh West to encompass both the Dyuktai and American Paleo-arctic traditions. In coastal areas of Alaska, artifacts dating to this time period were ascribed to the American Paleo-arctic tradition. However, in the interior they were named the Denali complex by Fredrick Hadleigh West who first defined them based on discoveries at several sites in central interior Alaska. The Denali complex was originally believed to date between 18,000 – 11,500 years old based on comparisons with similar artifacts from Siberia. Current knowledge suggests the Denali complex was present, perhaps intermittently, in the interior of Eastern Beringia beginning sometime before 14,000 years ago until about 9,000 years ago.

The Denali complex is known almost entirely from stone tools, including bifacial biconvex knives, lanceolate bifaces, end scrapers, large blades and blade-like flakes, wedge-shaped microblade cores, core tablets, microblades, burins, burin spalls, worked flakes, and retouched flakes (Figures 6.2 and 6.3). People also had tools and items made from organic materials, but most have not survived, with the exception of a few objects made from bone, antler and ivory. Although bone preservation is poor, the ecological setting of Denali complex sites suggests an emphasis on harvesting large terrestrial mammals, fresh water fish, and waterfowl.

Some of the stone tools from the oldest occupation at Swan Point have been made from several types of stone traded or brought from long distances, including obsidian or volcanic glass from the Koyukuk River hundreds of miles away. It is possible that the people who first camped at Swan Point had come from the Koyukuk area and brought the obsidian with them. However, it is more reasonable to assume

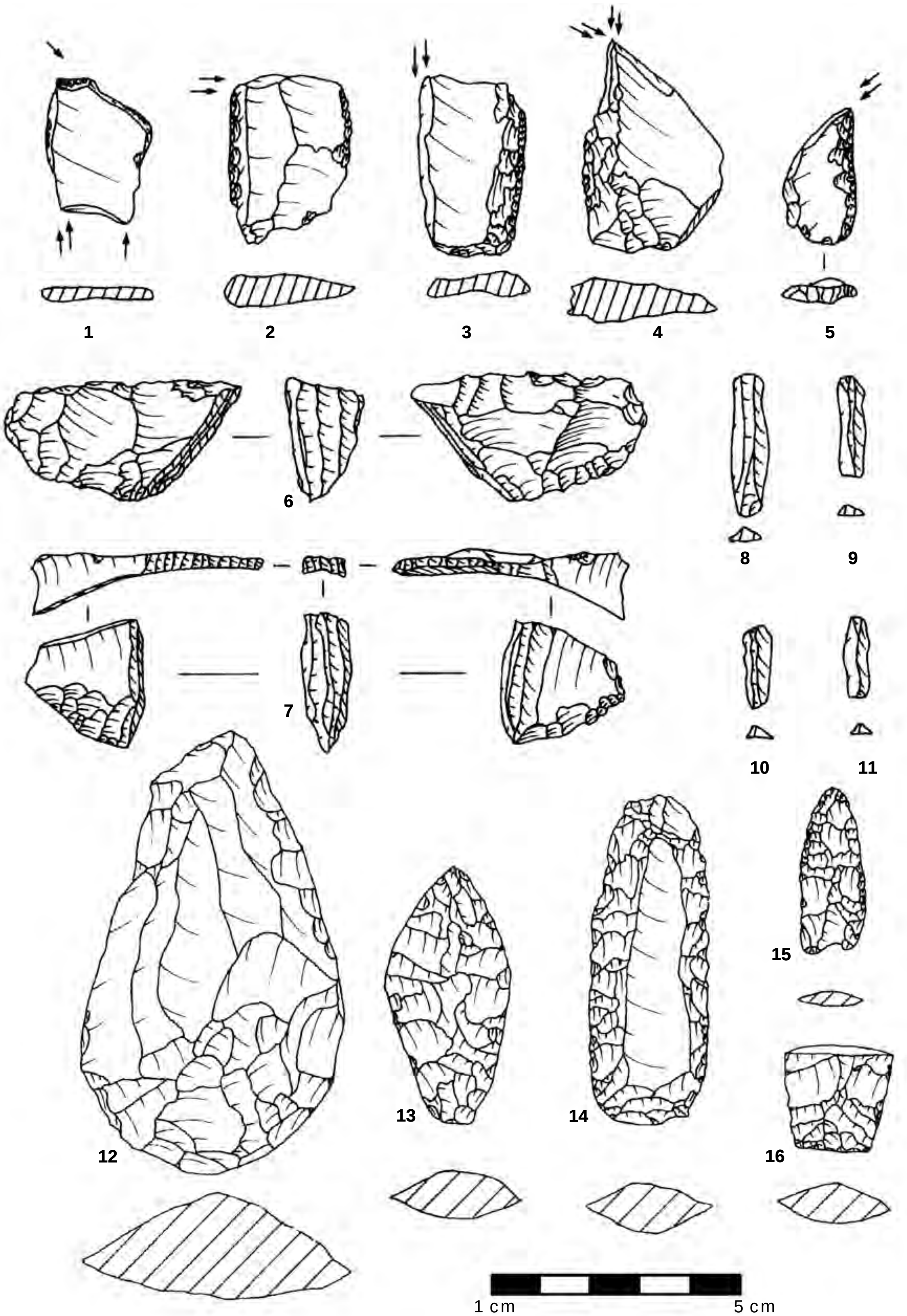

Figure 6.2 Line drawings of Denali complex artifacts from Component II at the Dry Creek site: 1-5 burins; 6, 7 wedge-shaped microblade cores and core tablet; 8-11 microblades; 12-14 knifes;15 projectile point; 16 projectile point base; (Powers and Hoffecker 1989).

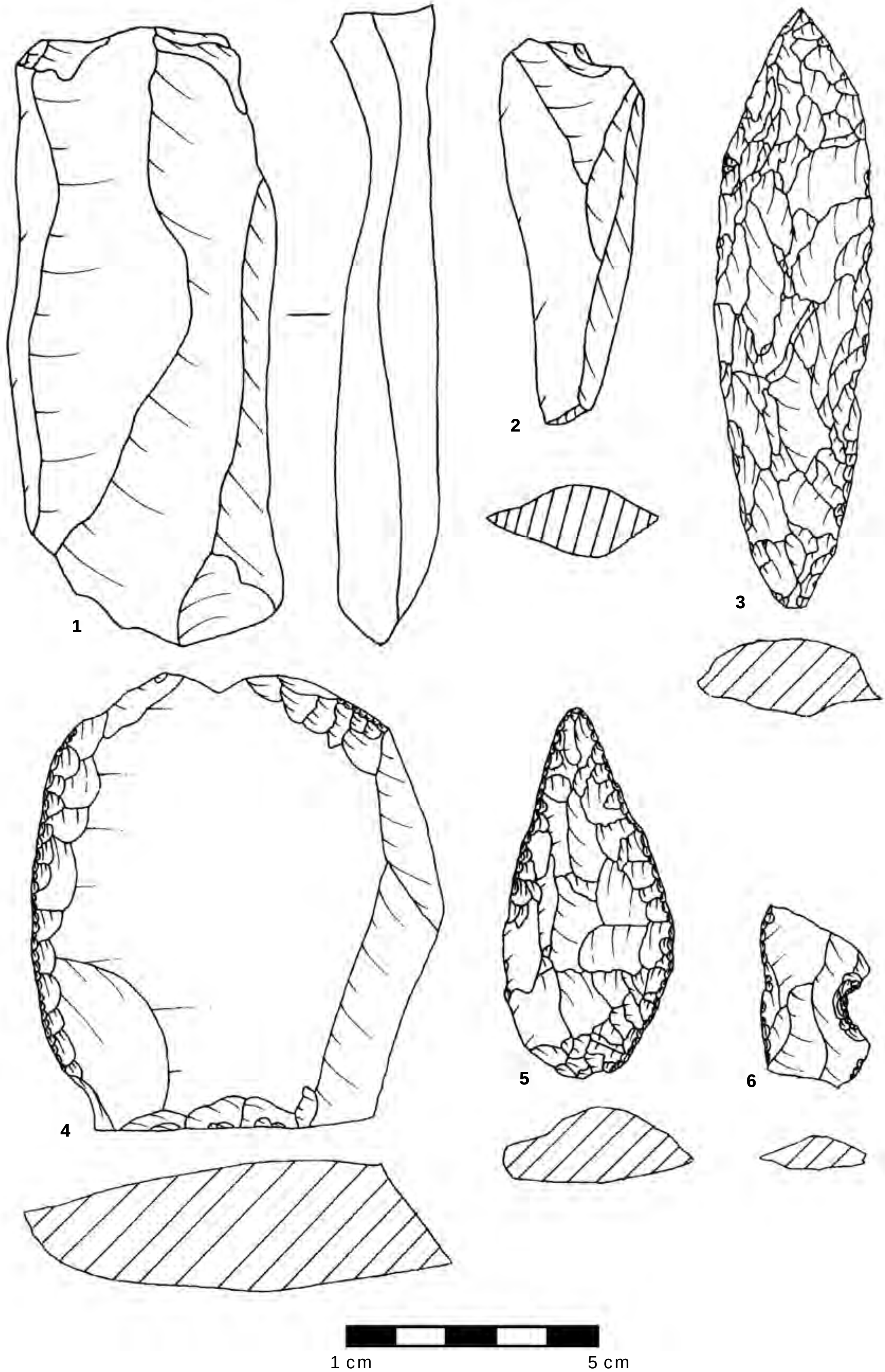

Figure 6.3 Line drawings of Denali complex artifacts from Component II at the Dry Creek Site:
1, 2 blades; 3 lanceolate biface; 4, 5 side scrapers ; 6 spokeshave (Powers and Hoffecker 1989).

that it was obtained by trade with neighbors. If this was the case, it must have taken some time after first settling in the region for people to become familiar with the landscape, to locate rare and far-flung resources, such as obsidian, and develop the trade networks necessary for transport as far away as the Tanana River valley. What this suggests to most archeologists is that even older sites must exist.

Additional evidence of the Denali complex is preserved in the next period of occupation at Swan Point, which dates to about 13,500 years ago. This level contains microblades, microblade core preparation flakes, blades, split quartz pebble choppers or scrapers, and burins. It also has red ochre. Animal remains include the fragmentary bones from elk, bison, and geese. This level also has worked mammoth tusk fragments. However, it is impossible to determine if the ivory is from animals killed by the people who camped there or had been collected from animals that had died from natural causes.

The combined evidence from Swan Point suggests to some archeologists that the earliest people living in interior Eastern Beringia may have practiced a similar life style for at least 500 years, followed by period that becomes hard for archeologists to interpret. The earliest occupations at other nearby sites - Broken Mammoth, the Mead site, and Dry Creek - hold evidence that people who camped at these sites did not use microblades. Archeologists have different opinions about what the absence of microblades means and why it is significant.

The Broken Mammoth site preserves four major periods of occupation that are dated reliably using the radiocarbon method. Artifacts and animal bones (faunal remains) are preserved in cultural Zones II, III, and IV, but apparently absent from Zone I. The oldest two Zones (III and IV) lack evidence of a microblade industry. The oldest cultural Zone IV was occupied between 13,550 – 13,000 years ago, and the artifacts probably represent a series of brief visits that may have occurred occasionally over several hundred years. Artifacts from Zone IV include waste flakes, a quartz chopper/scraper/plane, retouched flakes, biface thinning flakes, scrap fossil ivory, and a cache of tools made of fossil ivory consisting of two cigar-shaped objects (possibly pieces of ivory that would be later shaped to produce projectile points or foreshafts) and possibly a handle. What is significant to many archeologists is that this level lacks microblades or microblade cores. The absence of such a significant tool type has led them to believe that a different cultural group who did not make or use microblades may have occupied the site.

Animal bones from this level include bison, elk, swan, crane, goose, duck, ptarmigan, fish scales (possibly grayling), and bird eggshells. Bones from small animals include hare, marmot, otter, arctic fox, and ground squirrel. The jaw bone of a juvenile bison suggests people camped at the site during the late summer or fall. Bird eggshells indicate the site was also occupied in the spring. The animal remains from Zone IV suggest that the people who camped there enjoyed a varied diet of waterfowl, eggs, fish, and a variety of small mammals that they obtained by hunting, trapping, and gathering. Large mammal hunting was also important, particularly bison, elk and sheep. The researchers who excavated the site, Charles Holmes and David Yesner, think the ivory was probably scavenged from the remains of mammoths that had already died, perhaps hundreds of year earlier.

Until 2009 and 2011when an archeological field school took place at the Mead site, only limited excavation had been conducted there. The Mead Site, located about 1 km north of Broken Mammoth, was occupied 13,400 years ago, about the same time as Broken Mammoth Zone IV. Stone artifacts include a scraper, biface fragments, waste flakes left from chipping stone tools, and possibly a small projectile point fragment. Like Zone IV at Broken Mammoth, microblades were not found at the Mead Site.

Fred Kirsteatter was a young boy in the early 1960s collecting artifacts from the garden at his family's home at Healy Lake located in the upper Tanana Valley. He and his parents, Margaret and Paul, showed his collection to anthropologist Robert McKennan. This subsequently led McKennan and his student John Cook to excavate the nearby Healy Lake Village site. McKennan and Cook discovered small triangular stone projectile points and distinctive teardrop-shaped bifaces that they called Chindadn (an Athapaskan word meaning ancestor) points in the lower levels of the site.

Since that time Chindadn points have been found at other sites throughout Central Beringia. At Healy Lake they were found with microblades, but at other sites such as Broken Mammoth these very distinctive tools were found without microblades. At the Healy Lake Village site the deposits are relatively shallow and it is difficult to precisely separate artifacts that were deposited at different times from each other. The distinctive Chindadn points and microblades were found near the base of the deposit, where the oldest radiocarbon dates indicate the artifacts are about 12,500 years old. However, it is not possible to determine if they were associated with the microblades.

To the southwest in the Nenana River Valley, several sites dating between 13,200 – 12,500 years ago contain artifacts similar to the cultural zones at Swan Point and Broken Mammoth that lack microblades. Most of these ancient human occupations contain teardrop-shaped Chindadn and small triangular points similar to those found at Healy Lake, but without microblades. Archeologist Roger Powers and his student John Hoffecker named this the Nenana complex. The types of stone artifacts that define the Nenana complex are: 1) teardrop-shaped Chindadn and triangular projectile points and/or knives; 2) straight or concave-based lanceolate projectile points; 3) perforators; 4) end scrapers and side scrapers; 5) burins; 6) hammer and anvil stones; 7) small stone wedges; and 8) knives and scrapers chipped primarily on one side (Figure 6.4). These types of stone tools have been found at several sites in the Nenana River Valley including the lowest cultural level at the Dry Creek site, the Walker Road site, Component I at the Moose Creek site, and the Owl Ridge site in the Teklanika River Valley.

Nenana complex sites occur near the bottom of thick sections of windblown silt that began to accumulate toward the end of the last Ice Age, about 17,000 years ago. Radiocarbon dates for the Nenana complex range between circa 13,700 – 13,000 years ago, averaging about 13,200 years old. Animal remains from the earliest occupation at the Dry Creek site include the bones of sheep and elk. Gastroliths (tiny pebbles from bird gizzards) were found in the same level, suggesting that birds, probably grouse and ptarmigan, were also taken.

Evidence for possible tent-like structures has been reported from a Nenana complex site, Walker Road, located in the Nenana Valley. Archeologist Ted Goebel plotted the location of more than 130 artifacts and determined they formed a pattern around a circular clay-lined hearth that he interpreted to be the location of a circular tent approximately 16 ft (5 m) in diameter. Most fires appear to have been built

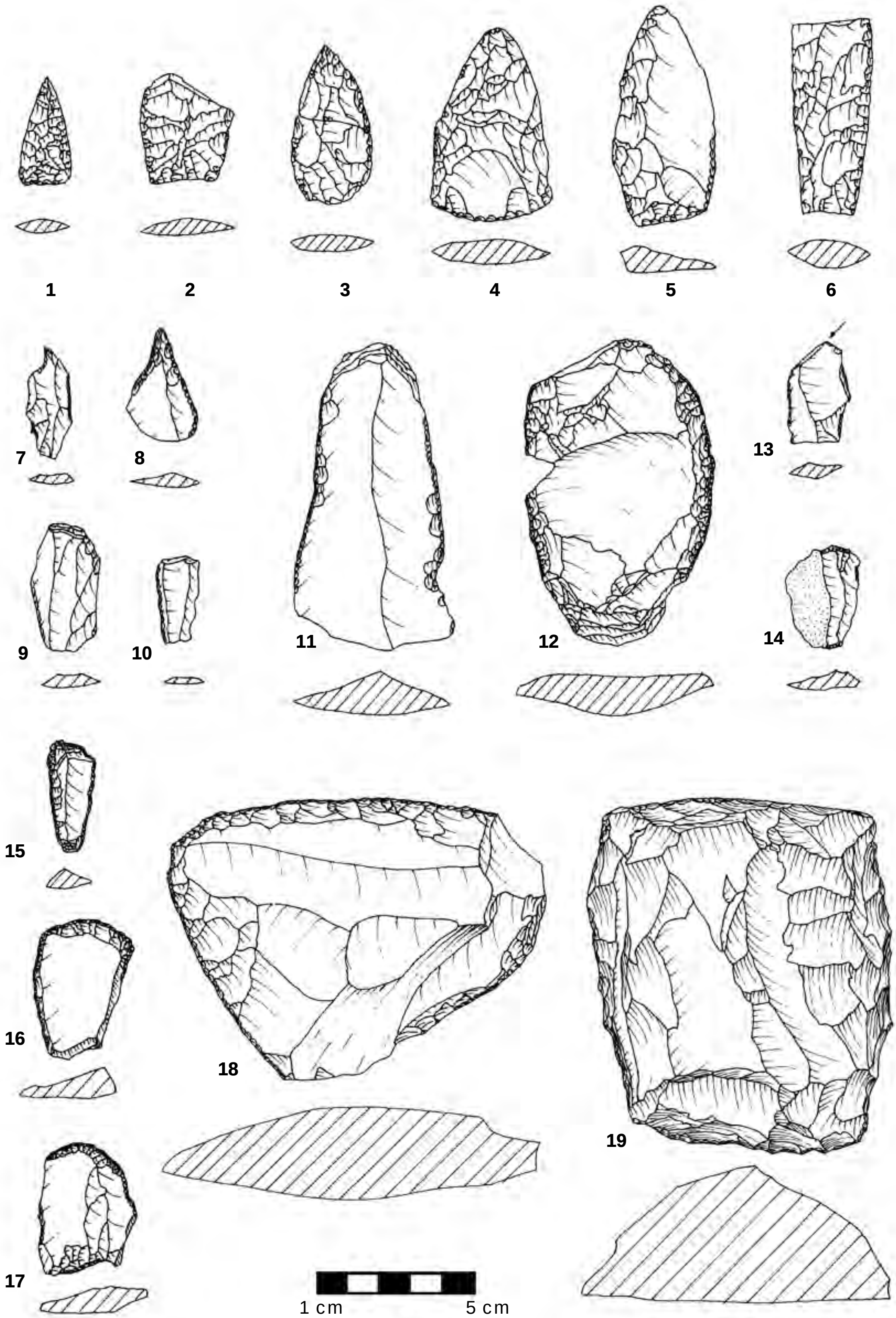

Figure 6.4 Line drawings of Nenana complex artifacts from Dry Creek, Moose Creek, and Walker Road Sites: 1-6 bifacially chipped projectile points and knives; 6-8 perforators; 9, 10 utilized blades; 11, 12 scrapers; 13 burin; 14 wedge-like artifact; 15-17 scrapers; 18, 19 scraper planes (Powers and Hoffecker 1989).

directly on the surface of the ground and commonly contain small unidentifiable calcined bone fragments, suggesting bone may have been burned for fuel and to help keep camp areas clean.

Obsidian from the Wrangell Mountains, far to the southeast, occurs in the lowest levels at both the Broken Mammoth and the Walker Road sites. Obsidian from the Batza Tena source on the south side of the Brooks Range occurs in Nenana complex sites in the Tanana valley. These discoveries suggest that a widespread trade network had already developed in interior Alaska as early as circa 13,400 years ago and probably earlier, based on the little evidence available from the earliest occupation at Swan Point.

The Chugwater site is located in the Tanana Valley. The oldest occupation at the site, component I, has been ascribed to the Nenana complex. This level contains broken bifaces, scrapers, and pointed oval bifaces. Farther southeast, KdVo-6 (the Little John Site) is a multi-component site located north of Beaver Creek in the Canadian Yukon excavated by archeologist Norm Easton. It is probably about 11,500 years old or older, based on the fact that a later occupation at the site is stratigraphically above it and has been radiocarbon dated to almost 10,200 years ago. The site contains bifacial stone tools and pointed oval knives or points near the base of the deposits that are characteristic of the Nenana complex.

Cultural Zone 3 at Swan Point is radiocarbon dated to about 12,900 years ago. It has no microblades or microblade cores. Animal bones include moose, elk, ptarmigan, and goose. Unidentifiable burned large mammal bone and lumps of carbonized fat and grease suggest that bones, and possibly animal fat, were burned as fuel in the campfire. Triangular and teardrop-shaped bifaces are associated with the hearths. This ancient camp site also contains small lanceolate points with convex/straight bases, thin triangular points, gravers made on broken points, and quartz pebble choppers or hammers. Like Zone IV at Broken Mammoth and the Mead Site, microblades were not found in cultural Zone 3 at Swan Point. However, approximately 10 cm above the hearths, six microblades associated with concave based projectile points were recovered. It appears that microblade-using people reoccupied the site soon after its abandonment by the people who occupied Zone 3.

Much further to the east, the Moose Lake site excavated by Alexander Heffner is located about 40 km south of Beaver Creek in Canada's Yukon Territory. Two radiocarbon dates suggest people first occupied the site sometime between about 12,750 and 12,100 years ago and some archeologists have tentatively ascribed the site to the Nenana complex. The site contains lanceolate and ovoid bifaces and flake cores, but lacks evidence of microblade technology. Significantly, the site is located 1 km inside the maximum extent of the continental glacier in an area that did not become ice free until about 13,000 years ago. This indicates that people were moving south into recently deglaciated areas soon after the ice melted.

The next occupation at the Broken Mammoth site is Zone III, which was occupied around 12,100 years ago. Like Zone IV at the same site, Zone III lacks microblades. It contains projectile point fragments, two small triangular projectile points, large biface and point fragments, quartz hammer stones, and a small-eyed bone needle. Animal remains include fossil mammoth or mastodon ivory, bison, elk, Dall sheep, canid (wolf, dog, coyote, or fox), river otter, porcupine, marmot, ground squirrel, red squirrel, swan, goose, duck, ptarmigan, fish scales, and egg shells. These discoveries suggest that people hunted, trapped and fished for a wide variety of small game including birds and fish. The egg shells indicate people lived there during the spring.

In the summer of 2010, Alaskan archeologist Ben Potter and his crew discovered the cremated remains of a 2-4 year old child at the Upward Sun River Mouth Site, also know as the Little Delta Dune Site. The site is located in the Tanana River Valley in interior Alaska. The child's remains were recovered from a shallow depression approximately 45 cm deep by 130 cm wide in what appears to have been the remains of a roughly circular semi-subterranean house supported by at least 6 posts and about 3 meters in diameter. The house and human remains were found in Component 3, which is about 11,500 years old. Careful excavation was necessary to recover the fragile remains and only about 20% of the skeleton was preserved. In consultation with local Athapaskan tribal members who named the child Xaasaa Cheege' Ts'eniin' (Upward Sun River Mouth Child), the analysis revealed that the child had been placed in the pit and cremated. The child's unerupted shovel-shaped incisors are of the Sinodont dental pattern, which is characteristic of most people from northeastern Asia. Although microblades apparently have not been found in Component 3, the bifaces most closely resemble those of the Denali complex.

From this same general time period Denali complex assemblages with microblades are found on glacial terrain in the Tangle Lakes region and adjacent areas of the southcentral Alaska Range. All are relatively shallow sites about 20 inches (50 cm) or less in depth. Most are situated on the top of glacial features and radiocarbon dated between 12,500 and 9,000 years ago. On the south flank of the southcentral Alaska Range in the upper Susitna River drainage, at least six Denali complex sites have been identified based on typological traits, stratigraphic position beneath dated tephras, and radiocarbon dating. Fragmentary burned animal bones from a few of these sites are from medium to large mammals. The location of all these sites on high overlooks suggests an economic emphasis on terrestrial mammal hunting.

At least two sites in the southcentral Alaska Range located in the Tangle Lakes region appear to be reliably dated. The Phipps site appears to be located on a former sand spit possibly formed at a time of higher water level for the Tangle Lakes. The site contains wedge-shaped microblade cores, microblades, and burins. Two radiocarbon dates indicate it was occupied about 11,900 years ago. Whitmore Ridge is located along the crest of a north-trending esker where three localities were identified. Although difficult to interpret, four radiocarbon determinations suggest a Denali complex occupation about 11,500 years ago.

In interior Eastern Beringia, the Denali complex has also been found at several other sites farther from the Nenana and Tanana River valleys. Many of the Denali complex sites in the Alaska Range, Tangle Lakes, and Susitna River areas are situated in locations that are ideal for hunting caribou. Although it appears that caribou were extremely important in the economy, sites located near lakes and rivers indicate that the exploitation of freshwater resources such as waterfowl, fish, and aquatic mammals, like beaver and muskrat, were also important.

Although data are sketchy, most sites are relatively small and lack evidence of structures or other features that might be indicative of permanent or semi-permanent settlement. What this suggests to archeologists is that they were used for seasonal subsistence activities. Most sites were probably open-air camps using skin tents or temporary tent-like structures generally located on bluffs with panoramic views.

The archeology of Eastern Beringia during this time period is difficult to interpret because some sites, and even different stratigraphic levels within the same site, contain microblades and others do not. The Nenana complex sites lack evidence of microblade technology, while the Denali complex has microblades. The Nenana complex also has some types of artifacts not found in Denali complex including small bifacially flaked triangular projectile points and the characteristic tear drop shaped Chindadn bifaces. Red ochre has been found in several Nenana complex sites, but apparently not at Denali complex sites. However, red ocher is associated with the Upward Sun River child burial that has been ascribed to the Denali complex. Some Nenana complex sites, such as Dry Creek, contain straight or concave-based lanceolate projectile points similar to examples made further south on the Great Plains about this same time.

Some archeologists think these differences imply that at least two different groups of people, or cultures, may have alternated occupying the same sites and regions of interior Eastern Beringia. For example, Denali complex hunters may have spent a few days or weeks at a site while hunting caribou. In the process of making and repairing their tools and weapons they may have left some microblades and perhaps microblade cores. Nenana complex people may have subsequently used the exact same site, and when they departed, may have left a few animal bones and bifacially flaked stone tools. If these brief events occurred within one or two hundred years of each other, enough sediment may not have been deposited to separate them as stratigraphic levels. If little sediment was deposited between the occupations, the artifacts from each camp would be deposited on the same surface and be mixed. From an archeological perspective, they might appear as one event in time. Furthermore, they would be virtually impossible to distinguish using radiocarbon dating. Circumstances such as these can lead archeologists suggest that these are all the same people who only used microblades in some circumstances or at different times of the year, thus explaining the absence of microblades at some sites.

Archeologists have different ideas regarding the significance associated with the presence or absence of microblades in archeological sites. Many assume that some groups of people, or "cultures," knew how to make and use microblades and that others not. Russian archeologist Sergey Vasil'ev suggested that similarities between the Dyuktai, American Paleoarctic and Denali traditions, the Nenana complex, and Northern Paleoindian tradition reflect interrelationships between different ancient populations resulting from "long term co-existence" during the late Ice Age in Alaska. In other words, the technological and typological boundaries between the traditions were probably "fluid" and technological exchange between them resulted in sharing some typological traits.

Charles Holmes and Ben Potter suggest that microblade manufacture and use was related to specific activities that may have taken place at an archeological site. Consequently the same people may manufacture or use microblades at one site or at one time but not another. For example, the same individuals might use microblades to clean fish at one site, but not at another where they might use only large stone spear points to hunt moose or caribou. There is also evidence to indicate microblades may have been more commonly used during the winter when lithic resources are scarce, and less frequently during the summer when stone is more readily available or during periods when the climate was colder as suggested by Brian Wygal. Consequently some archeologists believe that the presence or absence of microblades may not be a useful indicator to distinguish between different groups of people or cultures. Charles Holmes and Fredrick Hadleigh West lump all these early sites together under the Beringian Period or the East Beringian tradition regardless of whether they contain microblades or not. The answer is not simple and probably all of these ideas and perspectives are correct to varying degrees depending on the specific circumstances relating to each site.

Changing Environment

About 13,000 years ago the continental ice had melted sufficiently to create a deglaciated corridor between Eastern Beringia and the Great Plains of western North America. In Eastern Beringia the summers became warmer. Aspen and cottonwood trees became more common. Peatlands began to form, suggesting that there was increased moisture between 13,000 – 10,000 years ago. During this time mammoth and horse probably became extinct in this region, but bison, elk, caribou and other large mammals continued to survive. It is about this time that some of the stone tools found in Eastern Beringia begin to have a similar appearance to artifacts of approximately the same age found in the Great Plains and more southern parts of North America.

About 12,800 years ago a period of cooler climate known as the Younger Dryas began and continued until 11,500 years ago. There was an increase in herb tundra in central Alaska between 12,500 and 11,900 years ago. To the south and east, large areas of Canada were ice free and the unglaciated corridor connecting Eastern Beringia to the Great Plains had become well established. Bison, elk, and smaller prey such as fish, waterfowl, and small mammals had extended their range into the recently deglaciated terrain.

The climate began warming again at the end of the Younger Dryas 11,500 years ago and extensive areas of the continental shelf continued to flood. Large regions of Beringia that had experienced drier interior climates became increasingly maritime. Rising sea level probably led to the formation of tussock tundra adjacent to the encroaching ocean coast, which may have dramatically reduced continental habitat for surviving animals such as elk and bison, while at the same time increasing habitat for caribou and moose.

This complex environmental mosaic in conjunction with rising sea levels and changing climate may have created a situation in which two cultural traditions existed in adjacent changing habitats. The Denali complex may have occupied the coastal areas and nearby interior while the distinctively American Northern Paleoindian tradition occupied the territory further inland. They may have lived side by side, much as Eskimo and Athapaskan people did at the time of historic contact, occasionally exchanging ideas but using different technology and practicing different ways of life. Sometimes they may have used the same camp sites that had been used previously by their neighbors. Some archeologists believe the northward movement of Paleoindian people into Eastern Beringia from the south may have been in response to changing climatic conditions in North America.

Early Holocene

In interior Eastern Beringia it becomes difficult to distinguish between artifacts of the Nenana complex and the Northern Paleoindian tradition by about 11,500 years ago. The reason they cannot be differentiated is that distinctive bifacial projectile point and knife forms, such as the unique Chindadn points or knives characteristic of the Nenana complex and fluted projectile points of the early Northern Paleoindian tradition, were no longer used after this time period.

There are several sites excavated in interior Alaska dating to the interval between 10,500 and 9,500 years ago that lack microblades that some archeologists believe are late Northern Paleoindian sites. These are the Jay Creek Ridge site, Component I at Carlo Creek, the Eroadaway site, and Component II at Owl Ridge.

The Jay Creek Ridge site located in the upper Susitna Valley was occupied about 10,700 years ago. It is located on an approach to a mineral lick primarily used by Dall sheep. The people who camped in the shrub tundra at the site burned dwarf birch and willow. They made small triangular-shaped, concave-based projectile points similar to Paleoindian examples from the far south. They also made end scrapers. Carlo Creek was a fall/winter hunting camp occupied 9,500 years ago where caribou, sheep, and ground squirrel were eaten. People made and used elongate bifaces made from stone that was heat treated by fire before flaking, but they did not use microblades. The Eroadaway site is 9,560 years old, lacks microblades, and contains straight and slightly concave-based projectile points, some of which exhibit Paleoindian characterizes such as edge grinding. Spruce needles and burned twigs also were recovered from the site, suggesting spruce were growing close to the site when it was occupied. Like Carlo Creek, the site lacks evidence of microblade technology. Component II at the Owl Ridge site is dated between approximately 10,700 and 8,350 years old. It contains Paleoindian-like bifaces but lacks evidence of microblade technology. The distribution of cobbles may be the remains of a tent ring. In the Tanana Valley, an occupation dating 8,400 years ago is also reported from the Broken Mammoth and Mead sites, both of which also lack evidence of microblade technology but which contain bifacial stone tools.

During this same time people continue to make microblades at other sites in interior regions of Eastern Beringia. Component II at the Chugwater site is between 10,700 and 10,200 years old and contains a wedge-shaped microblade core, microblades, biface fragments, gravers, and scrapers. Component II at the Gerstle River Quarry Site is 10,750 years old and contains microblades, flakes removed from microblade cores, a burin and burin spalls — all artifact types associated with the Denali complex. Two later occupations containing microblades (Components III and IV) at the Gerstle River Site have been dated to 10,000 years ago and between 9,300 and 8,400 years ago respectively. The site's excavator, Ben Potter, has assigned these occupations to the Denali complex. Component III contains the remains of bison and possibly moose, caribou, or elk. A Denali complex occupation is also documented in Component II at Panguingue Creek located in the Nenana River Valley and dated between 9,500 and 7,800 years ago.

The Sparks Point site overlooking Upper Long Tangle Lake is a Denali complex site that contains wedge-shaped microblade cores, microblades, large blades, burins and burin spalls. Frederick Hadleigh West suggests three radiocarbon dates probably date the Sparks Point site to 10,250 years ago, although their association with the cultural component is somewhat ambiguous. Based on comparison to other sites from the Tangle Lakes area that are undated, including the Reger Site and Mt. Hayes 146, have been ascribed to the Denali complex. Farther west at the Little John site (KdVo-6) in the Yukon Territory, an occupation by microblade using people has been dated to 10,000 years ago.

Organic artifacts are extremely rare from this time period but a few examples have been found and include two spectacular bone projectile points discovered during gold mining operations on Goldstream Creek near Fairbanks. Initially reported by Froelich Rainey in 1939, the points were subsequently radiocarbon dated and now are known to be 8,500 years old. These points were not slotted for microblade insets and were too large to have been arrow points. They are sharply pointed on one end and scored for hafting on the other, suggesting they were used as atl atl or spear points.

Another rare and spectacular artifact reported by Greg Hare was found at an ice patch in the Canadian Yukon. It is a large antler projectile point slotted to receive microblade insets dated to 8,100 years old (Figure 5.3.1). Although it is now warped, it was straight when it was used. It is beautifully carved and has near its base what appears to be an ownership mark, a unique design carved into an object to identify its owner. It is too large to have been an arrow point and appears to have been used as a spear or atl atl dart point. This artifact provides a rare glimpse of the technique for hafting microblades like small razors in slots of bone and antler points as it continued until at least 8,000 years ago in the interior.

Component III at the Gerstle River Site, dated to about 10,000 years ago, contains the remains of a worked rod of mammoth ivory that was not slotted to receive microblades. It suggests that mammoth ivory remained a valuable resource for thousands of years after the animals had been extinct on the mainland. The ivory rod may be similar to two bone projectile points found along Goldstream Creek, near Fairbanks Alaska, and reported by Froelich Rainey in 1939. Both points do not have slots to hold microblades and were made from the long bones of large animals and were scored along their bases for hafting, or tying, onto a longer shaft. The points have been radiocarbon dated to 9,500 years ago. Their size and weight suggest they may have been used to tip darts or spears.

Like the Mesolithic (between 12,500 and 7,000 years ago) in Western Beringia, this same time period in Eastern Beringia is poorly understood. It is difficult to determine why at some sites people made and used microblades and at others they did not. Some sites, like the Healy Lake Village site, appear to be mixed. This could suggest that microblades and non-microblade using cultural traditions persisted in close proximity for thousands of years in interior Eastern Beringia. Alternatively it might indicate that at at some sites people chose not to make or use microblades depending on their needs or the season of the year. At other sites there is evidence suggesting that people did not make or use microblades when they arrived in Eastern Beringia, but began using them later in time.

At this time in coastal areas of Central Beringia, early American Paleo-arctic tradition hunters may have lived a lifestyle similar to that of their later ASTt descendants. People practicing an economy based on hunting marine mammals and changing environmental conditions may have drawn caribou adjacent to the coast inland. The ever-encroaching ocean and increasing caribou populations may have drawn American Paleoarctic tradition/Denali complex people further inland. In interior regions of Eastern Beringia, it appears that there is a transition from the Northern Paleoindian tradition into the Northern Archaic tradition (characterized by notched projectile points) similar to the transition from the Paleoindian tradition to the Archaic tradition elsewhere in North America.

Northern Archaic Tradition (6,800 – 3,500 years ago)

By 10,200 years ago spruce trees began colonizing Eastern Beringia from the south. Initially the vast region in the south and west of Eastern Beringia remained shrub and tussock tundra. Spruce first colonized Canada's Mackenzie River valley and the upper Yukon and Porcupine River valleys. Then the trees slowly encroached south and westward, until by about 6,800 years ago spruce covered most of the interior. At this time another radical change occurred in interior Eastern Beringia. People began making stone projectile points in a remarkably different way. They began chipping notches on the sides in order to more securely lash them onto shafts. The size of the stone points and the way they are notched suggest that they were used to tip spears or atl atl darts. Others were probably hafted in handles as knife blades.

Most archeologists have regarded the Northern Archaic as a cultural tradition derived from the more southern regions of North America, where similar types of artifacts are older and signify a way of life adapted to making a living from the plants, animals and other resources associated with the boreal forest. Like the Paleoindian tradition, it is a uniquely American innovation. It spread rapidly across Eastern Beringia replacing the Denali complex and Paleoindian adaptations that preceded it. Chipped stone projectile points with distinctive notches on their sides near their base for attaching them to a shaft are the hallmark of the Northern Archaic tradition.

By comparison with sites of the Denali and Nenana complexes or the Northern Paleoindian tradition, some of the Northern Archaic sites are larger and may possibly be more permanent settlements than those of the preceding times. The Fog Creek site is a large Northern Archaic site in the Susitna River canyon area where radiocarbon dates suggest the occupation began about 5,700 years ago. In the interior, one of the best dated Northern Archaic sites is Component IV at Dry Creek. Component IV probably consists of several occupations by Northern Archaic people that are well dated by the radiocarbon method to between 5,300 and 3,650 years ago. Northern Archaic artifacts have also been recovered from a number of sites in the interior including the Ratekin site and Tangle Lakes along the Denali Highway, at the Healy Lake Village site, and at least two sites on the Teklanika River.

Unfortunately the acidic soil of the boreal forest has destroyed most organic artifacts associated with the Northern Archaic tradition. Northern Archaic tradition artifact types include side-notched, lanceolate and possibly stemmed projectile points. Northern Archaic sites also contain end scrapers, elongated and semi-lunar bifaces, boulder chip scrapers, large unifaces, notched pebbles, hammerstones and choppers.

Some Northern Archaic sites in the interior and the Brooks Range are associated with microblades and others are not. Working from the village of Anaktuvuk Pass in the Brooks Range of Central Beringia with guidance from Simon Paneak, archeologist Jack Campbell found and excavated notched projectile points associated with microblades. Following this discovery, numerous sites containing notched projectile points, microblades, and other Northern Archaic tools were identified. Like the preceding Northern Paleoindian tradition, in many cases it is difficult to determine if the microblades were made and used by the same people who made the notched projectile points. However, many or most of the earliest dated Northern Archaic sites lack microblades. Their absence has led some archeologists to suggest that Northern Archaic people may have adopted the use of microblades in various regions at different times.

There are a few fascinating glimpses of the perishable tools used during the Northern Archaic period in Eastern Beringia. Because freezing is an excellent form of preservation, it is possible for the first time to study complete organic artifacts that have been recovered from melting ice patches (Figure 6.5). These artifacts made from wood and leather can be easily radiocarbon dated using only a very small sample. The remains of atl atl shafts and foreshafts have been recovered from several ice patches in Canada and Alaska. Greg Hare has radiocarbon dated the saplings and wood staves from which many of these specimens were made. Ranging in age between 9,300 year ago to about 1,250 years ago, most were made of birch although a few were made spruce and one was maple.

The atl atl was the primary weapon used to hunt large animals and there is little evidence for the use of the bow and arrow in interior Eastern Beringia during this time. Many of the atl atl shafts were armed with foreshafts. These are detachable wooden shafts with a slot on one end to attach a stone spear point and cone shaped on the other end to fit into a socket. This technology allowed the foreshaft to detach if it struck an animal. This helped protect the foreshaft from breaking if the wounded animal fell or began running, and it enabled the hunter to more easily recover the longer shaft.

Late Denali Complex (3,500 – 1,500 years ago)

There appears to have been a resurgence of microblade use in Eastern Beringia following the Northern Archaic tradition. Although it is not entirely clear, people living in the interior began making and using microblades that were strikingly similarly to those of the earlier Denali complex. For a long time, one of the mysteries of interior Alaska and adjacent areas of Canada was the very late occurrence of microblades and microblade cores. Although these artifacts are very similar to those of the Denali complex, it can be seen that there are significant differences when they are examined closely. For example, in the earlier Denali complex sites, the primary microblade core is the wedge-shaped core, but in later times they are frequently tabular, conical, pencil-shaped, and sometimes rotated. The microblades from the late Denali cores tend to be irregular and not as uniform as the earlier ones. They are frequently found with a wider variety of projectile points including notched, lanceolate, and stemmed forms.

An example of the late Denali complex is the Campus Site, located on the University of Alaska campus in Fairbanks. The site, which contains microblades and microblade cores, was originally selected by Frederick Hadleigh West as one of the sites significant for defining the Denali complex. Although the Campus site may have a Denali complex component in its lowest levels, its reanalysis by Charles Mobley

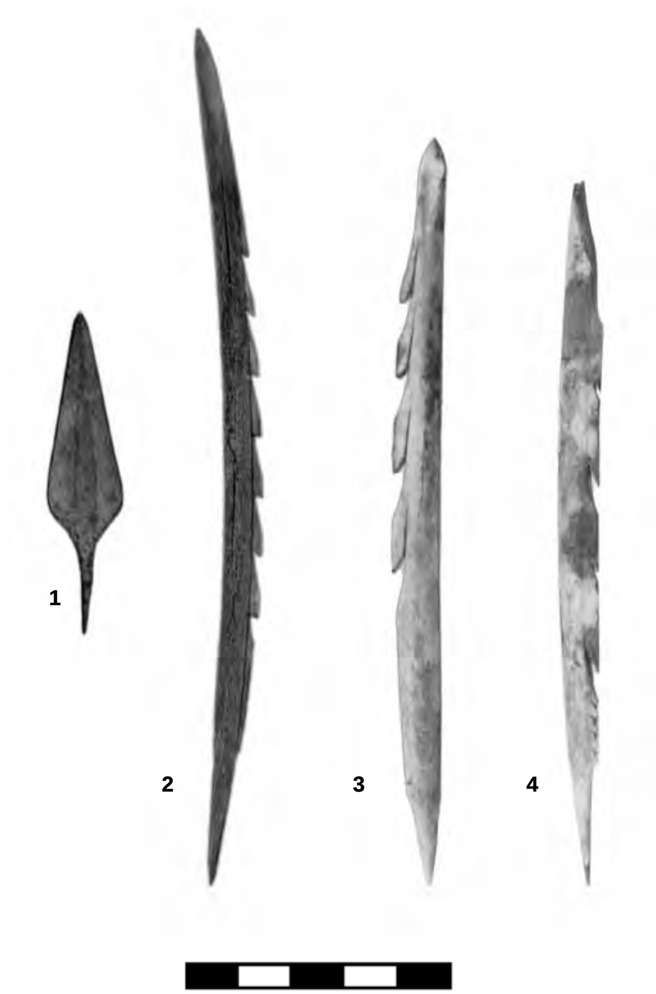

Figure 6.5 A copper end blade and antler arrow heads found melting from the Bonanza Ice Patch, Wrangell-St.Elias National Park and Preserve, Alaska: 1 Copper end blade; 2 Green staining at the tip (visible in this image as a lighter area) indicates that this arrow head once held a copper end blade; 3 Antler arrow head with copper end blade; 4 Antler arrow head with broken tip.

demonstrated that most of the microblades and microblade cores were much younger and dated to about 3,000 years ago. While not everyone accepts this interpretation, the Campus site and others like it made archeologists realize that not all sites containing microblades were as old as the Denali complex (9,000 - 14,000 years). In fact, many microblade sites are much younger.

Several sites in the interior that are relatively young have been found to contain microblades and/or microblade cores. A well-dated, stratified cave called Porcupine River Cave 1 has a brief occupation containing microblades firmly dated to 3,800 years ago. The site was probably the result of people hunting hibernating black bear during the winter. A well-documented occupation containing microblades in the upper levels at the Broken Mammoth site is reliably radiocarbon dated to between 2,900 and 2,500 years ago. At Dixthada microblades in the upper level may be as recent as 2,000 – 1,500 years old. At the Healy Lake Village site microblades have been dated to the same time period. Alaskan archeologist Charles Holmes coined the term Late Denali complex to describe this late occurrence of microblades in the interior.

It is possible that the beginning of the Late Denali complex correlates with Holocene climatic trends. Researchers Owen Mason and James Jordan discovered that between 3,500 and 1,600 years ago there were severe storms throughout Central Beringia. There is other evidence to suggest that sea ice was more extensive. During this interval of storminess and increased sea ice in the Bering and Chukchi Seas, it may have been difficult to harvest marine resources along much of the coast. These conditions may have added impetus for coastal people to move inland to harvest caribou and other resources in the interior.

Although there are differences in interpretation regarding the length of this cooler period, referred to as the Neoglacial period, most researchers agree that it began about 4,500 years ago and persisted until about 2,500 years ago. Geologist Thomas Hamilton documented an advance of glaciers in the Alaska Range at approximately 3,500 – 4,000 years ago, and many of the ice patches in interior Eastern Beringia appear to have formed during this time. This evidence suggests that slightly cooler climate, possibly favoring increased caribou habitat, occurred at a time when it was difficult to harvest marine mammals and fish along the coast. The few archeological sites dating to this time appear to be smaller, suggesting fewer people, or perhaps smaller settlements, were spread over larger geographic areas.

Arrows and Atl Atls

At the end of the Late Denali complex, people in interior Alaska and interior Yukon appear to have adopted bow and arrow technology. The bow and arrow was invented in Eurasia and people were quick to recognize its advantages. Although far more labor intensive to produce than the atl atl, it is much more effective for hunting, warfare, and defense in most situations. This technological innovation was quickly adopted around the world and Beringia was no exception. When people adopted the bow and arrow they did not entirely abandon the use of atl atls. Instead, they continued to employ them in specific types of situations where they were still useful, and all people in Beringia kept using atl atls even if they also used the bow and arrow. However, in some areas it appears that some groups did not adopt the bow and arrow and used only atl atls.

Robert Ackerman's study and dating of antler projectile points from the Nukluk Mountain Sites, the Ilnuk Site, and Lime Hills Cave 1 demonstrates that the bow and arrow was introduced to North America at the end of the last Ice Age along with the microblade industry associated with Dyuktai culture. Several of the points are exquisitely crafted and slotted to receive microblades. Their size, shape, weight, and similarity to later bone, antler and ivory examples indicate that they are arrow heads. Direct dates on the arrow heads indicate that one was 12,250 years old and another 8,800 years old. They are very similar to the ones recovered from Cave 2 of the Trail Creek Caves that Helge Larsen also recognized as arrow heads. In addition to the arrow heads identified by Larsen and Ackerman there are well-preserved wood arrow shafts from the North American side of Central Beringia dating to Choris times at Cape Krusenstern. They predate the ice patch arrows from the interior Alaska and Yukon by 2,000 years.

Among the amazing discoveries at ice patches in interior Alaska and Canada are dozens of wooden arrows, complete with fletching (feathers), antler arrow heads lashed in place with sinew, and some even with ochre paint preserved. Arrow shafts are easily distinguished from atl atl darts by their size and the nock for the bowstring. Atl atl dart shafts are not only larger, but exhibit a distal indentation to receive an atl atl hook. By directly dating the wooden atl atl and arrow shafts, Greg Hare eloquently demonstrated that the bow and arrow largely replaced the use of the atl atl in the interior of Eastern Beringia about 1,700 – 1,800 years ago. There is little evidence for the existence of the bow and arrow in more southern regions of North America until about 1,500 years ago. At that time its adoption is documented by the relatively sudden and wide spread distribution of small stone arrow heads. They appear to be miniaturizations of stone atl atl points that are lashed to arrow shafts in the same way stone atl atl points were secured to atl atl darts.

The early Eastern Beringian ice patch arrows are distinctively different. They are made of antler, not stone. Rather than being lashed directly to the shaft like the stone arrow heads to the south, the Beringian arrow heads have cone-shaped bases that fit securely into sockets at the end of the arrow. They are often elaborately barbed and sharply pointed. Although their elaborate barbing makes them distinctive, they are manufactured and hafted to the arrow shaft in the same way as people have done in coastal and near coastal regions of Central Beringia. This suggests that the use and manufacture of the bow and arrow was adopted in Eastern Beringia from people living in Central Beringia during Late Denali complex times near the end of the Neoglacial period.

Athapaskan Tradition (1,500 years ago – present)

Radiocarbon dates from numerous sites throughout Alaska and adjacent regions of Canada suggest that replacement of the Late Denali complex by the Athapaskan tradition may have occurred slowly and at different times in different areas of interior Eastern Beringia. Some scholars who study languages and their relationship to each other suggest that 2,000 to 3,000 years of development in Eastern Beringia would be necessary to achieve the modern diversity in Northern Athapaskan languages. Although the archeological evidence suggests a change in material culture from the Late Denali complex to the Athapaskan tradition somewhat earlier, this does not necessarily mean that this involved different people who may have spoken different languages.

Athapaskan speaking people are widely dispersed throughout western North America. They occupy areas from the lower Yukon River and Cook Inlet in Alaska, throughout the boreal forests of Alaska and western Canada, and areas along the North American cordillera south to Arizona and New Mexico. Despite vast geographic and environmental differences, the dialects are so similar that linguists believe these far-flung groups have not been separated long, perhaps only for 1,000 – 2,000 years. Archeological evidence supports this, as Athapaskan sites outside of Canada and Alaska appear to be no older than 1,000 – 1,500 years. Because of the diversity of geographic distribution of Athapaskan people and dialects, it is believed that the interior regions of Canada and Alaska are the heartland of the Athapaskan people and the place from which their cultures originated.

William Workman and other archeologists have suggested that volcanic eruptions at about this time in Alaska may have forced Athapaskan people from interior Alaska and the Canadian Yukon to move south. Regardless of the impetus for the diaspora, it is astonishing that relatively small groups of people traveled so far and successfully established themselves in a variety of different environments and in territory already occupied by others. This success may have been possible because of their skill in making a living from the cold lands of Alaska and northwestern Canada. Their knowledge of high latitude environments may have been ideally suited to subsistence in the high altitude environments of the Rocky Mountains. The early adoption of the bow and arrow also may have facilitated their migration southward through the western mountains and their movement southward may have led to the widespread introduction of the bow and arrow throughout the rest of the Americas.

By using the direct historic approach archeologists began excavations at historically known Athapaskan sites and have been able to trace the material culture of Athapaskan people back through time. Athapaskan-style house pits excavated by James VanStone and Joan Townsend at Kijik on Lake Clark (Figure 7.9) indicate that Athapaskan people occupied the region prior to Russian contact. At Lake Clark and adjacent areas to the west on the Alaska Peninsula their ancestors may have occupied the region as early as circa 1,500 years ago. The houses at Kijik exhibit strong similarities to the late houses on Kodiak Island, which suggests trade and sharing of cultural traits between Alutiiq and Dena'ina Athapaskans at that time.

Several archeological assemblages that have been radiocarbon dated to about 1,000 years ago can be linked to recent Athapaskan groups. This evidence suggests that changes in material culture (but not necessarily people) began sometime shortly before 1,500 years ago and were complete in all parts of the region by 1,000 years ago. By that time in Eastern Beringia primary reliance on stone working had given way to increased emphasis on the manufacture of material cultural items from native copper and organic materials (Figure 6.6). Long before the Russians arrived, the people of interior Eastern Beringia had entered the copper age and had become expert metal workers. Large daggers with scroll work handles and spear points were exquisitely crafted from copper. At Dixthada and other sites, native copper nuggets were annealed and hammered to manufacture awls, projectile points, knives, chisels, scrapers and other utilitarian and decorative objects.

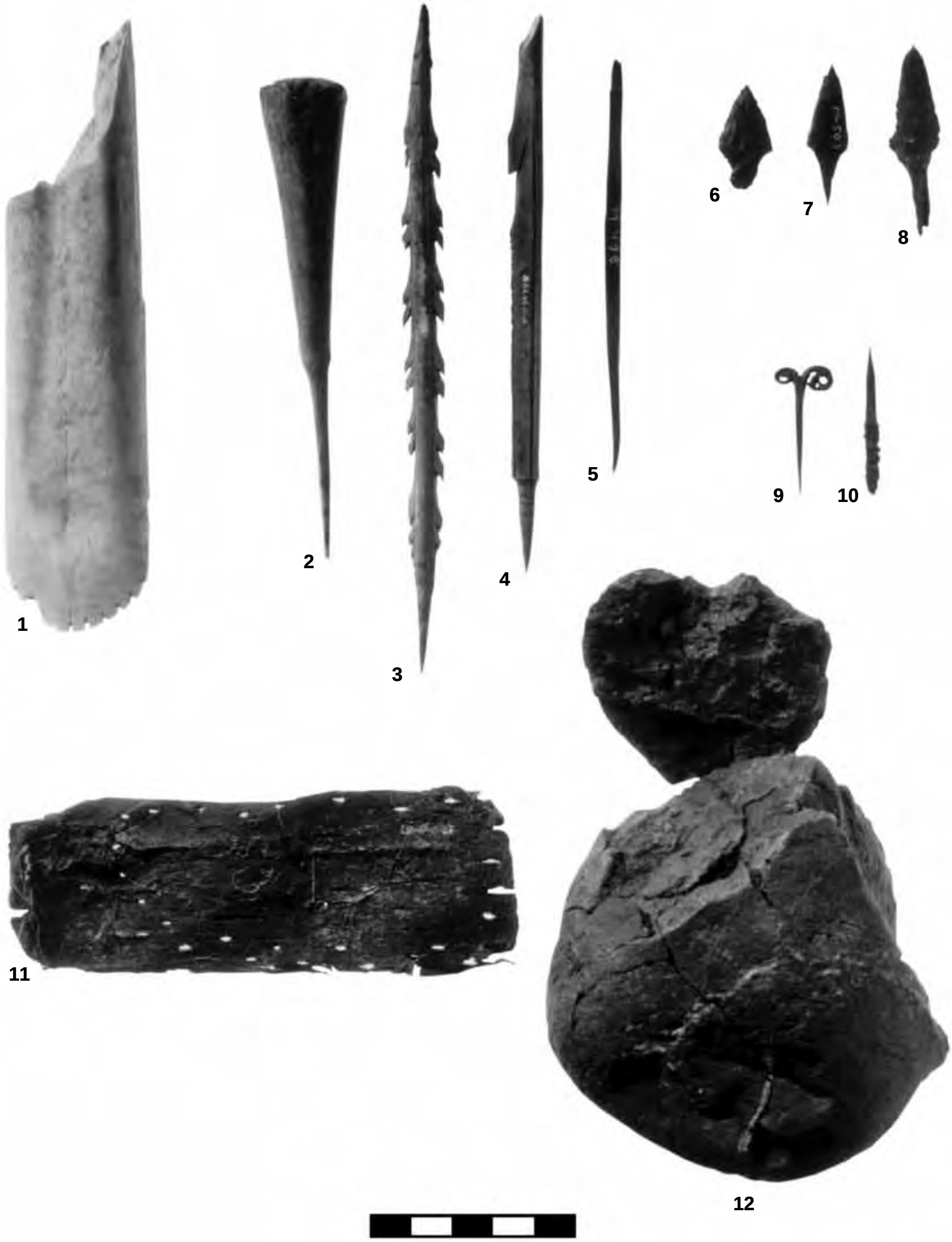

Figure 6.6 Traditional Athapaskan artifacts from the Dixthada site: 1 bone scraper; 2-5 blunt and barbed antler projectile points; 6 stone projectile point; 7 bone projectile point; 8 copper projectile point; 9, 10 copper awls; 11 stitched birch bark; 12 fire cracked rock (Dixon 1985:62).

The process of making copper artifacts relied on native copper nuggets that were found in streams and other areas throughout the region. The nuggets were heated and then hammered into bars and thin sheets, bars and wires that were then folded and consolidated by hammering into their final shape. Beautifully crafted stemmed copper projectile points were set into barbed antler and bone arrow heads. Other material cultural traits include intensive use of birch bark, high frequencies of fire-cracked rock, and pecked stone adzes. In some areas, particularly along major rivers such as the Yukon, some Athapaskan people adopted the manufacture and use of grit-tempered pottery similar to that made and used by Eskimo people along the coast. However, people continued to rely primarily on birch bark for making waterproof containers. There is little evidence about the exact types of clothing used by people during this time, however a rare 1,400 year old leather moccasin was found melting from an ice patch in the Canadian Yukon.

Euroamerican Contact (1830s – present)

When Euro-American traders, prospectors and explorers began to enter Alaska's interior in the late 1800s they found the region inhabited by resourceful people who spoke a wide variety of dialects of the Athapaskan language. They made their living primarily by fishing for salmon along rivers in the summer and hunting caribou and moose and trapping fur bearers in the winter. They lived in permanent villages frequently located along rivers and lakes where fishing was good, leaving home to make subsistence rounds during warmer months. They hunted a variety of large animals including moose, bear, sheep and goats. They took waterfowl in the summer, trapped a variety of small mammals, and fished through the ice in winter. They were engaged in trade with their neighbors. Goods from the interior forest, such as furs and birch bark containers, found their way to the coast where they were traded for marine mammal products and other items.

The first non-Natives to enter Eastern Beringia were explorers and fur traders associated with the Russian American Company and the Hudson Bay Company. These two commercial giants, one spreading eastward from Moscow and the other moving westward from London, met halfway around the world at the junction of the Yukon and Tanana Rivers near the Athapaskan village of Tanana in interior Alaska. The Russians established a trading post at the village of Nulato on the lower Yukon River and the Hudson Bay Company built a fort upstream at the junction of the Yukon and Porcupine Rivers that they called Ft. Yukon (Figure 6.7). From these and other trading posts, artifacts of Russian origin flooded into the interior from the west and artifacts of English manufacture entered the region from the east. Disease soon followed. Smallpox was introduced along the lower Yukon River in 1838-39 and later scarlet fever in 1851 and 1865.

Although gold was known from Alaska, it was the Klondike Gold Rush of 1897 – 1898 and the subsequent discovery of gold near Fairbanks in 1901 that brought large numbers of non-Native people into the interior. At this time the fish wheel was introduced in the interior. Native people moved close to trading posts and engaged in market hunting to provide meat and fish to the miners. The influx of outsiders introduced devastating epidemics of measles, tuberculosis, and influenza that further reduced the Native population.

Figure 6.7 Hudson Bay post at Fort Yukon (drawing by Fredereick Wymper 1866).

The Klondike Gold Rush occurred when the United States was undergoing an industrial revolution. This is reflected in the historic artifacts dating to this period. At the beginning, horses and horse drawn vehicles were the primary form of transportation, and human labor was necessary for mining and industrial production. Soon after gold was discovered in interior Eastern Beringia, there was a dramatic change in technology to machine-powered vehicles and tools. Early automobiles and trucks soon replaced horse-drawn sledges, wagons, and wood-fired boilers. By 1902 a telegraph connected the interior with the port at Valdez. Gold dredges introduced in the 1920s changed gold mining into large commercial enterprises. The archeological record of Eastern Beringia documents this unique transition in the economy and material culture of American society.

Summary

The oldest sites suggest Denali complex people occupied interior Eastern Beringia prior to 14,000 years ago and that this early technology and the people who used it had their origins in Asia. The Denali complex is similar to the American Paleo-arctic tradition and Dyuktai culture in Central and Western Beringia. People of the Denali complex made microblades and probably used the bow and arrow to hunt land mammals. After the Denali complex there appears to be a fascinating sequence of occupations that alternate between people who made and used microblades and probably used the bow and arrow and other groups that relied on the atl atl as their primary hunting tool and did not regularly make and use microblades (Figure 6.8).

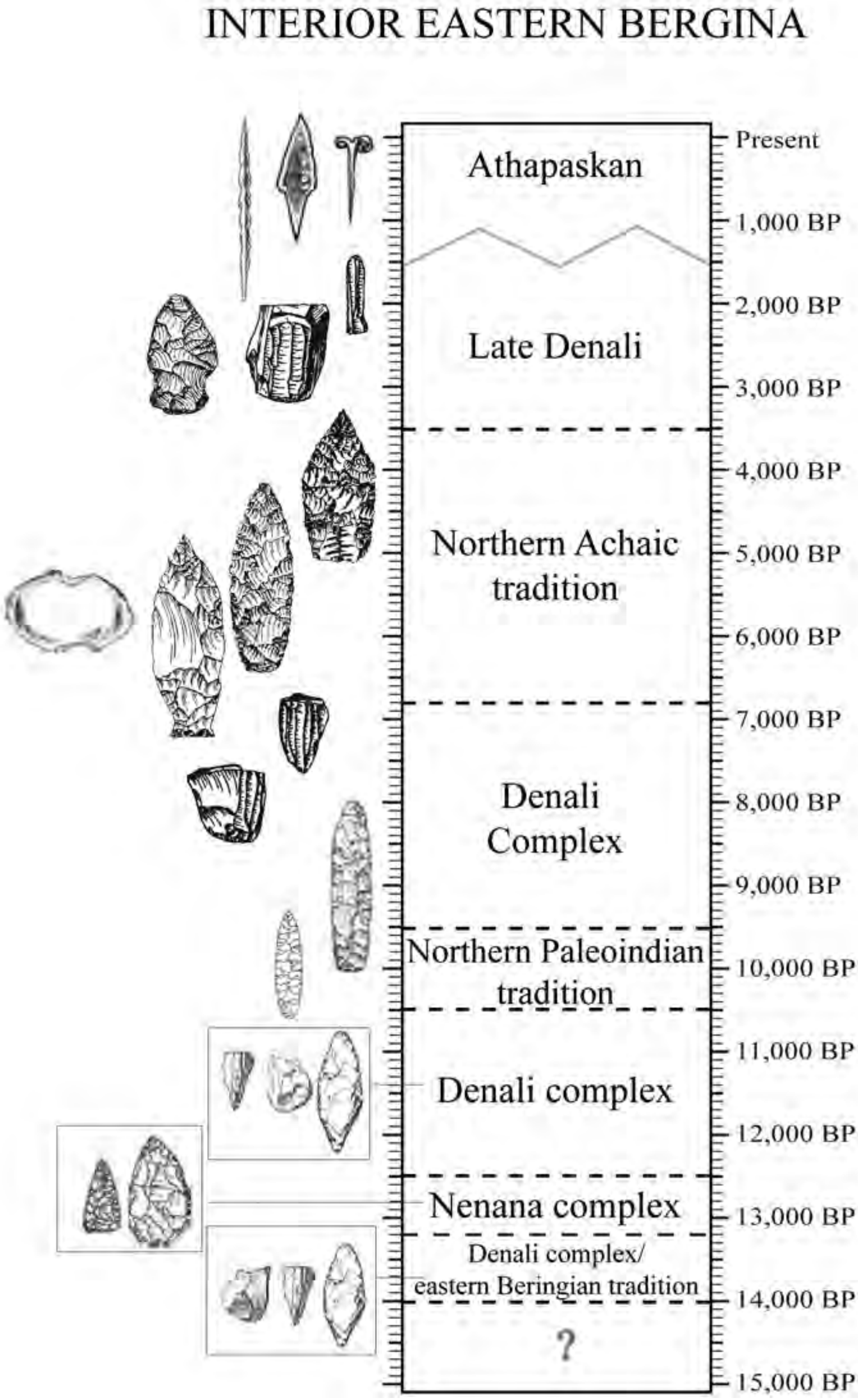

Figure 6.8 Cultural chronology of interior Eastern Beringia (Icons from Anderson 1988, 1968a, Mobley 1991; Powers and Hoffecker 1989; West 1967, Dixon 1985).

Following the Denali complex, the archeological record is confusing. There are occupations by microblade-using people of the Denali complex and Nenana complex and Paleoindian tradition people who may not have made and used microblades between about 12,500 and 7,000 years ago. The Denali complex people not only used the atl atl, but also hunted with the bow and arrow, while it appears that the subsequent Nenana complex and Paleoindian tradition lacked the bow and arrow and hunted with light-weight spears, or darts, propelled with an atl atl. Occupations at some sites suggest that Denali complex microblades and Paleoindian projectile point types appear to occur together. Artifacts from different occupations may have become mixed together, or there may have been cultural contact resulting in a blending, or sharing, of cultural traits.

The origin of the Nenana complex (13,700 – 13,000 years old) is unclear. Some archeologists have suggested that it originated from Asia, but similar artifacts of comparable age have not been found there. This has led some archeologists to think that it may be the first evidence of people to move north into Eastern Beringia from the American Great Plains at the end of the last Ice Age. Others suggest it is a variant of the Denali complex that for some reason lacks microblades. While the Denali complex occupation of the interior continued, a new people called the Northern Paleoindians arrived from the south about 12,500 years ago. This occurred soon after the continental glaciers had melted sufficiently to allow plants, animals and people to colonize the ice-free land.

By about 6,800 years ago a radical change occurred in interior Eastern Beringia. The warming climate had reached its peak and the boreal forest expanded to cover the entire region. The atl atl using Paleoindians may have modified their technology and adopted the distinctive notched stone points of the Northern Archaic tradition introduced by their neighbors to the south. Another possibility is that new people moved northward settling Eastern Beringia and areas as far west as the coast of the Bering and Chukchi Seas. This tradition is called the Northern Archaic tradition. Toward the end of the Northern Archaic tradition, people began making lanceolate projectile points and adopted the use of microblades.

About 3,500 years ago the climate became cooler and there was a resurgence of microblade use in interior Eastern Beringia. People living in the interior may have adopted use of the bow and arrow for the first time about 2,000 years ago. By about 1,500 years ago the use of the bow and arrow was adopted throughout much of the rest of North America. People in Eastern Beringia appear to be the last people in Beringia to abandon the use of microblades when they began making artifacts from native copper about 1,000 years ago. The sites and types of artifacts can be traced from this time period to the Athapaskan people who continue to occupy interior Eastern Beringia.

By the mid-1800s two great colonial powers, the Hudson Bay Company expanding from the east and the Russian American Company expanding from the west met on the Yukon River in interior Eastern Beringia. Subsequent epidemics, the gold rush of 1898, the introduction of aircraft, and the construction of the Alaska Highway irreversibly changed the cultural history of interior Eastern Beringia.

Additonal Reading:

Nelson, Richard K.
1973 *Hunters of the Northern Forests*. University of Chicago Press. Chicago.

VanStone, James W.
1974 *Athapaskan Adaptations: Hunters and Fishermen of the Subarctic Forests*. Aldine Publishing Company, Chicago.

CHAPTER 7
EASTERN BERINGIA
THE GULF OF ALASKA AND ALEUTIAN ISLANDS

The Alaska Peninsula is a spine of mountains that extends westward from Cook Inlet to the Bering Sea. The people who lived at its western end were culturally most similar to people of the Aleutian Islands. The lifeways of the people who lived on the north side of the Peninsula were more similar to the people of Central Beringia. However on the south side, they were more closely associated with the cultural developments that took place in the Kodiak Archipelago in the Gulf of Alaska. The rich maritime environments of the north Pacific Ocean and the Gulf of Alaska have supported thousands of people since the end of the last Ice Age.

Aleutian Islands

The Aleutian Islands are a string of volcanoes that have created mountains on the floor of the deep ocean. They stretch in an arc westward from the Alaska Peninsula far into the north Pacific Ocean (Figure 7.1). They are not a part of the continental shelf that formed the Bering Land Bridge. Even during times of lower sea level they were separated from the Bering Land Bridge by a deep ocean basin. Although the islands would have been larger when sea level was lower, they could not have been seen from the southern shores of the Bering Land Bridge. Some people have speculated that the first Americans may have traveled by watercraft from Asia and used the Aleutian Islands as stepping stones to reach North America. However, scientific evidence suggests that the first people to inhabit the Aleutian Islands came from the east (Alaska) not the west.

Most archeologists agree that the Aleutian Islands were colonized from the east and that over time people gradually moved onto the unoccupied islands to the west. Although the data are still far from complete, Don Dumond has attempted to determine the timing of the colonization of the island chain. In the Fox Islands in the eastern sector there is evidence of occupation beginning between 9,500 and 9,000 years ago. Moving westward he estimates the earliest evidence for occupation in the Andreanof Islands to be about 5,700 years ago and in the Rat Islands about 3,800 years ago. The Near Islands, the most westward group in the chain, are believed to have been colonized about 2,500 years ago.

The islands have long been the subjects of archeological research. This work began when William Healy Dall conducted excavations at several midden sites in

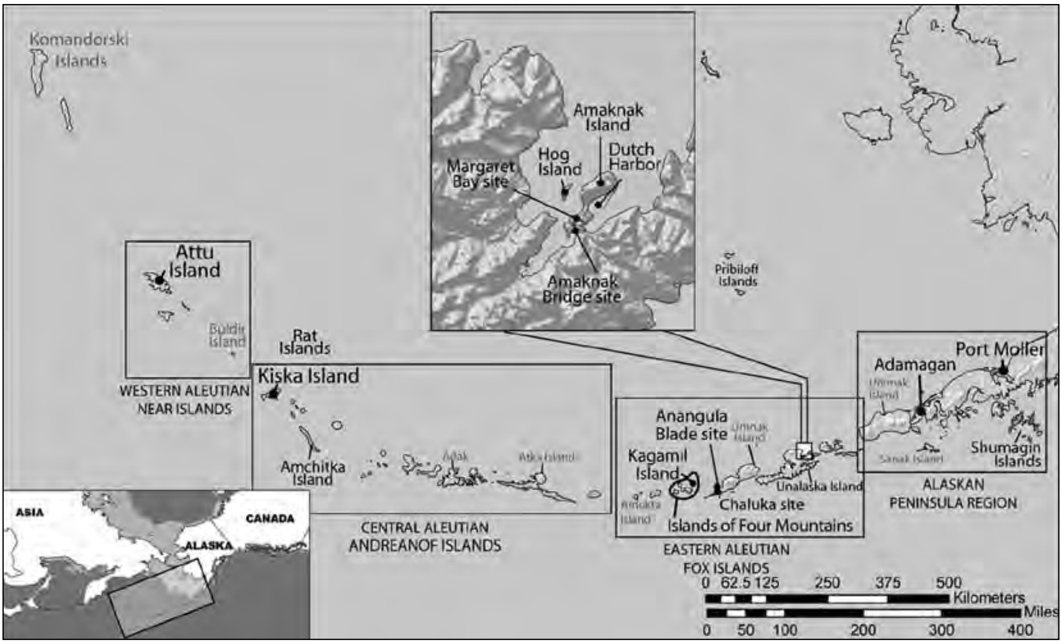

Figure 7.1 Map of the Aleutian Islands and important archeological sites.

the Aleutian Islands between 1871 and 1874. He used the method of stratigraphic superposition in his excavations and based on his findings proposed a three-stage sequence for the development of Aleut culture. This pioneering work was followed by that of Waldemar Jochelson, who in the 1920s excavated several sites that he interpreted to indicate cultural continuity over a long period of time. He believed that people originating from the Alaska mainland had colonized the Aleutians Islands originally from the east. Jochelson's work was followed by that of physical anthropologist, Aleš Hrdlička, who studied human skeletons from the islands in the 1940s. This work led him to propose a two-stage scheme based on the shape of heads: long-headed pre-Aleuts that were older and later Aleuts who had broad heads.

Interestingly, none of these early researchers were archeologists. Dall was a self-trained naturalist, Jochelson was primarily an ethnographer, and Hrdlička was a physical anthropologist. Much of this early work typifies a lack of sensitivity toward indigenous cultures prior to and shortly after anthropology was established as a formal academic discipline. This was a formative period in American science and the new discipline of anthropology had not considered the ethics surrounding the excavation of human remains.

As a result of this early work, two interpretations of Aleutian prehistory developed over time. The first postulated two distinct traditions: an early Anangula tradition followed by a later Aleutian tradition. The Anangula tradition was attributed to the initial colonization of the islands by people who relied primarily on large unifacially flaked stone blades as cutting implements. They did not make bifacial stone tools – tools that were chipped or flaked on both sides or faces. This initial colonization was followed by the Aleutian tradition, a later group of people who made and used bifacially flaked stone artifacts. The people of the Aleutian tradition lived in villages that accumulated large refuse piles called middens. These people would have been the ancestors of people living along the island chain when the Russians first arrived in the early 1700s.

The other idea was that there was one long, continuous occupation beginning with early colonists who relied primarily on stone cores and blades for cutting implements and other tools. From this start, the culture of the islands gradually developed into historically documented Aleut culture, with little or no outside influence. Later excavations by archeologist Alan McCartney demonstrated that beginning about 5,500 – 4,500 years ago people lived for thousands of years in the same villages. During the course of this continuous occupation residents repeatedly constructed houses on the same site, dug storage pits and graves, and engaged in other activities that disturbed the middens that accumulated over long periods of time. This mixed the layers of sediments and tended to "homogenize" the deposits. It also mixed the artifacts from different time periods together, which created the impression that most of the artifacts from different levels, or time periods, were similar.

The earliest archeological evidence from the island chain is known from the Anangula Blade site, located on Anangula Island at the tip of the Alaska Peninsula. William Laughlin, a student of Ales Hrdlička, discovered the site in 1938. It was the focus of excavations by Laughlin and his students for many years. Although the only faunal remains found were fragments of whale bone associated with hearths, it is clear from the physical location of the site adjacent to the sea that its occupants were culturally adapted to a maritime economy. Based on a suite of 45 radiocarbon dates, the occupation of the site began 9,500 years ago and possibly as early as 10,000 years ago.

Artifacts from the site include burins, pointed tools on blades, stone vessels, rubbing stones, red ochre, and abraders. Most archeologists agree that these artifacts are related to those of the early Mesolithic, or Sumnagin, cultures in Russia or a late regional variant the American Paleo-arctic tradition in North America. Features at the site include six shallow house or tent depressions, but details about the shape and construction are not known. If they were occupied at the same time, this site was probably a small permanent settlement or village. Burned whale bone was found at the site, which has led some archeologists to speculate that the people may have been whale hunters or perhaps scavenged whales that had died from other causes. Grooved stones were used as line weights to fish for bottom fish such as halibut. The location of the site and the types of artifacts recovered clearly indicate that people had a well-developed maritime subsistence technology. Geologist Robert Black suggested that the site was abandoned as a result of a volcanic eruption that buried the village under a thick layer of ash.

The earliest occupation at the nearby Chaluka site on Umnak Island is believed to be about 4,500 years old, but some archeologists have suggested it may be only 3,000 years old. Not only is the Chaluka site younger, but the unifacial blades and blade cores characteristic of the Anangula Blade site are not present at Chaluka. Despite a 5,000 year gap in time between the occupation of the Anangula Blade site on Anangula Island and the Chulaka site on Umnak Island, it is viewed by many archeologists as transitional between the Anangula blade site and later Aleutian sites.

Don Dumond and Rick Knecht excavated another site farther to the west on Hog Island, located in Unalaska Bay near Dutch Harbor. This site also provides important insights into the lives of the early Aleutian Islanders. The site has been radiocarbon dated to 9,000 years ago. However, it may be slightly older because the artifacts were found lying below a 9,300 year old volcanic ash. The distribution of artifacts suggests that a tent, or similar structure, was located at the site. Artifacts include blade and microblade cores, blades and microblades, scrapers, burins, a stone for grinding ocher, a pumice abrader, worked cobbles and pebbles, and a stone worked to serve as an oil lamp (Figures 7.2 and 7.3). The artifacts and ecological setting of the Hog Island site are similar to the Anangula Blade site and the people who lived there made their living primarily from the sea. Because the Hog Island site was located on

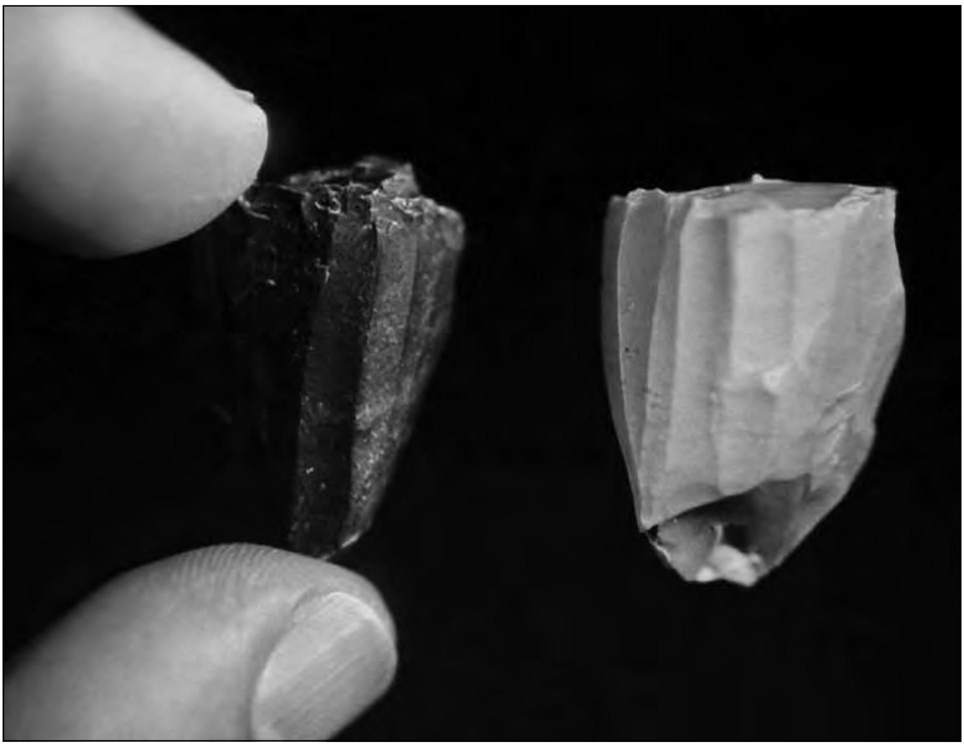

Figure 7.2 Microblade cores form the 9,000 year old Hog Island Site, near Unalaska, Alaska (Photo courtesy of Richard Knecht).

an island at the time it was occupied and because of the maritime ecological setting of the Anangula Blade site, it is clear that people living in the eastern Aleutian Islands had developed sea-worthy watercraft by this time.

Most archeologists believe that the early core and blade sites in the Aleutian Islands originated from the earlier American Paleo-arctic tradition on the Alaska mainland and bear striking similarities to the Russian Sumnagin cultures. To the east, American Paleo-arctic tradition occupations have been excavated at Ugashik Lakes and Kvichak Bay on the Alaska Peninsula. Although the ecological settings of these sites suggest terrestrial adaptations, Anangula and Hog Island demonstrate that maritime adaptations had developed by this time.

The Margaret Bay site (Figure 7.4) was excavated by Rick Knecht and is located not far from Hog Island on nearby Amaknak Island. Although there may be

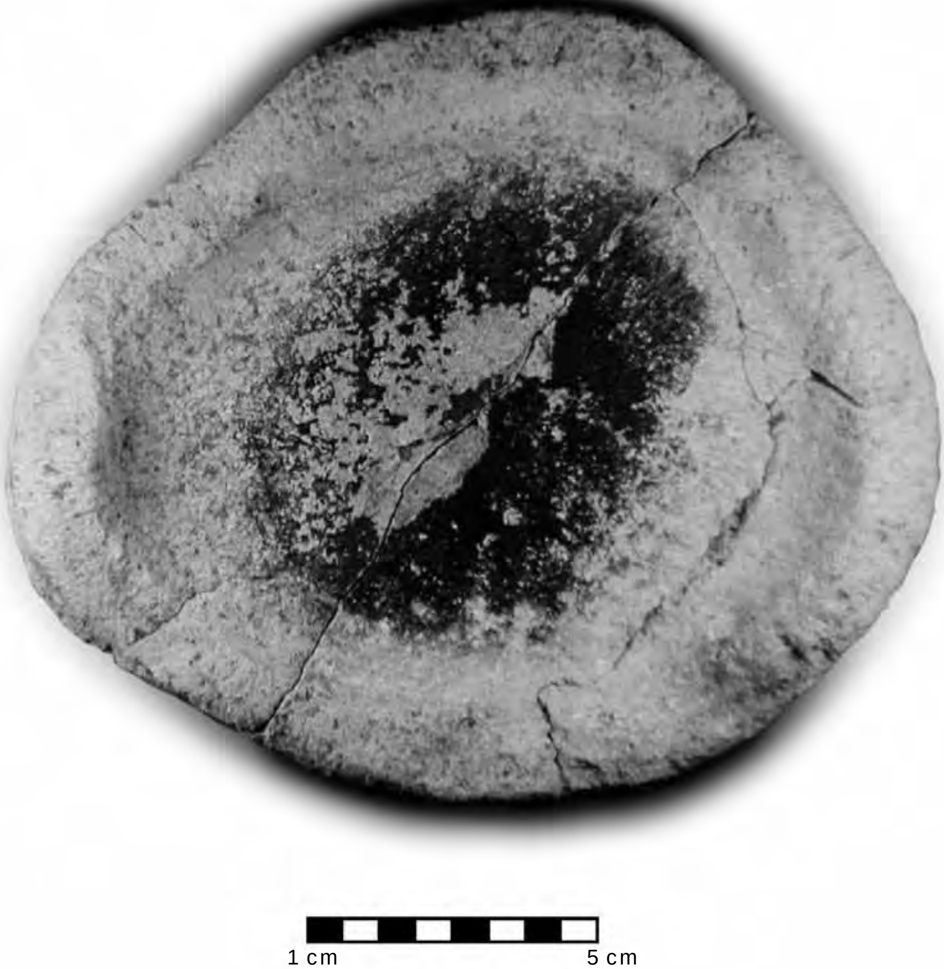

Figure 7.3 Nine thousand year old stone lamp from the Hog Island Site (Photo courtesy of Richard Knecht).

as much as 2,700 year gap between the two sites, archeologists recognize continuity in the types of stone tools used at both sites. The large number of blades and microblades at Hog Island, the Anangula Blade site, and the oldest levels at Margaret Bay suggest to most archeologists that the remains from Margaret Bay are part of the same cultural continuum. The earliest dated occupation at Margaret Bay is from level 5, which is about 6,300 years old. In addition to blades and blade cores, microblades and microblade cores, this level also contains stemmed and leaf-shaped projectile points or knives, end scrapers, a soapstone oil lamp, and a barbed bone harpoon head.

The next youngest level, level 4, at Margaret Bay is dated between 5,400 and 5,200 years old. Not only does the manufacture and use of blades and microblades continue, but other stone artifacts include burins, scrapers and stemmed and leaf-shaped bifacially flaked projectile points or knives. The level also preserved a number of distinctive barbed bone points typical of later forms common throughout the Aleutians. There are

Figure 7.4 An excavated slab-lined house at the Margaret Bay Site, Unalaska, Alaska (Photo courtesy of Richard Knecht).

pegs for atl atls, eyed needles, line or bola weights made from a walrus tooth, and fish hook barbs.

Level 4 is fascinating because in one area the bones of animals that no longer live in the region have been found. The bones of ringed seal, walrus, and polar bear were found in addition to many typical Aleutian species of today. Their presence in the eastern Aleutian Islands at this time roughly corresponds with a time of colder climate called the Neoglacial period. All these animals inhabit the edge of the ice pack and ride the sea ice southward in winter. This indicates that the Bering Sea pack ice came further south during this time. This may have resulted in contact with ASTt people to the north.

Level 3 at Margaret Bay contained the remains of a semi-subterranean house. The outer wall of the house was delineated by a series of stone piers. Inside the house were storage boxes lined with stone slabs. The house had an adjoining stone-lined hearth that contained charcoal dating to about 4,000 years ago. Bone was not preserved in this level. Stone artifacts included blades and microblades, stemmed and leaf-shaped points, chipped awls or lancets, a stone bowl, and ground slate artifacts including fragments of a lance blade and an ulu.

The last occupation at the site, Level 2, was the most spectacular. Four stone-lined semi-subterranean houses were found and one was completely excavated. Unlike the partial remains of the house in level 3, this structure was lined by a stone wall to form a round structure that had been dug about one meter below the surface. A radiocarbon date from charcoal on the house floor indicated that the house had been occupied about 3,500 years ago. Two sets of post molds suggested that a pair of tripods were used to support the roof. No entry was observed, so it is likely that the house was entered via a ladder-like notched log similar to later Aleut houses. Six storage pits had been dug into the floor and covered with stone lids. Two were lined with stone slabs and another with beach gravel. Next to the hearths were two shallow trough-like features made of stone slabs divided into compartments and sealed on the ends. Some of the compartments were filled with fish bones. These features appeared to have been areas where food was prepared. Several unilaterally barbed bone non-toggling harpoon heads were also recovered.

In Level 2 at Margaret Bay people continue to make blades and microblades, but microblades are less common. Stone artifacts from level 2 include scrapers, bipointed bifaces, a siltstone pendant incised in a net-like pattern, chipped stone otter effigies, small oil lamps and bowls, ground slate lance and/or knife blades, thick square-based stemmed chipped stone points, incised and shaped pumice objects, ground and chipped burins, gravers and borers, polished adze blades, and labrets. The stone artifacts, particularly the burins and microblades, suggest influences from the ASTt along the coast of the Being Sea region to the north. The earliest bone arrow points from Margaret Bay are barbed and not slotted for microblade or side blade insets. The pattern of barbing and a distinctive Aleutian haft made to fit a socket suggests that microblade or side blade insets may not have been used in the Aleutians at this time (6,300 years ago).

By about 4,500 – 5,500 years ago sea level had stabilized and intertidal zones rich in kelp and shellfish had become dependable resources for marine mammals and humans. People resided in the same place for long periods of time and large shell middens began to accumulate. Numerous middens throughout the islands document widespread sedentary life. People living in the villages collected local plants, driftwood, and shellfish. They also engaged in fishing and hunting marine mammals.

By about 3,000 years ago, people stopped using microblades in the eastern Aleutians and shortly thereafter stopped making blades struck from blade cores. Houses similar to the one carefully mapped and excavated from level 2 at the Margaret Bay site have been found at other sites. Somewhat younger, similar types of stone-lined houses have been reported from the lower levels of the Chaluka site on Umnak Island and at the Amaknak Bridge site on Amaknak Island (Figure 7.5).

From this time onward people lived in sedentary villages consisting of clusters of semi-subterranean houses constructed with driftwood and whale bone and covered with sod. The manufacture and use of ground slate ulus and other stone tools became common by about 1,500 years ago in the eastern Aleutians and appears to be adopted in the western Islands later. Chipped stone end blades, stone oil lamps and bowls, labrets, and ground stone adze blades were used commonly throughout the islands. Marine mammals, including whales, were hunted using barbed harpoons. Fish were taken using fish spears, nets, and hooks and lines with stone weights.

There is also evidence for increased variation in the economy throughout the Aleutian Islands during this time. For example, at the eastern end of the islands where salmon are plentiful, villages tend to be larger than those in the west where people are more reliant on cod, herring, and other ocean fish. In the central Aleutians, sea urchins, limpets and other shell fish were important resources that were harvested. People living

Figure 7.5 A large multi-room slab-lined house approximately 3,000 years old excavated at the Amaknak Bridge Site, Unalaska, Alaska. Note the v-shaped, dual smoke ventilation system leading to the chimney in the foreground. The two rooms in the upper right are the remains of a second house (Photo courtesy of Richard Knecht).

on the Alaska Peninsula used pottery similar to that used elsewhere in Central Beringia, while people to the west on the Aleutian Islands continued to use only stone to make bowls and oil lamps. People in the eastern Islands also adopted the use of the toggling harpoon similar to forms used along the Bering Sea coast.

During this time (about 1,500 years ago) there is evidence suggesting increased regional conflict. The use of the bow and arrow becomes common and body armor made of flat rectangular overlapping pieces of bone appears for the first time. In addition, many villages are located in high, defensible locations from which advancing adversaries can be seen for considerable distances.

The Islands of the Four Mountains are known for caves and rock crevasses used to bury the dead. Although the practice of investigating burials without permission from Native groups is not considered ethical by archeologists today, William Dall and later Ales Hrdlička collected artifacts from them in the late 1800s and early 1900s. The process of mummification which preserved these burials is unique to the Aleutians. On Kagamil Island in particular, more than 60 mummies were removed and taken to the Smithsonian Institution along with burial goods. Many were the remains of people who appear to have had high social status. These collections included clothing, weapons, armor, tools, baskets, woven mats, and stunning wooden masks. The state of preservation and local oral history indicated that they were ancient in age, but some may be as much as 2,000 years old. Because preservation of organic artifacts such as baskets is extremely rare in the Aleutians, these artifacts provide unique insights into the exceptional sophistication and craftsmanship attained by Aleut, or Unangan, culture prior to Russian contact.

By the early 1700s, the proximity of Alaska to the east was well known to Russians involved in the ever eastward expanding fur trade. In 1724 Tsar Peter the Great authorized government sponsored exploration under the leadership of Vitus Bering. Bering's first expedition (1725 – 1726) did little more than confirm Semeon Dezhnev's earlier exploration establishing that the two continents were separated by Bering Strait. However, Bering's second expedition in 1741 made several landfalls in Alaska. Although Bering died on the Commander (Komandorski) Islands, the survivors of this expedition returned with detailed information about the great land and the abundant, valuable fur-bearing animals they saw there.

Two years after Bering's voyage, private fur hunters reached the Commander Islands and began pressing eastward along the Aleutian Island chain, exploiting the diverse sea otter populations. They ruthlessly enslaved the resident Aleut population to work in the fur trade. By 1762 independent Russian fur traders had reached Kodiak Island and established Russia's colonial claim over this territory. By then the Aleutian Islands had been largely depopulated as a result of epidemics and Russian conscription. By 1774 Unalaska in the eastern Aleutians had become a small, permanent Russian outpost. In 1824 a Russian Orthodox mission was established at Unalaska (Figure 7.6). Because of its proximity to the deep water passes between the Bering Sea and the north Pacific, the village of Unalaska and adjacent Dutch Harbor maintained a prominent position in international trade and defense. Large numbers of ships visited this safe port beginning with the fur trade. It continued to be a busy port during the commercial whaling boom of the 1800s and World War II. It remains the center for regional commercial fishing.

Today the Aleutian people are called Unangan. They have an extensive oral history that indicates they knew of the Pribilof Islands to the north. The Pribilof Islands were apparently not settled until the Russians transported Aleut people there to harvest the fur seal breeding grounds. To the west, the Commander Islands also appear to have been unoccupied at the time they were found by the Russians. Although there apparently was no ancient occupation, Russian archeologists have located and excavated Bering's wreck and the camp where he died.

In June 1942, carrier-based Japanese bombers attacked Dutch Harbor. A few days later Japanese troops landed and established bases on the islands of Kiska and Attu in the western Aleutians. World War II had reached Eastern Beringia. Forty-one people from the village of Chichagof on Attu Island and 10 American servicemen at a weather station on Kiska were captured. The United States evacuated the remaining civilians, primarily Unangan people. In a decisive battle on Attu in 1943, more than 2,500 Japanese soldiers were killed, many took their own lives. Only 28 were taken prisoner. The United States suffered 3,829 casualties including 549 fatalities. The Japanese troops on Kiska Island slipped away under the cover of fog, leaving much of their equipment on the Island.

World War II left its mark on the Aleutian Islands and the islands were strategically important in the Pacific theatre. The first Japanese Zero fighter plane to

Figure 7.6 An eagle on top of the cross of the Russian Orthodox Church, Unalaska.

be recovered during the war was captured in the Aleutians and provided important information to the Allies about its design, construction, and vulnerability. Many archeological sites were damaged or destroyed as a result of military construction because they were located in defensive positions or provided ready sources of fill for construction sites. Abandoned military installations, equipment, and bunkers remain scattered throughout the islands (Figure 7.7). Morale building efforts encouraged American soldiers to loot sites and collect artifacts. Long after the War many of these collections were donated to museums and government agencies by aging veterans and

Figure 7.7 World War II military pillbox, Amaknak Island.

their descendents. The Japanese and American military equipment and installations on the Aleutian Islands are now significant historic sites providing important insights into the nature of World War II in the north Pacific.

The Cold War also had an impact on the culture history of the Aleutians. Weather and radar stations, listening posts, and other military installations were established along the Aleutian chain. As during World War II, archeological sites were damaged and destroyed by construction and looting by contractors and military personnel. Cold War activity in the Aleutians culminated in underground nuclear testing on Amchitka Island by the United States Atomic Energy Commission. Prior to detonating underground nuclear bombs on the island, several archeological surveys and limited excavations were supported by the Atomic Energy Commission on Amchitka Island.

Western Alaska Peninsula

The culture history for the western tip of the Alaska Peninsula is best known in the area from Port Moller to the end of the Peninsula. Although no American Paleo-arctic tradition sites have been reported from this region, they occur on the Alaska Peninsula to the east at Ugashik Narrows and Kvichak (Figure

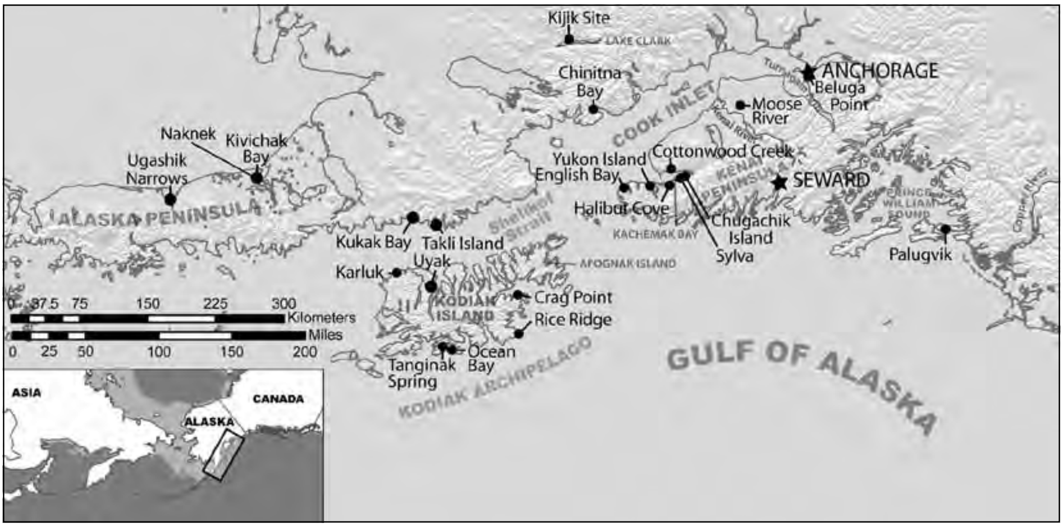

Figure 7.8 Map of the Alaska Peninsula and Gulf of Alaska depicting key archeological sites.

7.8) and in the Aleutians at Anangula and Hog Island to the west. The western peninsula is best known for its evidence of continuity with the culture history of the Aleutian Islands. In this region archeologist Herbert Mashner has conducted surveys and excavations and defined a sequence of cultural development spanning the past 5,000 years. The earliest period of occupation occurs between about 5,000 and 3,700 years ago. Several village sites in the vicinity of Izembek and Moffet Lagoons, and possibly the earliest occupations at Port Moller suggest that people lived all year at these sites during this time period. Stone artifacts include notched and stemmed projectile (dart) points, notched net sinkers, ovoid knives, scrapers and retouched and blade-like flakes. Villages dating to this time are on terraces and bluff edges, commonly near salmon streams. Animal bones suggest people made their living by fishing for salmon and cod in the rivers and ocean, collecting shellfish, and hunting birds and seals.

Following this period, the area was occupied by people who appear to be related to the Arctic Small Tool tradition that is widely recognized throughout much of Central Beringia. This period of occupation has been named the Russell Creek phase and occurs between about 3,500 and 3,000 years ago. During this time, people constructed relatively small oval houses between 10 ft and 6 ft (3 m and 1.75 m) in diameter. Over time they were built one on top of the previous one, each floor separated by a fresh layer of beach gravel. People hunted walrus, sea lions, seals, sea birds and migratory waterfowl. They fished primarily for cod and a variety of flatfish, although the remains of a few salmon occur. Bone and ivory artifacts include fishhook parts and harpoon fragments. Stone tools include microblades and microblade cores, bi-pointed, stemmed, and triangular end blades, as well as end and side scrapers. The houses are interesting because, like many ASTt examples, they contain stone slab box-like hearths; however, like many Aleut houses, they lack entrance passages. A post mold in at least one may suggest a roof entrance using a log notched like a ladder, a characteristic common in Aleut dwellings.

Following the Russell Creek phase, the construction of larger permanent villages resumes along with reliance on salmon fishing. There is no evidence that people made or used microblades. Instead the stone artifacts are characterized by stemmed end blades, large bifacial knives, and large numbers of stone net sinkers. These types of settlements persist between about 3,300 and 2,500 years ago. Then it appears the area may have been abandoned for about 300 years, possibly as a result of a large earthquake that may have caused the land to drop and adversely affect the streams in which salmon spawn. The dramatic event may have forced people to abandon the area temporarily.

Beginning about 2,200 years ago, the region appears to have been reoccupied and the population seems to have increased rapidly. There appears to have been contact with Norton people to the north. Some of the houses are built with entrance tunnels and contain ceramics and ground slate tools. The typical stemmed projectile points are most commonly basalt and are similar to Norton examples. These are all traits commonly associated with archeological sites farther north in Central Beringia.

Throughout this time, the population appears to grow. Individual house sizes become larger, possibly suggesting larger families, and the villages themselves become larger. One spectacular settlement, Adamagan, contains more than 500 house depressions and storage pits. At some of these sites, smaller house depressions seem to be arranged around larger ones to form what have been described as compounds, which may suggest changing social organization. By about 1,000 years ago, houses and villages became smaller.

Between about 875 and 750 years ago another major change occurred. People at the western end of the Alaska Peninsula began to live in large communal houses consisting of a main room surrounded by a number of smaller side rooms. Although the central room of these houses remained about the same size as earlier house types, the smaller connecting satellite rooms increased in size becoming as large as 775 sq ft to over 3,250 sq ft (70 to over 300 sq m). This change in house type suggests larger corporate groups, possibly based on kinship and a ranked society. During this period, people continued to make and use similar artifacts, but they apparently discontinued making pottery.

Farther east on the Peninsula, there has been extensive excavation at Port Moller by Japanese teams under the direction of Hiroki Okada. This large site is located adjacent to a natural hot spring and contains over 200 house pits. Although the site may have been occupied as early as 5,000 – 5,500 years ago, there appears to have been three primary periods of occupation; the first between about 3,800 – 3,200 years ago, again about 1,300 – 1,400 years ago, and finally about 700 –500 years ago. Two houses were excavated. The oldest was approximately 1,300 years old. The house was rectangular 24.5 ft by 41 ft (12.5 m by 7.5 m) with rounded corners. Eight posts supported the roof. The house contained more than 1,000 artifacts made of stone and bone. Many of the artifacts and economic characteristics are similar to the mainland to the east and the Aleutian Islands to the west.

Little archeological work has been conducted on the nearby Shumagin Islands, immediately south of the southern Alaska Peninsula. At the time of Russian contact, Aleut people occupied the islands. Archeological survey and testing suggests a record of human occupation going back at least 5,000 years, but little detailed information is available.

South Coast of the Alaska Peninsula

The archeological evidence from the western end of the Alaska Peninsula reflects a cosmopolitan blend of cultural influences from the Bering Sea region to the north, Gulf of Alaska to the south and east, and the Aleutian Islands to the west. However as one moves eastward, the watershed of the Alaska Peninsula more clearly divides the rivers flowing northwest to the Bering Sea and southward to the north Pacific. The northern flank of the Peninsula is gently sloping tundra plain dotted with fresh water lakes, rivers, and streams. On the southern side of the Alaska Peninsula the mountains rapidly descend to the Pacific Ocean, forming a rugged coastline. Ports and harbors remain ice-free all year. Caribou, brown bear, wolf, porcupine and other small mammals are found along the Peninsula. Rivers and streams flow to the coast on both sides of the Alaska Peninsula and host large runs of salmon that provide a rich seasonal resource.

During the last Ice Age the mountains of the Alaska Peninsula and the Kenai Peninsula were heavily glaciated. The moist Pacific air deposited deep snow on the mountains and volcanic peaks and the great weight of the ice compressed the land. However, about 11,500 years ago most of the ice had melted and passes across the mountains were ice-free. By 10,000 years ago sea level was about 4 ft (1.25 m) lower than it is today, and sea level continued to rise until about 6,800 years ago.

Although sea level rose as the glaciers discharged their water into the oceans, the land was also rising or rebounding in response to the great weight of the ice having been removed. Research by geologists suggests the land rose somewhere between 19.5 ft (6 m) and 23 ft (7 m) between 6,800 and 4,500 years ago. Consequently, archeological sites that used to be on the coast at that time can now be found as much as 30 ft (10 m) above modern sea level. Although there have been some dramatic local changes resulting from earthquakes and minor fluctuations in some areas in the last 4,500 years, the relationship of the sea to the land has remained approximately what it is today since that time.

Volcanoes play an important role in the archeology of the Alaska Peninsula. In some areas as many as ten eruptions have been recognized over the past 9,000 years. These have been documented based on layers of volcanic ash that archeologist Don Dumond and other scientists have used to help date the archeological sites throughout the region. The volcanic events also must have had repeated impacts on the plants, animals, and people living in their immediate vicinity, and in areas downwind from them where large volumes of ash were deposited. Two particularly large volcanic eruptions of Mount Aniakchak and Mount Hayes took place between 4,000 and 3,500 years ago. Richard VanderHoek and other researchers have suggested that these eruptions disrupted the lives of people living in the area and may have forced them to abandon the region. However, the archeological evidence suggests that plants and animals were able to recolonize much of the region within a few hundred years or less. These eruptions don't appear to have had a major impact on the long-term human occupation of the Peninsula.

Research under the direction of archeologist Jeanne Schaaf at the Mink Island site, located in Amalik Bay, documents a spectacular sequence of cultural development along the south side of the Alaska Peninsula. The oldest level was first occupied 7,600 years ago and contains stone blades and blade-like flakes that may be transitional between the American Paleo-arctic tradition and artifacts of the Ocean Bay I tradition that characterizes the early archeology of Kodiak Island. One spectacular find from this earliest occupation is a stone oil lamp found in a pit stained with ochre. It was discovered immediately below a house floor that was also covered with red ochre. This discovery is contemporaneous with similar finds on Kodiak Island and links the early inhabitants of the Mink Island site to those of Kodiak Island where similar artifacts have been found.

The lower midden at Mink Island revealed several additional occupational surfaces spanning the time from the earliest occupation (circa 7,600 years ago) to 4,100 years ago. A 6,000 year old occupation provided a rare glimpse into the homes of the people living at the site. Post-molds indicate that a driftwood frame supported the house. A pebble filled hearth heated it and the residents made and illuminated the house with oil lamps shaped from stone. The large stone blades that were commonly used in the earlier occupation are absent and people were making and using microblades. There is also evidence of ground slate artifacts.

Another dwelling was constructed at the site about 5,500 years ago. At this time people were making and using ground slate tools. Interpretation of the careful excavation indicates that it was probably a temporary shelter constructed of bent poles that had been covered with hide. The floor was a shallow oval depression stained with red ochre. Analysis of artifacts found within the structure indicate that people performed specific tasks such as making bone needles and grinding ochre. The similarities between the artifacts and cultural features at Mink Island suggest a long period of interaction and similar economic patterns at a very early time between the Pacific Coast of the Alaska Peninsula and the Kodiak Archipelago.

Other early sites in Amalik Bay, including those on Takli Island (Figure 7.9), and at Kukak Bay along the south shore of the Alaska Peninsula indicate that people were hunting marine mammals including seals, porpoise, sea otter, and sea lion. They also captured a variety of sea birds and waterfowl and fished for flounder, salmon, cod and halibut. Their tools included chipped stone stemmed points that probably served as end blades for larger bone points. Other stone artifacts include leaf shaped bifaces, scrapers, knives, and boat shaped oil lamps made from stone.

Figure 7.9 Aerial photograph of Takli Island. For thousands of years this rugged island served as home to maritime people (Photo courtesy of Becky Saleeby National Park Service).

By about 5,200 years ago people begin using and making long lance points, or knives, by sawing and grinding slate. They continued to hunt marine mammals and fish along the coast. Archeological remains from this time period are poorly known, but there is evidence that people from the coast also made excursions inland to hunt caribou and other animals. In some cases people from the Pacific (south) side of the Alaska Peninsula even camped at the same sites used at other times by Northern Archaic people who lived on the north side of the Peninsula. However, occupation by the two groups occurred at different times and there is little evidence of contact and exchange between them.

By about 4,000 years ago archeological sites are better preserved and suggest that people with a maritime economy lived in small camps. Although the evidence for houses or more permanent structures is sketchy, some post-molds and hearths have been found suggesting more permanent settlements. Salmon fishing is a major subsistence activity along with greater emphasis on deep-water fishing for halibut and cod. Stone projectile points are made by chipping and then grinding, rather than first sawing the slate with harder stone, as was done earlier. People continue to make and use bone harpoon heads with rows of barbs running down each side as they did in earlier times. They were tipped with stone points and probably used to hunt marine mammals including seals, sea lions, and sea otter. Other important types of artifacts include oil lamps, labrets made of jet, and bone pendants. Following this time there is a period (between 2,900 and 1,700 years ago) about which little is known. Some archeologists have suggested that the region may have been abandoned or archeological sites dating to this time have not been found or accurately dated.

Kodiak Archipelago

To the south of the Alaska Peninsula across Shelikof Strait in the Gulf of Alaska lies the Kodiak Archipelago (Figure 7.8). It is a group of islands lying south of Cook Inlet and the Kenai Peninsula. Kodiak Island is the largest in the group and is the second largest island in the United States, following the big island of Hawaii. The archipelago is only about 18 – 19 miles (30 km) away from the mainland, but ocean currents and frequent storms make the crossing dangerous. The islands are rich in marine life and host huge salmon runs. The archipelago has few land mammals, with the notable exception of the Kodiak brown bears, which are the largest bears in the world. Most archeological sites have been found along the coast or rivers where marine mammals and fish are abundant. The people of Kodiak Island call themselves Alutiiq.

It is difficult to determine when people first colonized the islands because rising sea level has flooded or destroyed any ancient shoreline older than 6,800 – 7,400 years old in most places. Pioneering research by Don Clark defined the unique cultural development over the past 6,800 years and a new generation of researchers is pushing the record back even further. The earliest firm evidence is from the Crag Point site where Richard Jordan reported finding microblades and microblade cores associated with the remains of two dwellings radiocarbon dated to 8,700 years ago. At the Rice Ridge site, archeologists found bone projectile points and tools slotted to receive microblades, which were radiocarbon dated to 7,100 years ago. During this time the climate in the Gulf of Alaska was one in which the summers were warmer and dryer than they are today and the islands were treeless.

A well-excavated site at Tanginak Spring contains microblades and microblade cores, as well as larger blades, in its lowest levels which have been reliably dated to about 6,200 years ago by Ben Fitzhugh. In addition, the lowest levels of the site contain beautiful leaf-shaped and flaked stemmed stone projectile points, knives and slate rods. The rods are local slate that have been used with little shaping or modification, possibly for polishing or sharpening other objects. The people who made these artifacts appear not to have made semi-subterranean houses. However, there is evidence at Tanginak Spring that sod blocks may have been used to hold down or reinforce tent-like structures or to make windbreaks. The sod blocks appear to surround charcoal and ochre-stained floors. These archeological traits are all characteristic of the earliest phase of the Ocean Bay tradition which is called Ocean Bay I.

Don Clark defined the Ocean Bay tradition based primarily on the results of his excavations at the Ocean Bay site on Kodiak Island. He divided the tradition into two periods, Ocean Bay I and Ocean Bay II. During Ocean Bay I times, about 6,000 years ago, people made leaf-shaped and stemmed flaked stone projectile points. During Ocean Bay II times (about 5,000 years ago) people began making projectile points and knives by grinding and polishing slate. The original definition of the Ocean Bay tradition did not include microblades or microblade cores. When archeologists found microblades at older sites (older than 6,000 years ago) that contained all the other types of artifacts used to define the Ocean Bay tradition, they expanded Clark's original definition to include microblades. Archeologists now recognize sites containing microblades found with chipped, leaf-shaped and stemmed projectile points as an early phase of the Ocean Bay tradition.

Most archeologists agree that the early sites containing microblades are the foundation for later cultural development on Kodiak and the adjacent islands. Early during Tanginak Spring times, people rarely ground slate to make projectile points, but over time ground slate points replaced ones made by chipping. Ocean Bay I settlements appear to have been camps at the mouths of salmon streams where people could hunt marine mammals including seals, sea otter, sea lions, and porpoise. House floors were distinctively stained with red ochre. The early occupations at Takli Island and at Kukak Bay on the Alaska Peninsula document a similar Ocean Bay I life style.

The early abandonment of microblade technology in the Kodiak Archipelago may reflect the relationship of microblades to the use of the bow and arrow. Although the bow and arrow are effective weapons for hunting large land mammals, darts propelled with a spear thrower are more effective for hunting marine mammals. A spear thrower, or atl atl, can be used with one hand while freeing the other hand to stabilize a lightweight kayak with a paddle. The bow and arrow may have been largely unnecessary because the Kodiak area has few land mammals.

Some time after 5,700 years ago the climate began to change again in the Gulf. As elsewhere in Eastern Beringia, the Neoglacial period introduced a time of climate cooling. Although the general climate was cooler, some researchers have suggested that in the Gulf of Alaska there were alternating intervals of warming and cooling, each possibly lasting as long as a few hundred years. By about 5,000 years ago during the transition from Ocean Bay I to Ocean Bay II, the use of stone lamps became common. Although there is considerable diversity within the region and different types of artifacts appear for the first time, most archeologists see a gradual transition from Ocean Bay I to Ocean Bay II. These developments do not appear to result from a replacement by a different culture or people, but suggest instead gradual cultural and technological change by the same people.

Beginning about 3,600 years ago and lasting until approximately 800 years ago, the Kachemak tradition is widely recognized throughout the Kodiak Archipelago. Frederica de Laguna first described the Kachemak tradition in the 1930s as a result of her research in lower Cook Inlet. The Kachemak tradition spans the time from about 3,800 – 3,200 to about 1,400 – 900 years ago in the Cook Inlet region. Artifacts from the Kachemak tradition are similar to those of the Norton tradition that flourished at the same time in Central Beringia and the Pacific drainage of the Alaska Peninsula. The Kachemak tradition is commonly referred to as Pacific Eskimo, meaning that cultural traits are similar to those associated with the Norton tradition in Central Beringia while at the same time retaining characteristics distinctive to the Gulf of Alaska region. The Kachemak tradition is distinctive in many of its cultural traits and lacks the elaborate sea ice hunting equipment used in Central Beringia.

Although the evidence is not entirely clear, most archeologists believe that the Kachemak tradition developed from the preceding Ocean Bay II tradition in the Kodiak Archipelago. Greater numbers of grooved and notched pebbles and cobbles used for fish line or net weights suggest an increased emphasis on fishing, or perhaps changes in fishing technology. A variety of other technological innovations are introduced during Kachemak tradition times, including the widespread use of the ulu, toggling harpoons, and labrets. Many of these traits suggest influences from Central Beringia. Amy Steffian analyzed labrets made from jet found at the Uyak site and determined that they had been manufactured from coal found only on the mainland.

During Kachemak times, people lived in villages comprised of semi-subterranean dwellings. These one room rectangular structures appear to be single family dwellings with interior stone lined hearths and entry passages. Dog bones have been found at several sites, indicating they had been introduced to the islands by this time, and probably even earlier. Barbed arrow heads made of bone suggest wide spread use of the bow and arrow and possibly increased social conflict, because with the exception of brown bears, there are no large land animals on the islands other than humans.

Kachemak burials are in the site middens and some of the skeletons have unusual cut marks and broken bones. Some skeletons have been found that are missing bones and others found where the bones have been rearranged and are not in their correct anatomical position. Bones from different individuals have been found in the same burial. Some of the remains have cut marks suggesting the bodies had been cut apart while still attached by flesh. In a few rare cases, human bones had holes drilled into it them and were used to make artifacts. No one knows the reasons for these unusual practices, but speculation includes warfare, unusual mummification practices, ancestor worship, and possibly even cannibalism.

The transition from Kachemak to Koniag in the Kodiak Archipelago correlates with a dramatic increase in salmon populations. Because salmon was the single most important economic resource on the islands, their increase may have resulted in a boost in the number of people living on Kodiak and adjacent islands. Many artifacts from this period are similar to those used in Central Beringia at this time, which suggests to most archeologists that there was increased contact between regions or perhaps that people even emigrated to the Kodiak Archipelago from the Bering Sea area. The many innovations introduced at this time include the widespread use of the steam bath for which rocks are heated, and carried into an enclosed area and sprinkled with water to create steam. People began making and using pottery, but only in the southern areas of Kodiak Island, and they soon abandoned the experiment. Koniag people hunted whales using unique ground slate whaling lances rather that the traditional toggling harpoon used farther north.

By 600 – 500 years ago some Koniag people were building large multi-family dwellings. These house types are significantly larger than those used in other regions of Eastern Beringia. Koniag houses have a large rectangular common area that may have been used at times as a center for community activities. Attached to it was a sweat bath, as well as several separate chambers arranged around and connected to the common room. The individual chambers are believed to be for families. The large communal building required the labor of many individuals and suggests to some archeologists a complex, kinship-based social organization. These large structures and associated storage pits were able to store large amounts of goods and food, such as dried salmon.

There is evidence for regional conflict. The bow and arrow was in use at least by Kachemak times and Koniag wooden slat armor was found at Karluk. Also excavated at Karluk were a Koniag wooden shield and a war club. Some archeological sites dating to this period are located in refuge areas, such as steep-sided small rock islands that are difficult to access. These types of sites provided protection for people under attack and were more easily defended. At the time of historic contact, the Alutiiq people were engaged in sporadic conflicts with the Aleuts to the west, people of Cook Inlet to the north, and Prince William Sound to the east. When the Russians arrived, the Koniag people spoke a dialect of Yupik Eskimo, which suggests they share a common historic background with people living in the Bering Sea region. Although the introduction or changes in language are difficult to date, this Eskimo contact or origin may go back to Kachemak, or even earlier, times.

Cook Inlet and Prince William Sound

Cook Inlet is a large area of low elevation that provides a break in the massive mountains along the Gulf of Alaska (Figure 7.8). It is a large marine inlet extending northward toward the interior and separating the Alaska Peninsula from the Kenai Peninsula. The earliest occupations in Cook Inlet area appear to be related to the microblade and core complexes of the American Paleo-arctic tradition or Denali complex. At Beluga Point, located on the north shore of Turnagain Arm, an early microblade site excavated by Doug Reger is estimated to be between 8,900 – 7,900 years old. Other sites containing similar artifacts but lacking radiocarbon dates have been excavated along the Kenai River and are believed to date to the same time. These sites document an early American Paleo-arctic tradition occupation throughout the region, and that people harvested resources from both the rivers and coast.

Like elsewhere in Central and Eastern Beringia, possibly as early as 6,800 – 5,700 years ago, people who made and used notched chipped stone projectile points appear to have replaced the earlier microblade-making population. Notched points have been reported as far south as Kachemak Bay.

In the southern areas of Cook Inlet, William Workman has excavated the Sylva site where he found evidence for an occupation by people of the Ocean Bay tradition dated to 5,100 years ago. The site contained the long stemmed ground slate projectile points or knives that characterize Ocean Bay II sites. Workman has suggested that the Ocean Bay found in Cook Inlet originates from the Ocean Bay sites on the Alaska Peninsula, which Don Dumond has called the Takli Birch phase, rather than those to the south on Kodiak Island. Animal remains included seals, ocean fish, shellfish, and marine birds indicating an economy largely based on resources from the sea. The evidence suggests that the Ocean Bay occupation of the site may have been relatively short, probably less than a few hundred years.

Following the Ocean Bay occupation there is scattered and poorly documented evidence that Arctic Small Tool tradition people may have occupied the area briefly. The best evidence comes from the earliest occupation of one site located on Chugachik Island reliably radiocarbon dated to 4,700 and 4,500 years ago. This level underlies a Kachemak tradition occupation and contains delicately flaked stone tools including small bipointed and stemmed projectile points believed to be arrow points, one or more side blades, a polished burin, and other artifacts characteristic of the ASTt. The ASTt occupation is followed by a long period of occupation by people associated with the Kachemak tradition.

During the early stages of the Kachemak tradition, the toggling harpoon, ground slate ulus, notched and distinctively grooved stone line weights, and labrets appear in archeological sites. Over time the archeological sites seem to get larger and as the population increased, the material culture became more elaborate. Artistic expression among the Kachemak people developed and became more refined. Later Kachemak sites frequently contain beautifully designed and crafted objects. Probably the most outstanding type of artifacts was the large stone lamp, some weighing almost 100 pounds (45 kilos) on which human and animal figures have been exquisitely carved. Artistic expression is also evident in beautifully carved ornamental pins made from bone, ivory, jet, and other exotic materials. Exquisitely crafted labrets, beads, and pendants have also been found. Some ground slate projectile points have been incised to create designs that possibly designate ownership. Artifacts include barbed arrow heads slotted to receive stone end blades, barbed dart heads, side prongs for atl atl darts, and fish hook shanks and barbs. Most of these types of artifacts are commonly associated with Eskimo (Norton tradition) sites of similar age in Central Beringia.

The Kachemak tradition is well documented by major excavations at several sites including Yukon Island, Cottonwood Creek, Halibut Cove, Chugachik Island, and other sites. All these sites clearly demonstrate that Kachemak tradition people primarily made their living from the sea. However, on the Kenai Peninsula some Kachemak people placed greater economic emphasis on salmon fishing and archeologists working there refer to it as Riverine Kachemak. Along the Kenai and Moose Rivers, people lived in rectangular single-room houses with stone-lined hearths. Some houses had entrance passages and internal storage pits, probably for storing salmon.

This time of elaborate cultural expression is also a time of complex burial practices. Like the Kodiak Archipelago, archeological sites in Cook Inlet have revealed a variety of practices dealing with the dead. For example, de Laguna excavated a multiple burial on Yukon Island. The burial contained the fully articulated remains of an adult male and a child, as well as two skulls of other individuals that some people have suggested were trophy skulls. The three adult skulls were covered with what appeared to be death masks made of white clay. Artificial eyes carved of bone had been placed in the eye sockets of all the skulls. A long marble labret was found near the center of the child's jaw and a labret made of gypsum was embedded into the clay on the left side of the man's jaw. The artificial eyes appear similar to those found in an Ipiutak burial at Point Hope and may suggest shared concepts about death or afterlife with people of Central Beringia.

In Prince William Sound, located on the eastern side of the Kenai Peninsula Kachemak-like artifacts have been found that are possibly 4,000 years old. Although the sites and artifacts are similar to those of the Kachemak tradition on Kodiak Island and Cook Inlet, they maintain distinct differences. Surveys throughout the region and excavations at Palugvik by de Laguna suggest that there was continuous cultural development from these early sites to the life way of the Chugach Eskimo, who occupied the region at the time of contact with the Russians.

The Kachemak tradition appears to end rather abruptly in Cook Inlet and the archeological record is difficult to understand. There appears to be little continuity with the previous Kachemak tradition during the period between roughly 1,500 years ago and the time of historic contact about 200 years ago. Given the limitations of radiocarbon dating, it is difficult to reliably define the historic relationships of many of the sites to one another. Several cultural traditions appear to be present. For example, some sites contain artifacts made of native copper suggesting relationships with interior Alaska, while others contain pottery and appear to be affiliated with Central Beringia. Sites from this period tend to be small and situated in inconspicuous settings, while others seem to be forts or refuge islands. This suggests to some archeologists that the region may have been in a state of conflict and cultural transition. At the time of Russian contact Athapaskan speaking people occupied the Cook Inlet region.

By the late 1700s European explorers began to map the region. On the third voyage of Capt. James Cook between 1776 and 1780, the English explorer charted much of the north Pacific including the Gulf of Alaska. Cook Inlet north of Kodiak Island was named for him. Grigorii Shelikhov founded the first permanent Russian settlement on Kodiak Island at Three Saints Bay by 1784. Immediately thereafter (between 1785 – 1786) Russian outposts were established on Afognak Island north of Kodiak and at English Bay on the Kenai Peninsula. By 1793 a shipyard near the modern town of Seward, Alaska, had been established under the authorization of Aleksandr Baranov.

The Russian American Company was approved by the Russian crown in 1799 and Sitka (Novo-Arkhangel'sk) was established that same year. It remained the capitol of Russian America until Russia relinquished its claim on Alaska to the United States in 1867. The interaction occurring over about a hundred years between these Russian settlements and Native people led to the development of a unique blend of Russian and Native American technology, knowledge, and values that left an important archeological record and cultural legacy of Eastern Beringia.

Summary

For more than 10,000 years both the land and sea levels have fluctuated dramatically at different rates throughout the Aleutian Islands and the Gulf of Alaska. As a result, a few early sites have been preserved in locations where the land rose faster than the sea. Rapidly rising sea level at the end of the last Ice Age probably flooded coastal sites older than 9,000 – 10,000 years old.

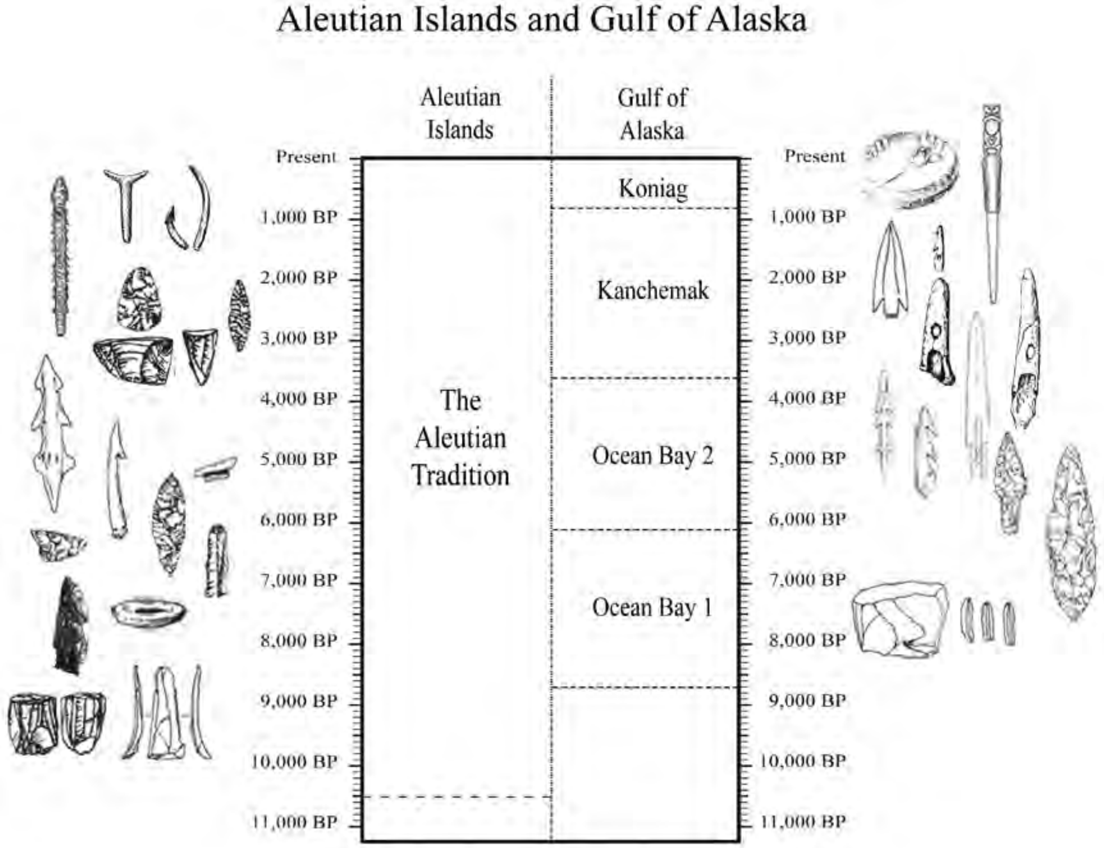

Figure 7.10 Cultural chronology of the Aleutian Islands and Gulf of Alaska (Icons from Clark 1984, Dumond 1987, Dumond and Knecht 2001, Fitzhugh 2004, McCartney 1984, and Jochelson 1925).

The Aleutian Islands were colonized by people using watercraft. They settled the island chain from east to west and the westernmost islands may not have been occupied until as late as 2,500 years ago. Evidence from two sites, Anangula and Hog Island in the eastern Aleutians, suggests the earliest residents were living in tent-like or semi-subterranean structures. Although there is a gap in the archeological record between approximately 7,000 – 9,000 years ago, there appears to be continuity in technology and life ways during that time. A series of large villages along the southern part of the Alaska Peninsula beginning 5,500 – 6,000 years ago reflect an economic and cultural interface between the cultures of Central Beringia and the Aleutian Islands.

Cultural development in the Kodiak Archipelago and southern side of the Alaska Peninsula took a different course (Figure 7.10). People of the American Paleo-arctic tradition first settled the area more than 7,500 years ago. People quit making and using microblades earlier (6,800 years ago) in the Kodiak Archipelago than anywhere else in Eastern Beringia. They were also the first to stop chipping stone projectile points (about 5,000 years ago) and to make them by grinding and polishing slate. This way of life, called the Ocean Bay tradition, persisted along the southern shores of the Alaska Peninsula and Kodiak Island. It extended north to Cook Inlet about 5,100 years ago.

By 3,800 years ago, the Kachemak tradition predominated throughout the region, reflecting many cultural traits associated with the Eskimo traditions of Central Beringia. The Kachemak tradition lasted until 800 years ago in the Kodiak Archipelago and possibly 1,000 years ago in Cook Inlet. About 750 years ago there was an increase in salmon that is believed to have enabled a greater number of people to live throughout the region. Site locations and artifacts during this period indicate widespread conflict and artifacts suggest increased contact with Central Beringia. At the time of Russian contact in the late 1700s, Athapaskan-speaking people occupied Cook Inlet and the upper Alaska Peninsula, while the Yupik Eskimo-speaking Alutiiq people, descendents of the Koniag, occupied the Kodiak Archipelago and Prince William Sound. The Aleutian Islands were the stepping stones for the Russian fur trade, which forever changed the economy and life ways of the indigenous people living on the islands and coasts of the Gulf of Alaska.

Michael Levin has estimated the Kodiak Archipelago and adjacent coasts may have been one of the most densely populated regions in Eastern Beringia supporting a minimum population between 6,000 and 6,500 people prior to the introduction of disease and forced labor by Europeans. Some researchers have estimated that the population may have been much greater based on the size and number of archeological sites dating to this time period. In the archeological record there is clear evidence that maritime hunting and fishing economies can sustain very large populations.

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CHAPTER 8
EASTERN BERINGIA
THE NORTHWEST COAST

The temperate rain forest of the Northwest Coast lies between the Pacific Ocean and the mountains of western North America (Figure 8.1). It extends from Prince William Sound in Alaska to northern California. In the past, most scientists did not consider the Northwest Coast of North America to be part of Beringia, because it was believed that the entire coast extending to the western limit of the continental shelf had been covered with glacial ice during the last Ice Age. However, in the 1980s researchers began to realize that some areas along the coast, called refugia, had remained ice-free during that time. In these pockets of land and in select areas along the continental shelf, tundra-like environments persisted and some land animals such as caribou and brown bears survived. This coastal region probably served as a corridor for marine mammals and birds, some land mammals, and possibly even humans to move between Eastern Beringia and the southern ice free areas of North America.

When Europeans first visited the area, the indigenous people living in the coastal environment were culturally similar to each other. They formed a cultural conduit linked by trade and social networks that enabled ideas and goods to be exchanged between Eastern Beringia and areas farther south in North America. This chapter presents the cultural history of the Pacific coast of North America stretching as far south as the Strait of Juan de Fuca near the present-day city of Seattle, which is roughly the limit of the continental glaciers during the last ice age.

Today the rugged coastline is characterized by fjords, islands, rocky headlands, and calving glaciers. The climate is cool and wet and the land is dominated by a thick forest of Sitka spruce, hemlock, and cedar. Brown and black bears, black-tailed deer, mountain goat, moose, and a variety of smaller mammals inhabit the forest. Six species of salmon swim inland from the ocean each year to spawn in the rivers. The sea also provides abundant resources including halibut, cod, seals, sea otters, sea lions, waterfowl, and sea birds. In many areas the intertidal zone has a wide variety of shellfish, and edible seaweed and kelp. However, the environment was not always the same as it is now. Despite the long anthropological interest in the art and culture of the Northwest Coast of North America, relatively little is known about its culture history. Archeological research in this region has lagged behind other areas of Beringia and North America in general. The archeological record is better known from work in

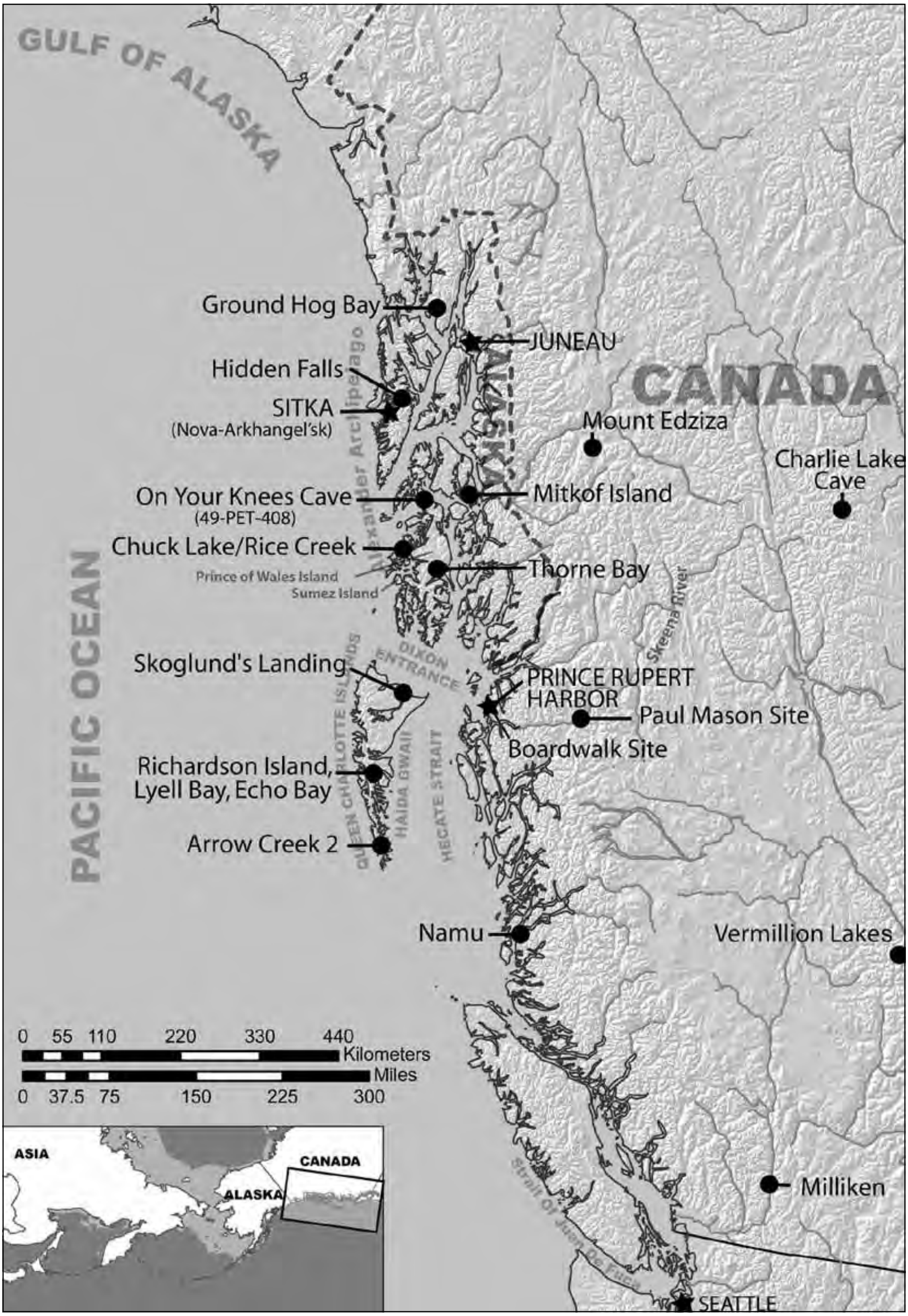

Figure 8.1 Map of the northern Northwest Coast and the location of archeological sites.

British Columbia and southern regions (Washington and Oregon) than from Alaska. This is primarily because there has been less development in Alaska, the population is less dense, and the region remains blanketed by a thick, temperate rain forest. The rain forest makes travel and archeological survey away from the coast extremely difficult. Thick vegetation masks land forms. Fallen logs and massive roots make it extremely difficult to excavate.

Early Period (14,000 – 7,000 years ago)

Most of the continental shelf from the Alaska Peninsula to the southern end of the Northwest Coast had been deglaciated by 19,000 – 16, 000 years ago. Occasional valley glaciers descended to the ocean along the Northwest Coast. At the end of the last Ice Age, the coast was still isolated from the mainland by glaciers that covered mountains to the east. The areas that were not covered by glacial ice were vegetated by tundra. Stunted shore pine probably survived in isolated pockets in low, sheltered areas. Beginning about 14,000 years ago, pine, alder, and ferns spread across the landscape. As the climate warmed, the glaciers melted and mountain passes opened between the coast and the interior. Some animals, such as ringed seals, retreated northward. A few caribou survived on the Queen Charlotte Islands until Europeans arrived. Elsewhere they became extinct and were replaced by deer migrating into the region from the south. Canadian archeologist Knut Fladmark has suggested that people may have first colonized the more southern areas of North America from Beringia during this time by moving along this coast.

At the end of the last Ice Age, the land began to rebound after the great weight of the glacier ice was gone. However, in most places sea level rose faster than the land could rebound. Although there was considerable local variation, the ocean actually rose about 55 – 60 ft (15 m) higher than it is today. The rebounding earth then began to outpace sea level rise and by 10,700 to 10,200 years ago sea level was only slightly higher that it is today. It is along many of these ancient shorelines and sea caves elevated above modern sea level that the earliest archeological sites have been found along the Northwest Coast. Geologist Thomas Ager has found that during this time the developing forest was more park-like than it is today with blueberries, shrubs, mosses and ferns on the forest floor. By 12,000 – 11,000 years ago the glaciers that filled the mountain valleys to the east had melted sufficiently to enable people and animals to cross most, if not all, of the major passes between the coast and interior. Sea level then dropped, or the land continued to rise, to create the modern shore line 5,000 – 6,000 years ago.

The oldest archeological evidence suggests that people first settled the area more than 11,500 years ago. It is about this time that Sitka spruce and hemlock spread into the region, changing the character of older forests consisting of pine, alder, and ferns. The oldest sites indicate that the earliest people were skilled coastal navigators who made their living primarily from the sea. The earliest archeological evidence is known from several caves located on Prince of Wales Island in Southeast Alaska and Haida Gwaii (the Queen Charlotte Islands) to the south.

Some archeologists assign these very early discoveries to the Pebble Tool tradition. This tradition is based on artifact types from a few sites in Southeast Alaska and coastal British Columbia that suggest occupation of the Northwest Coast occurred prior to 10,000 years ago. Philip Hobler reported stone flakes and flake cores from several intertidal sites in the Queen Charlotte Islands, which he presumed must have been deposited prior to sea level rise circa 10,000 years ago. A tool made from a large terrestrial mammal rib (possibly black bear) was recovered and dated to 12,300 years ago at On Your Knees Cave in Southeast Alaska. The cave is approximately 360 ft (110 m) above modern sea level and demonstrates very early human exploitation and use of noncoastal settings.

Archeologist Daryl Fedje recovered a basalt blade-like flake and a large volume of clam shells from material dredged from Werner Bay adjacent to a drowned fluvial terrace on the continental shelf of British Columbia. Based on local sea rise at the end of the last Ice Age, this locale would have been covered by the rising sea level sometime before 10,000 years ago, suggesting that the site may have been occupied by about 10,300 years ago. Although these data are preliminary, they suggest humans occupied the Northwest Coast of North America at the end of the last Ice Age when the sea level was lower prior to 12,000 years ago.

Occupations lacking microblades are reported from the lowest levels at Namu as well as several archaeological sites in Southeast Alaska and at a few caves in British Columbia that have very few artifacts. Some archeologists believe this documents a widespread occupation of the Northwest Coast that may support Knut Fladmark's hypothesis that the Northwest Coast was the earliest migration route to the Americas south from Beringia.

Although the evidence is fragmentary, it appears that people who made and used large leaf-shaped chipped stone projectile points and knives may have been the first to settle the region. Many of the sites contain pebbles or cobbles from which people have struck stone flakes. They may have made most of their other tools from organic materials, but organic artifacts from this time are extremely rare and seldom preserved. Innovative research by Canadian archeologists Daryl Fedje and Quentin Mackie has documented occupations lacking evidence of microblade technology at several archaeological sites in British Columbia including Skoglund's Landing, Milliken, Richardson Island, and Echo Bay. The oldest stratigraphic levels from two other sites, Namu excavated by Roy Carlson and Ground Hog Bay (Figure 8.2) excavated by Robert Ackerman, appear to lack microblades in their lower levels as well.

Figure 8.2 Robert Ackerman's archeological excavations at Ground Hog Bay (Photo courtesy of Myra Gilliam, United States Forest Service).

Although it is still controversial, some archeologists believe that radiocarbon dates suggest the Northwest Coast Microblade tradition first appears possibly as early as 10,300 years ago in Southeast Alaska. Roy Carlson has suggested that this way of making tools was introduced from interior Eastern Beringia and subsequently spread south from Alaska and reached the southern regions of the Northwest coast by 9,500 –9,000 years ago. On Your Knees Cave, Ground Hog Bay, and Hidden Falls are all sites in Southeast Alaska at which Northwest Coast microblade occupations have been reliably dated between 10,500 and 10,000 years ago. The earliest occupation at the Hidden Falls site (Figure 8.3), near Sitka, Alaska dates to 10,000 years ago and contains microblades, microblade cores, and a variety of other lithic artifacts. Microblades and microblade cores have been reported at the Arrow Creek 2 and the Lyell Bay sites in Haida Gwaii where they have been dated between circa 10,500 and 10,200 years ago.

The Northwest Coast Microblade tradition is distinctively different and appears later than microblade traditions elsewhere. The northern microblade industries

Figure 8.3 Archeological excavations at Hidden Falls, 1978, area A (Photo courtesy of Jeremy Karchut, United States Forest Service).

(American Paleo-arctic tradition and Denali complex) predate the earliest evidence of this technology in Southeast Alaska by thousands of years. The Northwest Coast microblade cores appear to lack the detailed preparation known from the Denali complex and American Paleoarctic tradition. The difference may indicate that people already living along the Northwest Coast adopted, or learned, this technological concept from their neighbors to the north where the process of preparing microblade cores and making microblades was older and more formal.

The difference also suggests that microblade technology was adapted to meet the unique need of the Northwest Coast. Microblades from this region are generally irregular in shape and frequently are struck from unprepared blocky conical flakes, nodules, and pebbles. The microblades along the Northwest Coast are generally short and irregular, often chipped from more irregular stone cores made from split pebbles that are frequently rotated to produce additional microblades. This suggests that they may have been used differently on the Northwest Coast. Some later examples indicate the microblades were hafted in handles and used as small scalpel-like knives and perhaps engraving tools.

Some archeologists believe that the use of microblades along the Northwest Coast suggests an actual migration into the region by people from the north. To others it indicates that the Pebble Tool tradition adapted microblade technology to their existing tool kit, producing and using microblades somewhat differently than their northern neighbors. The latter hypothesis is supported by the tool assemblage at the Namu site in central coastal British Columbia which appears to have changed very little over time, with the exception of the addition of microblades. If this hypothesis is correct, the use of microblades may have shifted primarily from use as insets in bone or antler projectile points to serve other functions. It appears that people in the region began using microblades sometime between 10,000 and 10,500 years ago. After microblades were introduced, people continued to make pebble tools and use leaf-shaped and stemmed chipped stone projectile points.

At On Your Knees Cave (49-PET-408) located on Prince of Wales Island in Southeast Alaska the partial remains of an adult male human in his early twenties were found scattered throughout the cave. The man was named Shuká Kaa, or "Man Ahead of Us," by the Tlingit people of Southeast Alaska. The tribal governments on Prince of Wales Island were consulted following Shuká Kaa's discovery and gave permission for the respectful analysis of his remains. Radiocarbon dates indicate that the individual dates to about 10,300 years ago. The skeleton is not complete and the remains are not from an ancient burial. They appear to have been scattered throughout the cave by scavengers, possibly foxes, wolves, or bears. Several of the bones have marks indicating that they had been gnawed by animals. It is a mystery how this young man died. He may have been killed while hunting bears in the cave. He may have died from other causes outside the cave and animals may have later dragged some of his remains inside where they were preserved.

The human remains were found with microblades, leaf-shaped and stemmed projectile points, and other stone tools made of obsidian and other exotic types of stone. The obsidian came from Mount Edziza on the British Columbia mainland and Sumez Island in Southeast Alaska. Because Prince of Wales Island was not connected to the mainland at the time the cave was used, obsidian and some of the other types of stones could only have reached the site by people using watercraft.

Analysis of these human remains is extremely important because they are the oldest human skeletal remains known from the Northwest Coast. They are geographically located between Asia and temperate North America, and they provide information about the genetic and physical characteristics of an individual who may be a descendant of the first inhabitants of the Northwest Coast. Part of the hip bone was preserved which enabled scientists to determine that the individual was male. The recently erupted wisdom teeth in the jaw indicate he was in his early twenties when he died. His teeth were heavily worn for such a young person, suggesting he had an abrasive diet.

Micro-sampling of the bone using a very small drill about the size of a dentist's drill allowed scientists to extract enough organic material to radiocarbon date the individual and conduct carbon isotope analysis. This chemical analysis showed that the young man was raised on a diet of sea food, probably consisting mostly of marine mammals and fish. Using a small amount of material extracted from the pulp cavity of one of his teeth, it was possible to successfully identify deoxyribonucleic acid (DNA) in the sample. Mitochondrial DNA (mtDNA) is transmitted from the mother to a child, and can be used to identify groups of people who share a common lineage. Four basic lineages have been identified throughout the Americas and are designated A, B, C, and D. The young man from On Your Knees Cave belongs to the lineage (or haplogroup) D, which is common among Eskimo and Aleut people to the north and among people living in South America. Conclusions drawn from the analysis of mtDNA can sometimes be controversial and ambiguous.

The Chuck Lake site on Heceta Island in Southeast Alaska has preserved faunal remains dated to 9,100 years ago. This site is important because it clearly documents early Northwest Coast microblades with a maritime economy. The Chuck Lake site was adjacent to the sea at the time it was occupied and the people who lived there harvested shellfish and bottom fish. Rockfish were the most abundant subsistence resources, while land and sea mammals and waterfowl constituted a small percentage of the diet. Further south at the Namu Site, microblades first occur about 9,500 years ago. The Richardson Island site has a second component that is characterized by a microblade industry radiocarbon dated between 10,200 – 9,500 years ago.

The few open air sites that have been excavated are located on ancient beaches and appear to have been used as brief camp sites, while early cave sites seem to be locales where people sought temporary shelter and perhaps hunted hibernating bears. With the exception of the cave sites, most sites are located in ecological settings favorable for harvesting salmon, saltwater fishing, marine mammal hunting, and gathering intertidal shellfish and other resources. Many are located on islands that only could have been reached with the use of some type of watercraft, possibly skin boats during the earliest times. Wide use of volcanic glass (obsidian) and other exotic types of stone, such as quartz crystals, are found at most sites dating to this early time period. Obsidian found at Hidden Falls and Ground Hog Bay 2 is from Sumez Island, near Prince of Wales in the Alexander Archipelago, and Mt. Edziza on the upper Stikine River on the northern British Columbia mainland. These findings indicate that people either made long trips to collect these valuable materials, or more likely, there were widespread trade networks established along the coast by 10,000 – 11,500 years ago, and possibly earlier.

Wood, bone and shell have not been preserved at most of the archeological sites known from this period. However, at a few sites the remains of the animals harvested and eaten by people have been found and clearly indicate that people made their living from the sea. Caribou may have persisted as late as 9,000 years ago in some areas of the Alexander Archipelago, and a small population lived on Haida Guaii until the time Europeans arrived. At the Arrow Creek 2 site in British Columbia, archeologists found an alignment of stones that could be part of a stone fish trap possibly 10,200 years old. At other locations fish bones (including cod and salmon), clams and other shellfish, sea otter, and seals were harvested. A few cave sites suggest that black bear were also hunted, probably during the winter when they were hibernating.

The period immediately following the end of the Ice Age was a time of relatively rapid climate adjustment. People continued to use microblades and to make their living primarily from the ocean, rivers, and inlets. They were faced with continuous changes in sea level, forests, and shifting intertidal zones, which probably prevented people from inhabiting particular sites for long periods of time. They may have had to move frequently in order to continue to adjust to the changing environment and shifting resources. This pattern of relocation may explain why archeological sites from this early period tend to be relatively small and difficult to find.

Middle Period (7,000 – 4,000 Years Ago)

By 7,000 – 6,000 years ago, sea level stabilized along much of the coast. Although the ocean was no longer rising, the land continued to rise slowly. Over hundreds of years, people who wanted to live on the coast were forced to keep gradually moving seaward to stay close to the shoreline. Mature forests developed on the islands. Sometime about 5,700 – 5,200 years ago cedar trees colonized the mainland and islands. For the first time, large mature cedars provided unique resources suitable for constructing houses and seaworthy canoes. As sea levels continued to stabilize, larger shellfish beds formed, and salmon runs probably became stable and reliable.

These environmental changes enabled larger groups of people to live together in the same locations for longer periods of time. Stone tools such as scraper planes used to work wood become more common. Archeologists have uncovered large plank houses dating to this period, suggesting more complex social organization and economic specialization. These houses clearly represented a large investment in labor and a commitment to residing at a particular location for a long period of time. Their size indicates that they were occupied by large groups of people who were probably related. These large households must have provided a comfortable and relatively stable lifestyle and probably reflect an effective economic and social organization.

The coniferous forest of the Northwest Coast makes the soil very acidic. Consequently organic artifacts made from materials like wood and bone are rarely preserved. However, on Prince of Wales Island the remains of a beautifully crafted basket made of spruce root was preserved in the mud along the banks of the Thorne River where it was found by geologist Dave Putnam. It was subsequently radiocarbon dated by archeologist Terry Fifield to about 6,100 years ago (Figure 8.4). At another site on Mitkof Island, in Southeast Alaska, archeologist Jane Smith found an alignment of wooden stakes radiocarbon dated to 5,700 years ago. The stakes were driven into the intertidal mud to make a fish weir that was used to funnel salmon and other migratory fish into a place where they could be speared or trapped. These rare discoveries indicate a long history of a rich and complex technology employing organic materials along the Northwest Coast.

Abraders used to shape, polish, and sharpen stone and bone tools begin to appear in archeological sites by 7,000 years ago. By 6,000 years ago people commonly make stone tools by grinding softer stones with harder ones to shape artifacts, rather than chipping stone. Although this method frequently requires more time to make a tool, it has the advantage of enabling people to use a wider variety of stone. After people started making ground stone tools, they did not immediately stop making

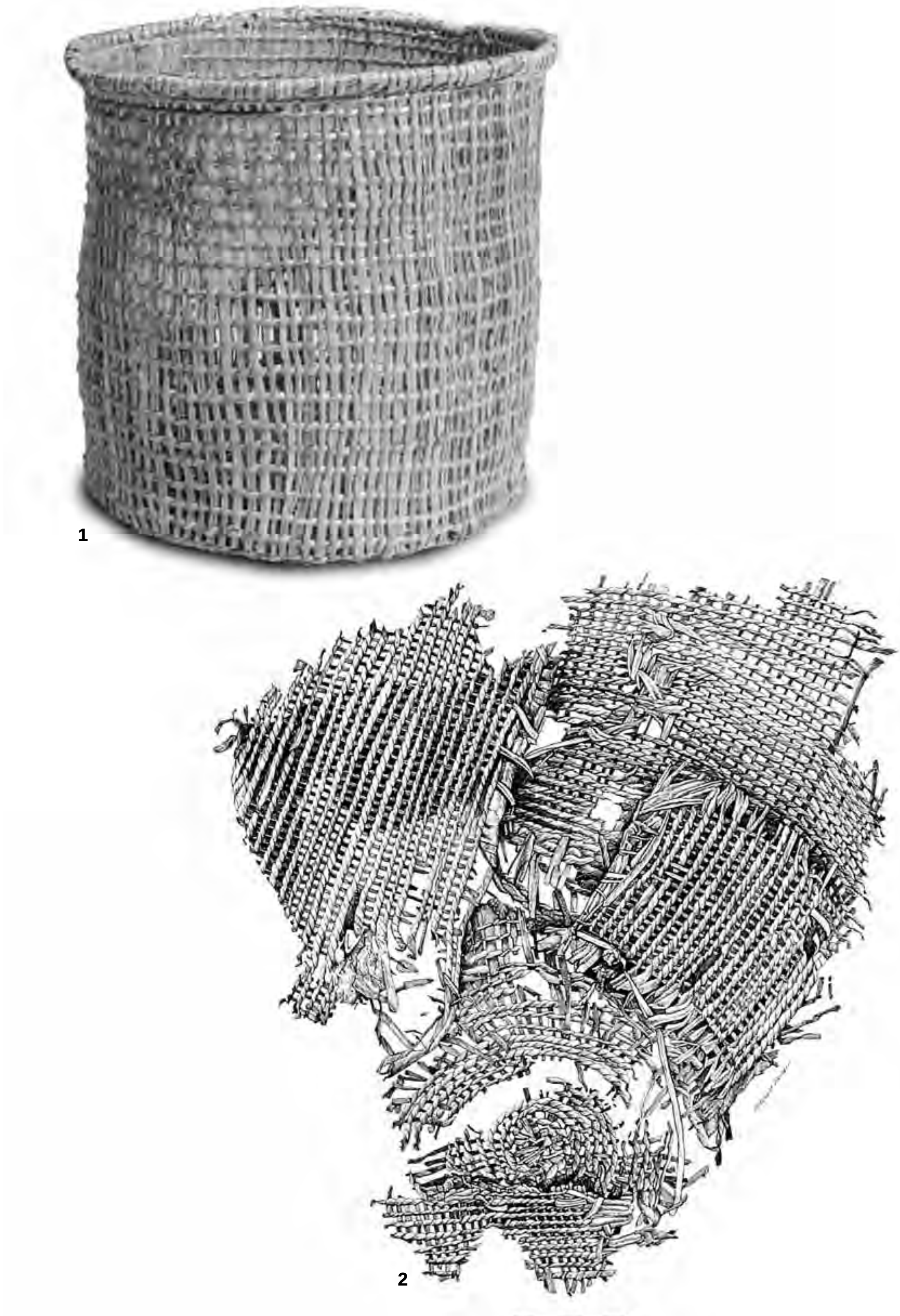

Figure 8.4 Thorne River basket: 1 Replica of the original discovery woven by Dolores Churchill; 2 Technical drawing by Margaret Davidson of the original discovery.

chipped stone tools. People continued to use microblades hafted in handles until at least 2,000 years ago.

By about 5,000 years ago a wide variety of new artifacts begin to appear along the coast. They include labrets and beads, ground stone adze blades, and ribbed stones (stones with raised ridges). Bone spear or harpoon points with barbs along one edge are preserved at some sites. Dog bones possibly 4,500 years old have been found at a site near Sitka, Alaska, indicating that people had domesticated dogs by at least this time. The bones of deer, black bear, and a variety of marine mammals have been found at several sites.

Canadian archeologist Knut Fladmark suggested that dramatic changes in the relationships between the land and sea at the end of the last Ice Age did not fully stabilized until about 5,000 years ago. He postulated that this stabilization led to increased salmon productivity in the streams and rivers of the Northwest Coast. He theorized that the establishment of large predictable salmon runs enabled the development of cultural patterns often used to characterize the complex hunter-gather cultures of the Northwest Coast.

Madonna Moss has questioned the "land sea interface" hypothesis as the primary mechanism for the development of Northwest Coast cultures. Instead she points out that there is great ecological diversity throughout this vast region and that environmental change and stability did not occur at the same time in all places. She also underscores the "deep" history underlying maritime subsistence beginning with Shuká Kaa and other maritime focused sites along the coast including fish weirs constructed prior to 5,000 years ago. She emphasizes that people living along the Northwest Coast have been primarily fishers throughout their long history.

During this time people made their living hunting land and marine mammals, collecting shellfish, fishing, and probably collecting plant products from both land and sea. They may have lived in relatively small groups and occupied specific locations for shorter periods of time depending on shifts in local environmental conditions and resources. In some areas they probably moved seasonally depending on the availability and timing of local resources. Northwest Coast art may be traced to at least this time, and possibly earlier. Jon Erlandson has described a few fragments of painted split wood boards. Petroglyphs are rocks that have designs pecked into their surface and have been found in many locations along the Northwest Coast. The earliest petroglyphs may date to this period but their meanings are poorly understood. Some people have suggested they convey information similar to road signs, or they record historical events, territorial markers, or serve other purposes.

As the environment continued to stabilize, shell middens were formed because people stayed longer at the same place and harvested more from the mature shell fish beds. The resulting piles of accumulation refuse were sometimes used as places to bury the dead. There is evidence by about 4,000 years ago that people built groups of houses in particularly productive areas along the coast, particularly where there were predictable salmon runs. Some archeologists have interpreted this to be the beginning of village life.

Late Period (4,000 Years Ago – Present)

By 4,000 years ago, villages occupied by large groups of people became established along the coast and rivers. Stone tools such as adzes, mauls, and scraper planes associated with heavy wood working become increasingly abundant and important to the economy (Figure 8.5). Mature old growth forests contained huge trees that were important resources for producing split planks for building houses and for the construction of huge ocean-going dugout canoes. Although resources varied between and within various regions, people were more intensively harvesting a wider array of plants and animals. On rivers where salmon were

Figure 8.5 Northwest Coast wood working tools: 1 D shaped adze; 2 antler wedge; 3 nipple maul; 4 stone hammer; 5 planks were removed from logs by splitting with hammer and wedges.

abundant, large plank house villages developed. A wider array of animal remains are preserved in sites dating to this period including harbor seal, porpoise, sea and land otter, black bear, beaver, marmot, muskrat, whales, salmon, and a variety of off-shore fish. Shellfish include mussels, clams, and sea urchins.

It is during this period that the elaborate art and social complexity of Northwest Coast cultures is recognizable for the first time in archeological sites. The earliest art objects are decorated tools and carvings of animals in bone and ivory. However, most art was probably produced in wood as suggested by the increase in the types of stone tools used for working wood at sites from the more southerly areas of the Northwest Coast.

Archeological excavations reveal that by about 3,200 years ago people had added artifacts such as long lanceolate ground stone points, composite harpoons, drilled seal tooth pendants, shell beads, incised stones, shell knives, single edge ground stone knives, composite toggling harpoons, composite fish hooks, and wooden boxes to their inventory of tools and ornaments. There is evidence that eulachon, an oil-rich fish, was added to the economy at this time. Widespread use of stone net sinkers indicate the introduction of fishing with nets and an expansion of fishing technology.

About 90 miles (160 km) upstream from Prince Rupert harbor on British Columbia's Skeena River is the Paul Mason site, with 12 rectangular house depressions laid out in two rows. All the houses face southwest and are oriented toward larger rectangular structures located uphill. The village has been dated to between about 4,000 – 3,200 years old and is the earliest reliably dated and documented village site in the northern region (Alaska and British Columbia) of the Northwest Coast. The Boardwalk site is located in Prince Rupert harbor and appears to have been a village consisting of two (and possibly three) rows of plank houses probably occupied about the same time or possibly earlier than the Paul Mason site. These early village sites, particularly the larger structures at the Paul Mason site, suggest increasing social complexity and organization.

Many of the skeletons from the sites in the Prince Rupert harbor area have forearm bone fractures that suggest to some archeologists that their arms were broken while attempting to fend off blows to the head. Many of the skulls have fractures, probably resulting from blows to the head delivered by war clubs. The number of these types of injuries is higher among males than females. The taking of heads as trophies is also suggested based on the fact that some skeletons were missing their skulls and there are cut marks along the neck bones where the skulls were attached. Employing a concept called ethnographic analogy (comparing evidence in the archeological record to the historically documented practices of people) some archeologists have suggested that slave raiding may have been a source of conflict, as it was in later times in some areas along the coast.

Burials associated with the Boardwalk site and other sites in the Prince Rupert harbor area may also provide insights into social ranking. The majority do not contain grave goods. However, the burial of an adult male from the Boardwalk site contains elaborate high status grave goods. Dated to 2,600 years ago, the grave contained a decorated club, copper bracelets, copper-wrapped sticks, and finely crafted weapons. The artifacts associated with this burial suggest the individual was a warrior and that he may have gained status and wealth through warfare. Some archeologists have speculated that this is evidence for the development of social ranking and warfare during this time in Northwest Coast societies. Some sites are located in defensive positions and were fortified by log palisades.

Copper artifacts are frequently found in archeological sites predating the arrival of Europeans and were in wide use along the Northwest Coast when Europeans first arrived. The copper was probably from the Copper River and Wrangell St. Elias region of interior Eastern Beringia. Copper was processed from nuggets, possibly beginning as early as 2,500 – 2,000 years ago. Research suggests the nuggets were heated, hammered and shaped to form a variety of tools and decorative objects. By the time the Russians arrived, large coppers were the ultimate symbol of wealth. These large decorated shield-shaped objects were skillfully crafted from a single piece of copper and displayed in clan houses. This period is also characterized by an increase in ornaments such as beads, pendants, and nose and hair pins made of bone, jet, soapstone, and shell. A variety of carvings in bone and wood have also been found.

The number and size of archeological sites continued to increase and indicates that the human population along the coast was growing, possibly peaking at about 1,000 years ago. Afterward, there appears to be a slight decline in population, accompanied by a renewed emphasis on chipping stone tools as opposed to grinding. They used bone points barbed along one side that detached from the shaft and could be retrieved using a line tied through a hole drilled at the base. Iron artifacts are frequently found in archeological sites predating the arrival of Europeans and were in wide use along the Northwest Coast when Europeans first arrived. The iron was derived from spikes and hardware attached to shipwrecks and driftwood carried by ocean currents across the Pacific from Asia.

People living along the Northwest Coast used wood as a medium for artistic expression. They added ground stone chisels and axes to their wood working tools. The magnificent trees of the Northwest Coast enabled them to create small as well as large sculptures such as totem poles and house posts. Probably the largest and most spectacular objects were carved and painted house screens. These screens were magnificently crafted heraldic partitions located on the rear platforms of clan houses to separate the chief's quarters from the rest of the household. Unfortunately, wood decomposes rapidly in the acidic soils of the Northwest Coast rainforest and little of this magnificent early art has survived.

Bill Holm provides a perceptive analysis of the fundamental elements of Northwest Coast art. At the time of contact with Europeans, a design system had developed that relied on formal rules which required portraying the body parts of creatures within formlines that could be painted on a surface, or incised into the surface of an object. Formlines were used to outline the form of animals such as raven, eagle, and killer whale and to define the features of the animal such as wings, joints, eye sockets, and teeth. Formlines always joined to form an uninterrupted design, and were generally painted black. If the formline was black, the resulting spaces were painted red. If the formline was red, the spaces were colored black. Blue and green were used to paint less significant spaces within the formlines.

The art of the Northwest Coast is internationally recognized for its dramatic figures, colors, and complexity. Most painting and sculpture were clan symbols or symbols used to illustrate stories. Two dimensional paintings and flat sculptures were sometime made three-dimensional by adding dramatic beaks, wings, or limbs. Holm recognized that many of the representations were abstract and understanding them is difficult unless standard recognition features, such as claws, teeth, or fins, were included in the sculpture. Although totem poles are probably the most widely recognized symbols of Northwest Coast art, there is little archeological evidence of them prior to the arrival of European explorers and traders.

Archeologists agree that the cultural remains from this period were left by people who were the ancestors of the contemporary ethnographic groups of Tlingit and Haida who occupied the northern Northwest Coast at the time of the first European exploration of the region. In 1774 and 1775 the Spanish, aware that the Russians were pressing ever eastward, dispatched expeditions to the Northwest Coast from their bases in California. As a result of their explorations, many of the islands in British Columbia and Southeast Alaska were given Spanish names. Other explorers, including Captain James Cook who explored the North Pacific between 1778 and 1779 for England, soon followed the Spanish. The Russians continued to operate from their base on Kodiak Island. By 1799 the new capital of Russian America, Novo-Arkhangel'sk, was built at what today is Sitka, Alaska. This was in the heart of Tlingit territory.

By this time the trade in fur seal pelts was in full force through the entire Gulf of Alaska and along the Northwest Coast. The pelts were sold in China where there was a high demand for the fur and traders could make great profits. The Russian American Company led large expeditions of Native people to hunt fur seals from small ocean-going kayaks. Independent European and American traders operated from ships along the coast. By the early 1800s large quantities of items like copper and iron, so valuable prior to the arrival of Europeans, had flooded the local market and had become so common along the coast that they were of little value.

Contact with outsiders from Europe, American and Asia soon led to the introduction of diseases for which the people of the Northwest Coast had no immunity. A series of epidemics ravaged the population. The northern area experienced the first outbreak of smallpox in 1775. It has been estimated that it killed about two-thirds of the population. It was followed by a second smallpox epidemic in 1836, and outbreaks of measles in 1848 and again in 1868. While there may have been about 50,000 people living along the northern coast prior to the arrival of Europeans, by 1890 their number was reduced by disease to about 10,000.

After the 1867 Russian withdrawal from Alaska, EuroAmerican colonists began entering the region in greater numbers. Attracted by economic opportunities in mining and fishing, the flood of immigrants culminated in the Klondike Gold Rush of 1897 – 1898. These were the last pulses of Canadian and American westward expansion and justified as manifest destiny. Artifacts from this time are a silent record of the impact and change this transition brought to Native cultures of the Northwest Coast.

Summary

It is still not known when people first colonized the Northwest Coast, but the available archeological evidence suggests that it was prior to 11,500 years ago.

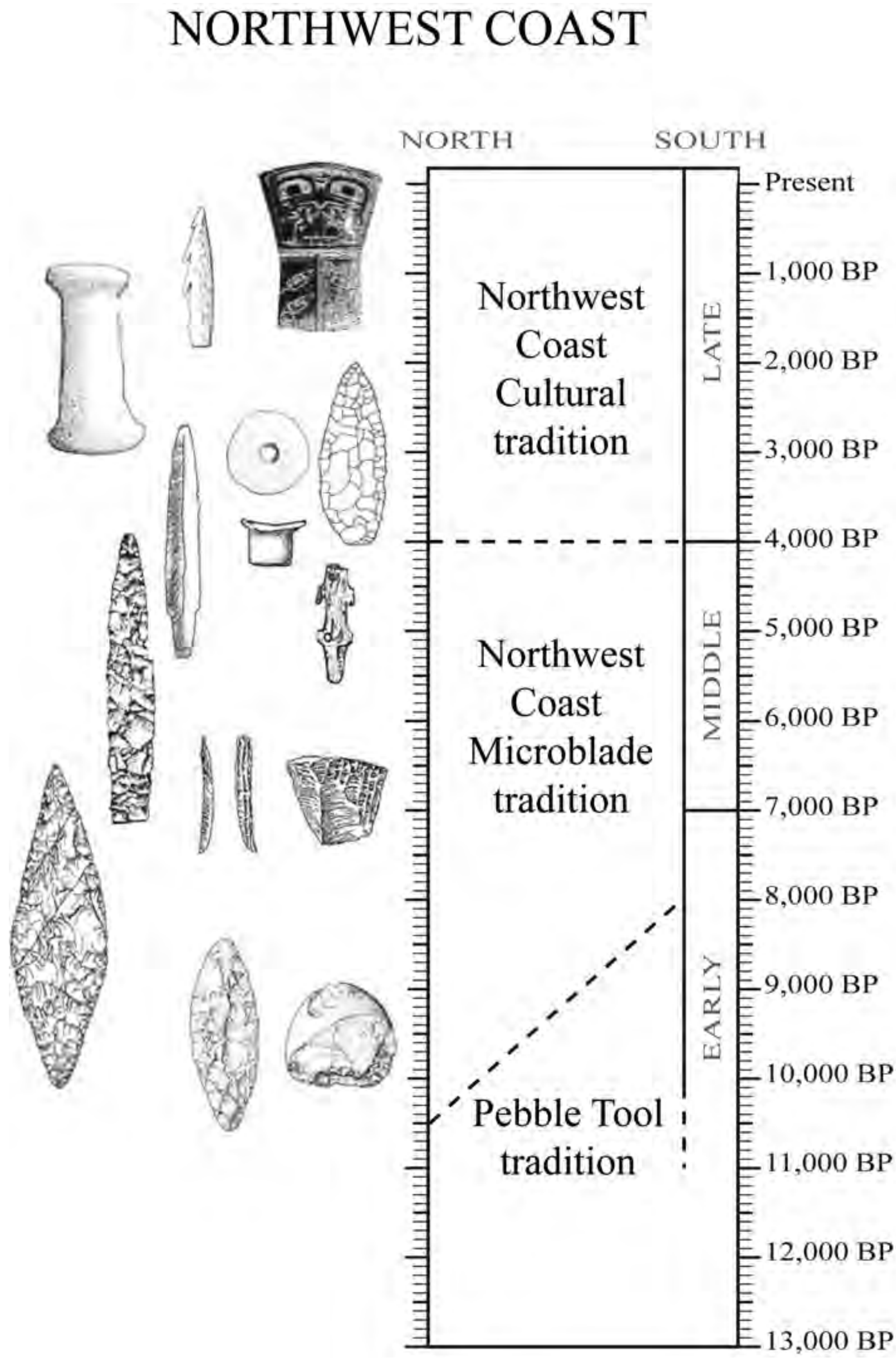

Figure 8.6 Cultural chronology of the Northwest Coast (Icons from Carlson 1990; Davis 1990).

Obsidian found at the oldest sites demonstrates that the source of these valuable commodities had already been discovered by this time; so older archeological sites probably exist. Artifacts made from exotic types of rocks were found on islands where they do not exist naturally, indicating that they were transported to the islands by people. They are evidence that early people had watercraft enabling them to travel extensive distances along the coast and between islands. There may be sites underwater along the ancient Ice Age shore line that were flooded by rising sea level more than 12,000 years ago.

From the earliest times the people of the Northwest Coast made their living primarily from the sea and rivers. By 6,000 years ago people were using fish weirs to harvest large numbers of salmon. They were concentrated in permanent, or semi-permanent villages at locations where large numbers of salmon, ocean fish, and sea mammals could be harvested. There is little known about the roles and importance of plant and shellfish gardening including clam gardens and related mariculture practices. The rich environment and sedentary life enabled people to devote time to the development of sophisticated art expressed in wood carving and the manufacture of utilitarian objects. By 2,500 years ago people had developed methods to work native copper nuggets into tools and ornaments. The rainforest provided large trees that people used to split planks to construct houses, and hollowed out to make large ocean going canoes.

Most archeologists who have worked along the Northwest Coast agree that the archeological record appears to be one of long, relatively stable and continuous development (Figure 8.6). Although there is local diversity, cultural development throughout the region as a whole does not indicate abrupt and dramatic change in technology, economy, or lifestyles. This fact has led most scholars to agree that there have not been major population replacements in the region and that the patterns characteristic of the cultures of the Northwest Coast can be recognized from at least 6,000 years ago.

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CHAPTER 9
SUMMARY

The culture history of Beringia is the story of two vast cultural spheres, one Asian and the other American, in contact for thousands of years (Figure 9.1). It is the legacy of humans coping with environmental change on a grand scale and remarkable human adaptation to changing environments of land, sea, and ice. It is also the story of the activities in the daily lives of people living in small villages and camps over thousands of years. This saga is summarized within the context of four primary themes: 1) colonization of the New World, 2) East meets West, 3) environment change and cultural development, and 4) the origins and character of sedentism.

Colonization of the Americas

Although it is still not known when people first came to Eastern Beringia, it is clear that it was sometime prior to 14,000 years ago. It is possible that people were in Western Beringia during a period of warmer climate about 27,000 years ago. The archeological evidence is clear that people and mammoths lived together in Asia. The evidence from the Yana RHS site and Berelekh suggest that people hunted mammoths in Siberia. Hypothetically a migration across the Bering Land Bridge to the southern areas of North America could have happened before the Laurentide and Cordilleran Ice came together about 22,000 – 25,000 years ago. However, there is little evidence indicating that people occupied Beringia or North America at that time.

Ironically, very few sites have been found in Western Beringia that are older than sites in North America. The oldest reliably dated human occupation in Western Beringia is about 13,000 years ago at Ushki Lake on Russia's Kamchatka Peninsula, while the earliest in Eastern Beringia is Swan Point, dated to about 14,000 years ago. This was a time of massive global change when huge continental glaciers were melting, sea level was rising rapidly, and giant Ice Age animals, such as mammoths, were becoming extinct. Some archeologists believe that Beringia was not the route taken by the first people to colonize North America. They suggest that the Americas were first populated by oceanic voyages either from Asia or possibly from Europe. Obviously, additional research is essential to resolve this issue.

The earliest cultures to reach North America via Beringia were people who made and used microblades. The evidence seems firm that by about 14,000 years ago

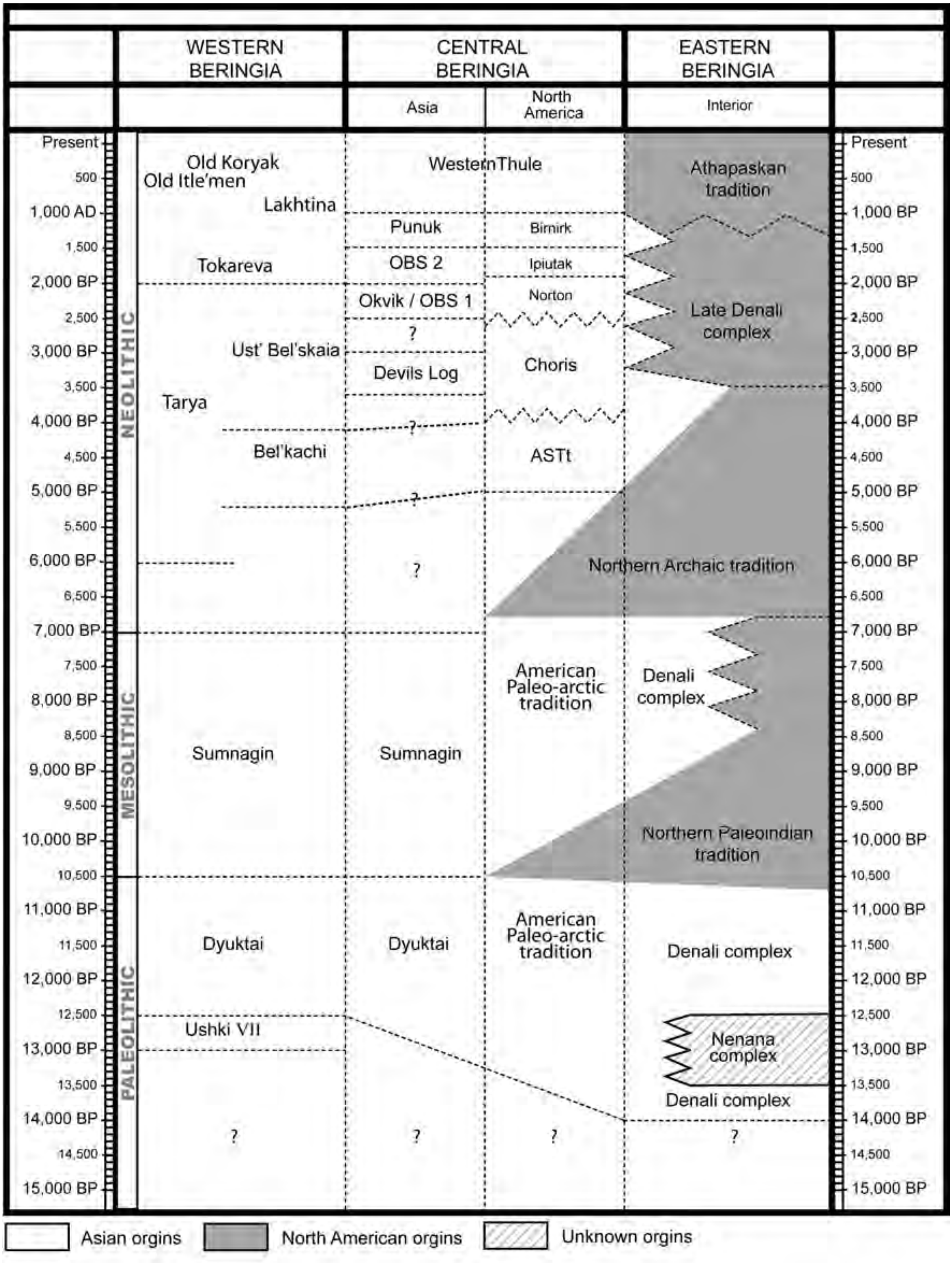


Figure 9.1 Table correlating the expansion and contraction of Asian and American cultural traditions in Beringia.

people camped in Eastern Beringia at Swan Point and the Little John site in Alaska's Tanana River valley. By this time people were already using obsidian obtained from a source hundreds of miles away. This suggests that widespread exploration had already taken place and possibly that long distance trade networks had been established.

When people camped at Swan Point for the first time, a massive ice sheet extended across Canada from the Atlantic Ocean to the western side of the Rocky Mountains. It wasn't until about 14,000 years ago that this massive glacier had melted to expose a very narrow corridor of land between the two ice sheets. However, it probably took another one or two thousand years for the ice to melt sufficiently to permit plants, animals, and humans to move between Beringia and the southern regions of North America.

Research by geologists indicates that the Northwest Coast was largely deglaciated as early as 19,000 – 16,000 years ago. People using watercraft could have moved south of the continental ice along the Northwest Coast before they could have moved through interior Canada. Modern geology helps us understand the context surrounding the first movement of people into North America, but archeologists still do not know how and when people first arrived south of the continental glaciers. The evidence indicates that they were far south of the ice sheets by 14,500 – 15,000 years ago, prior to the time when the interior route was deglaciated.

The end of the last Ice Age was the first opportunity for the Beringian push – pull effect to take place. People living along the Beringian coasts and on the Bering Land Bridge would have been "pushed" inland as sea level rose. They would have also been "pulled" eastward by unoccupied land being colonized by plants and animals as the glaciers receded.

When the continental glaciers melted sufficiently for people and animals to move and live between them, people already living south of the continental ice sheets moved north. About 12,500 years ago these Paleoindian people from the south probably encountered people who had already been living in Eastern Beringia for more than a thousand years. The new arrivals from the south introduced a distinctive American technology called the Northern Paleoindian tradition to Beringia for the first time. The hallmark of this technology was fluted and large lanceolate stone dart and spear points, and other distinctive stone tools. The archeological evidence refutes the theory that mammoth hunters from Asia came across the Bering Land Bridge and then moved south through central North America to colonize the continents at, or before, the end of the last Ice Age.

Rising sea levels flooded the former coastline of Beringia at the end of the last Ice Age and the earliest coastal archeological sites may now be under water. Some under water sites may have been destroyed and disturbed by ice gouging. In the eastern Aleutian Islands and along the Northwest Coast, the earliest coastal sites are about 11,500 – 9,000 years old. These sites are preserved because the rising land outpaced rising sea level in specific areas. However, in most other places rising sea level has flooded ancient shorelines and submerged coastal archaeological sites occupied prior to 9,000 years ago.

All of the early coastal sites that remain above sea level contain microblades. However, there is some evidence to suggest that there may have been an earlier migration along the coast by people who did not make microblades. Nevertheless, the evidence is clear that early microblade-using cultures were able to make their living from the sea, as well as the land.

Early people using microblades and other types of stone tools first moved into northeast Asia and then across the Bering Land Bridge when sea level was lower. They may have skirted the southern coast of the Land Bridge using watercraft. People could have crossed Beringia by both land and sea. Although other routes have been suggested, most archeologists believe people first came to North America via Beringia.

The oral history of Native Americans varies greatly. Some accounts support origins via water, others by land, and others state that people originated in the Americas. Different groups may have had different origins — some may have come early and others later. The timing and character of the human colonization of the American continents remains one of the major unsolved questions in world archeology.

East Meets West

Beringia is the connecting link, or crossroad, between Asia and North America and it played a vital role in the development of circumpolar cultures. The presence or absence of microblades and evidence of the bow and arrow may be useful indicators to identify two major cultural traditions, one Asian and the other distinctly North American, that met and interacted in Central and Eastern Beringia. These events dramatically influenced the lives of early Beringians and helped forge unique and ingenious cultures.

The difference between microblade and non-microblade technology is significant and can be used to help identify Asian and North American cultural influences in Beringia. Sometimes, but not always, microblades appear to be associated with the use of the bow and arrow. Wooden artifacts such as bows, arrows, and atl atls decompose over time and are rarely preserved in archeological sites. The only parts of these weapon systems that are commonly found are the stone dart tips, arrow heads, and microblades. These stone artifacts can tell us about the missing tools that have decomposed. For example, compared to arrow heads the stone and bone points used to tip atl atl darts tend to be larger, heavier, and wider where they attach to the shaft.

Although the origins of the Nenana complex remain unclear, the Northern Paleoindian and Northern Archaic traditions originated south of Beringia in regions of North America where sources of tool stone were available throughout the winter months. These technological traditions did not use microblades, nor the bow and arrow. Instead they preferred to use the atl atl as their primary weapon. The bow and arrow was not adopted in the more temperate areas of North America until about 1,500 years ago. These significant differences suggest that the cultures derived from the Paleoindian tradition in more southern regions of North America are distinctively different from the microblade and bow and arrow using traditions derived from the Asian Dyuktai and American Paleoarctic traditions. The presence or absence of these and other cultural traits enable archeologists to identify these two spheres of cultural influence as they waxed and waned throughout ancient Beringia.

Asian Beringian traditions emphasized the manufacture of microblades and relied heavily on projectile points made from bone, antler, and ivory, while the Paleoindian and Northern Archaic traditions are best characterized by distinctive types of stone projectile points used to tip atl atl darts. These technological traits enable archeologists to define the geographic boundaries of these traditions based on the age and location of the archeological sites that contain these distinctive types of artifacts. Most archeologists agree that the origins of Dyuktai culture in Western Beringia, the American Paleo-arctic tradition in Central Beringia, and the Denali complex in Eastern Beringia are derived from the Paleolithic microblade cultures of Asia. The archeological evidence indicates that the microblade traditions of Asia reached interior Eastern Beringia more than 14,000 years ago.

The invention of microblade technology was essential to sustain human life year round in the Arctic. Microblade technological systems require a complex sequence of procurement and manufacturing steps that are so complex that they must be learned and passed from one individual to another. The transmission of this complex technological system from one generation to the next implies other shared technological, economic, and social concepts. The very earliest sites that have organic preservation indicate that throughout Beringia microblades were used as insets in the sides of antler arrow points. These finds suggest the widespread use of the bow and arrow by early microblade-using people throughout Beringia by at least 11,500 years ago. Danish archeologist Helge Larsen called this the "the circumpolar side blade tradition." He realized that microblades were used throughout the circumpolar north as razor-like insets in the sides of arrow heads made from bone, antler, or ivory.

Larsen and other archeologists also recognized the technological continuity from these early microblade traditions to the later Arctic Small Tool tradition when a transition from microblades to bifacially flaked side blades took place. During late Arctic Small Tool tradition times about 4,500 – 4,000 years ago, there was a transition in Central Beringia from using microblades to using bifacially flaked sides blades as insets. The use of chipped side blades continued over time but they became smaller and less common until about 1,000 years ago when people stopped using side blades altogether. Remarkably, even after they were no longer used, people continued to incise a line, sometimes called a blood line, on the projectile point where the insets used to be located. It is difficult to believe that these practices were independently developed by different groups of people at different times over such a vast area. Instead, these incredibly long-lived practices suggest a long and continuous tradition of behavior passed from one generation to the next and that other customs and social beliefs were shared and passed from generation to generation as well.

It is tempting to think of these early Beringians who shared this long tradition of technological development and learned behavior as a single people, or culture. However, it cannot be proven that these individuals were biologically related or even spoke similar languages. To confirm such relationships would require analysis of the genetic characteristics and the languages of these ancient people that are not available. It is also clear that significant cultural differences exist within this larger technological continuum. For example, some groups living at the same time, hunting in the same way, and even sharing similar art styles, used labrets as body adornment while others did not. The presence and absence of these symbols of social status suggest significant regional differences between groups for thousands of years.

In sharp contrast to the Asian-derived microblades are the archeological assemblages developed in North America that lack microblades and instead are typified by bifacially flaked projectile points. This way of making stone tools, called the

Northern Paleoindian tradition, is dramatically different from that of the circumpolar side blade tradition. The making of Paleoindian points was a reductive strategy in which a large piece of stone was reduced by chipping it into a desired shape. In contrast to this extravagant use of stone, microblades were conservative in the use of stone. Asian projectile points were produced by an additive process of fixing razor like microblades into slots on the site of antler or bone points.

Although far more labor-intensive, the manufacture of antler points with stone insets guaranteed that the materials necessary to make projectile points and other cutting tools could be available even when frozen ground and winter snow prevented access to stone during much of the year. In other words, the microblade technique is an Arctic adaptation, while bifacially chipping stone projectile points reflects a temperate, more southern, adaptation. Some archeologists have suggested that intervals of cooler climate favored caribou-hunting and tundra-adapted, microblade-using cultures, while warmer intervals may have favored more temperate-adapted cultures focused on hunting animals such as deer or bison.

In contrast to the circumpolar microblade tradition, Paleoindian people did not use the bow and arrow. Instead they primarily relied on the atl atl and javelin-like spears for hunting. Based on their size, shape, and weight, the fluted and lanceolate projectile points made by the Paleoindian tradition were used to tip atl atl darts. The width of the projectile point at the hafting point provides an indication of the size of the shaft to which it was attached. Their size indicates that stone points were attached to atl atl darts and not used to tip arrows. These contrasting conceptual approaches to making and using tools reflect ways of life that were culturally different. The interaction between these Asian and American traditions was played out primarily in interior Eastern Beringia and on the North American side of Central Beringia.

The Nenana complex is an anomaly and it is difficult to determine its significance. It was once believed to be the oldest complex in Eastern Beringia. It is characterized by small triangular bifacial projectile points and distinctive ovate bifaces that were probably used as knives. It does not have microblades, but some sites have projectile points resembling Paleoindian types. The Nenana complex appears to be geographically restricted to areas of interior Eastern Beringia for about a thousand years between about 13,200 and 12,100 years ago. It may represent a particular type of site associated with the Denali complex, or an early variant of the Northern Paleoindian tradition, or perhaps the remnant of an earlier non-microblade culture which was in place prior to the arrival of the Denali complex. Don Dumond cautiously has suggested that the Nenana complex may represent an early movement of people northward to Eastern Beringia from areas south of the continental glaciers immediately prior to the Northern Paleoindian tradition. By about 12,500 – 11,500 years ago, it becomes difficult to distinguish the Nenana complex from the Northern Paleoindian tradition, a fact that suggests a possible sharing or incorporation of technological traits between the two.

The Northern Paleoindian tradition occurs throughout much of Eastern Beringia beginning sometime between 12,500 and 11,500 years ago and possibly persisting until about 7,000 years ago in some areas of Central and Eastern Beringia. The appearance of fluted and lanceolate projectile points in Eastern Beringia document people moving north from southern parts of North America, colonizing new land recently exposed by the melting continental glaciers, until they reached interior Eastern Beringia. The pulling effect of deglaciation is demonstrated by the presence of these artifacts. There is some evidence to suggest that Paleoindian people may have first spread northward into Alaska along the Brooks Range and then south into the more interior regions of Eastern Beringia. Between 12,500 and 11,900 years ago there was an increase in herb tundra in central Alaska and to the south and east as large areas of Canada were deglaciated. This vegetation may have favored the types of game familiar to Paleoindian hunters from the south, such as bison and elk. Although the evidence is difficult to interpret, it appears that neither Northern Paleoindian people nor their technological innovations reached the Asian side of Central Beringia.

Following the Paleoindian period the climate continued to warm and the northern forest continued to expand throughout eastern and Central Beringia. In the southern regions of North America people abandoned the use of lanceolate projectile points between 9,000 – 8,000 years ago and began to tip their darts and spears with notched projectile points. The evidence from Eastern and Central Beringia suggests that by about 6,800 years ago new arrivals from the south occupied the entire region, bringing with them the Northern Archaic tradition.

This notched point technology developed in the southern part of North America 1,000 – 2,000 years earlier. Like their Paleoindian predecessors, they did not use the bow and arrow, but relied on the atl atl to propel their spears. The boreal forest had continued to expand and by about 6,800 years ago it had reached all the way to the present coast of the Bering and Chukchi Seas. Northern Archaic sites are common and frequently large, suggesting larger numbers of people. They made and used stone projectile points and knives with notches and other types of artifacts valuable for making a living from the forest. The early Northern Archaic period marks the farthest westward push toward Asia by New World cultures. It occurs at a time when the climate is near its warmest and the forest has reached its maximum extent.

Microblades seem to disappear from Eastern Beringia during early Northern Archaic times. It appears that the people of the side blade tradition may have withdrawn to the coastal fringe and islands of the Bering and Chukchi Seas — perhaps all the way to Asia. In the Kodiak Archipelago, cultural development takes a unique path. People permanently abandon the use of microblades earlier than anywhere else in Beringia. This early abandonment of microblade technology about 7,000 years ago may be related to the fact that there were few land mammals to hunt in the Archipelago, and the bow and arrow was not effective for marine mammal hunting or fishing. Also the relatively warm Pacific waters around the Archipelago may have created a warmer climate that allowed people access to supplies of stone during winter months. They are the first Beringians to produce projectile points and other tools by sawing, grinding, and polishing stone, rather than chipping it.

Interior Eastern Beringia and the American side of Central Beringia was the geographic interface between the Asian microblade traditions and Paleoindian non-microblade traditions of North America. Interior Eastern Beringia was a complex environmental mosaic with the boundaries between these technological traditions shifting repeatedly over time. Consequently, when viewed from the perspective of a single geographic place, some archeological sites have a sequence of occupations alternating between those containing microblades and those that do not. The evidence also suggests that over time there was an exchange of technology that moved in both directions. Later Paleoindian people may have adopted the use of microblades and microblade-using groups may have acquired Paleoindian-style projectile points. Despite this apparent contact, the concept and use of the bow and arrow did not spread south from Eastern Beringia to people elsewhere in North America until about 1,500 years ago.

The period of Russian and European contact marks the most recent episode of East meets West in Beringia. The Russians pushing eastward met Europeans moving westward in two regions. The Russian American Company encountered the Hudson Bay Company in interior Alaska, where so many cultural contacts appear to have been made in the past. As they pushed south from the Gulf of Alaska along the west coast of North America, the Russians encountered the Spanish as they explored their way northward from California. These historic encounters probably reflect the spheres of contact that characterized prehistoric contact and exchange, one coastal and the other interior.

Soon after the Russians and Europeans began their exploration of Beringia, disease and epidemics swept through the land killing many people. The new economic and political systems introduced by European and American explorers and colonizers irreversibly changed the Native cultures of Beringia. At the same time Native technology and inventions such as the parka, dog traction, and kayaks were widely adopted by non-Native people.

Environmental Change and Cultural Development

Because Beringian people make their living directly from the land and sea, environmental change has played an important role in their cultural development. Sharing knowledge and information is critical to success for all societies, but even more so in extreme environments with relatively small populations. Under these circumstances seemingly insignificant mistakes, false information, and errors in judgment can be disastrous. Survival in the extreme physical environments of Beringia required social environments where people could obtain information and share innovations.

The need for safety can foster a conservative approach to adopting new ideas and technology. In Beringia new concepts had to be carefully tested to determine if they were advantageous and safe prior to adopting them. By examining when and where these innovations first occur, it is possible to determine the direction from which they came, how fast they were adopted, and how they were transferred to neighboring groups. It is also possible to determine how viable innovations were and to explore the reasons some people accepted them and others did not.

Periods of colder climate may have resulted in the eastward expansion of microblade-using people in Beringia (Figure 9.1). Periods of cooler climate may have been more advantageous for microblade-using people hunting on land. For example, during periods of cooler climate, caribou habitat tends to expand enabling caribou hunters to move into new areas. Furthermore, microblade technology is an adaptation to colder climates because it conserves a usable supply of tool stone through the winter when most sources are inaccessible under ice and snow.

Conversely, periods of warmer climate appear to have favored the northward and westward expansion of non-microblade-using people. During warmer periods, cultures that adapted to hunting other types of animals and to a more extravagant use of stone were economically more successful. During periods of warmer climate, microblade-using people may have also put greater emphasis on harvesting resources from the sea, rather than the land. If microblade-using people tended to aggregate along the coast during periods of warmer climate, the result may have been lower populations in non-coastal areas. Such demographic shifts would have made it easier for non-microblade-using people to occupy the region with less conflict. While it is tempting to attribute these cultural changes to climate change, there may have also been cultural factors affecting such as population increases or declines, cultural innovations, the need for trade, and social conflicts and alliances.

Correlating these cultural or technological pulses with climate change also suggests that there may have been a lag in time between climate change and territorial expansions and contractions of microblade and non-microblade use. The interface of these changing boundaries may explain the complexity observed in many archeological sites, particularly in Eastern Beringia where these shifts may have been most dramatic.

The period beginning about 4,000 years ago appears to be a time of major upheaval and possible cultural displacement throughout much of central and Eastern Beringia. It is a time of cooler climate, stormier seas, increased tundra, and minor glacial advances in alpine areas. Marine mammals that inhabit the edge of the Bering Sea ice pack move with the winter sea ice and appear as far south as the Aleutian Islands for the first time. It appears to be a time of population dispersal, technological change, exploration, and perhaps innovation. It is also a time when there is a strong technological push eastward from the Asian side of Beringia.

Pottery was also is introduced from Asia to Western Beringia at this time (about 4,000 years ago), and pottery was widely used for thousands of years in Western and Central Beringia. However, the people of Eastern Beringia who were aware of ceramics did not adopt pottery. It is difficult to identify environmental reasons why the Asian paddle and anvil technique of pottery making never spread farther south in North America. Perhaps the rejection of this new technology was a deliberate cultural choice based on social preferences rather than other more pragmatic economic or environmental concerns.

In the Kodiak Archipelago, Koniag people experimented with pottery manufacture introduced from the Bering Sea region, but it never took hold and was rejected in favor of more traditional materials such as bowls and oil lamps pecked from stone. Relatively small amounts of pottery have been found as far inland as the junction of the Yukon and Tanana Rivers, but its use was never widespread farther inland. Instead people favored containers made of traditional materials such as birch bark.

The strength of the Asian influences in North America can also be observed in interior Eastern Beringia. Here there appears to be a combination of the use of microblades and Northern Archaic projectile points (notched and later lanceolate). This suggests movement into the interior of coastal microblade-using people or adoption of their technology. Caribou habitat and populations may have expanded during this colder interval. Perhaps deteriorating climatic conditions along the coast forced or encouraged people to place greater reliance on inland resources, such as caribou. There is some evidence to suggest that the bow and arrow was finally adopted in interior Eastern Beringia about this time (about 1,700 years ago), possibly as a result of a prolonged period of interaction between people of Central and Eastern Beringia.

From there it spread southward and was adopted throughout the rest of North America by about 1,500 years ago.

Although microblade use was not continuous in interior Eastern Beringia, the late radiocarbon dates from several sites suggest that microblade manufacture persisted longer in this region than anywhere else, possibly until as late as 1,500 – 1,000 years ago. The manufacture and use of microblades appears to terminate somewhat earlier in Central Beringia between about 3,800 – 2,500 years ago. With the exception of the Kodiak Archipelago, microblades disappear at the same time metal — copper, bronze, and iron — is introduced. The genius of microblade technology was that it solved the problem of not being able to obtain stone throughout much of the year and it may have been impossible to abandon it until a more efficient replacement, such as metal, was available. The introduction of metal no longer required the constant replacement of stone cutting edges, because even small pieces could be resharpened and could last for many years. Microblade use was discontinued about 3,800 years ago in Central Beringia, 3,000 years ago in Aleutians, 2,000 – 1,500 years ago in interior Alaska and Canada, and between 2,500 – 2,000 years ago on the Northwest Coast.

Based on the size and shape of the stone projectile points and the atl atl dart shafts found at melting ice patches, it is clear that people living in interior Eastern Beringia were using spears and darts propelled using the atl atl. Well-preserved antler arrow heads, and later bow fragments, and other archery equipment appear to have been in use in Central Beringia beginning with the American Paleoarctic tradition, possibly as early as 14,000 years or more ago. However, to the south, in regions that are now Canada and the contiguous United States, the widespread occurrence of small stone projectile points used to tip arrows does not occur until about 1,500 years ago.

Beginning about 1,500 year ago many areas in Beringia appear to be in a time of cultural unrest, movement, and conflict. Widespread conflict is indicated by the location of many archeological sites throughout Beringia. Old Itelmen sites in Kamchatka, sites throughout the Aleutian Islands, in the Kodiak Archipelago, in Kachemak Bay, and along the northern Northwest Coast are located in obscure or defensible locales. These locations have been interpreted to be places where people can hide from enemies or can be more easily defended by small numbers of people. The artifacts from many sites throughout Beringia also reflect increased conflict. For example, there is an increase in archery equipment, body armor, war clubs, and shields. Some burials and human remains from this time also exhibit indications of violent death and trauma.

This was a time of climate change known as the Little Ice Age. Shortly after 1,250 years ago the climate became colder, sea ice was more extensive, and mountain glaciers advanced. Shifting biological resources caused by climate change may have contributed to widespread social unrest. Colder climate may have caused animal populations, such as fish and large mammals, to decrease in some areas and increase in others. Changing climate may have also made some species easier or more difficult to harvest as a result of factors such sea ice conditions or the amount of water in rivers at given times of the year. The changing environment may have encouraged some groups to seek additional resources in neighboring territory or to expand existing territory as a result of increases in population.

The Little Ice Age resulted in increased salmon runs in some areas, such as the Kodiak Archipelago, where a marked cultural change from the Kachemak to Koniag traditions took place. It also marks the clear emergence of Athapaskan culture in the interior Eastern Beringia and Western Thule in Central Beringia. These were the cultures encountered by the first Russian and Europeans to visit Beringia and they had been forged during this time of climate change and social unrest.

Sedentism

Scientists speculate that people began as hunters and gatherers living in small groups and moving from place to place to obtain food, water, and other things necessary to survive. At some point they became more sedentary, staying in one place year round. This in turn led to villages that were occupied for generations. This stable way of life, called sedentism, can be identified throughout Beringia by the remains of permanent communities occupied by people for thousands of years. Sedentism is considered an important stage in human cultural development from which advanced civilizations emerged. The cultural history of Beringia may offer unique insights into origins of sedentism and the reasons why it developed.

Throughout much of the world, sedentism is usually associated with agriculture, where surplus grain and other agricultural products can be stored to sustain the population throughout the year. However, people throughout Beringia were able to live in permanent settlements for thousands of years based primarily on the harvest of marine mammals and fish. The earliest evidence for this is at Ushki I in central Kamchatka where seven single chambered houses were found clustered around two larger multifamily dwellings occupied 13,000 years ago. In other areas and later in time, substantial villages were located on the Alaska Peninsula, along the Northwest Coast, throughout the Aleutian Islands, in the Kodiak Archipelago, and along the coasts and islands of the Bering and Chukchi Seas.

Although these villages were not cities, they provide insights into the origins of urban living and complex societies. They suggest that early maritime adaptations enabled people to live in one place year round, and this alternative to agriculture may have formed the economic foundation for later civilizations elsewhere in the world. They demonstrate that an economy based on agriculture is not necessary to live in permanent settlements, develop complex technology, sustain social hierarchies, and achieve the high levels of sophisticated art that characterized Beringia.

New Frontiers

Despite the substantial progress that has been made, knowledge of this vast region remains incomplete. Traditional archeological survey, excavation, preservation, and analysis are needed in all areas of Beringia. In addition, there are exciting new research frontiers, including the archeology of melting glaciers and underwater archeology.

Most knowledge about the early archeology of Beringia is based on the few stone tools that have been preserved. Tools, clothing and other materials made from plants and animals usually decompose soon after deposition. This preservation bias greatly limits the ability of archeologists to understand the past. A better understanding of material culture is possible in cases where organic remains, such as bone and wood, are preserved. There are some environments where preservation of organic material is excellent. For example, some bogs, underwater sites, permafrost, and glaciers have preserved organic remains in exceptional condition. Waterlogged deposits on Kodiak Island have revealed a complex and colorful material culture that would be invisible if only the stone artifacts were known.

It is difficult to determine the timing and origins of early maritime adaptations because rising sea level flooded the former coastline of Beringia at the end of the last Ice Age and coastal archeological sites are now underwater. In the eastern Aleutian Islands and along the Northwest Coast the earliest coastal sites are about 11,500 – 9,000 years old. There is evidence from several cave sites in Alaska and British Columbia for settlement on islands that required the use of watercraft along the Northwest Coast more than 11,500 years ago.

Many archeologists believe that understanding these early maritime adaptations holds the key to understanding the way people were first able to colonize North America. The record of early North Pacific maritime adaptations is probably preserved in some places along the submerged Ice Age shorelines. Archeological sites resulting from people living inland on the former Land Bridge and adjacent coasts may be preserved under the cold waters of the Okhotsk, Bering and Chukchi Seas, the Gulf of Alaska, and the Northwest Coast.

Although marine archeological survey was tried as early as the 1970s in the Bering Sea, underwater archeology in Beringia has lagged far behind underwater archeology elsewhere in the world. Marine archeological survey in Beringia has been hampered by severe weather, oceans covered by ice much of the year, poor navigational controls, high costs and limited resources, and the absence of sunken treasure ships. The first underwater survey in the Bering Sea in 1976 demonstrated the feasibility of marine archeological survey in Beringia. Off the coast of British Columbia Daryl Fedje and Heiner Josenhans conducted marine survey and testing in 1997 that resulted in the recovery of a stone artifact probably dating to about 12,000 years ago.

With advances in satellite navigation and underwater technology, such as remotely operated underwater vehicles (ROVs) (Figure 9.2), the archeology of Beringia's continental shelves may prove to be one of archeology's most exciting and challenging frontiers. It remains a vast pristine environment that has escaped much of the destruction and disturbance resulting from modern industrial development. Artifacts and even well preserved archeological sites may lie beneath Beringia's cold Arctic waters.

Since about the 1980s, scientists have recorded that the earth is undergoing a period of global warming. Researchers have documented that glaciers throughout Beringia have been melting and the extent of sea-ice is decreasing. Archeological remains are being exposed on the surfaces and along the margins of some melting glaciers and ice patches. Frozen environments have produced some of the most complete examples of prehistoric human remains and artifacts ever discovered. Their excellent state of preservation makes them suitable for analysis with a variety of scientific techniques.

The discovery of a late Neolithic "Iceman" in 1991 brought world attention to the archeological potential of glaciers. Found near a 10,500 foot (3,200 m) glaciated pass in the Tyrolean Alps in northern Italy, the Iceman carried an impressive array of sophisticated technology including armaments, clothing, storage containers,

Figure 9.2 Remotely operated vehicle (ROV) used to search for submerged archeological sites on the continental shelf of Southeast Alaska in 2010: 1 On deck; 2 Deployed on surface prior to dive to conduct underwater survey.

wood-working implements, fire-starting equipment, and even medicinal plants. The pioneering work of Canadian researcher Greg Hare, Native participants, and scientific colleagues soon followed this discovery. In the southern Yukon Territory of Canada near the British Columbia border, several thawing ice patches were discovered containing frozen archeological and paleontological specimens. The search spread to Alaska where similar discoveries have been made. The finds from these sites are extremely important because they preserve organic artifacts seldom found in other types of sites. Some amazing discoveries include arrows with feathers and stone projectile points attached with sinew lashing, atl atl darts, and clothing. Because they are organic, they can be dated using the radiocarbon method.

Kwaday Dan Ts'inchi, meaning "Long Ago Person Found" in Southern Tutchone (Athapaskan), was found in northern British Columbia, Canada. The remains of this individual who lived 500 years ago were discovered along an ice ridge on a glacier at an elevation of approximately 5,250 ft (1,600 m). Artifacts recovered with *Kwaday Dan Ts'inchi* included tools, weapons, clothes, and even trail food. These and other fortuitous discoveries were brought to the attention of archeologists by outdoor recreationalists.

These finds demonstrate that organic artifacts are preserved within these unique frozen depositional environments and that they will continue to be exposed if ancient ice continues to melt. The exceptional preservation of organic artifacts found in such contexts can make them appear to be recent, particularly to the untrained eye. As a result, their full significance may not be recognized. For example, the Iceman from the Tyrolean Alps was regarded as a recent fatality and was initially treated as a forensic case. Therefore, it is important to date every specimen and not assume that specimens are recent, or that assemblages of objects are all the same age.

In addition to the archeological remains that have been reported from mountain glaciers, numerous organic artifacts have been discovered melting from small patches of perennial snow and ice (Figure 9.3). The archeology of glaciers and ice patches presents unique challenges. Because it is not feasible or practical to dig test pits in glacial ice and ice patches, archeologists rely primarily on surface finds. Once thawed, organic remains soon decompose or are subject to destruction by scavenging animals and decay. Consequently, it is important for these sites to be located in order to collect, study, and preserve the rare artifacts they contain. If global warming continues, artifacts important to understanding Beringia's past will continue to be exposed. It is important that glaciers and ice patches likely to contain these rare organic artifacts be identified and monitored.

Figure 9.3 The Bonanza Ice Patch in Alaska. Caribou are attracted to ice patches in the summer to cool down and escape insects. People have hunted them at these sites for thousands of years.

Legacy

For thousands of years Beringia has been the zone of cultural contact between Asia and North America. The archeological record from this region documents a series of Asian – North American population shifts that can be correlated with climate change. It cannot be adequately interpreted without understanding the environment, fluctuating sea levels, and changing climate.

In Central Beringia an amazing sequence of technological progress and innovation took place. Over thousands of years the ability to make a living from the Arctic seas enabled people to prosper. Ultimately the innovations and refinements included the invention of specialized equipment such as snow goggles and snow knives made of bone and ivory to extend hunting and fishing onto the sea ice. Dog traction and specialized sleds enabled people to travel long distances across the vast expanse of the frozen ocean. Many Beringian inventions such as kayaks, the toggling harpoon, and crampons have been adapted widely and have made lasting contributions to contemporary society. These ingenious people adapted to the most extreme environment on earth, the ice of the Arctic Ocean. This type of problem solving is essentially the same as that required for contemporary space exploration. People created artificial environments in which to work and live, discovered ingenious ways of procuring food and fuel, and developed the knowledge and skill to navigate vast regions and return home safely.

Native people of Beringia have made significant contributions to science and scholarship by sharing their knowledge and expertise. During the formative stages of archeological and ethnographic research they carefully explained the function and meaning of the everyday objects they made and used. This legacy is essential to understand and interpret the objects found in archeological sites. Their patience in working with researchers and scholars not only enriched science, but also made scientists better people.

During the early years of research in Beringia, many natural scientists did not demonstrate respect for Native people, their cultural beliefs, or even their dead. Human remains were exhumed inappropriately and Native people were not consulted about what were appropriate and respectful ways to conduct research in the context of their cultures. Archeologists and other scientists have learned from these mistakes and strive to be respectful of Native values, consult with tribal governments, partner with local people, and share research results. Tribal sovereignty and self governance, land claim settlements, and legislation codifying Native rights have changed the way science is conducted. Native people and indigenous scholars throughout Beringia continue to take leadership roles in research by sharing their interpretations through media, as well as local and regional interpretative centers and museums.

The unique mix of East and West that has made Beringia a fertile home for innovation, invention, and adaptation continues. The historic events of Russian, European and American contact combined with Native knowledge have created a new Beringia with even greater cultural diversity. In the past, the overall flow of cultural traits has been primarily from Asia to North America. For much of this time the dividing line between the two cultural spheres has been in North America, somewhere in the region of what is today interior Alaska. If the correlation between climate and cultural trends continues, the current interval of climate warming in the Arctic suggests there may be an expansion of American cultural traits westward toward Asia. It will be fascinating to see if the trends of the past foreshadow Beringia's future.

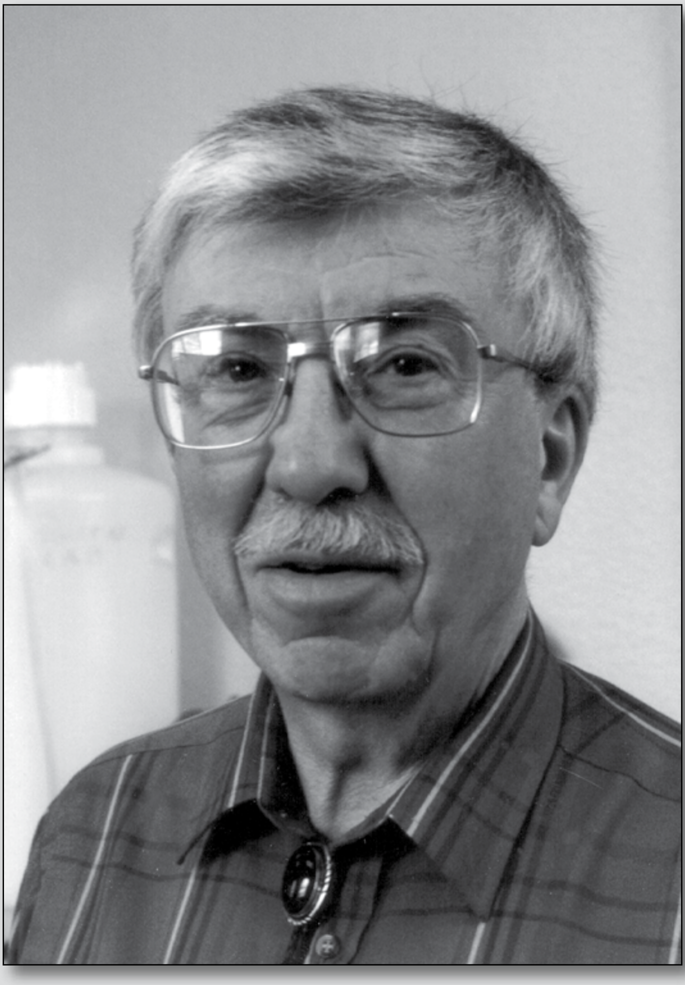
Pioneers of Beringian Archeology

The following biographical sketches provide insights into the history of Beringian archeology, the influences various scholars have had on one another, and their impact on world archeology. Although this appendix is far from complete, is provides useful historic contexts from which to interpret the development of Beringian archeology. All living individuals, and some of those who are deceased, featured in biographical sketches have given permission to be included and assisted with photographs and important biographical and historic information about themselves, their colleagues and mentors. Some living individuals who were invited to be included in this section chose not to participate. Consequently, it should not be assumed that because certain individuals are not included that their contributions to Beringian archeology are not significant.

Robert E. Ackerman
b. 1928

Robert Ackerman began archeological research in Alaska in 1956 under the direction of J. Louis Giddings. Ackerman was born in Grand Rapids, Michigan, and educated at the University of Michigan, receiving his B.A. and M.A. degrees in 1950 and 1951 respectively. He was awarded a Ph.D. in 1961 from the University of Pennsylvania and began as an Instructor in Anthropology at Washington State University that same year. He was a Russian language specialist in the United States Air Force.

His research has focused on cultural relationships between Asia and North America. Since 1959 he has made repeated research visits to Russia to analyze and interpret archeological collections and is a leading expert on the archeology of the Bering Sea region. He has made important contributions to the broad interpretation of archeology of the north Pacific Rim, and more specifically to the archeology and ethnology of Alaska. Ackerman has conducted extensive field research throughout Alaska including the Bering Sea region, southcentral and Southeast Alaska. His significant contributions to the archeology of Southeast Alaska include the first documentation of early microblade using cultures in this region of Alaska. As Professor of Anthropology and Director of the Museum of Anthropology at Washington State University, he trained numerous students in Alaskan archeology. He was the recipient of the Career Achievement Award of the Alaska Anthropological Association in 1999.

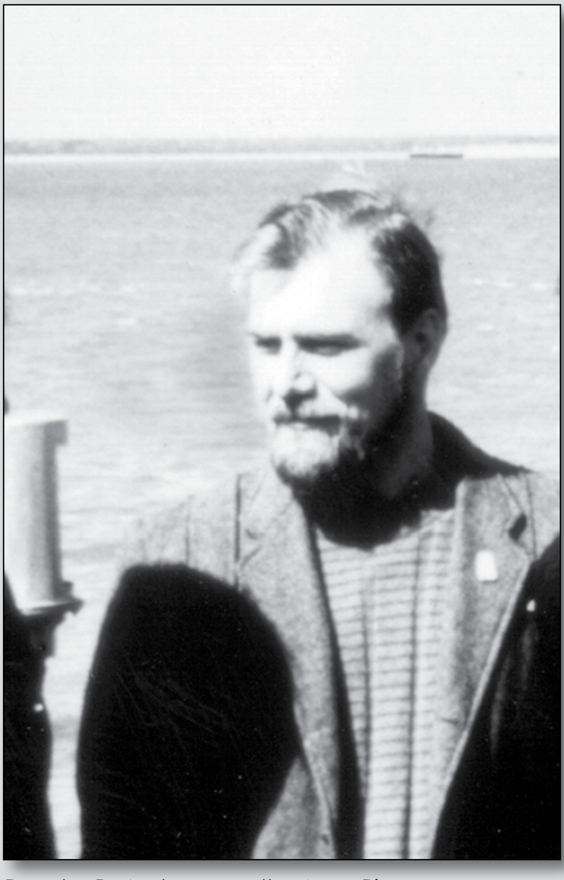


Robert E. Ackerman at the Department of Anthropology, University of Washington, 1996 (Photo courtesy of Robert E. Ackerman).

Douglas D. Anderson
b. 1936

Douglas Anderson began his career in Alaskan archeology in 1960 working with J. Louis Giddings at Cape Krusenstern where he excavated and analyzed Ipiutak settlements. Following Giddings' death in 1964, he undertook the formidable task of completing Giddings' unfinished research, including the analysis and publication of his field work at Cape Krusenstern and excavation of the deeply stratified site at Onion Portage on the Kobuk River. At Onion Portage he excavated and described the Akmak assemblage, the oldest occupation from the site. He has made numerous important contributions to defining and interpreting the archeology and cultures of northwestern Alaska. In addition to his impressive record of archeological research, he and his wife, Wanni W. Anderson, have conducted important long-term ethnological studies near Selawik, Alaska. They have also maintained a second research area in Thailand where he has excavated and tested sites including Lang Rongrien Rockshelter which spans 40,000 years of prehistory. He has probably served as mentor for more graduate students pursuing careers in Arctic anthropology than any other Arctic scholar.

Born in Olympia, Washington, Anderson received his B.A. from the University of Washington (1960), his M.A. from Brown University (1962) and his Ph.D. from the University of Pennsylvania (1967). He has served on the faculty of Brown University since 1965. He has been a visiting lecturer at universities in Thailand and Russia, a member of the Advisory Council for the National Park Service, and a member of the subcommission for Anthropology and Archaeology of the IREX/USSR (Russian) Academy of Sciences. He is the foremost expert on the archeology of northwest Alaska and remains active in teaching and research at Brown University.


Douglas D. Anderson on the Amur River, near Khabarovsk, Russia, 1973 (Detail from a photo by C. Vance Haynes).

Herbert O. Anungazuk
1945 – 2010

Herbert Anungazuk was born and raised a naturalist and hunter in the Inupiaq community of Wales, Alaska. He graduated from Mount Edgecumbe High School in Sitka, Alaska and attended Haskell Institute in Lawrence, Kansas. He served in the military during the Vietnam War and married Lena Riley in 1983. He began working as an anthropologist and heritage specialist for the National Park Service in 1985. As an Inupiaq speaker and whaler with extensive knowledge of the communities, history, land, and people of the Seward Peninsula and northwestern Alaska, he was a highly respected Park Service anthropologist. He partnered and collaborated with colleagues including Ernest S. "Tiger" Burch, David Hopkins, Allen McCartney, Igor Krupnik, Jeanne Schaaf, and many others.

Anungazuk was a gifted speaker and author. In addition to his many reports and presentations at professional meetings, he published in the scholarly journals such as the Alaska Journal of Anthropology and the encyclopedia *Archaeology in America,* and he contributed more than 4,000 entries to the Wales Sea Ice Dictionary. His work helped many archeologists better understand the significance and context of the ancient remains they discovered. His contributions to Beringian anthropology and archeology reached beyond Alaska and his work raised national awareness of the importance of indigenous knowledge in resource management. He received the Alaska Anthropological Association's Professional Achievement Award in 2010.

Herbert Anungazuk on the Seward Peninsula. (Photo courtesy the National Park Service Alaska Regional Office.)

Hans-Georg Bandi
b. 1920

Hans-Georg Bandi's fascination with Iñupiat archeology began when he served as a field assistant to Danish archeologist Count Eigil Knuth's 1948 expedition to Pearyland in Northern Greenland. Ten years later he met J. Louis Giddings who invited him to participate in work at Cape Krusenstern, Alaska. As visiting professor at the University of Alaska in Fairbanks in 1962 – 1963, he studied the spectacular St. Lawrence Island collections made in the 1920s and 1930s by Otto Geist. He collaborated with Frederick Hadleigh-West on field research in the Yukon Flats in 1963-1964. He conducted an archeological reconnaissance on St. Lawrence Island in 1965, and began excavations during the summers of 1969, 1971 – 1973. He excavated dwellings and reported burials dating to Punuk, Okvik and Old Bering Sea times and recorded sites along the west coast of the Island that appeared to be in places that were situated for defensive purposes against hostile attacks coming from the Chukchi Peninsula.

Bandi was born in Thun, Switzerland, and received his Ph.D. from the University of Fribourg (1945) where he studied under Hugo Obermaier. In Switzerland he served as assistant curator at the Ethnographic Museum Basel (1945 – 50) and as professor of prehistory and paleo-ethnography at the University of Bern, and as curator of the pre- and protohistoric section at the Bernese Historical Museum (1950 – 1985). He was a visiting professor at Brown University (1959) and at the University of Alaska Fairbanks (1962 – 1963), Research Associate in Anthropology at the Smithsonian Institution (1970), and Research Associate at the Institute of Arctic Biology, University of Alaska Fairbanks (1972 – 1974). From 1986 until 1995 he served as Secretary General for the Swiss-Liechtenstein Foundation for archaeological research abroad, and remains active in researching the archeology of the Upper Paleolithic, Ice Age art, and Iñupiat archeology.

Hans-Georg Bandi on St. Lawrence Island, Alaska, 1973 (Photo courtesy of Hans-Georg Bandi).

Theodore (Ted) Paul Bank, II
1923 – 1981

As an anthropologist and explorer, Theodore Bank dedicated his career to the study of the people and ecology of the North Pacific rim and the archeology of the Aleutian Islands. He led at least 35 scientific expeditions in various parts of the world, and served as the director (1969 – 1981) of the Aleutian-Bering Sea Institutes Program. He was an active member of the Explorers Club and proudly carried Flag #159.

Bank was born in Patterson, Louisiana, and was a student at Harvard (1941-1943) before serving as a naval weather observer in the Aleutians during World War II. After the war he attended the University of Michigan where he received B.S in forestry (1947). He spent two winters in the Aleutian Islands where he was a school teacher in the village of Atka during the winter of 1948 – 49. He returned to University of Michigan to earn a M.S in ethnobotany (1950), and pursued postgraduate studies in Anthropology until 1953. As a Fulbright scholar (1955 – 56) he conducted research among the Ainu of northern Japan. Based on the results of his excavations in the Aleutian Islands, he questioned the two stage colonization model for the island chain proposed by Aleš Hrdlička and his student William Laughlin. Perhaps he was best known for his book, *Birthplace of the Winds* (1956), a personal account of his early work in the Aleutians.

Ted and Janet Bank in front of their semi-subterranean house, Atka, Alaska, 1949 (University of Alaska Archives and Special Collections).

John Martin Campbell
b. 1927

Jack Campbell began his Arctic research in 1956 when he conducted an archeological survey and excavation in the area of Anaktuvuk Pass in the Brooks Range. He is best known for defining the cultural sequence in that region of Alaska based on the excavation, description and dating of a series of archeological sites. He was a friend and student of Simon Paneak. His interests include ornithology, and he has published numerous articles on Alaskan birds. He served as assistant editor for *American Antiquity* (1960 – 1970), summarizing archeological research in the Arctic. He served as Executive Secretary (1970 – 1974) of the Alaska Archaeological Project for the Arctic Institute of North America and the U.S. Department of the Interior. In this capacity he helped provide oversight and support for the archeological work associated with construction of the Trans Alaska Pipeline. He has also conducted important ethnohistoric work among Iñupiaq and Ahtna peoples, focusing on human-environmental interactions. He is Professor Emeritus at the University of New Mexico and Research Professor at the Maxwell Museum of Anthropology.

Campbell was educated at the University of Washington (B.A. 1950), University of New Mexico (1950-51, 1954-55), Georgetown University where he received a Certificate of Completion from the USAF Psychological Warfare School (1952), and Yale University where he was awarded a Ph.D. in 1962. As a graduate student he was president of the Yale Anthropology Club (1957 – 1958). He served on the faculty of George Washington University (1959-64) before joining the University of New Mexico in 1968 where he was on the faculty until his retirement in 1992. He was Chairman of the Anthropology Department (1964 – 1972) and Director and Acting Director of the Maxwell Museum of Anthropology (1970 – 1974).

John M. Campbell on the upper Tanana River, interior Alaska, 1969 (Photo by Charles E. Holmes courtesy of John M. Campbell).

Donald Woodforde Clark
b. 1932

Born in Portland, Oregon, Donald Clark moved to Kodiak, Alaska, at the age of nine. He majored in geology at the University of Alaska Fairbanks where he received his B.S. in 1956. He received his MA. (1966) and Ph.D. (1968) from the University of Wisconsin, Madison, and joined the National Museum of Canada (now Canadian Museum of Civilization) in 1968.

His Beringian research has focused primarily on the archeology of Kodiak Island and Kachemak Bay, as well as surveys and excavations in the Koykuk River drainage and Hahanudan Lake in northwestern Alaska, and Canada's Yukon Territory. With his wife, ethnographer Annette McFadyen Clark, he explored the Batza Tena obsidian source that was reported to them by Koyukon Indians. Fluted obsidian projectile points from this locale are similar to some of the oldest Clovis artifacts found in North America. Clark has also conducted archeological surveys and excavations around Canada's Great Bear Lake and in the central Yukon Territory. He is probably best known for his 1963 recognition and excavation of the early Ocean Bay complex on Kodiak Island and his subsequent excavations and analysis of archeological remains attributable to Kachemak, Koniag and historic Russian traditions. Clark was honored with the Professional Achievement Award of the Alaska Anthropological Association in 1997. He is a research scientist at the Canadian Museum of Civilization.

Don Clark on horse back near Carmacks, south central Yukon Territory, Canada, 1990 (Photo by Ruth Gotthardt courtesy of Donald W. Clark).

Henry Bascom Collins
1899 – 1987

When Henry Collins made his first trip to Alaska in 1927 with Aleš Hrdlička and T. Dale Stewart, he became fascinated with questions regarding the antiquity and origins of Eskimo culture. He returned to Alaska in 1928 and began excavations on Punuk Island and at the eastern end of St. Lawrence Island. In 1929 he excavated on St. Lawrence and surveyed the Alaska mainland. His first monograph, published in 1929, employed typology and art styles to lay the foundation for Eskimo archeology in the Bering and Chukchi Sea regions. This pioneering research outlined a chronology of cultural development that has remained fundamentally unchanged since then. He continued excavations on St. Lawrence Island in 1929 and 1930 and resumed his Alaskan field research again in 1936. He was the first to recognize that successive beach ridges provided a means of relative dating of the archeological sites in the Bering Sea region. His insights had an important impact on his young protégé, James A. Ford, who like his mentor worked both in Alaska and the southeastern United States. In 1936 Collins was awarded the gold medal of the Royal Academy of Sciences and Letters of Denmark for his research interpretations regarding the origins of Eskimo culture, and in 1984 he received the award "For Outstanding Contributions to American Archaeology" from the Society for American Archaeology. He was widely respected among his colleagues for his academic objectivity, scholarly rigor, and illuminating interpretations.

Born in Alabama, Henry Collins was educated at Millsaps College (B.A. 1922) and immediately began archeological field research in the American Southwest and South. He joined the Division of Ethnology, U.S. National Museum in 1924 and received his M.A. from George Washington University in 1925. He was awarded an honorary Doctorate of Science degree from Millsaps College in 1940. Throughout his career he provided extensive service to the profession. He was a co-founder of the Arctic Institute of North America, chairing its Board of Governors in 1948. He served two terms (1942 & 1952) as vice-president of the Society for American Archaeology, and was extensively involved in the International Congress of Anthropological and Ethnological Sciences. He was acting director of the Bureau of American Ethnology (1963 – 1965).

Henry B. Collins putting grass into his Native boots, or "muk-luks," Nunivak Island, Alaska, 1927 (National Anthropological Archives, Smithsonian Institution).

William Healey Dall
1845 – 1927

William Dall was born in Boston, Massachusetts. His father was a Unitarian missionary and his mother was an early activist for women's rights. As a boy Dall began collecting shells and other natural history specimens. When he was a teenager his father introduced him to Louis Agassiz, who mentored Dall in the study of natural history. Working with Augustus A. Gould, Dall soon became skilled at the identification of mollusks and a student member of the Boston Society of Natural History.

Dall did not receive a formal college education. He became a clerk for the Illinois Central Railroad in Chicago where his interests in natural history drew him to the Chicago Academy of Sciences and he became acquainted with its director, Robert Kennicott. After the first trans-Atlantic cable was broken in 1865, Dall accepted an invitation from Kennicott to serve as naturalist for the Western Union International Telegraph Expedition to Alaska to find an overland telegraph route to Europe. His decision to accompany Kennicott as the expedition's scientific director set him upon a life long scientific career. When Kennicott died suddenly in Alaska the following year (1866), Dall's peers unanimously elected him to lead the expedition. After the installation of the second trans-Atlantic cable was successful, he continued exploring Alaska at his own expense. Between 1868 and 1870 he studied his collections and reported his explorations while based at the Smithsonian Institution. With support from Spencer F. Baird he was appointed acting assistant with the Coast Survey in Alaska and commanded four cruises in Alaska between 1871 and 1880. In 1899 he contributed his extensive knowledge and expertise to the Harriman Alaska Expedition.

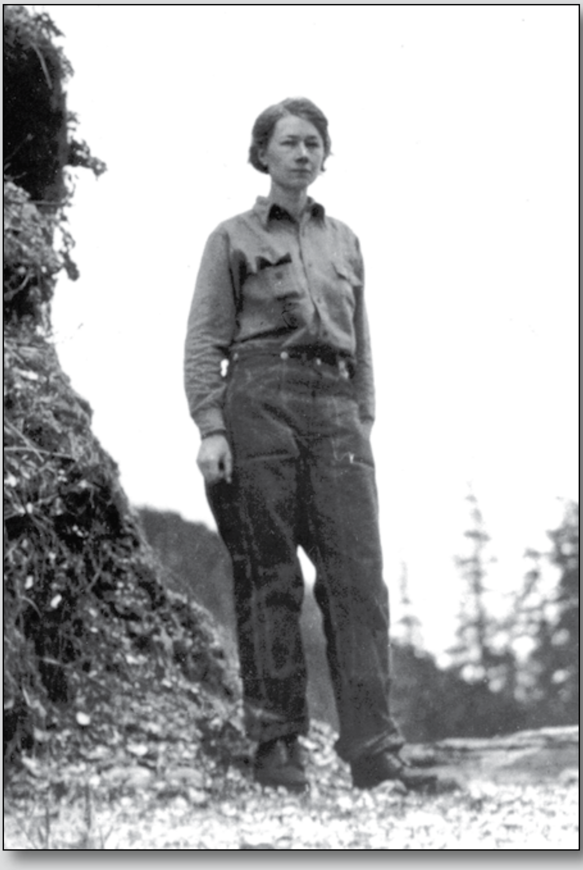
Dall published several works important to Beringian archeology. He was the first scientist to apply the principle of stratigraphic superposition to chronologically order archeological remains in Alaska and perhaps in North America. In 1877 he proposed a three-stage sequence to explain the prehistoric development of Aleut culture. This was the first explicit model for cultural development in Beringia based on field research. Although lacking a formal college education, Dall was awarded an honorary M.A. by Wesleyan University in 1888, Doctor of Science by the University of Pennsylvania in 1904, and a law degree by George Washington University in 1904. Between 1893 and 1927 he was chair of invertebrate paleontology at the Wagner Institute of Science, and from 1899 to 1915 was honorary curator of the Bishop Museum, Hawaii. From 1884 until 1925 he was a paleontologist for the U.S. Geological Survey and concurrently held the position of honorary curator in the National Museum of the United States, beginning in 1880 until his death in 1927.

William Healey Dall, Chief of Marine Department Scientific Corps, Western Union Telegraph Expedition (Photo by Bradley and Rulofson, San Francisco, July 9, 1865).

Frederica Annis Lopez de Leo de Laguna
1906 – 2003

Known to her many friends and colleagues as "Freddy," de Laguna began her career in northern archeology as an assistant to Danish archeologist Therkel Mathiassen in 1929. Her Alaskan field research began with field work in Cook Inlet and Prince William Sound between 1930 and 1933, followed by a reconnaissance of the middle and lower Yukon in 1935. Between 1949 and 1958 she turned her attention to archaeological and ethnographic field work in Southeast Alaska where she focused on the development of Northern Tlingit culture using archeological, historical and ethnographic records. She conducted field research in and around the villages of Angoon and Yakutat. Later she focused on ethnographic work with Athapaskan peoples in interior Alaska during the 1960s.

De Laguna's parents were philosophy professors at Bryn Mawr College, Pennsylvania, where she received her A.B. degree in 1927. She studied anthropology and archeology in France and England in 1928 – 1929 before earning her Ph.D. from Columbia University in 1933. After work at the University of Pennsylvania Museum and the Soil Conservation Service, she joined the Bryn Mawr faculty in 1938. In addition to her many scholarly publications, de Laguna wrote verse and several popular books. Notable among her extensive professional awards and professional service are President of the American Anthropological Association (1965 – 1966) and distinguished Service Award recipient (1986); Vice-President of the Society of American Archaeology (SAA) (1949 – 1950) and recipient of the SAA Fiftieth Anniversary Award (1996); Charter member and President (1948–1949, 1964–1966) Society of the Sigma Xi (Bryn Mawr Chapter); first recipient of the Alaskan Anthropological Association career achievement award (1993); and the Silver Trowel Award for Significant Contribution to the Archaeology of Kachemak Bay, Homer (Alaska) Society of Natural History (1993).



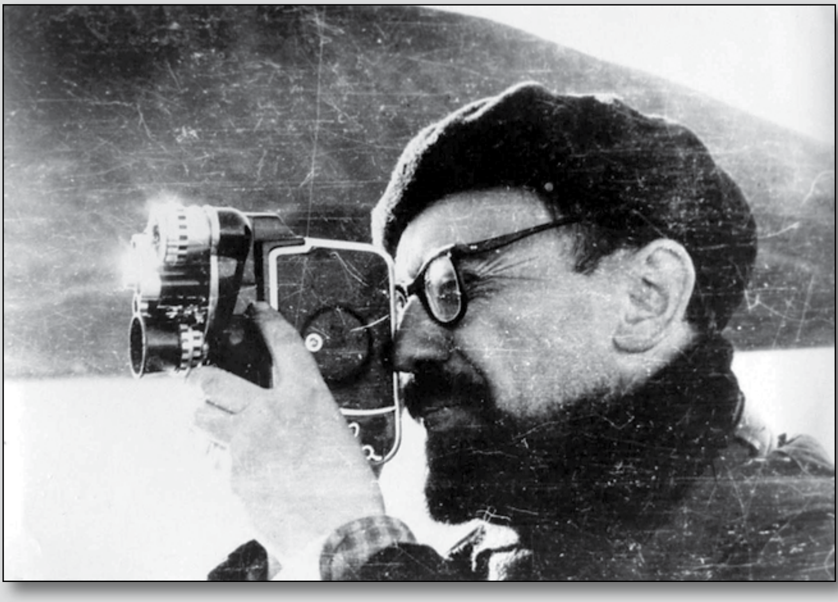
Frederica de Laguna at Palugvik, Prince William Sound, Alaska 1933 (Photo by Kaj Birket-Smith courtesy of Frederica de Laguna).

Nikolai Nikolayevich Dikov
1925 – 1996

Nikolai Dikov began research in the Russian Far East in 1955 and soon became one of Beringia's most prolific archeologists. He popularized the archeology of Northeast Russia. An energetic field researcher, writer and teacher he authored almost 200 publications and papers and mentored many students. Beginning in 1962, Dikov collaborated closely with his wife, archeologist Tamara Mitrofanovna Dikova, until her death in 1981.

He excavated at the Uelen cemetery, and conducted surveys and discovered hundreds of sites along costal areas of Chukotka and several of Chukotka's great rivers including the Anadyr, Amguema, Main, and Vankarem. At the Ust'-Belaya cemetery and other sites along the Anadyr River, he defined Neolithic Ust'-Belaya Culture. In 1961 he led an expedition along the Kamchatka River and began test excavations at Ushki Lake in the Kamchata River valley. His excavations at Ushki Lake enabled him to accurately date a spectacular archeological sequence beginning in the Paleolithic about 13,000 years ago and continuing until historic times. In 1963 he resumed research in Chukotka. In 1964 searched for early sites on Bering Island, where he concluded that the Commander and Aleutian Islands had not been used as stepping stones to the Americas by ancient people. In 1965 he conducted large-scale excavations at the Chini cemetery, followed by research on petroglyphs near Chukotka's northern coast in 1967 and excavation of several sites containing pebble tools in the Kolyma region between 1972 and 1975. He discovered the Chyortov Ovrag (Devil's Log) site on Wrangel Island in 1975. Between 1979 and 1986 he investigated many sites on the Chukchi Peninsula and drew comparisons to similar sites in Alaska.

Dikov was born March 17, 1925, in the town of Sumi, in the Ukraine. His parents died at an early age and he was sent to to live with his aunt in Lenengrad where he graduated from Leningrad State University in1949. Under the supervision of A. P. Okladnikov, he excavated burial grounds in the Trans-Baikal region. In 1953 he completed his dissertation on the Bronze Age that was published in 1958. In 1960 he became Chairman of the Laboratory of History, Archaeology, and Ethnography at the Northeastern Interdisciplinary Research Institute of the Northeastern Branch of the Academy of Sciences in Magadan, a position that he held for the next 35 years. In 1979 he was elected Corresponding Member of the USSR Academy of Sciences.



Nikolai Nikolayevich Dikov filming in the Russian Far East, circa 1960s (Photo courtesy Northern Interdisciplinary Research Institute, Russian Academy of Sciences).

Tamara Mitrofanovna Dikova
1933 – 1981

Tamara Dikova's passion for archeology led to her becoming an important researcher in the archeology of Siberia. For many years, she conducted field research with her husband Nicoli Dikov in Chukotka (Chini Cemetery), Kamchatka (Ushki), and the Kolyma River drainage (Siberdik, Kongo). In 1968 she graduated from the Department of History at Leningrad State University and took part in expeditions to Lake Baikal and the Yenisey River in Siberia. She was a catalyst in the formation of a productive group of archaeologists in Magadan, where she mentored students, analyzed collections, and served as an archeological instructor at Magadan State Pedagogic Institute.

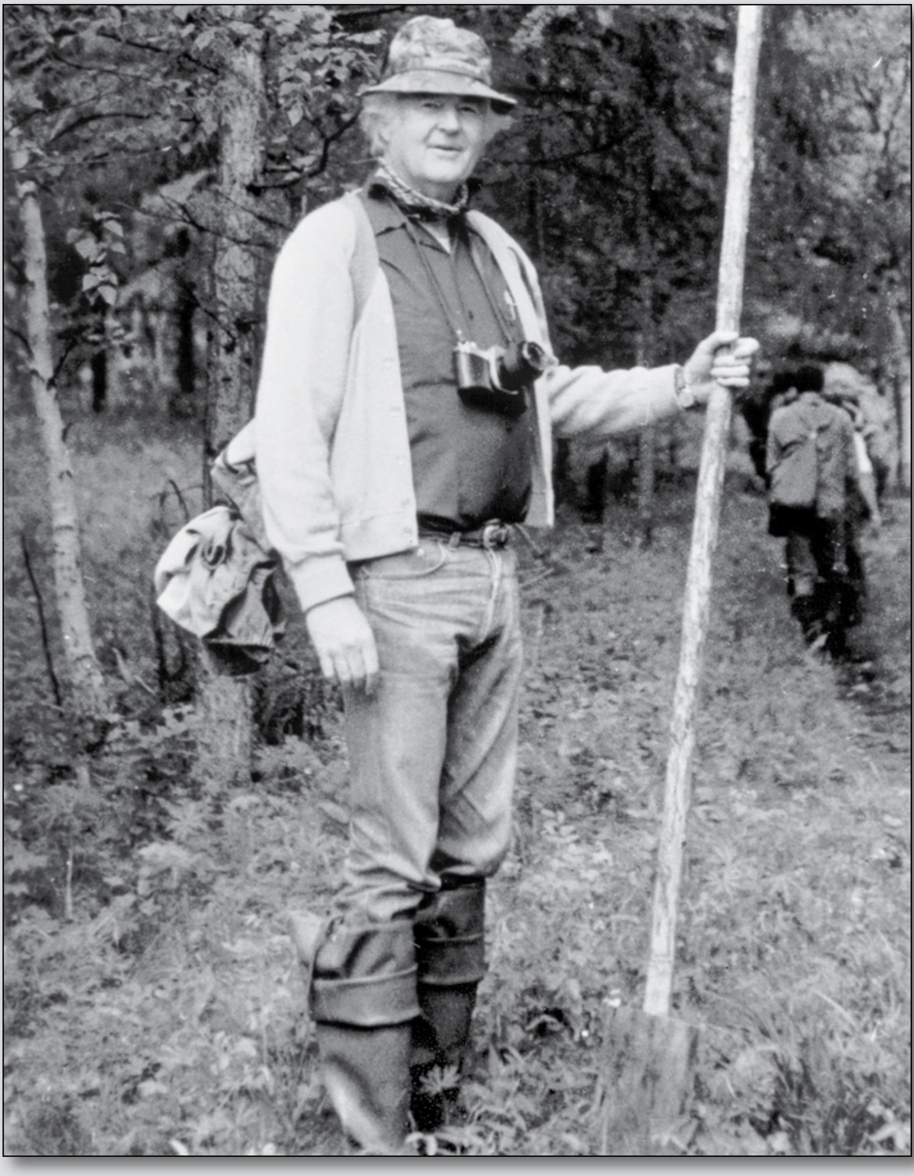
In 1972, she began work in Southern Kamchatka, focusing on defining cultural development on the Kamchatka Peninsula, the use of labrets, the origins of the Neolithic (Tarya Culture), and the Ainu occupation. She led expeditions in unpopulated areas where there were no roads, and excavated dozens of sites in the difficult environment and terrain of Southern Kamchatka. Tamara Dikova summarized her research in her Ph.D. Dissertation, but it was never presented to the examining board because of her untimely death. It was later edited by N.N.Dikov and published as the book, South Kamchatka Archaeology in Association with the Problem of the Peopling of the Ainu (1983).

Tamara M. Dikova (Photo courtesy Sergei Slobodin and Alexaner Lebedentsev).

Don Edward Dumond
b. 1929

Although his early graduate training was in Mexico, Don Dumond shifted gears and began his research on the Alaska Peninsula when he was still a graduate student at the Univeristy of Oregon in 1960. He has published many reports on the archeology of this culturally complex and important region of Alaska. His first major summary of Eskimo-Aleut prehistory was a pioneering effort to associate archeology and linguistics, which he later reexamined, adding evidence from physical anthropology. With James VanStone, he described the results of excavation of Paugvik, a 19th century Alaskan village, and the social and economic context of the early Russian fur trade in Alaska. He excavated a 9,000 year old site on Hog Island in the eastern Aleutian Islands. With colleague Rick Knecht, he documented a broad overview of the cultural chronology of the Aleutian Islands. He is widely recognized for his ability to synthesize complex archeological data over large geographic areas and through vast periods of time including the archeology of Alaska and the colonization and cultural development of the North American Arctic.

Dumond was born in Texas and educated at the University of New Mexico (B.A. 1949), Mexico City College (M.A. 1957), University of Oregon (Ph.D. 1962). He joined the faculty at the University of Oregon that same year and later served as head of the Department of Anthropology (1972 – 1979). He was Director of the Oregon State Museum of Anthropology, housed at the University of Oregon Museum of Natural History (1977–1996). He is professor emeritus of anthropology at the University of Oregon.



Don E. Dumond in the eastern Sayan Mountains of southern Siberia conducting field research among the Tofalar, 1991 (Photo courtesy Don E. Dumond).

James Alfred Ford
1911 – 1968

James Ford began his Alaska work when he was 19 years old as a field assistant to Henry Collins at Gambell on St. Lawrence Island in 1930. This experience made a profound impression on the young scholar and his subsequent explanation of archeological seriation. Between 1930 and 1936 he worked in Alaska, primarily at Point Barrow and adjacent areas. He collected ethnographic information and conducted archeological investigations at Birnirk, Nuvuk, Utkiavik, and other sites. His Alaskan research culminated with the publication of *Eskimo Prehistory in the Vicinity of Point Barrow, Alaska* (1959), a classic work in which he defined Birnirk culture and its relationship to Western Thule. He served as a curator at the American Museum of Natural History in New York between 1946 and 1964 and the Florida State Museum from 1964 until his death. The insights derived from his Alaskan work had an important influence on American archeology that reached far beyond Alaska.

He was educated at Louisiana State University (B.A. 1936), University of Michigan (1937 – 1938), and Columbia University (Ph.D. 1946). During World War II (1942 – 1945) he helped design equipment and clothing for arctic conditions and supervised field tests in Alaska. He was President of the Society for American Archaeology in 1963 – 1964.

James A. Ford excavating on St. Lawrence Island, Alaska, 1930 (Photo detail courtesy Anthropological Archives, National Museum of Natural History and Betty Meggers).

Otto William Geist
1888 – 1963

Otto Geist was born in Bavaria, the son of a school superintendent and amateur archeologist. As a boy he collected Roman artifacts. In 1923 he came to Alaska where he met naturalist Olaus Murie from whom he learned taxidermy and developed a passion for natural history. Geist led the first "Bunnell-Geist" expedition in 1926 and collected vast amounts of archeological and ethnographic material in the Bering Sea region. These collections provided the foundation for the University of Alaska Museum. Between 1926 and 1935, Geist excavated every summer on St. Lawrence Island and the Punuk Islands. He also spent several winters on St. Lawrence Island. He was the first non-Yupik person to become a member of a whaling crew. He accumulated large archeological collections from the Kukulik mound and other sites that were described and published with Froelich Rainey in 1936. According to anthropologist Ivar Skarland, his colleague at the University of Alaska, Geist was the first to recognize western Thule culture in Alaska. After 1935 Geist collected within the broader context of natural history. Under his supervision significant archeological material was recovered from the Pleistocene "muck" deposits near Fairbanks and other regions of Alaska. Geist lacked formal academic training and was probably the last of the old style naturalists who conducted primary field research in many disciplines. He received an honorary Doctor of Science degree from the University of Alaska in 1957. He left his estate to the University of Alaska Museum and established the Geist Fund that continues to support Alaskan archeology and paleontology.

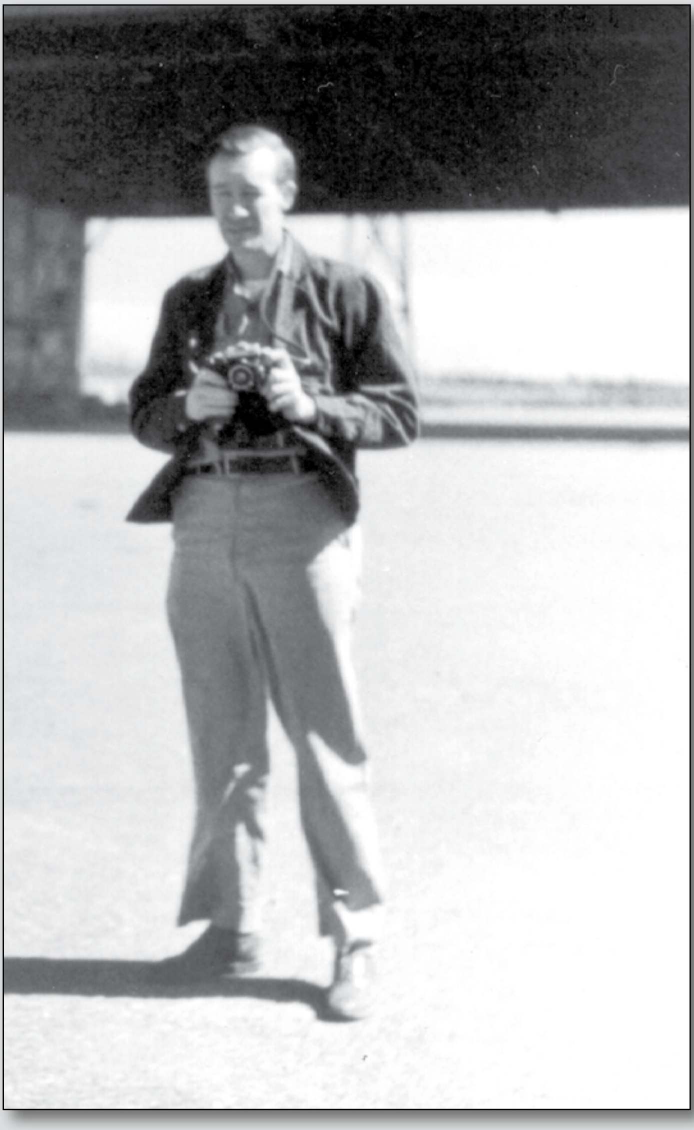
Otto Geist examining a mountain of bones from his Kukulik Mound excavations, St. Lawrence Island, Alaska 1935 (From Agvook White Eskimo, courtesy of Charles J. Keim).

James Louis Giddings, Jr.
1909 – 1964

Courageous and self reliant, Louis Giddings sometimes traveled alone in the Alaskan bush with few supplies and only a .22 caliber rifle. Henry Collins called Giddings the "Prince of Serendip" because of his uncanny ability to discover important sites. He was a prolific author and promptly reported the results of his discoveries, excavations and analysis. Giddings became interested in archeology through tree ring dating which he applied to the wood found in the frozen "muck" deposits overlying gold bearing gravels in interior Alaska. In 1939 he was invited by Froelich Rainey and Helge Larsen to participate in archeological excavations at Pt. Hope, where he was the first to recognize that the depressions in the ground were house ruins, later attributed to the Ipiutak culture. Later that same season he discovered and excavated the first Okvik house on St. Lawrence Island.

Giddings became deeply committed to a career in archeology and soon became Alaska's most productive and energetic archeologist. His spectacular accomplishments included the first dating of western Thule culture using dendrochronology from five sites he excavated along the Kobuk River; the application of Collin's beach ridge chronology to the massive 114 beach ridges at Cape Krusenstern and the Choris Peninsula; the definition of the Norton tradition and the Denbigh Flint complex; and the recognition of the key site at Onion Portage on the Kobuk River. Throughout his career he worked closely with Native people and shared a deep respect for their way of life. Although his research was largely confined to an area within 200 miles of Kotzebue, he defined the cultural chronology of Northwest Alaska and its relationship to the larger world of Arctic archeology.

Giddings was born in Caldwell, Texas. He attended Rice University for three years and summer school at the University of Colorado before moving to Alaska, where he received his B.S. from the University of Alaska in 1931. He was appointed as an instructor at the University of Alaska in 1938 following publication of his first two articles in the Tree-Ring Bulletin. He studied under Froelich Rainey and received his Ph.D. from the University of Pennsylvania in 1952. He joined the faculty at Brown University where he served until his untimely death in 1964.



Louis Giddings on the airfield at Galena, Alaska, 1949 (Photo courtesy of Charles Lucier and James VanStone).

Thomas D. Hamilton
b. 1936

Tom Hamilton is a geologist who began his Alaskan career as a field assistant to Otto Geist in 1960. He got his first exposure to Alaskan archeology when Geist ordered him (as a young student with no archeological training and no help) to excavate a large archeological site on the Meade River. He has made important contributions to Alaskan archeology by providing valuable geological support, environmental interpretations, and dating for several significant Alaskan sites. With archeologists Douglas Anderson and Helge Larsen, he defined the geologic relationship of the Akmak assemblage to the other cultural occupations at the Onion Portage site in northwestern Alaska. Hamilton also provided geological expertise and support to archeological excavations at Healy Lake in Alaska's interior. Along with colleagues Roger Powers and Robert Thorson, he defined the stratigraphy, age, and paleoenvironmental context of the Dry Creek site in the Nenana River Valley. He was instrumental in dating and interpreting the geological setting of Ground Hog Bay 2, which was the first dated early Holocene microblade site discovered in southeast Alaska. He has helped to date and interpret most of the early archeological finds from several regions of Alaska and has synthesized Alaska's early archeological chronology and paleoecology.

Tom Hamilton was born in White Plains, New York, and educated at the University of Idaho (B.S. 1960) and the University of Wisconsin (M.S. 1963, Ph.D. 1966). He served on the faculty in the Department of Geology at the University of Alaska Fairbanks from 1966 until 1974 when he joined the Branch of Alaskan Geology of the United States Geological Survey from which he retired in 1994. He served as a geological consultant for the Trans-Alaskan Pipeline (1969 – 1974). His specialties include Alaskan Quaternary geology and stratigraphy, glacial and periglacial geology, environmental geology, and geoarcheology. He is an emeritus researcher with the U.S. Geological Survey in Alaska.

Thomas D. Hamilton examining a mammoth tusk in the field. (Photo courtesy of Thomas Hamilton.)

Charles Edgar Holmes
b. 1942

Charles Holmes was born in Georgia and grew up in Florida. He served in the US Army Security Agency prior to moving to Alaska to study at the University of Alaska in Fairbanks where he completed his B.A. (1970) and M.A. (1974) degrees in anthropology. He continued his graduate education at the University of Calgary (1974-75) and transferred to Washington State University where he completed his Ph.D. (1984). His dissertation focused on the archeology of the Lake Minchumina region in interior Alaska and was published in 1986. During the 1970s and early 1980s, Holmes worked as an archaeologist for the Bureau of Land Management and the Bureau of Indian Affairs. Later he served 20 years as supervisory archaeologist at the Alaska Office of History and Archaeology before retiring in 2004. He was an adjunct and affiliate faculty member at the University of Alaska Anchorage, and remains active as a cultural resource consultant and affiliate research professor of anthropology at the University of Alaska Fairbanks.

His 40 years experience in Alaskan archeology includes work in all regions of Alaska, but his primary interests are early Beringian archeology, lithic technology, boreal forest adaptation, and the Athapaskan archeology in the Tanana River Valley. He has a reputation for his uncanny ability to discover some of the earliest and most significant sites in Eastern Beringia, including Dry Creek, Broken Mammoth, Mead, and Gerstle River. His long-term commitment to the excavation and interpretation of the Swan Point site has helped define the East Beringian tradition in central Alaska and clarify questions concerning the later Northern Archaic tradition. His work at Swan Point was the first unequivocal evidence to firmly demonstrate the strong technological connection between 14,000 year-old sites in central interior Alaska and Western Beringian sites in Siberia.

C. E. Holmes screening sediment in the Shaw Creek Flats near the Swan Point Site, Alaska, 2007 (photo courtesy of C.E. Holmes).

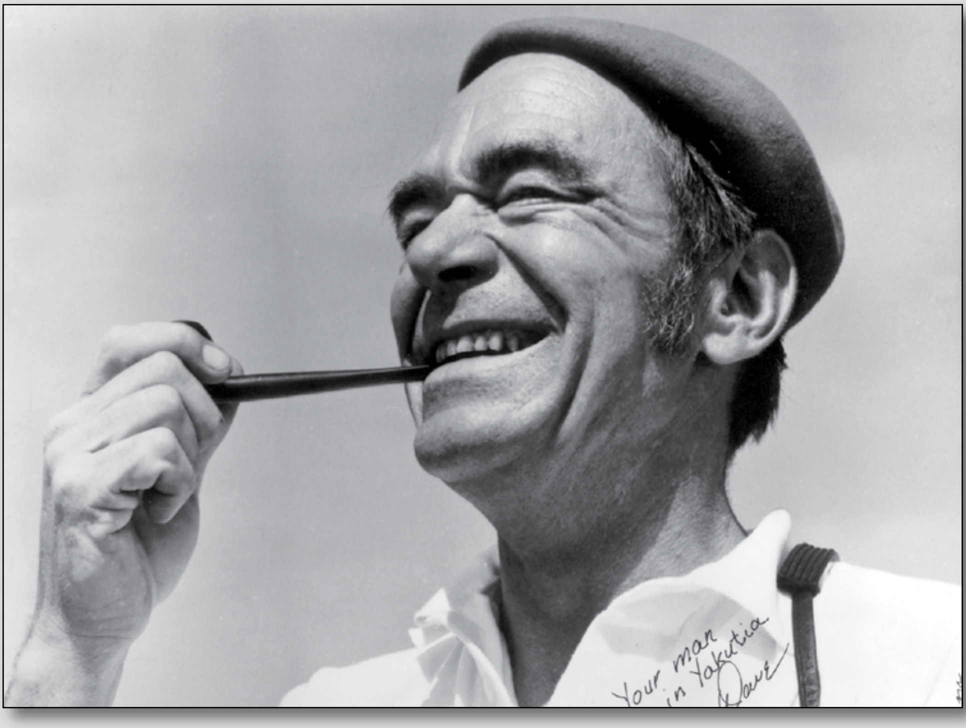
David Moody Hopkins
1921 – 2001

David Hopkins was the world's foremost expert on the Bering Land Bridge and authored more than 200 papers and publications on its geology and related topics. Born in Greenfield, New Hampshire, he was mentored by his mother to develop a deep curiosity about nature. At an early age he spent hours in the woods and fields exploring and discovering the wonders of the natural environment. As a boy he developed a passion for trains and in later life collected railroad memorabilia.

Hopkins was admitted to Harvard University after completing his B.S. at the University of New Hampshire in 1942. He postponed graduate work to avoid conscription during World War II by accepting a position with the U.S. Geological Survey. He was sent to Alaska as a field assistant. Hopkins served as a weatherman at Cold Bay in the eastern Aleutian Islands during World War II. Discharged in 1946, he resumed graduate school at Harvard where he was a student of the famous Quaternary geologist Kirk Bryant. Bryant brought out Hopkins' innate open mindedness and instilled in him a passion for interdisciplinary science. In 1955 Hopkins received one of the first Ph.D. degrees in Quaternary Geology awarded by Harvard University.

He worked closely with Alaskan archeologists beginning with test excavations at Trail Creek Caves in 1948 and stratigraphic interpretation of the Denbigh Flint Complex with Louis Giddings in 1950. He was best known as organizer and editor of two important books, The Bering Land Bridge in 1967 and the Paleoecology of Beringia in 1982. As a political activist with a dislike for cold war politics, he pioneered scientific exchange by bringing Beringian scientists together in a spirit of mutual cooperation and understanding for the first time in 1973 in Khabarovsk, USSR. He made many trips to Siberia where he conducted fieldwork.

Following retirement from the USGS in 1984, Hopkins joined the faculty at the University of Alaska in Fairbanks as Director of the Alaska Quaternary Center (1985– 1990). Internationally recognized as a leading Quaternary scholar he received the Kirk Bryan Award in 1968, the Fryxell Award in 1988, Geological Society of America Career Award in 1990, and the Quaternary Geology Career Award in 1995. His life and career are documented in the book *Last Giant of Beringia: The Mystery of the Bering Land Bridge* by Dan O'Neill.



Dave Hopkins in Yakutia, 1968 (Photo Courtesy of David M. Hopkins).

Aleš Ferdinand Hrdlička
1869 – 1943

Alois (Aleš) Hrdlička was born in Humpolec, Bohemia (Czechoslovakia), and immigrated to New York City in 1882. He graduated first in his class from both Eclectic Medical College in 1892 and Homeopathic Medical College in 1892. In 1903 he was appointed assistant curator in charge of the new Division of Physical Anthropology, United States National Museum, where he served until his retirement in 1942. In 1926 and 1929 he conducted archeological surveys in Alaska along the Yukon River and the Bering and Chukchi Sea coasts. In 1930 he undertook an archeological reconnaissance of portions of the Kuskokwim and Stony Rivers, and in 1931 surveyed areas around Bristol Bay, Lake Iliamna, and along the Nushagak, Molchatna, Wood, and Kvichak Rivers.

Between 1931 and 1938 his research focused on the Gulf of Alaska and the Aleutian Islands. His excavations at Uyak Bay on Kodiak Island began in 1931 and continued along with surveys of adjacent regions until 1936 when he turned his attention to the Aleutian Islands. He excavated caves near Dutch Harbor and on Kagamil Island in 1936, and in 1937 – 1938 surveyed the Aleutian and Commander Islands. As a physical anthropologist he concentrated on the analysis and interpretation of human remains. Based on his research he defended forcefully his interpretation that humans had inhabited the Americas no longer than about 4,000 years.

Aleš Hrdlička during his survey along the Yukon River (Photo taken at "Jack's Camp," between Holy Cross and Paimute, Alaska, 1929 (National Anthropological Archives, Smithsonian Institution).

William Nathaniel Irving
1927 – 1987

William "Bill" Irving was born in Toronto, Canada, and grew up in Alaska. Irving's father, Laurence Irving, was an Arctic biologist and faculty member at the University of Alaska (the Irving Building on the University of Alaska Fairbanks campus is named in his honor). Bill was introduced to Alaskan archeology as a field assistant to Frederica de Laguna in 1949. His father's friendship with the Inupiat people of Anaktuvuk Pass inspired him to initiate independent field research in the Brooks Range in 1950 – 51. He published a description of archeology in the Brooks Range in 1951 before he received his Bachelors degree from University of Alaska in 1952. In subsequent years his Brooks Range research continued to expand knowledge of the archeology of northwest Alaska. He recognized and described burins among the artifacts from the Campus site and conducted a survey of the Susitna River. His work in northern Alaska culminated with his excavations at Punyik Point and his definition of the Arctic Small Tool tradition describing a series of related coastal and interior sites extending across the North American Arctic.

He attended Harvard University from 1953 until 1957 before transferring to the University of Wisconsin (Ph.D. 1964). During his graduate studies, Irving carried out field work in Alaska, Canada's Keewatin, South Dakota and in Mexico's Yucatan. His later career focused primarily on the very early archeology and paleoecology of Eastern Beringia in the Old Crow Basin in Canada's Yukon Territory. He and his colleagues reported a bone flesher, other artifacts and the fractured bones of extinct mammals that Irving believed may have documented human presence in the Americas as early as 150,000 years ago. This work served as a catalyst stimulating extensive interdisciplinary research throughout Eastern Beringia. In 1964 he joined the National Museum of Man in Ottawa. In 1969 he left the Museum to join the faculty at the University of Toronto where he served until his death.

Left to right: Truman Cleveland, Herbert Custer, William Irving, and Nelson Greist, northwest Alaska, circa 1968 (Photo courtesy of Thomas D. Hamilton).

Diamond Jenness
1886 – 1969

Diamond Jenness was Canada's most distinguished anthropologist. Born in Wellington, New Zealand, Jenness began field research in 1911 – 12 in New Guinea where he contracted yellow fever. While there he received an invitation from Edward Sapir to join the Stefansson Arctic Expedition. In 1913 he sailed north until the expedition ships became trapped in the arctic ice. One vessel, the Karluk, drifted westward and was crushed near Wrangel Island. During the next three years Jenness hunted, fished, trapped, and traveled with the Inupiaq and Inuit people with whom he lived.

He conducted the first archeological survey along the arctic coast east of Pt. Barrow in 1913. He identified Dorset culture in the eastern Canadian arctic based on his analyses of artifacts collected by Inuit people living near Cape Dorset. Jenness was also the first to identify Old Bering Sea culture on Little Diomede Island in the Bering Sea from artifacts that were discovered 8 feet below the surface of a midden by a Diomede Islander while digging a meat cache. Jenness organized a symposium at the Fifth Pacific Science Congress in 1933 that resulted in the publication, *The American Aborigines; their Origin and Antiquity* (1933). This scholarly synthesis lay the foundation for the role of Beringia in American archeology.

Jenness earned a B.A. in 1908 from Victoria College, University of New Zealand (now Victoria University of Wellington), as well as a B.A. (1911) and M.A. (1916) from Oxford University. His work as a scholar was interrupted by his service in two World Wars. He was an artillery gunner in World War I and during World War II he served as Deputy-Director of Intelligence for the Royal Canadian Air Force and later as Chief of the Inter-Service Topographical Section. A well-rounded anthropologist, Jenness was proficient in linguistics, physical anthropology, ethnology, and archeology. He was widely respected for his strength of character, integrity, intellect, and courage.

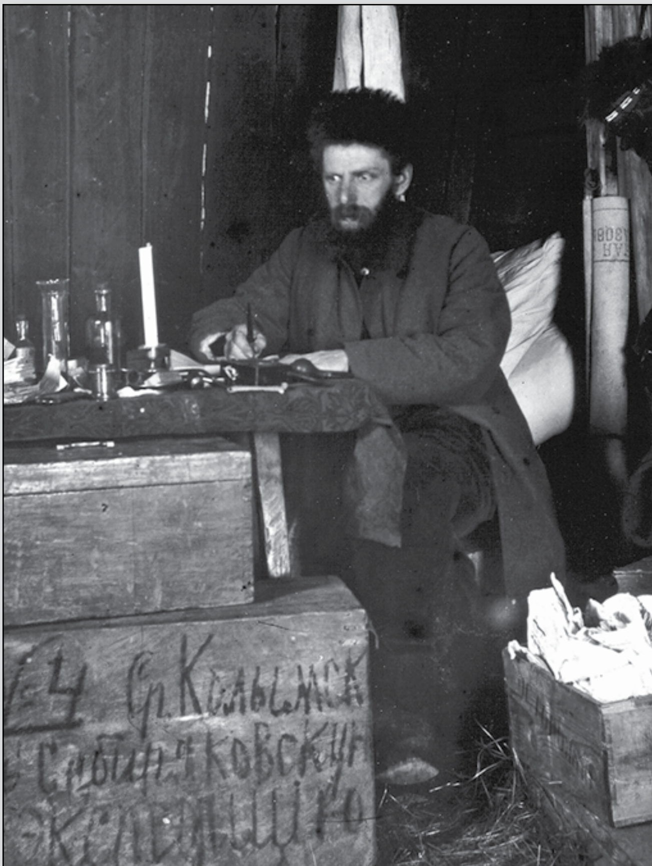
Diamond Jenness (Photo [No. 50806] with permission of the Canadian Museum of Civilization).

Waldemar Jochelson (Vladimir Il'ich Iokhel'son) 1855 – 1937

Waldemar Jochelson was born in Vilna, Russia (now Poland), and was forced to leave his homeland in 1875 because of his revolutionary activities as a college student. He first fled to Germany and then to Switzerland, where he continued his studies and contributed to anti-Russian publications. He returned to Russia in 1884 under an assumed name, was promptly arrested, served three years in solitary confinement in the Petropavlovsk Fortress in St. Petersburg and was subsequently sentenced to exile in East Siberia for another ten years. It was during this period that he became an expert in the ethnology of the native tribes and linguistics of Siberia and began publishing scientific articles. As a result of this work he was invited by the Russian Geographical Society to participate in the 1895 – 1897 Yakut Expedition.

In 1899 he was invited by the American Museum of Natural History to lead the Siberian Division of the Jessup North Pacific Expedition (1900 – 1902), headed by the founder of American Anthropology, Franz Boas. In 1909 – 1911 he led the Aleut-Kamchatka Expedition sponsored by the Russian Geographical Society. From 1912 until 1922 he served as junior ethnographer and curator for the Museum of Anthropology and Ethnography of the Russian Academy of Sciences and the Institute of Oriental Studies in Perograd . His scientific contributions were widely recognized throughout Russia where he received the Russian Geographical Society's silver (1895), gold (1900), and large gold (1914) medals; the gold medal of Moscow University's Society for Anthropology and Ethnography (1912); and the Russian Academy of Sciences Akhmatov prize (1916).

Jochelson immigrated in 1922 to the United States where he was associated with the American Museum of Natural History and the Carnegie Institution. Although he was primarily an ethnographer, he made important contributions to the archeology of Beringia. The results of his excavations in the Aleutian Islands and Kamchatka were published in 1925 and 1928, respectively by the Carnegie Institution of Washington. Jochelson employed sound archeological methods by excavating using natural stratigraphic units and exposing reference sections to guide subsequent excavations. Although he disagreed with the archeological interpretations of William Healy Dall, together their work laid the foundations for Beringian archeology.



Waldemar Jochelson in a Yakut house, circa 1896 (Courtesy of the Department of Library Services, American Museum of Natural History, Neg. No. 11016).

Richard H. Jordan
1946 – 1991

Richard Jordan was the only archeologist of his generation who had field experience in Alaska, Canada and Greenland. Born in Anchorage, Alaska, Jordan spent his early childhood in Seldovia before moving to the Lower 48 states with his parents. He received his B.A. degree from Dartmouth College and returned to Alaska in 1970 to excavate at Healy Lake and participate in the archeological survey of the Trans Alaska Pipeline System (later Alyeska Pipeline). In 1971 – 1972 he was awarded a Marshall Fellowship and studied Arctic archeology with Helge Larsen and Jorgen Meldgaard at the National Museum of Denmark in Copenhagen. In 1972 he began a long and productive association with William W. Fitzhugh at the Smithsonian Institution. During his early career his interest focused on past environments and how they may have influenced Inuit culture. He worked primarily in the eastern Arctic concentrating on "Neo-Eskimo" culture and the effects of European contact on Inuit culture (Jordan 1978).

While conducting field work with William Fitzhugh, Jordan completed his Ph.D. at the University of Minnesota (1975). In 1974 He was appointed to the faculty at Bryn Mawr College, Pennsylvania, where he carried on the tradition of Arctic scholarship begun by Frederica de Laguna. As a faculty member at Bryn Mawr he rediscovered Alaskan archeology in 1980 when he began field work on Kodiak Island. According to his friend and colleague William Fitzuhugh, Jordan's Kodiak research soon assumed "Baranov-like proportions" and his work ignited a revitalization of interest in cultural heritage among the people of Kodiak Island. In 1989 he accepted an appointment to head the Anthropology Department at the University of Alaska Fairbanks.

Dick Jordan at the Karluk I site, Karluk Spit, Kodiak Island, Alaska, 1984 (Photo courtesy of Colleen Lazenby).

Margaret (Jacob) Kirsteatter
1915 – 1998

Margaret Jacob was born in Mansfield Village, located in the upper Tanana River region of interior Alaska. Her father, Gus Jacob, died when she was two years old. Her mother, Agnes Sam, moved Margaret and sister back to her home at Healy Lake. Her mother remarried Paddy Healy, who died soon thereafter. As a consequence of these tragic events, Margaret was raised by her grandparents who never spoke English and lived a traditional life style. As a result, she gained an intimate knowledgeable of the Athapaskan language, ecology, subsistence practices, and customs. She did not begin to learn English as her second language until she was a teenager. She was proud of her culture and was a traditional culture bearer until the time of her death.

Beginning in 1946, she and her husband Paul Kirsteatter were the only permanent year-round residents at Healy Lake. The remaining families had moved to villages along the Alaska Highway in order to have access to schools and other amenities. Margaret was appointed "Chief" of Healy Lake by Chief Andrew Isaac and for 25 years kept land claims alive and fought for the recognition of Healy Lake Village.

Mrs. Kirsteatter shared her extensive knowledge of traditional Athapaskan lifeways and subsistence with Dartmouth anthropologist Robert McKennan, making important contributions to his 1959 ethnography "The Upper Tanana Indians" and other publications. Her son, Fred Kirsteatter, collected stone artifacts from various sites around Healy Lake and brought his discoveries to the attention of Robert McKennan who recognized the importance of the Healy Lake region and initiated excavations under the direction of his student, John Cook. Research at Healy Lake led to dating some of the earliest archeological remains from Alaska and sparked additional research throughout the Tanana Valley and other regions. Margaret Kirsteatter was gracious and hospitable to the many researchers and students who worked in the upper Tanana River Valley and freely shared her extensive knowledge of Athapaskan culture with others.

Margaret Kirsteatter near her home at Healy Lake, circa 1980 (Photo courtesy of Fred and Paul Kirsteatter).

Helge Eyvin Larsen
1905 – 1984

Helge Larsen, born in Copenhagen, Denmark, graduated from the University of Copenhagen (B.A.) in 1930. He immediately began working at the National Museum of Denmark where he was introduced to Arctic archeology by Therkel Mathiasen, whom he accompanied to Greenland in 1930. He participated in field surveys and excavations in Greenland throughout the 1930s. His work in Beringia began in 1939 when he traveled to Alaska and conducted excavations of Western Thule sites at Point Hope with his colleagues Froelich Rainey and Louis Giddings. They also discovered and excavated the Ipiutak site at Point Hope. He escaped to the United States prior to the German occupation of Denmark during World War II, and analyzed the Ipiutak artifacts at the American Museum of Natural History in New York.

Following the war he resumed work in Alaska. He was a visiting professor at the University of Alaska (1949 – 1950), where he was awarded an honorary doctorate that year. He continued conducting field work at Platinum in 1948; Pt. Spencer, Deering and Trail Creek in 1949 – 1950; and with Louis Giddings at Cape Krusenstern in 1961. He served as a scientific advisor for the excavations at Onion Portage following Giddings' death in 1964. In 1970 he served on the scientific advisory board to protect archeological sites during the construction of the Trans-Alaska Pipeline.

Larsen's accomplishments were recognized by the Danish Royal Geographical Society which awarded him the *Hans Egede* medal in 1955, and he received the Greenland Society's *Rink* medal in 1980. Larsen devoted his professional life to Arctic archeology and ethnology at the National Museum of Denmark, where he served as head of the Ethnography Department from1963 until 1975. Along with his quick sense of humor, Larsen brought a stimulating international and circumpolar perspective to Beringian archeology.

Helge E. Larsen at Point Hope, Alaska, 1941 (Photo reproduced with permission of the Photographic Archives, American Museum of Natural History, New York, Neg. No. 2A 38090 by Froleich Rainey).

William S. Laughlin
1919 – 2002

William Laughlin developed his enduring scientific interest in Alaskan archeology and physical anthropology as a field assistant to Ales Hrdlička in 1938 during archeological survey and excavations in the Aleutian and Commander Islands and Kodiak Island. Although he worked throughout the Arctic, he is best known for his work in Aleutian-Siberian studies, human biology, population history, biogeography of the Eskimo world, and for pioneering cooperation with Russian colleagues across Bering Strait during the height of the Cold War. He was the catalyst for the symposium and subsequent publication, *The First Americans*. His most significant archeological contributions are his excavations of the core and blade site on the Aleutian Islet of Anangula adjacent to Umnak Island. In addition to his extensive research and publications, he stimulated many students to pursue careers in Alaskan archeology and biological anthropology during his long academic career.

He was educated at Willamette University (B.A. 1941), Haverford College (M.A. 1942), and Harvard University (Ph.D.1949). He was awarded an honorary D. Sc. from Willamette University in 1968. He served on the faculty at the University of Oregon from 1949 until 1955, when he joined the faculty at the University of Wisconsin, where he served as Chairman from 1960 to 1962. In 1969, he left Wisconsin and relocated to the University of Connecticut, where he was professor and Chairman of the Laboratory of Biological Anthropology until 1985. Notable among his extensive professional awards and professional service are his Fulbright Scholarship for study at the University of Copenhagen and the National Museum of Denmark (1956); editor of the American Journal of Physical Anthropology (1958 – 1963); extensive service for the National Academy of Science and the National Science Foundation; and a unique honorary lifetime membership, along with land on which to build a home, awarded by the citizens of the Alaska Native Village of Nikolski.

William S. Laughlin and Russian colleagues on Anangula Island in the Aleutians, 1972. From left to right: A.P. Okladnikov, Vitali Y. Larichev, W. S. Laughlin, and Ruslan Vasilievsky (Photo courtesy of William S. Laughlin).

Hiroaki Okada
1933 – 2004

Hiroaki Okada worked closely with his wife, Atsuko Okada on ethnological and ethno-archeological investigations in Alaska in 1960 and 1962. Along with other colleagues, they conducted extensive field research in Alaska including an archeological survey at the Hot Springs Village site, Port Moller, on the Alaska Peninsula in 1960. He subsequently led excavations at Port Moller for six field seasons between 1972 and 1984. This fieldwork, which included the excavation of several houses, has made an important contribution to the archeology of the Alaska Peninsula. Between 1986 and 1991 Hiroaki led archeological investigation on Heceta Island and adjacent areas in southeast Alaska. At the Chuck Lake site he discovered microblades associated with preserved faunal remains demonstrating the early (about 8,200 years old) evidence for a maritime economy in southeast Alaska.

Hiroaki was born in Japan and educated at the University of Tokyo, receiving a B.A. in American Studies (1955) and an M.A. in Anthropology (1960). He was awarded his Ph.D. from the University of Tokyo in 1966, and became a member of the faculty at Seikei University that same year. Atsuko Okada received her Ph.D. from Meiji University in 1958 and subsequently served as Professor and Dean of International Cultural Relations, Hokkaido Tokai University. Hiroaki was a Fulbright Fellow at the University of Wisconsin, Madison (1964–1966); a Waseda/GLCA Exchange Professor (1971–1972); Fulbright Exchange Research Scholar (1979); and a Visiting Research Scholar at the Boreal Institute for Northern Studies at the University of Alberta, Canada (1986). Prior to his death he was professor emeritus at Hokkai Gakuen University and Director of the Museum of Northern Peoples, Abashiri, Hokkaido, Japan.

Hiroaki Okada (left) and Atsuko Okada leading a private seminar at the Abashiri Museum, Hokkaido, Japan, 1995 (Photo courtesy of Hiroaki and Atsuko Okada).

Alexei Okladnikov
1908 – 1981

Born in a rural village in Irkutsk Oblast, Alexei Okladnikov was the son of a local school teacher. Following the completion of secondary school, he attended Irkutsk Pedagogical Institute from 1926 until 1934. He immediately undertook graduate work at the State Academy of History of Material Culture in Leningrad, where he completed his thesis and graduated in 1938. From 1938 to 1948 he was a senior research fellow at the Institute, completing his doctoral thesis in 1947. He subsequently publised a popular version of it entitled, *History of Yukutia,* in 1955. In 1949 he became director of the Leningrad branch of the Institute of History of Material Culture. He moved to Novosibirsk in central Siberia and helped establish the Siberian branch of the Soviet Academy of Sciences in 1961. From 1966 until his death he served as the chairman of the history department at Novosibirsk State University and director of the Institute of History, Philology and Philosophy. In 1968 he was appointed a full academician to the Academy of Sciences of the Soviet Union.

Throughout his dynamic career he authored or edited over 100 books and hundreds of articles. In 1974 he led a group of Soviet archeologists to the Aleutian Islands under the sponsorship of William Laughlin. This courageous effort was the first time since the Russian Revolution archeologists from Western Beringia had been able to physically participate in Eastern Beringian research. Okladnikov was a bigger-than-life character and a powerful political and economic force in the archeology of Western Beringia during Russia's Soviet era. He pioneered the archeology of the Russian Far East and was a teacher and mentor. He trained many students who established academic departments and research centers throughout Western Beringia.

Alexei Okladnikov on the Amur River 1973.

Wendell H. Oswalt
b. 1927

Wendell Oswalt began his career in Alaskan archeology as a field assistant to J. Louis Giddings in 1947 in the Kotzebue-Kobuk region and participated in the excavations at Cape Denbigh with him in 1948. Based on Giddings' pioneering work, Oswalt attempted to expand tree-ring studies in the region of Hooper Bay and along the Copper and the Susitna Rivers during the summers of 1950 – 1953. In addition to his early contributions to dendrochronology, he and JamesVanStone co-founded, the *Anthropological Papers of the University of Alaska* in 1952. He conducted archeological excavations in the Katmai National Monument in 1954 and in the Bristol Bay-Kuskokwim region in 1960. In 1963 he initiated ethnoarchaeological studies with VanStone at Crow Village and expanded this research at the site of Kolmakovskiy Redoubt in 1966, 1967, and 1969. Oswalt introduced the term "ethnoarchaeology" to Alaskan archeology,

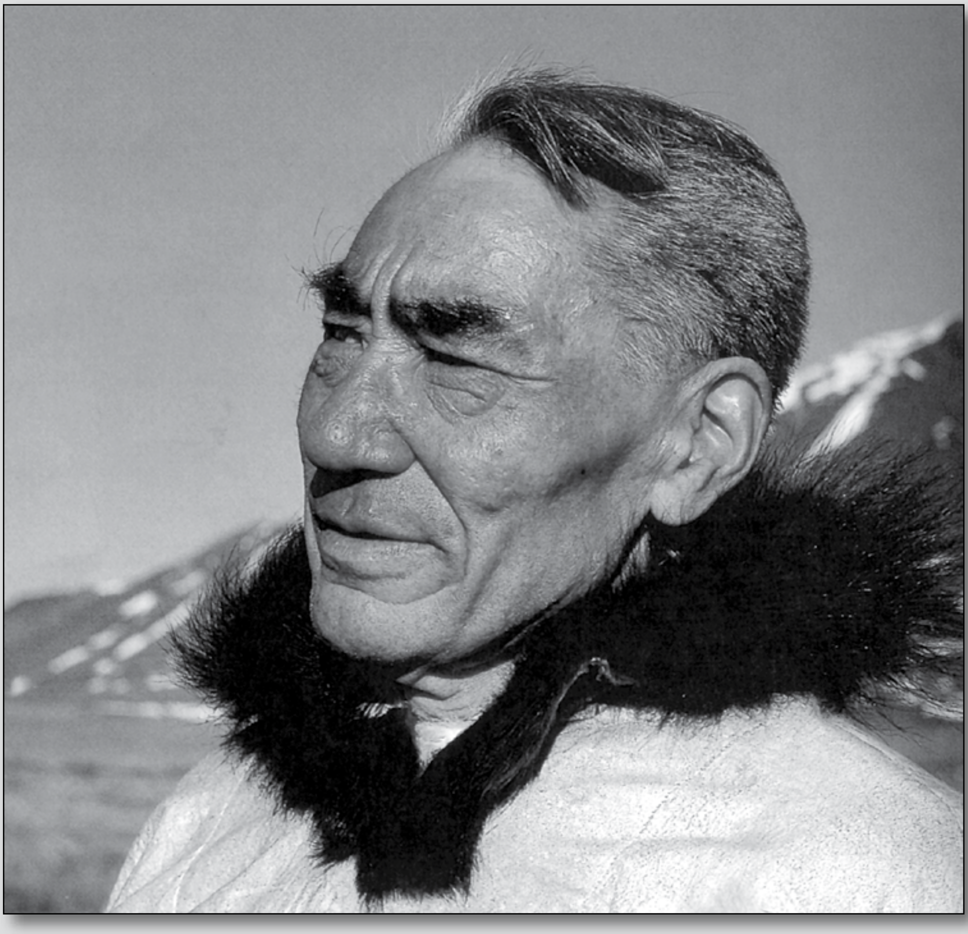
Oswalt was born in Youngstown, Ohio. He received his B.A. from the University of Alaska in 1952 and his Ph.D. from the University of Arizona in 1959. He was a Museum Assistant at the University of Alaska Museum (1948 – 1951) and later was a Research Anthropologist at the University of Alaska Fairbanks (1955 – 1957). In 1958 he joined the faculty at the University of California Los Angeles (UCLA) as an Acting Instructor. He served as visiting Professor at the University of Alaska during the summers of 1960, 1962, and 1964, while serving on the faculty of UCLA (1959 – 1990). He was Chairman of the Department of Anthropology at UCLA from 1973 – 1976 and retired in 1990. He wrote 14 books and six monographs. During his later career he focused on contemporary Eskimo technology and settlement patterns.

Wendell H. Oswalt looking westward toward Greenland from Lands End, Iceland, 1981 (Photo courtesy Helen Oswalt).

Simon Paneak
1900 – 1975

Born near the Killik River in Alaska's Brooks Range, Simon Paneak was raised during a time of turmoil. Traditionally the Nunamuit were inland people who lived primarily by hunting sheep and caribou in the mountains and adjacent coastal plain stretching northward to the Arctic Ocean. Disease and famine in the early 1900s forced them to move near trading posts on the coast for work and supplies. During this time Paneak became fluent in English. With the collapse of the fur trade during the Great Depression, several Nunamuit families returned inland in the 1930s to hunt the caribou that had become more numerous.

Because he was bilingual and willing to share his knowledge, scientists and researchers relied on him for information, expertise, and advice. He compiled knowledge from elders and traditional culture bearers and freely shared it with scientists, including biologist Laurence Irving, and anthropologists Nicholas Gubser, Helge Larsen, Jack Campbell, and others. He made a traditional Nunamuit tent from caribou hide and willow frame, as well as other objects, for the University of Alaska Museum. He coauthored at least three scientific publications and is acknowledged in at least a dozen others. Between 1967 and 1969, Paneak completed a series of drawings and maps depicting Nunamuit life that was published in 1998. Intensely interested in history and ecology, Paneak fully recognized the need to preserve traditional Nunamuit ecological knowledge. He made many contributions to the understanding of archeology, culture history, geology and biology of Northern Alaska.



Simon Paneak near Chandler Lake, Brooks Range, Alaska, 1967 (Photo courtesy of John M. Campbell and University of New Mexico Press).

William Roger Powers
1942 – 2003

Roger Powers was born in Pocatello, Idaho, and raised on a near-by ranch. His initial interests in Great Basin archeology were soon replaced by his passion for Russian archeology under the mentorship of Chester Chard. His fascination with the archeology of Russia led him to translate, synthesize, and interpret the archeological literature of northeastern Siberia. He completed his Ph.D. dissertation at the University of Wisconsin on the archeology of Chukotka, Kamchatka, and Yakutia and this impressive work was subsequently published in *Arctic Anthropology* in 1973. He began his teaching career at the University of Alaska at Fairbanks in 1971 and retired in 2001.

While on the faculty, he conducted excavations on St. Lawrence Island with Hans-George Bandi in 1973. He then engaged in archeological surveys on the Seward Peninsula (1974 – 75), where he survived a near-fatal floatplane crash while landing on a lake. He subsequently began excavations at the Dry Creek Site that had been discovered by Charles Holmes. This excavation along with additional survey in the Nenana River valley by Powers and his students led to new interpretations of the early archeology of Eastern Beringia. As a result of this research, he and his students defined the Nenana complex and suggested that earlier bifacial artifact assemblages lacking microblades may predate the Denali complex. This pioneering work serves as the foundation for continuing research to explaining the relationship of early technological traditions in interior Eastern Beringia.

William Roger Powers at Panguingue Creek in 1989.

Froelich Gladstone Rainey
1907 – 1992

Froelich Rainey was born in Black River Falls, Wisconsin, and raised on a working ranch in eastern Montana, the R-lazy-B (Rainey Brothers Ranch), where he worked as a cowhand. He completed his B.A. degree in English at the University of Chicago in 1929, but wanderlust set in. At age 22, he hopped a freighter to Shanghai, China, and after a battle with pirates in the Strait of Formosa, he jumped ship in the Philippines. From there he returned to the United States and enrolled in graduate studies at Yale University under the mentorship of Cornelius Osgood, an ethnographer who was working with Athapaskan tribes in Alaska. Rainey received his Ph.D. from Yale in 1935.

Rainey became the University of Alaska's first professor of anthropology and began the analysis of the massive archeological collections made by Otto Geist on St. Lawrence Island in 1935. This culminated in their joint publication, *Archaeological Excavations at Kukulik,* the following year. Rainey then began a vigorous stint of field research in interior and coastal Alaska. His article, "Archaeology in Central Alaska," laid the foundation for all subsequent work in the interior of Eastern Beringia. He partnered with Helge Larsen and together they excavated the spectacular Ipiutak site at Point Hope. Rainey's academic career was interrupted during World War II for service on the Board of Economic Warfare and with the State Department between 1942 and 1945. After the war Rainey served as director of the Museum of Anthropology and Archaeology at University of Pennsylvania from 1947 to 1976. While he was a professor at the University of Alaska, Rainey met and worked with an energetic student, Louis Giddings, who later enrolled as a graduate student at the University of Pennsylvania and continued his studies with Rainey.

Froelich Rainey was an eloquent and engaging personality and public figure. He hosted a series television programs between 1950 and 1968, educating and entertaining the public with the curiosities and adventure of anthropology and archeology. Although Rainey conducted research throughout the world, his greatest accomplishments were in Beringia and public education.

Froleich Rainey in uniform during World War II, circa 1944 (University of Pennsylvania, Museum of Anthropology and Archaeology).

Dennis Joe Stanford
b. 1943

Dennis Stanford is best known as curator of Paleoindian Archeology at the National Museum of Natural History, Smithsonian Institution, but he has made significant contributions to Beringian archeology as well. Stanford was introduced to Alaskan archeology in 1966 as a field assistant to Robert Humphrey during an archeological survey in the Utukok River valley in the western Brooks Range. As a graduate student at the University of New Mexico he was urged by Jack Campbell to investigate the controversial questions about the origins of Thule culture by conducting excavations at middens near Point Barrow. After brief investigations at Utkiavik, he began excavations at Walakpa, a site located about 12 miles (19.3 km) south of Barrow. Stanford's excavations at Walakpa revealed more than 20 stratigraphic levels and demonstrated the gradual development of Thule culture from Birnirk. Stanford suggested that this change was caused by climatic change and over- utilization of seals by Birnirk peoples.

Stanford was born in Cherokee, Iowa, and grew up in Colorado, New Mexico and Wyoming. He was educated at the University of Wyoming (B.A. 1965) and the University of New Mexico (M.A. 1967, Ph.D. 1973). He has served as Associate Curator (1972–1978) and Curator (1978–present) at the Smithsonian Institution's National Museum of Natural History, where he was Head of the Division of Archeology (1990 - 1992 and later Chairman of the Department of Anthropology (1993 - 2001). He was visiting professor of Quaternary Science at the University of Alaska Fairbanks in 1989. Along with colleagues Robert Gal and Margret Jodry, he is engaged in field research in northwestern Alaska and in the interpretation of the relationships between early Alaskan archeological sites and those from the more southern areas of the Americas. Stanford has conducted important research in bone taphonomy and the Ice Age paleoecology of North America, and his most significant research contributions have been in Paleoindian archeology and the first peopling of the Americas.

Dennis Stanford with two recently harvested spotted seals, Chukchi Sea coast, 1970 (Photo courtesy of Dennis Stanford).

Tasyan (Sergeyevich) Tein
b. 1938

Tasyan S. Tein was born in Naukan Village in Siberia in 1938. The son of a Yupik hunter, Tein dedicated his life to learning his people's past. He entered Anadir' Pedagogic College in 1959 and graduated in 1964. Following graduation he worked as a teacher and educator at the boarding school in the Russian village of Nunyamo. In 1965 he entered Magadan State Pedagogic Institute, graduating four years later. After getting a teaching diploma in history and social sciences, he was sent to Wrangel Island where he worked until 1971. That year he was invited to Magadan Oblast Local Museum to do research. In 1974 he entered graduate school at the Laboratory of History, Archaeology, and Ethnography, Northeastern Interdisciplinary Research Institute of the USSR Academy of Sciences, under the supervision of N. N. Dikov. His archeological research of the ancient Eskimo culture began in earnest in 1975 as a result of his participation in an expedition to Wrangel Island organized by Dikov, when the research team discovered the Paleoeskimo Devil's Log Site.

While working on his dissertation, "Ancient Eskimo Culture of the Northern Chukotka, Including Wrangel Island," Tein prepared several articles and books on Eskimo archeology and ethnography. Between 1976 and 1986, he conducted field research in Chukotka at the Devil's Log and Rirkapiy sites, as well as on Ratmanov Island. His dissertation was approved in 1991 at the Leningrad Branch of the Institute of Archaeology. He published several books including *Devil's Log Mystery, Eskimo Holidays,* and *This Is How It Was: Essays on the Asian Eskimo Culture.* In 1982 he composed the scripts defining the roles for participants for several ceremonies celebrated in the Russian Yupik village of Uelen, including the Whale Holiday, Day of Hunters Initiation, and Day of the Canoe Launching. In 1988 his expertise was essential in making the arrangements for the successful Soviet-American Eskimo Native Celebration that brought Alaskan Eskimo people from the United States to the Russian village of Uelen for an historic celebration.

Tasyan Tein on Wrangel Island, circa 1980 (Photo courtesy of Sergei Sobodin and Alexander Lebedintsev).

Christy G. Turner II
b. 1933

Christy Turner developed his interest in Alaskan archeology physical anthropology with William S. Laughlin at the University of Wisconsin where he received his Ph.D. in 1967. His Alaskan research has concentrated on the prehistory of the Aleutian Islands where he conducted fieldwork on Umnak and Anangula Islands (1962), on Amchitka Island in (1968), and Akun and Akutan (1970 - 1973). Much of his work has focused on the initial colonization of Alaska based primarily on dental evidence in combination with archeological and linguistic data. His dental research suggests three human migrations to the New World from Asia. At the Chaluka site in the eastern Aleutian Islands he and his wife Jacqueline discovered the oldest known Neo-Aleut skeleton, radiocarbon dated to AD. 780. Their excavations at Chaluka also documented the effects of early Russian and American contact on the Aleut people.

As a physical anthropologist, he has worked extensively throughout the world. He was on the faculty of Arizona State University (ASU) beginning in 1967 and served as assistant and associate Dean of the Graduate College (1972–1977); ASU's Regents' Professor (1992–present); and was appointed Distinguished Research Professor (1984–1985). Turner was honored as a Life Fellow of the Museum of Northern Arizona (1985) and appointed as a visiting scholar (NSF, IREX, and Nat. Acad. Sci.) to the USSR (1979, 1980–1981, and 1987). He served two terms on the Repatriation Review Committee for the Smithsonian Institution. He has trained numerous graduate and undergraduate students in physical anthropology and received the Alaska Anthropological Association's Professional Achievement Award in 2012.

Jacqueline A. Turner (left) and Christy Turner excavating at Chulka, Umnak Island, Alaska 1971 (Photo courtesy of Christy G. Turner II).

James W. VanStone
1925 – 2001

In his humble way, James VanStone worked cooperatively with colleagues and Native People to establish the connections between archeology, ethnography and history in Eastern Beringia. He was educated at Oberlin College (B.A. 1948) and the University of Pennsylvania (Ph.D. 1954). He taught at the University of Alaska Fairbanks for seven years (1951–1958). While on the University of Alaska faculty he ran a trap line for beaver and commuted to campus from his cabin by dog sled. He and Wendell Oswalt founded the Anthropological Papers of the University of Alaska in 1952. In 1993 he was awarded the career achievement award by the Alaska Anthropological Association.

He undertook archaeological and ethnographic field work in a number of areas in Alaska and Canada. His archeological excavations in Kotzebue Sound were followed by community studies at Point Hope (1962) and the village of Snowdrift (Lutsel Ke') on Great Slave Lake (1965). A major focus of VanStone's research was the impact of Russians and Americans on the Yupik Eskimos of southwest Alaska in the 19th and early 20th centuries. This long term project has involved archeology, ethnohistory, and ethnography.

After leaving the University of Alaska, he taught at the University of Toronto (1959–1966) before joining the staff of the Field Museum of Natural History in Chicago in 1966 as Curator of North American Archeology and Ethnology. During the latter part of his career he undertook the challenge of completing the work of Margaret Lantis after her death. VanStone conducted contextual studies of a number of collections in the Field Museum and was responsible for the Museum's permanent exhibit "Maritime Peoples of the Arctic and Northwest Coast" which opened in 1982.

James W. VanStone at a winter trap line camp near Great Slave Lake, Canada, 1961 (Photo courtesy of James W. VanStone).

Ruslan Sergeevich Vasil'ievskii
b. 1933 – 2012

A vigorous field researcher, Ruslan Sergeevich Vasil'ievskii began his professional career in 1957 at the Magadan Museum of Local Studies where he initiated an ambitious program of archeological survey and excavation along the northern rim of the Okhotsk Sea. He was a student of A. P. Okladnikov and graduated from the Leningrad (St. Petersburg) State University, Department of History. He was one of the foremost experts on the adaptation and cultural relationships of the ancient people of the North Pacific, which was the subject of his Ph.D. dissertation. His pioneering research led him to define the stages of development of Koryak culture beginning about 4,000 years ago.

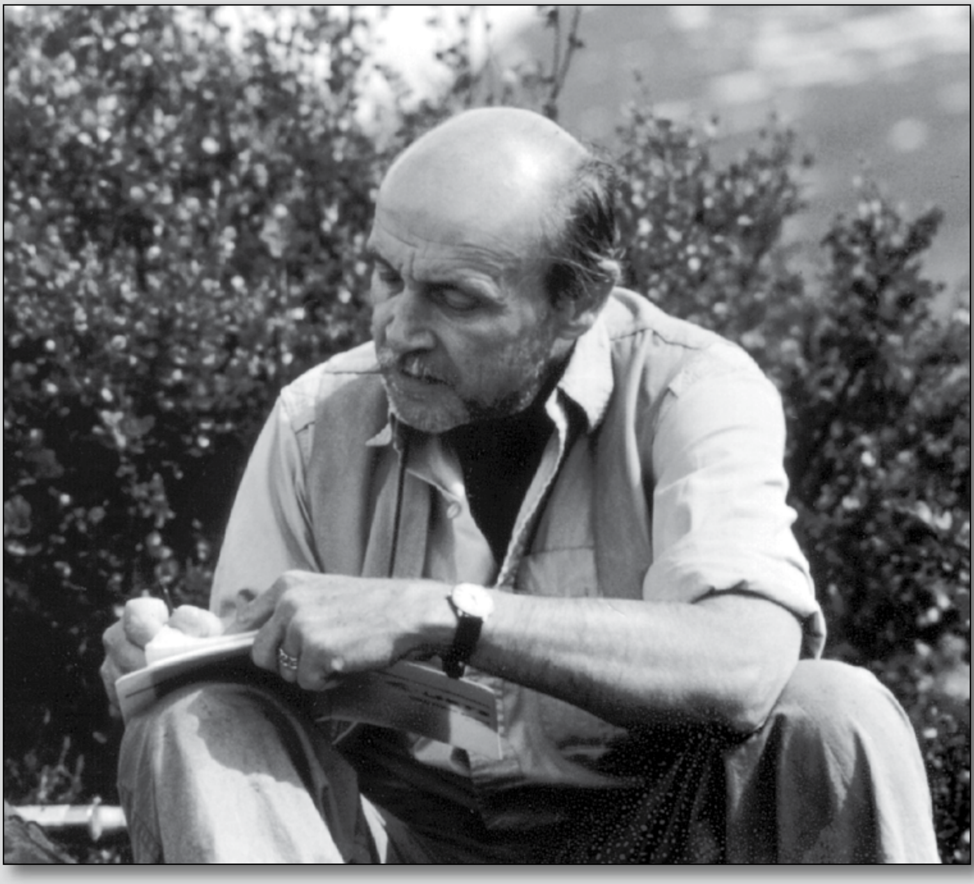
Vasil'ievskii left Magadan in 1964 to work at the Institute of History, Philology and Philosophy in Novosibirsk under the head of his former teacher, Academician A.P. Okladnikov. He was awarded his Doctoral degree in 1975. Along with A.P. Okladnikov, Vasil'ievskii participated in several American-Soviet archaeological expeditions to Alaska and the Aleut Islands. He was a leading researcher at the Institute of Archaeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences in Novosibirsk and published more than 200 scientific articles and books.

Rusian Sergeevich Vasil'ievskii on the shore of the Okhotsk Sea, Yama River, 1959 (Photo courtesy of Igor Vasil'Ievskii and Eugeny Rybin).

Frederick Hadleigh-West
b. 1928

Fred Hadleigh-West was introduced to Alaskan field research in 1954 when he accompanied Ted Bank to the Aleutian Islands as a field assistant. He conducted extensive field research throughout Alaska including his dissertation research in the late 1950s on the cultural ecology of the Netsi Kutchin, followed by archeological surveys and excavations on the western Arctic coast, southeast, and interior Alaska. He is best known for his discoveries and excavations in the northern and southern foothills of the Alaska Range, where analysis and comparison of artifacts from the Donnelly Ridge site led him to describe and define the Denali complex. He later conducted extensive excavations in the vicinity of the Tangle Lakes. His book, *American Beginnings* (1996), provides a significant contribution to comparative analysis and interpretation of Beringian archeology.

Hadleigh-West attended Tulane University and University of Michigan, and received his Ph.D. from Louisiana State University. He joined the faculty at the University of Alaska in 1957 as an instructor of Anthropology and Geography. He served as editor of the *Anthropological Papers of the University of Alaska* and curator of the University Museum's Anthropological collections (1957 – 1965). He inaugurated the Occasional Monograph Series, Studies of Northern Peoples, with its first publication *Kobuk River People* by J. L. Giddings. After leaving Fairbanks, he was Visiting Lecturer, University of Wisconsin-Madison (1965 – 1966) and returned to Alaska to serve as a professor at Alaska Methodist University in Anchorage until 1974. He was appointed Senior Research Scientist at the University of Wisconsin (1974 – 1976) and was on the faculty of Williams College (1977 – 1982). Since 1982 he has held the position of Curator of Archaeology at the Peabody Museum of Salem, Massachusetts, as well as Director of Archaeology, and Editor in Chief of the Review of Archaeology (formerly Quarterly Review of Archaeology).



Frederick Hadleigh West taking field notes, Tangle Lakes (site Mt. Hayes 72), Alaska 1978
(Photo courtesy of Frederick Hadleigh West).

Glossary of Select Archeological and Geological Terms Commonly Used in Beringian Archeology

annealing: The process of repeatedly heating and hammering metal to produce a desired shape.

archeology: Subdiscipline of anthropology involving the study of the human past through material remains.

artifact: Any portable object used, modified, or made by people such as stone tools, pottery, and weapons.

assemblage: Term used by archeologists to describe a group of artifacts occurring together at a particular time and place.

atl atl: The Aztec word adopted by archeologists for spear thrower that utilizes the principle of the lever to increase the distance and force with which a hunter can throw a light weight spear called an atl atl dart.

atl atl dart: Light weight shaft tipped with a projectile point propelled by a spear thrower, or atl atl.

band: A term used by anthropologists to describe small-scale societies that make their living primarily by hunting and gathering and move seasonally to harvest wild food.

Beringia: Geographic area extending from Russia's Verkhoyansk Range in the west to interior Alaska and adjacent areas of Canada that were not covered by continental glaciers during the ice ages in the east. It includes the Bering continental shelf and extends from the Arctic Ocean southward to Kamchatka and the Sea of Okhotsk in Asia and the Strait of Juan de Fuca in North America.

biface: Stone tool that has been flaked (chipped) on both sides, or faces.

boreal forest: The nearly continuous belt of coniferous trees across the North America subarctic overlying formerly glaciated areas and areas of patchy permafrost. In Russia it is called taiga.

burin: Stone tool exhibiting one or more characteristic facets or flakes removed from one or more edges used primarily for engraving and working bone, antler, and ivory.

burin spall: Slender stone flake, frequently triangular or rectangular in cross-section, removed from a burin.

burin spall artifact: Burin spall that has been used as the point, or tip, of an engraving tool.

basalt: Dark-colored fine grained volcanic rock widely used by early people to make stone tools.

carbon 14: Carbon molecule used in radiocarbon dating.

chert: Hard dense cryptocrystalline sedimentary rock that was commonly used to manufacture chipped (flaked) stone tools.

cobble spall scraper: Flake struck from a cobble exhibiting use along one or more edges indicating it was used for scraping softer materials.

complex: Shared way of life and economic system throughout a region that persisted for periods of time. It is similar to the concept of tradition, but more restricted geographically and persists for shorter periods of time. It is interchangeable with the term "phase". Complexes or phases can be part of a tradition, and may be used to subdivide traditions.

core: Stone, bone, or antler artifact used as a blank to make other tools or flakes.

crampon: Cleat that can be strapped or tied to a shoe or boot to provide traction when walking on ice.

dendrochronology: Study of tree-rings patterns that uses annual variations in climate to produce differential growth to date archeological features and measure environmental change.

flake: Piece of stone (or bone) detached from a core by a blow or pressure. A flake generally exhibits a flat area, or platform, at one end from which ripple marks extend indicating the direction in which force was applied to remove the flake from its core.

foreshaft: Short detachable shaft made of wood, bone, antler, or ivory placed between a harpoon head or projectile point and the shaft of a spear, dart, or harpoon.

harpoon: Spear or shaft armed with a barbed or toggling projectile point designed to remain imbedded in an animal when struck.

herb tundra: Dry open tundra comprised of lichen and low growing (5-10 cm, or 2-5 inches) plants.

Holocene: Geologic epoch, or period of time, beginning at the end of the last Ice Age about 12,000 years ago and continuing to the present time.

horizon: An archeological horizon is recognized by unique styles or characteristics (such as a specific art style or way of decorating pottery) that appear and spread rapidly throughout a geographic area.

Ice Age: Although there have been many ice ages during the earth's history, the most recent glacial period, discussed here, occurred during the Pleistocene Epoch and ended about 12,000 years ago.

ice-free corridor: Hypothetical narrow strip of land between the continental glaciers that was once believed to have been used by people to migrate between Eastern Beringia and the southern parts of the Americas prior to 13,000 - 14,000 years ago. Geologists have proven that an ice-free corridor did not exist at that time.

labret: Body adornment made of stone, bone, or ivory worn in a piercing in the cheek or lip.

lanceolate: Tapering from the base toward an apex; lance-shaped.

leaf- shaped: Tapering from a pointed or round base toward an apex.

loess: Wind blown silt which constitutes the primary sedimentary deposits at many archeological sites in Beringia.

kashim: Large house occupied by men where community activities are held.

Mesolithic: An Old World term meaning the middle Stone Age used to describe the period about 12,500 until 7,000 years ago when people made large stone blades, leaf-shaped points or knives, scrapers, and stone adzes. The Mesolithic period is transitional between the Paleolithic and the Neolithic.

microblade: A small (usually less than .5 cm wide) parallel-sided stone flake. Microblades were inset in a line in a slot carved in bone or antler projectile points to form a razor-like stone cutting edge, or hafted in handles and used like razor knives.

microblade core: Specially chipped nodules of stone from which microblades were produced. They exhibit at least one flat area, or platform, and long parallel sided facets (flake scars) produced when the microblades were removed from the core.

midden: The accumulated domestic debris and trash resulting from human occupation.

muskeg: Wetland, or bog, common in arctic and boreal areas consisting of peat and decomposing plants.

native copper: Metallic copper found in nuggets that can be worked by hammering and annealing.

Neolithic: An Old World term meaning the new Stone Age beginning in Western Beringia about 7,000 years ago and lasting until the time of Euro-American contact and characterized by ground stone tools, ceramics, and metal. In Beringia, the Neolithic period is divided into several cultures some of which can be traced to Native groups still occupying the region.

ochre: Red, yellow, or brown iron oxide that is ground and used as a pigment.

obsidian: Volcanic glass, highly prized for making stone tools and widely traded by early people.

Paleoindian: Archeological term used to describe distinctive types of stone tools and projectile points found throughout some areas of North America at the end of the last Ice Age between about 13,300 and 11,500 years ago.

Paleolithic: Old World term meaning old Stone Age describing all archeological sites older than about 12,500 years that are characterized by long parallel-sided stone blades and bifacially flaked tools that were in wide use until the end of the last Ice Age.

paleontologists: Scientists who study fossil animals and plants.

phase: Shared way of life and economic system throughout a region that persisted for periods of time. It is similar to the concept of tradition, but more restricted geographically and persists for shorter periods of time. It is interchangeable with the term complex. Complexes or phases can be part of a tradition, and may be used to subdivide traditions.

Pleistocene: Geologic epoch, or period of time, also called the Ice Ages, beginning about 1.8 million years ago and ending about 12,000 years ago, when large glaciers covered much of the earth's surface.

projectile point: Pointed object generally made of stone, antler, or metal attached to the end of an arrow, spear, or atl atl dart.

radiocarbon dating: An absolute dating technique applied to specimens that were once living (plants and animals). It measures the decay of radioactive isotope of carbon (^{14}C).

scraper: Stone tool usually unifacially flaked along one or more edges to produce a steep angle and used to scrape or work hides or other materials.

semi-subterranean: Term used to describe houses or other structures that are constructed to be partially underground.

shrub tundra: Moist, or wet, tundra dominated by low shrubs.

slate: A comparatively soft, fine-grained rock that can be split into slabs and thin plates that was commonly used to manufacture ground stone artifacts.

stratigraphy: Sedimentary units that are deposited vertically and used by archeologists to establish the relative age of artifacts. Because the layers are deposited from the bottom up, artifacts in underlying (lower) sedimentary units were deposited prior to those in overlying (younger) units.

tephra: Ash from the eruption of a volcano.

tephrochronology: Dating method that determines the age of unique deposits of volcanic ash in stratigraphic relationship to archeological remains.

taiga: Boreal forest.

toggling harpoon: Harpoon head attached to a line designed to turn side-ways in a wound when resistance is applied to the line. It holds an animal more securely by employing a spur (a barb like protrusion) at its base.

tradition: Archeological term used to describe groups of artifacts that are similar over a large geographic area and persist for long periods of time. It implies a common way of life and economic pattern passed from generation to generation over long periods of time.

tussock tundra: Tundra dominated by cotton grass tussocks that form high clumps often in marshes or bogs.

ulu: All purpose knife with a crescent shaped blade commonly associated with Iñupiaq and Yupik culture.

uniface: Stone tool flaked on one side, or face, only.

Younger Dryas: A period of cooler climate that began about 12,800 years ago and continued until about 11,500 years ago.

Guide to the Pronunciation of Russian Names[1]

Many of the names of specific sites or cultures in the chapters on Western and Central Beringia are in Russian. This guide will assist the reader in the pronunciation of these names. The list below appears in alphabetical order according to Russian alphabet, which comes from the Cyrillic script. Some of the site and culture names mentioned in the text are not in Russian but are transliterations of names in the Native languages of the Russian Far East or Alaska.

a (as in st**a**r or c**a**r)
b (as in **b**oots)
v (as in **v**oice)
g (as in **g**o or **g**ood)
d (as in **d**o)
ye (as in m**e**t)
yo (as in **y**onder)
zh (as in plea**s**ure)
z (as in **z**oo or i**s**)
i (as in m**ee**t or s**ea**t)
y (as in ma**y** or bo**y**)
k (as in **c**at or **k**ind)
l (as in **l**ion)
m (as in **m**other)
n (as in **n**ow)
o (as in **p**ort)
p (as in **p**ure or **p**oor)
r (as in **r**iver)
s (as in **s**wim or **s**outh)
t (as in **t**iger)
u (as in l**u**nar or t**u**ne)
f (as **f**ood)
kh (as in Lo**ch** Ness)
ts (as in it**s** or walt**z**)
ch (as in **ch**eap or **ch**eese)
sh (as in fi**sh**)
shch (as in bor**shch**)
“ (hard sign no equivalent)
y (as in rip or flip)
‘ (soft sign no equivalent)
e (as in b**e**st or ch**e**st)
yu (as in **you** or **Yu**kon)
ya (as in **y**ard)

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[1] This pronunciation guide was taken from a transliteration table presented in the following:
Dolitsky, Alexander B. and Henry N. Michael
2008 *Spirit of the Siberian Tiger. Folktales of the Russian Far East.* Alaska-Siberia Research Center, Juneau

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