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The Late Prehistory of the Alutiiq People

Culture Change on the Kodiak Archipelago
From 1200-1750 A.D.

Richard A. Knecht

May, 1995

Submitted to the Faculty of Bryn Mawr College in partial fufillment
of the requirements for the degree of Doctor of Philosophy

Directed by Dr. Richard Jordan and Dr. Richard Davis
Department of Anthropology

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This work is dedicated to the memory of Dick Jordan, and other crew members, village elders, and friends who helped bring Kodiak's prehistory to light, and who have since passed away

Johnny Aga
Minnie Agnot
Jim Baglien
Guy Balluta
Fr. Peter Kreta
Herman Malutin, Sr.
Tanya Malutin
Nina Olsen
Alex Panamaroff
Lawrence Panamaroff
Frieda Reft
Robin Squartsoff
Zoia Sugak
Sargent Tunohun

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Chapter 1: The Research Problem

Introduction

The Karluk One site, located near the modern village of Karluk, Alaska, was continuously occupied by Alutiiq people between A.D. 1200 and the 18th century. Because of remarkable site preservation, many artifacts made from organic materials were recovered, including types unique to the Karluk One assemblage. When work was initiated at Karluk One in 1983, various theories had been advanced to explain the transition from the Kachemak tradition to the Koniag tradition sometime after 1000 A.D., ranging from migration and population replacement (Hrdliçka 1944, Dumond 1988) to a gradual fusion of influences from neighboring societies (Clark 1974, 1988). Preliminary analysis of the Karluk One data indicated that the change from Kachemak to Koniag was in situ, beginning around 1200 AD. (Jordan and Knecht 1988).

This thesis presents a more detailed analysis of the Karluk One data. It indicates that the house forms, settlement patterns, and artifacts unique to the Koniag tradition came into being shortly after 1400 A.D. High population densities at salmon streams, and the use of large multiple room houses, the associated rise of social ranking, and changes in material culture also take place at this time. It is argued that these changes are linked to the onset of a period of climatic cooling known in the northern hemisphere as the Little Ice Age. According to recent geological data this climatic fluctuation impacted the Kodiak Archipelago between 1440 A.D. to 1710. At Karluk these changes were accompanied by greater emphasis on fish resources, and a decline in sea mammal hunting until early in the 18th century. Large settlements on the higher reaches of the Karluk, Ayakulik, and Afognak rivers had already

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become more dispersed by the time of sustained Russian contact after 1784. It is suggested that similar changes in late prehistoric settlement and house form observed elsewhere in coastal Alaska may be also linked to climatic changes associated with the Little Ice Age.

This relationship between climatic fluctuation and cultural change helps explain the rise of social complexity among maritime societies on the North Pacific. Models of cultural evolution tend to reflect a positivist outlook, viewing social complexity as an inevitable outcome, of technological and social adaptation to the exploitation of abundant marine resources. Cultural evolution is viewed here as a process of change toward increasing complexity; with both positive and negative implications for the members of a society. At Karluk One, archaeological evidence demonstrates that cultural complexity arose as an adaptation to difficult circumstances incurred by a climatic shift, a change probably not experienced by most individuals as a cultural flourescence. This thesis will also explore the ways that culture change can be viewed against the background of complex systems theory, which predicts that any open, non-linear system (culture) will react to a change in equilibrium (such as a climatic shift) by becoming more complex.

The Study Area

The Kodiak Archipelago lies in the western portion of the Gulf of Alaska, southeast of the Alaska Peninsula. The islands lie in close proximity to each other, encompassing an area of more than 13,000 square km. The regional environment is characterized by extraordinary dynamism. As a segment of the Pacific 'ring of fire' it is among the most geologically volatile regions on earth. Life in the Gulf of Alaska is punctuated by frequent and violent episodes of earthquakes, tsunamis, and volcanic eruption. Although

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the climate is moderate compared with areas further north. Weather patterns in the North Pacific generate intense pressure systems which are commonly accompanied by extreme winds and heavy precipitation.

Offshore, east of the Kodiak island group, lies the Eastern Aleutian Trench. Formed by tectonic forces, it plunges to a depth of more than 6 km. Currents upwelling from the abyss, circulated and transported by surface winds, supply minerals and nutrients that nourish a rich broth of plankton. This forms the foundation of one of the world's most productive marine biomasses. Sea mammals and fish are abundant in the waters surrounding Kodiak, and even small creeks teem with salmon during summer runs. Low tides reveal the dense resources of the littoral zone; the rocks carpeted with chitons, limpets, periwinkles, and other edible invertebrates; bay bottoms are matted with shellfish beds composed of mussels, clams, and cockles. Millions of seabirds clamor above shoreline rookeries; puffins, ducks, and auklets everywhere dot the sea. In spring and fall pods of several species of whales migrate by the thousands within view of the coast; seals, sea lions, porpoise, and sea otters are also abundant in nearshore waters.

The biological riches of the Kodiak region lie near the center of a larger environmental continuum which spans the North Pacific rim; from Sakhalin, the Kuriles, and the Kamchatka Peninsula in the Soviet far east, to the Aleutian Chain, and the Northwest Coast of North America. The cultures which flourished on these shores relied on maritime hunting and fishing, rather than agrarian economies. On the southerly ends of the arc formed by the North Pacific rim exist temperate rain forests, with terrestrial resources; large game animals such as deer, and in what is now the Russian far east, wild pigs. Northward, along the top edge of the Pacific are the treeless,

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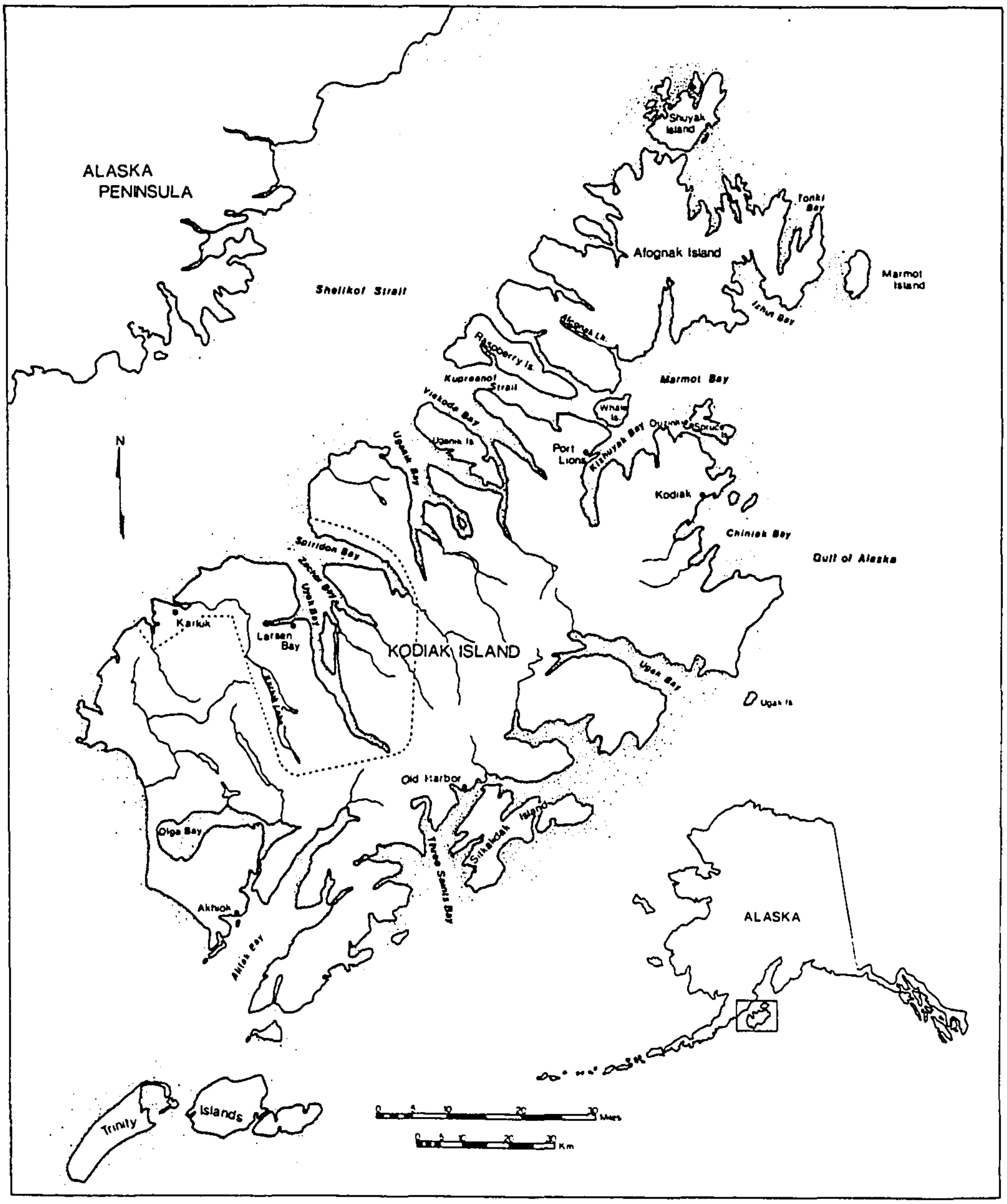

Figure 1: Map of the Kodiak Archipelago

The dotted line indicates the boundaries of the 1983-1987 study area.
(From Jordan and Knecht 1988)

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windswept coasts where the maritime economic focus was naturally more pronounced.

A cultural-developmental continuum also exists on the misty coastlines of the North Pacific, where a series of ethnically diverse societies gradually developed large sedentary populations, trade networks, elaborate artistic traditions, long distance warfare, and ranked social systems. Remarkable parallels between these cultures exist in house form, settlement pattern, material culture, social stratification, myth, and developmental trajectory; despite diverse ethnic identities independent of large distances in time and geography. The development of non-agrarian, yet culturally complex North Pacific societies presents a challenge to anthropologists now struggling to describe and explain culture change in this area.

The Alutiiq Culture area and Ethnic Identity

The Alutiiq culture area is defined by a common language, biological ancestry, and shared cultural traditions. Geographically, it includes Prince William Sound, the southeastern coast of the Kenai Peninsula, the Kodiak Archipelago, and the Alaska Peninsula (Figure 2). Archaeological evidence increasingly shows that these bonds may extend far into prehistory; even the earliest assemblages recovered from within the historically known boundaries of Alutiiq territory have closely similar traits. The eastern boundary, Copper River, between the Alutiiq and the Eyak and Tlingit Indians, and the western boundary, False Pass, where Aleut territory traditionally begins, both appear to be very old, and may in fact have been maintained for thousands of years.

Alutiiq is one of five dialects included in the Yupik Eskimo language sub-group, which stretches from Sirenski, Siberia to Prince William Sound.

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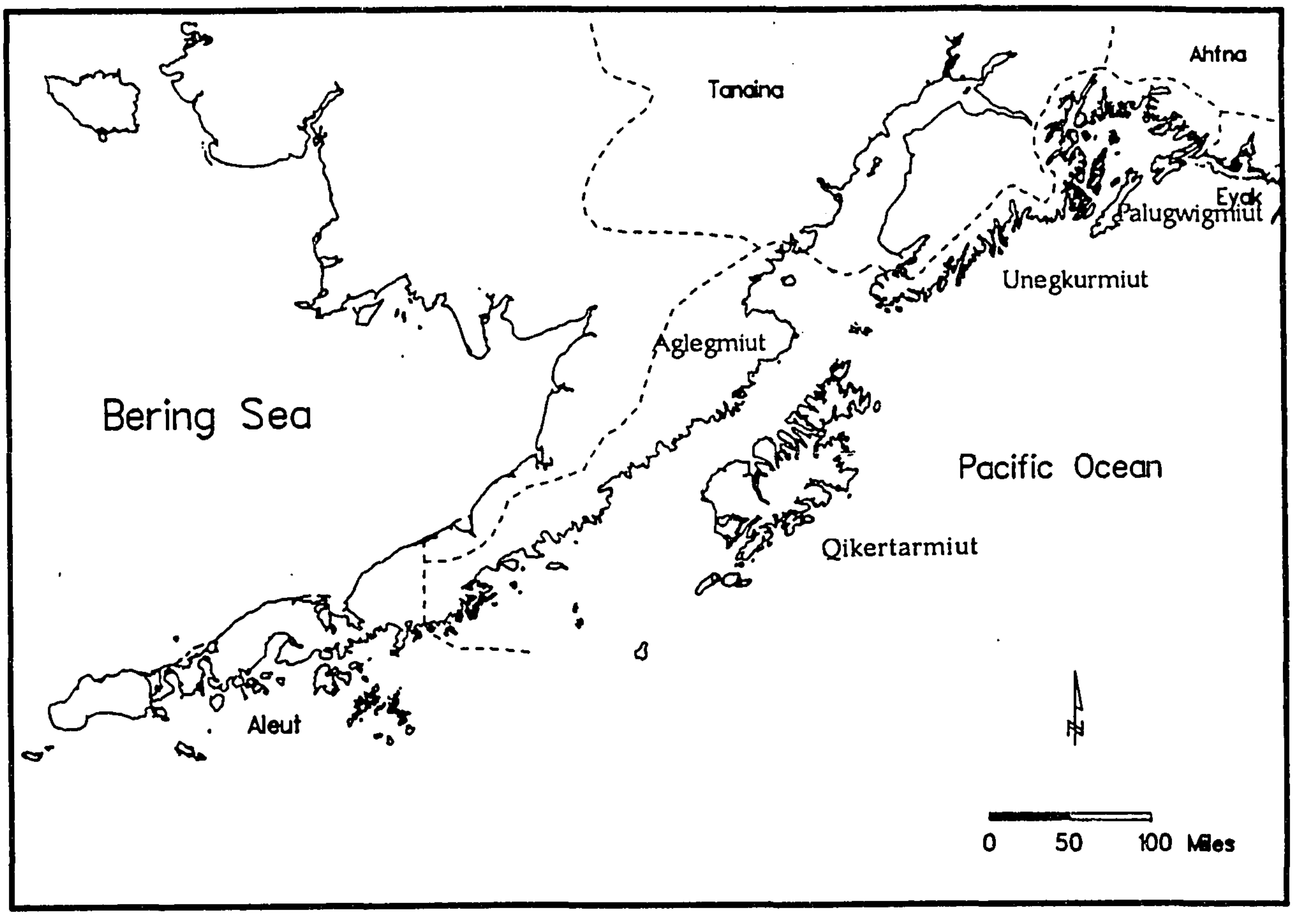

Figure 2: The Alutiiq Culture Area

The heavy line approximates the territories historically occupied by Alutiiq speakers in south Alaska. Alutiiq people are also referred to as Pacific Eskimo in anthropological literature.

(After Haggarty et. al 1991, McCartney 1988,)

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Yupik is closely related to Inuit-Inupiaq, spoken from the Seward Peninsula in Alaska, and across Arctic Canada and Greenland (Woodbury 1984:56). Alutiiq has also been referred to by linguists as Pacific Eskimo, or Pacific Yupik (Woodbury 1984); anthropologists and archaeologists have also used the term Pacific Eskimo, or Koniag Eskimo in the literature (Clark 1984; Donta 1993; Fitzhugh 1988; Yaw Davis 1984). The term Pacific Eskimo accurately reflects the location and ethnicity of the area, however any use of the term 'Eskimo' as a self-designator has been rejected with some disgust within the contemporary Native community. The Yupik Eskimos living to the north are ancestral enemies, despite many ancient cultural and linguistic ties. Complicating the situation further is the fact that many in the Alutiiq area refer to themselves as 'Aleuts' reflecting the fact that the Alutiiq and Aleut were typologically lumped together by the Russians during the 18th and 19th centuries (Clark 1984). Within the Native community, the distinction between Aleuts from the Aleutian Islands, and Aleuts from south Alaska is well known, however problematic this might be for the literature.

The term 'Alutiiq' meaning 'Aleut' in Pacific Eskimo speech was first coined by linguist Jeff Leer. Since 1982 it has been quickly adopted by the Native community on Kodiak Island as a self-designator (Clark 1984, Jeff Leer, personal communication 1991). Closely related but distinctive sub-groups within the Alutiiq culture area include the Paluwigmiut, (or Chugach) of Prince William Sound, the Unegkurmiut on the Kenai Peninsula, the Aglegmiut of the Alaska Peninsula, and the Qikertarmiut (or Koniag) of the Kodiak Archipelago (Haggerty et. al 1990:76; Knecht and Pullar 1990).

Traditional group self-designators and minor differences in dialects also exist for nearly every local village group with the Alutiiq culture area. While united by a common culture and heritage, the Alutiiq today are

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divided by rivalries between families, villages, and since 1971, membership in village corporations and three separate regional Native corporations. Today there are 15 Alutiiq villages, as well as communities within the larger towns and cities of south Alaska. In Prince William Sound are the villages of Tatitlek and Chenega, on the Kenai Peninsula are English Bay and Port Graham; on Kodiak Island are Port Lions, Larsen Bay, Karluk, Akhiok, Old Harbor, and Ouzinkie; and on the Alaska Peninsula are Chignik, Chignik Lagoon, Chignik Lake, Perryville, and Ivanof Bay.

History of Archaeological Research on the Kodiak Archipelago

The history of archaeological research in the Kodiak Island region has been ably reported by Donald Clark (1988, 1990). I will only summarize those projects that bear most closely on the origins of Koniag cultures and those that have been undertaken in the last five years.

Prehistoric Natives, usually living on top of many feet of accumulated midden, must have frequently encountered artifacts as they excavated house pits and building sods, as well as on the beaches in front of eroding sites. Traditionally, such objects were considered somewhat harmful, for they are the possessions of the dead and were supposed to be left alone or reburied. Some chronologically anomalous artifacts, including lithics with waterworn flake scars, occasionally are found on prehistoric housefloors (Clark 1984: 88), indicating that they were sometimes curated, perhaps simply as useful salvage, or alternatively, as a kind of charm.

Little mention is made of prehistoric sites by writings from the Russian American period. Clergymen interested in agriculture apparently noticed the luxuriant vegetation that thrives on the rich organic soils of archaeological sites, for they were frequently used as locations for gardens (Gideon 1989:89,

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Veniamenov 1984:32). Shellfish in archaeological middens alter the soil chemistry and discourage the growth of Sitka spruce, thus providing an inviting and easily tilled clearing to gardeners around the island during the historic period. An 'abandoned Aleut settlement' near Kodiak was among the sites where the clergy experimented with various crops. Whether any of the artifacts doubtless encountered by early gardeners found there way to Russia is unknown, but such collections probably existed in some form. The Kachemak tradition midden at Three Saints Bay was utilized as a garden soil by some of the first Russian settlers in 1784. By the early 20th century gardens had been placed on archaeological sites at Crag Point in Anton Larsen Bay, at the Garden Point site on Spruce Island, on the south coast of Afognak island, at KAR-31, in Old Karluk, and on a site in Larsen Bay which would become known as the Uyak site. Modern villagers still mine middens for soil and transport it in wheelbarrows to their gardens (Amy Steffian: personal communication, 1994).

Heinrich Holmberg, a Finn who visited Kodiak Island from June to September 1851, made notes and collections on the geology, natural history, and ethnology of Russian America, (Clark 1990; Holmberg 1853; 1985; Varjola 1990:44). His ethnographic collections were acquired by the National Museum of Denmark and include archaeological specimens from the Kodiak archipelago. These include a Kachemak tradition labret, grooved adzes, slate projectile points, and slate ulu blades (Birket Smith 1941). It is unclear whether or not the pieces were surface collected or excavated, and there are no surviving notes on the provenience of the pieces.

With the onset of the American period beginning in 1867, professional and amateur collectors from various museums passed through the area; usually collecting archaeologically derived material only as an occasional

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supplement to ethnographic collections. In the early 1870's Alphonse Pinart collected some human skulls from Uyak, Uganik, and Ugak bays (Clark 1990, Pinart 1872). Burial caves are known to exist in all three areas; it is possible that the skulls, as well as a portion of a spectacular assemblage of Alutiiq masks he made came from caves rather than village sites. Jacobsen apparently made a brief an unsuccessful attempt at digging a site in Seal Bay, on Afognak Island (Clark 1990: 6; Jacobsen 1977:203).

William J. Fisher, a former member of the California Academy of Science, moved to the village of Kodiak in 1879 and remained there until his death in 1903 (Crowell 1992: 20). He collected ethnographic and natural history specimens for the Smithsonian Institution as a means of supplementing his salary as a tidal observer, and no doubt to pursue his scientific interests. Fisher excavated in amateur fashion at several sites, sent specimens to Washington, and even made a list of archaeological sites on Kodiak and the Alaska Peninsula accompanied by a map, which has since been lost (Crowell 1992: 22). Like Pinart, Fisher also collected masks, some of which came from caves.

During the 1880's and 1890's large salmon canneries were constructed in many locations within the Alutiiq area; cannery supervisors made small collections of ethnographic materials, some of which went to museums like the Lowie Museum in California, and the Burke Museum in Seattle, and many other small museums elsewhere in the United States. A short description of the Alitak petroglyphs was written by the superintendent of the Alitak cannery and published by the Alaska Packers Association (Clark 1990:7; Halvorsen 1917). The wife of the superintendent of the Larsen Bay Cannery, Mrs. Gordon Jones, occasionally dug artifacts from the Uyak site, where

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artifacts had been exposed by Native gardens on the site surface (Clark 1990; Collins 1984; Dora Aga; personal communication 1988).

Ales Hrdliçka, a well known physical anthropologist working out of the Smithsonian Institution, had visited areas north of the Alaska Peninsula, seeking skeletal evidence of the peopling of the new world from Asia. Notified by a fisheries biologist of the finds on Kodiak, Hrdliçka arrived at Larsen Bay in the summer of 1931 (Clark 1990: 7). A large prehistoric village site was located near a Native village, which had grown up next to a cannery built in Larsen Bay in 1911. The site was variously known as Jones Point (Clark 1990), Our Point (Hrdliçka 1944), the Uyak site (Heizer 1954), and in Larsen Bay as the 'bone yard'. Hrdliçka tested the site, and returned with small crews in 1932, 1934, 1935, and 1936 (Heizer 1954:1). On his last visit to Alaska in 1938, one of his student crew members was William Laughlin (Laughlin 1966). Primarily interested in recovering human skeletal material, Hrdliçka was notoriously unconcerned with stratigraphic provenience. When faced with the complex stratigraphy that is typical of the deep midden sites in the area, he chose to ignore mapping procedures in favor of moving as much dirt as possible:

> To go into greater details, with measurements of depths, etc., was soon found on this site to be quite impracticable, and would have confused rather than simplified matters. Also find it impracticable to dig from the surface... It seems that the best procedure under the circumstances will be to excavate by clear vertical cuts reaching to the very base of the deposits... (Hrdliçka 1944: 141)

Original film footage of Hrdliçka at work at Larsen Bay is preserved in the archives of the Smithsonian Institution. He can be seen swinging a large pick at the base of a midden profile several meters high. As he works, a square meter or two falls to the ground, which is quickly shoveled into a

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small iron mining car on rails. Other scenes show him brushing at skulls exposed in the midden face before summarily pulling them free from the soil. In this manner he managed to excavate nearly completely a site which originally covered eight acres, removing about 8000 cubic meters of midden (Scott 1992).

Although about 4,600 artifacts were recovered, the assemblage consists primarily of complete, larger pieces. Smaller artifacts, which must have numbered in the thousands were not recovered; others deemed to be in poor condition, or excessively common specimens were simply left behind (Heizer 1956; Dora Aga, personal communication 1989). Much more significant in Hrdliçka's point of view was the assemblage of human remains, consisting of at least 867 human skeletons.

Crew members who paused in an attempt to take field notes were sternly reprimanded by Hrdliçka for "slowing the rate of midden removal" (Laughlin personal communication 1988). Although elevations were not taken, the excavators did notice gross differences in the characteristics of the midden layers. In the Kodiak Archipelago, Koniag tradition sites contain a large amount of firecracked rock, or sweatbath rubble, Kachemak sites are typified by a complex stratigraphy of shellfish lenses, and storage pits, and Ocean Bay sites feature micro-stratified bands of red ocher, and are usually found in a matrix of 'butterclay', actually weathered tephras. According to Heizer's notes, this very general pattern was also reflected at the Uyak site (1956). No effort was made to determine which artifacts might be intrusive, however they were labeled with color-coded pencil marks indicating whether they had come from the upper, or Koniag layer, the later pre-Koniag, or intermediate layer, or the oldest pre-Koniag of deep layer (Heizer 1956:8).

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Between field seasons at Larsen Bay, Hrdliçka took a series of cranial and post cranial measurements from the skeletal material from the Uyak site, and published a series of statistics (Hrdliçka 1944). Richard Scott has analyzed Hrdliçka's methodology in some detail (1992), and noted that: "Hrdliçka reached conclusions with a strong dose of typological intuition supplemented by a few numbers, especially cranial length, cranial breadth, and the derived cranial index" (1992:152). In sum, the 'pre-Koniag' skulls tended to be longer than the more round-headed skulls from the Koniag layers. In comparing the samples, Hrdliçka found that the Uyak skulls differed from those of high Arctic Eskimos. He concluded that on the basis of cranial differences, that there was no direct relationship between the pre-Koniag and Koniag peoples, and that neither population was related to Eskimos (Hrdliçka 1944, Scott 1992).

Clark (1990), has described how Hrdliçka's reconstructions of Kodiak's prehistory, although colorful, and not without critics, nevertheless continue to be a topic for present day prehistorians. Hrdliçka's version of the late prehistory of the Kodiak Archipelago, which was stated in no uncertain terms:

> Our excavations on Kodiak Island and especially those at Our Point in Uyak Bay, have shown beyond any doubt that the Koniags had been relative newcomers to the island, having occupied it for but a few centuries; and that before them and for a much longer period the island was peopled by a distinct human strain, differing from the Koniags considerably both culturally and physically...The Koniags themselves must have come to the island in large numbers sufficient to annihilate and drive out the old-timers, for apparently they suddenly took over the old sites everywhere and established themselves on top of them, without any period of infiltration, transition, or perceptible admixture (Hrdliçka 1944:394).

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Hrdliçka's enthusiasm for skeletons, general disdain for Natives, and cantankerous personality left a deep impression on his students, colleagues, and the Native community (Pullar 1992). Among the Aleut he was known as the 'dead man's daddy', and villagers in Larsen Bay still refer to him as 'Aley Hardliquor' (Laughlin 1988). Hrdliçka's reconstructions of the past are specific and vivid to the point that they imply a love of story telling: on one occasion he revealed with a flourish a skeleton from the site that had been found to be missing an arm; "And how do you think he lost the arm?...a bear bit it off!" (Frederica De Laguna, personal communication 1984). He may well have appreciated the fact that stories about him have remained a mainstay in anthropological folklore, and are still recounted around field camp fires, thanks in large part to the superb powers of recollection possessed by William Laughlin, Frederica de Laguna, and Dora Aga.

An indefatigable field researcher, Hrdliçka traveled by skiff to many locations around the archipelago, accomplishing the first archaeological survey of Kodiak Island, and recording the locations of nearly 100 sites (Clark 1990; Hrdliçka 1944). It was Hrdliçka who correctly stated that Kodiak's prehistory "must become one of the chief milestones in the studies of the far northwestern regions" (Hrdliçka 1944:8).

Fortunately for all concerned, Frederica de Laguna had been doing archaeological research elsewhere in the Alutiiq area, excavating prehistoric sites on Kachemak Bay, located on the Kenai Peninsula coast of Cook Inlet, in 1930, 1931, and 1932 (de Laguna 1934, 1975). Having participated in some of the first ever archaeological excavations of Eskimo sites (de Laguna: 1982), she instantly and correctly recognized the cultural affinities of the assemblage she encountered in Cook Inlet to those she had seen in Greenland:

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> The analysis of the elements has exhibited the complexity of the Kachemak Bay Culture. The basis seems to have been a fairly generalized type of Eskimo culture, which in itself included a number of elements common to the Arctic and North Pacific areas. It is, however, the style of workmanship, especially the finish of the bone and antler specimens, and certain stylistic features, difficult to describe and impossible to enumerate, that most clearly show the Eskimo character of the Kachemak Bay Culture (de Laguna 1934: 217).

In 1946, Robert Heizer, who had helped excavate the Uyak site as a student, re-analyzed the artifact assemblage as well as he could, given the lack of field data (Heizer 1956). Recognizing the unreliable nature of layer attributions, he separated the assemblage simply into upper and lower levels. Currently, with what is now known about diagnostic artifacts from different time periods, it is clear that the Uyak site was a multi-component site. The bulk of the site dates from the Kachemak tradition, however the Koniag and late Ocean Bay phases are also represented in the assemblage. Most of the Koniag tradition materials do indeed fall within those artifacts coming from the 'upper layer'. Heizer's work with the Uyak assemblage helped salvage vital information otherwise lost through Hrdliçka's haphazard excavation technique.

The nature of Kachemak material culture led Heizer to disagree with Hrdliçka's assessment of the ethnicity of the Uyak skeletons:

> I would interpret the Uyak site data and the few generalizations derived from them as broadly confirmatory of Collins' view (1951:434) that the basis of the culture was Eskimoan and that its bearers had passed beyond Bering Straits before the development of the distinctive Old Bering Sea-Ipiutak cultures. In the Pacific Eskimo-Aleut area we may be dealing with subarctic coastal sea-hunting cultures whose nature is about what we would expect as the original or basic Eskimo culture (1956:10).

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Heizer readily identified parallels between the Uyak site and the prehistoric culture of the Cook Inlet, however the relationship of the pre-Koniag and subsequent Koniag occupation was still unclear. In conjunction with regional chronologies then being developed, Heizer suggested that Koniag culture began around 1000 A.D. and lasted into the contact period (1956:10). The long term chronology of prehistory would have to await further investigation. Hrdliçka had made some preliminary tests at Karluk, and had found it promising (1944: 102-103). Heizer concurred:

> If we really want such answers, we must find a deep site on Kodiak and excavate it properly. In my opinion, the extensive midden at the mouth of the Karluk River, a few miles west of Uyak Bay, offers the most promise for a really old site, for the Karluk is an important salmon stream which would have attracted early settlement (1956:10).

Donald Clark first encountered Hrdliçka's 'Anthropology of Kodiak Island' (1944) while a teenage volunteer at Kodiak's City Library in 1947 (Clark 1988). He began to surface collect and test sites in the Kodiak area; some of his early collections are now in the Baranof Museum in Kodiak. In 1952, while employed by the Bureau of Fisheries counting salmon at a weir in Olga Bay, he mapped and tested a large Koniag site. The report he sent to Robert Heizer was subsequently published in the appendix to Heizer's report on the Uyak site (Clark 1956 in Heizer 1956).

Other excavations taking place during the summer of 1952 were those undertaken at Karluk by Frederic Milan, with support from the University of Alaska Museum (Clark 1974). Milan excavated five test pits around Karluk Lagoon, four in Old Karluk (KAR-31, then referred to as KAR-716), and one at Karluk One (KAR-1, then referred to as KAR-715). His choices of test pit locations were somewhat limited by the contemporary house and gardens

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then existing on both sites. His test pits at Old Karluk were excavated no more than two meters deep and yielded historic and late prehistoric artifacts, including a historic burial. Some of the last Native residents of Old Karluk vividly remembered when the burial, covered with glass trade beads was found (Frieda Reft: personal communication 1983), and still avoided disturbing the area.

At Karluk One, Milan was again limited by the densely clustered, and still occupied houses and gardens that existed on the site as late as 1978. He managed to install a 1 x 3 meter trench behind a former schoolhouse, and excavated it to a depth of 1.5 meters (Milan 1974). Here he found a wooden figurine, an adze blade, shaft fragments, and a chert core. Although Milan's location maps lack detail, the location of the schoolhouse is evident from photographs in federal archives of the school when it was in operation during the 1920's.

Milan was disappointed not to encounter more ancient deposits, however; as time would tell, his excavations revealed only a portion of the archaeological record buried at Karluk. Milan did, however, recommend further work in the area, citing numerous house pits on the Karluk River mouth, sites on Karluk Lake, as well as oral traditions of large village sites higher up on the Karluk River (1974:85).

In 1959 Clark tested a Koniag midden located in Anton Larsen Bay near Kodiak, subsequently called the Kizhuyak site to avoid confusion with earlier work by Hrdliçka at the similarly named, but distant Larsen Bay (Clark 1974, 1988). In 1961 and 1962, Clark tested a Koniag site at Monashka Bay (Clark 1974, Donta 1993). He obtained a C-14 date of A.D. 1350 ± 100 from charcoal at the Kizhuyak site, and 1652 ± 44 at Monashka Bay (Clark 1974: 25, 49).

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William Laughlin, who in 1938 had accompanied Hrdliçka on a trip to Kodiak, the Aleutian Islands, and the Commander Islands, had long been involved in his own long-term study of the Aleutian Islands and their inhabitants. An archaeologist and physical anthropologist, Laughlin was interested in collecting data which might shed light on the possible biological affinities between the Aleuts of the Aleutian Islands, and the Native peoples of the Alaska Peninsula and Kodiak (Laughlin 1966). In 1960 Laughlin and a team of medical researchers collected genealogies and blood samples from the Chignik area on the Alaska Peninsula, and then went to the village of Old Harbor, on Kodiak Island (Jorgenson and Laughlin 1963). Laughlin and Jorgenson were interested in locating village sites that might yield skeletal material relevant to the modern population. They removed three skeletons from the Koniag site at Rolling Bay, on Sitkalidak Island, and also visited the historic Russian settlement site at Three Saints Bay (Laughlin 1966:155).

Laughlin, then at the University of Wisconsin, along with researchers from a variety of disciplines, organized the Aleut-Konyag Prehistory and Ecology Project, which operated on Kodiak Island during the 1961, 1962, and 1963 field seasons (Laughlin 1966, Laughlin and Reeder 1962). Besides archaeology, research was done on physical anthropology, community studies, and demography in several Native villages on Kodiak. Excavations continued at Rolling Bay; among the crew was Donald Clark, who had met Laughlin when he had passed through Kodiak the year before (Clark 1988).

In 1962, excavations were undertaken at Three Saints Bay, site of the first permanent Russian settlement in Alaska; the site was chosen for a project on the historic period, but it turned out that a relatively thin historic layer lay on top of about two meters of accumulated prehistoric midden. Among the student excavators on the site was William Workman. Clark also

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directed some further work at Rolling Bay. The artifacts from Three Saints Bay clearly resembled those recovered by Hrdliçka at the Uyak site; a cultural horizon still referred to in 1962 as 'Paleo-Koniag' (Clark 1988). The affinities with De Laguna's material from Kachemak Bay were clearly recognized, and Clark soon adopted the term 'Kachemak Tradition' (Clark 1970). By 1963, Clark was directing excavations on Kodiak; graduate student attrition from earlier projects had also left him responsible for interpreting the results of earlier field seasons. Development of a coherent prehistoric sequence for Kodiak became his primary research goal; and solving the problem of the origin of Koniag culture was the key to the mystery posed by Hrdliçka's work.

Clark searched for a site with both Kachemak and Koniag components that might yield data on cultural continuity, that according to Hrdliçka had been absent at the Uyak site (Clark 1988:9). After some survey, working out of a base camp at Three Saints Bay, Clark began work at Kiavak Bay, a site first documented by Hrdliçka's surveys (Hrdliçka 1944:118, Clark 1974), which yielded both Kachemak and Koniag tradition artifacts. Further analysis, however, revealed that it was the early part of the Kachemak tradition that was represented at Kiavak, and that the Koniag tradition occupation came after a 1500 year hiatus (Clark 1974, 1988).

The 1963 field season yielded further data with the chance discovery by Clark and a co-worker of hitherto unrecorded types of chipped stone points coming from a buried midden which had been freshly exposed by a road cut behind Ocean Bay, on Sitkalidak Island. Clark now had recovered the material he needed to construct the basic tripartite prehistoric sequence for Kodiak Island; soon to become known as Ocean Bay, Kachemak, and Koniag.

In 1964, the Good Friday earthquake rocked the archipelago, destroying several Native villages, much of downtown Kodiak, and resulting in

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subsidence of most of the coastline. The results of the subsidence, which on the eastern coast of Kodiak was often 2-5 meters, was catastrophic for already vulnerable coastal archaeological sites. Archaeological gear stored between field seasons at the Shearwater cannery in Ugak Bay was lost and the subsequent insurance settlement funded field work the following summer by Clark and Workman. This work included survey and some excavation at the Crag Point site, composed mostly of late Kachemak age material (Clark 1970, 1990).

In the wake of the earthquake's toll on Kodiak's archaeological sites, area residents were able to accumulate spectacular private collections simply by walking the beach and surface collecting. The data that can be gleaned from these collections is variable, but continues to be a useful source of information. There was a seven year hiatus in professional field work as Clark and Workman got on with their respective careers. During the 1971 season, Clark and Workman fielded a project near the Afognak River, on the south coast of Afognak Island. There they excavated two sites discovered during the 1964 survey, which proved to be from the early Ocean Bay period. This was an important step in defining the earliest cultures of the archipelago (Clark 1979).

Little field research took place during the remainder of the decade of the 1970's; although Clark was able to produce a stream of publications in those years which still comprise the foundation for the literature on area prehistory (Clark 1970, 1974a, 1974b, 1975, 1979). Several survey and testing projects took place during the 1970s, sponsored by the U.S. Fish and Wildlife Service (Clark 1990, Klinger 1980, Nowak 1978, 1979, Yarborough 1978).

In 1980, a Pennsylvania engineering firm, Wapora, Inc. made a successful bid to do archaeological survey in preparation for construction of a

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power plant at Terror Lake, near the head of Kizhuyak Bay, on Kodiak Island. At Bryn Mawr College, Richard Jordan was then between ongoing projects in the Eastern Arctic, and was recruited to help direct the project; joined by his wife Colleen Lazenby and Glen Sheehan, a graduate student at Bryn Mawr (Righter and Jordan 1980). The survey located some small prehistoric sites on Kizhuyak Bay; but was important in that it sparked Jordan's interest in Kodiak archaeology. It was located on the opposite end of the Eskimo world that he was so familiar with and in an area with a much richer resource base. In his words, "I wondered what Eskimo culture would be like if they had all the food and wood they wanted." (Personal communication 1983). Of particular interest was a wooden figurine of a man and bird standing back to back. Jordan saw the piece in the collections of the Baranof Museum in the city of Kodiak; it was floating in a jar of vodka, where it had been placed by the well-meaning museum staff. Ronnie Lind, a Native resident of Karluk, had found the artifact eroding out a prehistoric village site on Karluk Lagoon.

In 1982, Sheehan and Kevin Smith, an undergraduate student from Haverford trained by Jordan in Bryn Mawr's field school program, were employed on a large scale salvage archaeology project in Barrow. At Jordan's urging they visited Karluk on their return trip south. They saw dense midden deposits and abundant hospice, and back in Kodiak, talked with officials from Koniag, Inc. the regional Native corporation representing the Kodiak region. Back at Bryn Mawr, Jordan, Sheehan, and Smith submitted a proposal to the National Endowment for the Humanities for a field season in 1983.

At that time I was doing archaeological contact work for Gilbert-Commonwealth out of Jackson, Michigan; and had worked on excavations throughout the eastern U.S. Several projects were on the boards in 1982; I

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chose to go to Pennsylvania on a whim. I was trying to set an office record for working in the largest number of different states (I was up to number 14). During the fall and early winter of 1982, I was an assistant director of an archaeological contract project associated with a pumping station in Buck's County, Pennsylvania. Several Bryn Mawr graduate students, including Colleen Lazenby and Alexander Dolitsky were on the field crew. I had been interested in the north after taking classes at Michigan State with Moreau Maxwell; Lazenby suggested I stop at Bryn Mawr at the project's end to talk to Dick Jordan about joining the field project being planned for Kodiak. Being raised in the midwest, I was familiar with Bryn Mawr only as one of several private, probably elitist schools in the east. I reluctantly stopped at Jordan's faculty apartment with some fear and loathing, expecting he would be dressed in a three piece black suit like Sigmund Freud, squinting through a monocle. Jordan did not fulfill my anachronistic stereotype of an 'eastern' professor; and I entered Bryn Mawr's graduate program and enlisted in the Karluk field project.

In the summer of 1983, the crew consisted of Dick Jordan, Glenn Sheehan, Kevin Smith, Mariann Smith, Alexander Dolitsky, and myself. We were later joined by Claudia Chang from Sweet Briar College, who was interested in doing some social anthropology in Karluk. We rented Herman and Tania Malutin's recently abandoned house in New Karluk, about a mile from the newly constructed pre-fabricated houses of the modern village. Smith and Sheehan, along with a small rubber raft which might have been appropriate for a Arizona swimming pool, a 5 horsepower outboard motor, and a huge mound of field gear, were dropped off on Karluk Lake to survey the lake shore and river. They managed to map several large Koniag sites and appeared at the head of the lagoon some weeks later, dragging the now

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bottomless raft behind them, as well as the soaked remnants of their equipment.

Jordan was with us for the first three weeks of the project, then returned east. Every day of those three weeks was spent in a dawn to dusk survey; crashing through brush, rousting sleeping bears from house pits, and mapping (Jordan and Knecht 1988). When darkness fell, we stayed up far into the night, drinking by the hissing light of the coleman lantern and talking anthropology. Jordan was inexhaustible. As time went on the crew wore out. We took turns staying up with him; far into the night you could hear his fists pound on the dirty graph paper of the site maps spread out on the kitchen table.

Much to our collective relief, Jordan left for the east, and we could return to a relatively blissful 12 hour work day, and a six-day work week. Kevin Smith drew a profile of the Karluk One site; Sheehan and Mariann Smith recorded profiles on the KAR-31 site, on the north side of the lagoon. I excavated test pits and trenches in the historic levels of KAR-31, and in a barabara at KAR-37 that dated from the 1840's. I had been trained primarily as a historic sites archaeologist at Michigan State and the Russian period archaeology seem promising. Initially this was an uphill battle. Once, while walking the beach in front of the site, I handed Dick an early 19th century ceramic sherd. He looked at it, said, "White men's trash", and tossed it into the lagoon. I can still see it in my mind's eye; the sherd made six little skips, then sank out of sight.

By the end of the summer, we had collected about 500 artifacts. Karluk One had yielded some spectacular wooden objects from the Koniag tradition and KAR-31 was multi-component, and might yield a complete sequence. On the last day of work, Sheehan and I excavated down into the beach in front of

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the KAR-31 profile and found a red-ocher surface, along with some chipped stone. Large historic and prehistoric village sites had also been mapped along Karluk Lagoon, the Karluk Lake and River System, and in Sturgeon Lagoon.

In 1984, a proposal to fund more work at Karluk was submitted by Jordan to the National Science Foundation, which was turned down. The Native community in Karluk and Kodiak had been watching our progress with some interest; at the end of the field season we made presentations and showed some of the finer pieces we had found. The Kodiak Area Native Association was then headed by Gordon Pullar a young Alutiiq leader with undergraduate training in anthropology and a deep interest in cultural preservation. Pullar encouraged Jordan to return to Kodiak and helped by finding some funding through a youth employment program. The village of Karluk donated the use of a house, student volunteers paid for their own travel and food expenses, and the project somehow came together (Pullar and Jordan 1988). I was able to reach Kodiak through a travel grant from Bryn Mawr's 'Freddy Fund' a modest, but crucial endowment fund established by Frederica de Laguna, who along with Jane Goodale, had established the department of anthropology at Bryn Mawr.

At Karluk, thirteen crew members shared a small two bedroom house. Morning bathroom lines formed like those in front of Lenin's tomb. Pink salmon, a delicacy usually reserved for dogs and seagulls, fed the crew. The off-island crew members that season included Dick Jordan, Colleen Lazenby, Barbara Cellarius, Philomena Hausler, Nurit Goldman, May Loemker, Amy Steffian, Kevin Smith, Dick Taylor, Miriam Kahn, Dr. Richard Knecht, Sr., Richard Jordan, Jr., Lucas Jordan, and myself. A substantial part of the crew were Alutiiq; crew members from the village of Karluk included Michelle Chya, Katherine Reft, Lynn Reft, Joyce Reft, Daryll Squartsoff, Robin

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Squartsoff, Marie Sugak, Edward Charliaga, Herman Malutin, and Phillip McCormick. They were not the first Alutiiqs to join an archaeological crew; Hrdliçka had worked with the grandfather and great-grandfather of the Reft sisters when he spent several days excavating at Old Karluk in the 1930s (Hrdliçka 1944).

Jordan and Smith, along with most of the crew from Bryn Mawr, worked on the Karluk One site. A block of six 2 meter squares were excavated in front of the former Karluk fish co-op building, abandoned in 1978. The stratigraphy of the site was confusing at first, however a pattern of successive house floors separated by relatively sterile layers of roof sods emerged. Evidently, reflooring episodes had taken place. Preservation conditions at the site were extraordinary; many artifacts made from wood, and other organic materials were recovered, most of which we had never seen. Once exposed, the wood could begin to dry and crack in an hour or two. At the end of every day, a trash bag full of wooden artifacts, each in its own zip-lock bag, was taken up the hill behind the old village and stored in a freshwater pond. The block was excavated to a depth of about 2 meters, and about 1,000 artifacts were recovered (Jordan and Knecht 1988).

During the 1984 season, I directed excavations and a field school composed of students from Karluk, with the assistance of Mary Loemker. We excavated the first complete Koniag dwelling, and learned details about barabara construction that would be useful in interpreting the features found at Karluk One. The site had been occupied during the 1840's, and yielded historic materials as well as stone artifacts such as oil lamps, ulus and splitting adzes which were evidently in use well into the 19th century (Knecht and Jordan 1985). The Native archaeology students became superb field technicians. With their care and sharp eyes, we recovered more than

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2,000 artifacts, most of which were tiny glass trade beads. More importantly, their families got daily updates on our discoveries, and the interest of the Native community in archaeology grew rapidly. Much of the subsequent progress in archaeological work on Kodiak stems from that involvement.

We finished the project three weeks ahead of schedule; sending most of the crew to work at Karluk One, I opened a trench of four 2 meter squares to get an expanded look at the red ocher level we had encountered at the base of the KAR-31 profile in 1983. There we exposed a portion of an Ocean Bay house floor, which was defined by a densely packed layer of red ocher, along with some stemmed points. A C-14 date taken from a hearth on the floor yielded an uncalibrated date of 4900 ± 100 B.P. (Jordan and Knecht 1988). As Hrdliçka, and later Heizer, had surmised, a long sequence was indeed present in the more than 4 meter of accumulated midden at Karluk. Milan's 1952 excavations had revealed only about the last five of the 50 centuries of the archaeological record at Old Karluk; his test at Karluk One was only thirty meters distant from the 1984-87 excavation block.

By 1985, Kevin Smith had withdrawn from the project, and I inherited the task of analyzing the Karluk One data with some arm twisting from Jordan; "The Russian stuff is easy, let's see what you can do with this pile of whittled sticks". By then, however, we both knew that Karluk One was a key site for viewing the Koniag tradition with much better resolution than had been available on sites with poorer preservation. Furthermore, the long sequence represented at the Old Karluk site would allow us to at last find out what had transpired as the Kachemak tradition developed into the succeeding Koniag tradition. Jordan wrote another proposal to the National Science Foundation, which defined the overall research goals of the Bryn Mawr

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Archaeological Project in terms of the evolution of social complexity among hunter-gatherers:

> "The primary goal of this project is to investigate the nature and development of ranked Eskimo societies ... Expected results will contribute information relevant to a growing body of theoretical work related to the evolution of hunter-gatherer complexity, and provide empirical data on the problem of the origin and development of Eskimo culture. (Jordan 1985: i)

The proposal was funded, and again we set out for Karluk; the goals of the 1985 season were twofold: I was to expand the excavation block at Karluk One, to determine the extent of the house floors encountered in 1983, and to reach the bottom of the site. Jordan would open a large excavation block at Old Karluk. Given the scale of the project, an interdisciplinary approach was needed: Robert 'Beetle Bob' Nelson from Colby College investigated the Pleistocene paleo-ecology through sediment and pollen studies in the Karluk Lagoon area (Nelson and Jordan 1988). Charles Utermohle, a physical anthropologist and archaeologist, would excavate and analyze any human remains we might encounter. Faunal analysis was undertaken by Tom Amorosi, under the direction of Tom McGovern of Hunter College (Amorosi 1986, 1987, 1988). Aron Crowell, then working out of the Smithsonian Institution, accomplished an archaeological survey of Uyak Bay, located just north of Karluk Lagoon, assisted by Philip McCormick and Lanita Collete (Crowell 1986). Frederica de Laguna also joined the crew as an excavator and leading area expert.

Other crew members on the 1985 Karluk project included Philomena Hausler, Kirsten Hoffman, Patrick Saltonstall, Teri Silvio, Andrew Millstein, Amy Steffian, Daniel Albrecht, Dee Crowell, Beth Workmaster, Jennifer

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Krier, Colleen Lazenby, Richard Jordan, Jr. and Lucas Jordan. Of the 14 student crew members on the 1985 project, 8 are now completing advanced degrees in anthropology. Karluk residents working as field technicians on the project included Robin Squartsoff, Darryl Squartsoff, Darin Malutin, Marie Sugak, Jerry Sheean, Edward Charliaga, Brian Panamaroff, and Guy Balluta.

With a crew of this size, we were able to excavate on the scale we needed to; the original block of six 2 meter squares was expanded by another seventeen 2 meter excavation units; and about 107 cubic meters were excavated (Jordan and Knecht 1988: 256). The site seemed to never end. The midden extended to levels well below the current beach. Finally, we were able to reach sterile deposits in a block of six squares at nearly 4.5 meters from where we began. We recovered another 7,000 artifacts, 4,000 of which were mapped, taking point provenience on each piece. Floor boards and features representing 10 housefloors were also documented .

After helping get the Karluk One excavation off to a good start, Jordan took the bulk of the crew to KAR-31, and installed a 4 x 8 meter excavation block. Excavated to sterile soils some four meters below the ground surface, Historic, Koniag, Kachemak, and Ocean Bay materials were recovered; about 4,500 artifacts in all. In addition, a large Koniag village, with more than 125 hospice, was mapped on the mouth of the Karluk River.

Early in the 1986 season, Philip McCormick and I mapped large Koniag villages along the upper Karluk River, downstream from the old portage trail to Larsen Bay, which completed the survey of the Karluk River. Later in the season, with the support of the Kodiak Area Native Association, and relying heavily on numerous favors from various Kodiak residents, we again launched a major excavation. The Crag Point site was chosen, the site of earlier work by Clark and Workman; the field camp was set up on an unused

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house and former crab cannery loaned to us by Pam and Jim Baglien. The object was to learn more about the Kachemak tradition; occupations from that period on Karluk Lagoon were relatively small; most of the middens and hospice there were of Koniag tradition origin. It was also an attempt to obtain more material from the Kachemak-Koniag transitional period. Dumond had suggested that the Karluk sequence may have been unique because of its rich fish resources. Based on Clark's earlier work at the site, Jordan thought that Crag Point would yield more transitional material to prove that the idea of in situ development was in fact island wide.

Aron Crowell and I directed the excavation, with the assistance of Amy Steffian. A block of thirty-three 2 meter units exposed a complete Kachemak house floor, and also yielded some early Ocean Bay materials and the earliest, although in my view suspect, C-14 date for the island; 7790 ± 620 years B.P. (Jordan 1991). Some site survey around the Anton Larsen Bay area was also undertaken.

A total of 22 full-time crew members worked at Crag Point in 1986; others on the project included: Stevie Nangendo, Caryn Libman, Daniel Albrecht, Robin Benson, Beth Workmaster, Pam Innes, Julie Teneyck, Brandt Feuerstein, Robin Squartsoff, Darryl Squartsoff, Philip McCormick, Guy Balluta, Tonia Balluta, Lanita Collette, Charlotte Taylor, John Halperin, Samantha Newman, Susan Wentzel, Ron Rodgers, and Patrick Brackley. Dick Jordan visited the site, and worked with us for about ten days. Numerous volunteer excavators from Kodiak worked for a day or two as opportunities permitted. Material from the 1986 Crag Point excavations has been analyzed by University of Alaska-Fairbanks student Robin Mills, who with the assistance of Amy Steffian and Don Clark, is currently preparing a monograph on the site.

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In the winter of 1986, Jordan again approached the National Science Foundation for funds to continue the work at Karluk One. The object was to excavate another series of housefloors, and to attempt to expand the sample of data from what appeared to be the Kachemak-Koniag transitional tradition represented by the lower levels of the site. Funding in hand, a large field crew again converged on the village of Karluk in 1987. As in past summers we were joined by a number of Native excavators, some of whom, beginning their third consecutive summer of field work, had become skilled field technicians.

By this time the Kodiak Area Native Association was beginning to make plans to build a museum to house the Karluk One assemblage; as the Makah tribe had done with the large assemblage recovered from Ozette, a prehistoric wet site in Washington State. Gordon Pullar, and a Culture Heritage Committee composed of Native leaders and elders visited museums around the country, and decided to establish cultural heritage preservation programs within the Native Association. Accordingly, I was hired in the spring of 1987 as a coordinator for KANA's cultural preservation effort. After completing cataloging and preliminary analysis of the 1983-1985 Karluk One collections, I moved to Kodiak.

At Karluk One, we opened a large excavation block, 12 x 12 meters in size adjacent to the northern side of the earlier excavations. This necessitated breaking through a concrete floor, which was all that remained of the former Karluk Co-op building. Long hours of work with sledge hammers were required to expose the original ground surface. After a month of field work, I had to return to KANA; Jordan and the crew remained and excavated several housefloors, again representing reflooring episodes, from a barabara which was next to the one excavated by us in 1984 and 1985. It was clear that the

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artifact contents of the Koniag houses were essentially the same, in that changes in the assemblages were occurring throughout the site, and represented more than the long-term history of a single household. Some spectacular pieces of prehistoric wooden artwork, were recovered, along with the plethora of material culture that we had come to expect from the site. Unfortunately, none of the squares were excavated to a depth of more than 2.5 meters; and only a limited amount of material was recovered from the earlier levels of the site (Jordan; Karluk field notes: 1987).

Another significant project was undertaken during the 1987 field season. Amy Steffian, a veteran of several field seasons with the Bryn Mawr Archaeological Project, and now a graduate student at the University of Michigan, directed excavations at the Uyak site. There were intact portions of the site that Hrdliçka had somehow missed. Steffian's crew in Larsen Bay included Sofia Chya, Chris Donta, Natalie Harrison, Kirsten Hoffman, Hitomi Hongo, Pam Innes, Alison Kadlec, Philip Kugzruk, Kusimba Makokha, Moses Malutin, Jr., Philip McCormick, Paula Molloy, Nicole Panamaroff, Patrick Saltonstall, Kirstin Williams, and Beth Workmaster.

No fewer than 16 late Kachemak houses were uncovered on the east side of the site. C-14 dates from these structures clustered between 1,130 ± 70 and 1,320 ± 70 B.P. (Steffian 1992: 18). Kachemak tradition houses proved to resemble each other in terms of size and floor plan, in contrast to the numerous floor plans and size variability we had observed in Koniag house pits (Steffian 1992 b). Some human skeletal material was recovered although not nearly in the quantity found by Hrdliçka. Harris lines were observed in human remains from both the Uyak and Crag point sites; suggesting that nutritional stress may have occasionally been experienced by Kachemak peoples (Steffian and Simon 1993). A fine assemblage of late Kachemak

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artifacts was also obtained; 4,400 artifacts were recovered from the roughly 400 cubic meters excavated at the Uyak site in 1987 and 1988: Hrdliçka had recovered 4,600 pieces in 8,500 cubic meters (Steffian 1992 a, 1992 b).

During 1987, another project, under the auspices of the Bureau of Indian Affairs, also took place in the Larsen Bay area. At KOD-29, a prehistoric site with both Kachemak and Koniag components, an excavation trench was placed in a Koniag structure, and penetrated into the Kachemak levels below; about 200 artifacts were recovered (Crozier 1989).

1987 was the last of five productive field seasons undertaken by the Bryn Mawr archaeological project; in 1988 the administration of Bryn Mawr College closed the graduate program in Anthropology. Dick Jordan moved on what he hoped were the greener pastures of the University of Alaska Fairbanks, which was in the process of establishing a PhD program in anthropology (Fitzhugh 1994). The Kodiak Area Native Association, however continued to support fieldwork in cooperation with other universities and museums. In 1988, KANA, with support from the Alaska Humanities Forum, sponsored the first Kodiak Cultural Heritage Conference, attracting 40 speakers from 8 countries. KANA also sponsored a second field season for Steffian's work at the Uyak site.

In the spring of 1988, Philomena Knecht and I were approached by Marie Rice, who was curious about midden exposed on her property by the recent installation of a power line. To our surprise the site (KOD-363), was located some distance from the current shore line. We collected a number of late Ocean Bay ground slate points from the surface. Exposed shell middens suggested that there was a Kachemak age occupation, probably covering some earlier Ocean Bay material, and no faunal material in that quantity had been seen in an Ocean Bay site before. A graduate student at Harvard University,

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Philomena was looking for a Kachemak age midden for a dissertation project; following up on her recent stable isotope research using some samples from Hrdliçka's assemblage (P. Knecht 1987).

Fully expecting a Kachemak tradition site, perhaps a meter or two deep, we opened a 2 x 2 meter test unit. Instead we found first late Ocean Bay, then early Ocean Bay materials, in a square that finally bottomed out nearly four meters below the ground surface. Climbing out of the square that had come to resemble a mine shaft we found that our knees were stained with the bright red ocher of ancient housefloors. Vera Griffin and Kusimba Makokha also helped excavate the test unit. Most exciting was the bone preservation on the site; harpoon heads, needles, wedges, throwing board parts, and faunal remains were found. The finely stratified site held the record of 2,000 years of continuous occupation spanning the entire known Ocean Bay period. The basal C-14 date was 6080 ± 90 B.P., the terminal date was around 3850 ± 90 B.P. (P. Knecht 1993).

That summer, Philomena directed excavation at KOD-363 of a block of six more 2 meter units adjacent to the original test. On her crew that summer were Donald Clark, back in the Kodiak trenches after an absence of 16 years, Ron Rodgers, Susan Wentzel, K.D. Wentzel, Philip McCormick, Richard Knecht, Sr., Hank Pennington, and Albert Joseph. William Laughlin, then celebrating the 50th anniversary of his first field work on Kodiak, also joined the crew for a time.

Early in the spring of 1989, I opened a 6 x 6 meter block at the Blisky I site, an early Kachemak site on Near Island, in conjunction with an archaeology class I was teaching at Kodiak College. The preceding winter had been unusually severe, and we found that the ground was still frozen and we were unable to accomplish much before the end of the term. Complicating

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matters still further was the Exxon-Valdez Oil Spill in late March of that year, which affected virtually all the coasts of the Alutiiq Culture area. At least 28 archaeologists with coastal experience were hired by Exxon. Site surveys by helicopter and boat were undertaken in an effort to minimize further damage to exposed middens by clean-up crews. By summer's end, the number of recorded archaeological sites in the Alutiiq area had doubled (Mobley, et al 1989, Erlandson et. al 1992).

Chris Donta, then a graduate student at Bryn Mawr, returned to the Monashka Bay site, a prehistoric village site near the city of Kodiak, first tested by Clark in 1961 and 1962. Donta installed a block of seven 2 meter excavation units, and recovered 685 artifacts from the late Kachemak and Koniag deposits, 92% of which were lithics (Donta 1993: 333). The assemblage of 147 incised pebbles augmented Donta's research interests in this artifact (Donta 1988, 1993).

Philomena Knecht and Donald Clark continued excavations at KOD-363 in the summer of 1989, assisted by Jenny Factor, Allana Tousaignant, Arthur Mason, and other volunteers from the area. A portion of a late Ocean Bay dwelling was exposed, indicating that semi-subterranean houses were in use by at least 4,000 years B.P. In 1990 Philomena was joined by Karen Workman in the final year of excavation on the site.

In 1990 KANA, the University of California-Berkeley, and the Sakhalin Regional Museum, USSR, conducted a joint research project at Three Saints Bay, directed by Aron Crowell, with the assistance of Valery Shubin and myself. More than 40 field school students from Berkeley and the Native community on Kodiak participated, as well as five Russian archaeologists from Sakhalin Island. By summer's end more than 100 people had visited the site at one time or another. A large excavation block on the site exposed

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the thin midden of historic materials left by the first Russian settlement on the site beginning in 1784.

In the spring of 1990, Dick Jordan and I made a brief investigation of an eroding midden site on the Geese Islands, with the assistance of Gary Aronsen. I had seen Ocean Bay type harpoon heads in a private assemblage reportedly from this site and Dick was interested in possibly fielding a large project here, or on Tugidak Island. We drew a profile and took a carbon sample deep inside the midden, which yielded only a Koniag tradition date. It was to be Jordan's last fieldwork on Kodiak Island.

In the fall of 1991, I went to UAF to work on artifact descriptions for my dissertation on Karluk One. I took up residence at Dick Jordan's house, and he was able to review the preliminary analysis. Shortly after I returned to Kodiak, Dick Jordan died suddenly of a heart attack, at the age of 43. His students and colleagues were all hit hard (Kaplan 1991, Moss and Erlandson 1992, Fitzhugh 1994). Busy with administrative chores as department chair at UAF, Jordan had never had a chance to process the large 1987 assemblage from Karluk One. We had planned to combine the present dissertation on the 1983-85 seasons with the 1987 analysis to produce a site monograph. Only a small amount of the 1987 assemblage had been catalogued; the conservation of the material was also incomplete. In 1992 the entire Karluk assemblage and documentation were moved to the Alutiiq Culture Center in Kodiak, where cataloguing of the 1987 material is proceeding under my direction.

In 1991, Crowell returned to Three Saints Bay with a small crew and excavated a historic dwelling probably occupied by Russians and Native conscripts; results of the excavation are now being collated by Crowell as a doctoral dissertation project.

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In the summer of 1991, with funds acquired through some local archaeological contract work on Spruce Cape and Woody Island (Knecht 1991a, 1991b), I was able to take three Alutiiq college students to the Soviet Union. They included Sven Haakanson, Cheryl Heitman, and Vicki Nelson. Also with our party was Louise Jackson, of the University of British Columbia. We joined an excavation directed by Valery Shubin, who had spent the last 12 field seasons excavating a site on Urup Island, in the Kurile Island chain. The site on Aleutka Bay had been occupied by Kodiak and Aleutian Chain Natives, brought there by the Russian-American Company in the early 19th century to hunt for sea otters. An Alaska Native village thus flourished on the Kuriles for the better part of a century. We uncovered the remains of barabara pits and artifacts identical to those we knew from the Kodiak Archipelago.

Back on Kodiak, Philip McCormick and I surveyed sites along Chiniak Bay along the Kodiak road system, and recorded twenty new sites from all time periods. Geologists Gary Carver and Lou Gilpin were in the first year of what became a long-term study of the paleo-seismicity of the Kodiak archipelago (Carver and Gilpin 1993). I joined the project as an archaeological consultant. The chronology of archaeological sites was used to supplement data from sediment cores. Carver and Gilpin developed a model of long term shoreline change that became important to understanding site location in the region.

During a helicopter survey of ancient marine terraces on Sitkalidak, we happened to fly over a sea stack, just off shore. It was covered with house pits, and I realized that it might well represent the location described by Shelikhof in his account of a Russian attack on such a rock in 1784. William Laughlin was then visiting Kodiak, and I invited him, Joe Kelly, Fred Clark,

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and Sven Haakanson to join in scaling the rock and confirming the site location. We were able to land near the site with a float planes. We then waded out to the site on the spit which linked it to Sitkalidak, which was already awash with the rising tide. William Laughlin had forgotten to bring rubber boots; he tied his pants and shoes around his neck and waded through the 400 yards of surf, which was sometimes waist deep. He then joined us in scaling the sheer 35 feet of the cliff face with a rope to reach the site. The fog then settled in; by 3 a.m. we were able to again wade to shore, where a fishing boat sent by worried friends in Old Harbor took us back to the village.

In July of 1992, with support from the Old Harbor Native Corporation, I directed excavations on the refuge rock (KOD-450), assisted by Sven Haakanson. Others on the crew that year were Louise Jackson, Roger Gonzales, Putter Brown, Shawn Dickson, Alanna Tousaignant, and Jerry Tousaignant; geologists Gary Carver and Lou Gilpin also operated out of the camp. We mapped the remains of at least 26 Koniag houses on top of the refuge rock, along with auxiliary structures, and excavated one complete house. This was the first excavation at a Koniag refuge rock, and also provided data on Shelikhov's attack which ended Koniag independence and marked the beginning of the Russian presence on the island. About 1,200 artifacts were recovered from the site, and a well preserved faunal assemblage, all dating from August of 1784.

Other work undertaken during the 1992 field season was a survey of the upper reaches of the Ayakulik River, on the southern end of Kodiak Island supported by Akhiok-Kaguyak Corporation. Hrdliçka had been told by local Natives that house pits were common there, but had never made the trip up river (Hrdliçka 1944). Fish and Wildlife Service surveys were limited to the mouth of the Ayakulik. With the assistance of Sven Haakanson, now

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a graduate student at Harvard University, I mapped about 150 Koniag tradition hospice, all located seven miles or more from the sea. Like the Karluk River system, virtually every piece of well drained ground next to the river was lined with hospice. Another 50-100 Koniag houses remain to be mapped on Red Lake, at the source of the Ayakulik. No Kachemak tradition houses or artifacts were encountered any where on the Ayakulik system.

A chance also came to investigate the Alitak petroglyphs and survey Russian Harbor, thanks to support by the Akhiok-Kaguyak Corporation. I was joined by Sven Haakanson, Louise Jackson, and Ivan Aseyev, a petroglyph specialist from the Institute of Ethnography in Magadan. We found five discrete groups of petroglyphs on Alitak; prehistoric village sites were located adjacent to petroglyphs on both sides of the cape. Some of the design motifs on the petroglyphs are reminiscent of those seen on late Kachemak and Koniag artifacts and ethnographic pieces.

We also landed at Russian Harbor, scene of the first recorded contact between Russians and Alutiiq people in 1763 (Glotov 1763). We located and mapped the four barabara's described in the 1763 account. Testing revealed early historic materials in one of the barabara's indicating that at least one party of Russian explorers may have used it for shelter.

In the earlier part of the field season of 1992, Sven Haakanson, Philip McCormick, and I spent several days testing a large prehistoric midden at Malina Creek, on Afognak Island, with the support of the Afognak Native Corporation and Afognak Joint Venture, Inc. During the Exxon surveys of 1989, Chris Wooley and I had briefly stopped at the site; an eroded midden exposure revealed that wood was preserved, resembling Karluk One. Clay lined pits, often associated with Kachemak tradition sites, could be seen near the ground surface of a site that was at least three meters deep. The 1992 test

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found that the site consisted of a mound at least 6 meters deep, surrounded by a larger, shallower deposit several acres in size. We mapped late historic hospice on the site surface. C-14 results were disappointing in that the best preserved wood was not of Kachemak age; but only dated to 500 ± 50 B.P. Nevertheless, it presented an opportunity to obtain a Koniag assemblage comparable to that from Karluk One. Furthermore, the site was being heavily eroded and was in danger of being lost.

In 1993, with the support of Afognak Joint Venture, I directed a large scale excavation at Malina Creek. A preliminary visit that spring by helicopter nearly ended this tradition of field research when the engine failed and we crashed into the trees just south of Malina Bay, but the project was able to proceed as scheduled nonetheless. On the crew at Malina Creek were Sven Haakanson, Shawn Dickson, Kathryn Woodhouse-Beyer, Deas Manning, Daniel Brown, Allison Brown, Rodger Gonzales, Mark Rusk, Cheryl Meunier, Brian Davis, and Mike Pozniak. An excavation block 16 x 20 meters in size was installed on the north end of the midden mound; six squares were excavated to a depth of nearly 6 meters before sterile glacial till was encountered. Historic, Koniag, Kachemak, and Late Ocean Bay deposits were all present on the site; providing important details on the transitions between major cultural phases.

The other major project of the 1993 field season was a site survey of Sitkalidak Island, directed by Ben Fitzhugh, a graduate student at the University of Michigan. The project, supported by the National Science Foundation and the Old Harbor Native Corporation, resulted in the recording of numerous new sites (Fitzhugh 1993). The survey was scheduled to resume during the 1994 season.

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Today, the process of archaeological field research has evolved into a research effort undertaken by the Alutiiq people themselves, so that they, their children, and non-Natives would better understand their long-term history and cultural identity. The Alutiiq now plan, fund, and staff nearly all aspects of the field and laboratory research. A regional museum and archaeological research center is now under construction by the Kodiak Area Native Association in the city of Kodiak.

The Rise of Current Theories on the Origins of Koniag Culture

There are two recurrent themes throughout the anthropological literature on the Kodiak prehistory, and the Alutiiq culture. One is the notion that Eskimo speaking cultures must be intrusive in the north Pacific; that the Alutiiq are relative late comers from an ancient Arctic homeland. Perhaps related to this notion is a persistent reluctance to attribute any of the innovations and developments that have come to define Eskimo culture to Kodiak Island.

The short shrift given to the Alutiiq is curious for several reasons. The Alutiiq culture area is part of the environmental continuum which characterizes the region settled by all Eskimo speakers; including the Arctic tree line, an ancient boundary between Eskimo and Indians territories (Stager and McSkimming 1984: 27). The Kodiak Archipelago possesses both the most forgiving climate and most productive marine ecosystem within this continuum. Not surprisingly, it has also become clear that the Kodiak Archipelago had the largest population densities in the entire Eskimo universe. The known time depth of the human prehistory of the Alutiiq culture area, along with the Aleutian Islands, is so far greater than that recorded on more northern coasts.

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Despite this, prehistorians have traditionally pointed their directional arrows of linguistic and cultural influences toward Kodiak Island from the Bering Sea, and to a lesser extent, from the Northwest Coast. It is obvious that the sea-going cultures of south Alaska were in constant contact in a variety of contexts; perhaps best summarized as 'trading and raiding'. Information and people moved over long distances; people learned things from each other. New technologies that anthropologists like to call 'traits' no doubt became adopted if they were appropriate to the problem at hand. One could also reasonably expect that as many new ideas would flow one way as another. One variable in this process might be population size; a larger population has a statistically greater chance of coming up with new technologies and ideas. As a population center on the North Pacific, the Natives on the Kodiak archipelago must have developed numerous innovations that came to be adopted by their neighbors. If one is to believe much of the literature, however, nearly all the elements that came to comprise the historically known Koniag culture were borrowed from elsewhere.

This state of affairs is not due to some deep seated prejudice against the Alutiiq, but was originally rooted in understandable cultural and geographical biases. The image that came to represent the quintessential Eskimo in the western mind was developed from eastern Arctic, and later, from contact with Bering Sea Eskimos. Alutiiq culture, battered by years of Russian, then American contact, presented a less attractive study area than the Bering Sea or Northwest Coast. Anthropologists interested in salvage ethnography passed the area by, and except for some work in Prince William Sound (Birket-Smith 1953), made no attempt at traditional ethnography. Eventually the notion of an Eskimo society in south Alaska became somewhat anomalous in our geo-

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cultural world view, and it was easy to view Alutiiq culture as a later, intrusive society or as an amalgam of borrowed traits.

Some additional bias on the nature of geographical boundaries may also have contributed to this impression. The Alutiiq culture area is located at one end of an Eskimo speaking world that extends to the eastern coast of Greenland. That it should represent a population center, or cultural hearth seems counter-intuitive at first glance.

New data acquired from recent excavations, and re-analysis of Hrdliçka's physical anthropological evidence, is steadily eroding many of these time honored preconceptions. There exists some inertia, however, because of the sheer mass of accumulated literature. Hrdliçka's version of Koniag genesis was based on a sudden, violent conquest and subsequent population replacement of pre-Koniag, now recognized as Kachemak tradition peoples (1944). This scenario found no takers among subsequent theorists; there was just too much continuity evident within the artifact assemblage. Instead, the rise of Koniag culture was viewed as a somewhat more gradual, but still externally derived. In his reanalysis of the Uyak site, Heizer though that "developmental changes are due in part to influences diffusing from the mainland" (1956:10). Margaret Lantis, in noting links between Koniag and Yupik ceremonialism, decided that "The only explanation for this is that the Koniags were intrusive on the Pacific Coast" (1947:118). She suggested that the Koniag had been pushed south by the Malemiut, who had in turn been pushed out by a hypothetical westward migration of Thule people (1947:119).

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The Archaeological Record

The Thule migration idea was taken up by Cressman and Dumond (1962; Clark 1974:170), who noted that materials from the Brooks River Camp phase on the Alaska Peninsula, dating from 1200 A.D. were similar to those from the Koniag phase. They proposed that the entire Alutiiq culture area was "culturally- or at least linguistically, swamped" by the large influx of population moving south across the Alaska Peninsula. The proposed direction of these influences was based on a preconceived idea of where the proper cultural hearth of Eskimo peoples should be located:

> All in all, the evidence indicates clearly that the center of gravity of Eskimoan is to the north around Bering Strait...Because I knew and know of no model of language capture that does not imply a very substantial influx of population, I also concluded in the 1960's and I conclude now, that at about A.D. 1000 there was a migration of people from the Bering Sea toward the Kodiak region (Dumond 1988: 386).

Dumond's most recent reconstruction still finds population movement a reasonable scenario, however, he admits that this did not necessarily completely replace the indigenous population given archaeological evidence for continuity (Dumond 1993: 15). The language issue remains the mainstay of his argument for a northern intrusion.

In *Koniag Prehistory* (1974), Clark listed the artifact traits observed in the Koniag tradition assemblages from the Rolling Bay and Kiavak sites, and concluded that:

> The list of elements added, modified from earlier forms, or lost in the make-up of the Koniag tradition is very extensive...Since the end of the Kachemak tradition and the beginning of the Koniag tradition are poorly represented in field investigations there may in fact be a qualitative gap in the sequence creating a spurious

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> contrast. In my estimation, however, the magnitude of change is so great, and some of the traits so obviously intrusive, that special historical events have to be invoked even though the Kachemak tradition may have been in transition to the Koniag tradition during the centuries between 900 A.D. and 1200 (1974:171).

In later work, Clark envisioned small groups of incoming settlers moving to Kodiak from Cook Inlet and points east during the years 1100-1200, introducing splitting adzes, sweat bathing, petroglyphs, and incised pebbles to the Archipelago. From the Alaska Peninsula, similar immigrants introduced ceramics to form the ceramic facies of Koniag culture on the southern half of the archipelago (1984: 147-148). In Clark's view, Koniag prehistory may have been a trend among affiliated local groups, each with its own developmental path; sometimes including sharp ethnic cleavages (1988: 221-222).

Richard Jordan and I, based on our preliminary review of the archaeological record at Karluk One argued that the Koniag tradition was essentially an *in situ* development, arising out of the Kachemak and later transitional Koniag tradition sometime around 1200 A.D., with accelerated changes occurring only after 1400 A.D. (Jordan and Knecht 1988). We could find no evidence for an abrupt break in the archaeological record such as observed in the Eastern Arctic, where a Thule migration has been well documented around 1,000 A.D. Instead, changes in artifacts took place at different times, reflecting a gradual shift between Kachemak and transitional Koniag tradition.

Physical Anthropology and Linguistic Data on Koniag Origins

Although the archaeological record from Karluk suggested continuity, there remained two bodies of evidence that suggested otherwise; Hrdliçka's

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original contention that skeletal evidence showed two diverse populations, and the continuing debate on linguistics.

The question of Kachemak-Koniag continuity came under intense scrutiny from 1990-91, when the Larsen Bay Tribal Council began legal action against the Smithsonian Institution in an effort to have the human remains taken from the village by Hrdliçka returned for reburial. The Smithsonian contested Larsen Bay's claim on the basis that the largely Kachemak assemblage was not ancestral to the modern Alutiiq claimants. The Smithsonian, and Native American Rights Fund, representing Larsen Bay, commissioned evaluations of the data by archaeologists, physical anthropologists, and Native area experts (Dumond 1990, P. Knecht 1990, Pullar and P. Knecht 1990, Scott 1990, 1992). The archaeological arguments for continuity were along the lines cited above; new evidence, however was generated by data from physical anthropology (Scott 1992), and linguistics (P. Knecht 1990, Leer 1991).

Christy Turner (1988) analyzed a set of dental traits on the Uyak site remains, and concluded on dental grounds, that the Kachemak peoples were not Yupik speaking Eskimos, but Na-Dene speaking Indians. Richard Scott was commissioned by the Smithsonian to study the Uyak skeletons; confident that his findings would support their contention that the Kachemak people were not ancestral to the Koniag and their descendants. Scott began by addressing the issue raised by Turner's analysis. He increased the sample size by examining the entire Uyak assemblage, and further widened the data base by making 21 different observations on root and crown traits (Scott 1992:156).

Scott found no significant dental dichotomy between the pre-Koniag and Koniag samples; and found that the Uyak samples were most closely related to Eskimos and Indians. He also reviewed genetic studies:

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"Genetically, living Kodiak Islanders share their closest affinities with Aleuts, Eskimos, and the Chuckchi, while only distant ties link them to Athapaskans, Tlingits, Algonquians, or Northwest Coast Indians "(1992:158). Non-metric cranial traits and post cranial characteristics of the Uyak site skeletons also indicated Kachemak-Koniag continuity. Furthermore, at least some of the differences in cranial measurements that formed the basis for Hrdliçka's original conclusions could be reasonably attributed to cradleboard deformation. Scott noted that Hrdliçka had compared the Uyak material to the relatively long headed skulls from high Arctic peoples, and suggested that if Hrdliçka had examined his own data by region, that he would have concurred that the Uyak skulls do not differ significantly from other Yupik Eskimo populations (1992: 161).

Dumond maintains that the best evidence for a migration by Bering Sea peoples is linguistic (1990:54); which for an archaeologist represents a significant leap of faith. Dumond has cited recent work by Jeff Leer (1990), a linguist at the Alaska Native Language Center at UAF. Philomena Knecht, who like Leer is conversant in Alutiiq, analyzed the linguistic evidence in some detail (1990: 10-12). Leer suggested that there had originally been a linguistic continuum in south Alaska, which he called the Northern Northwest Coast language continuum (NNWC). Languages within this continuum are diverse, but share one characteristic; when referring to a third person, they included cross-references to that person on virtually every word in the sentence (Leer 1990; P. Knecht 1990). This feature appears in Aleut, Eyak, Haida, and Tlingit, but not in Alutiiq.

Leer has also indicated, however, that it is entirely possible that Alutiiq could represent a dialect which derives from an earlier Yupik language; one that could have been spoken on Kodiak long before the development of

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Alutiiq (P. Knecht: 11). Modern Alutiiq may have developed from Central Yupik within the last several centuries, particularly as the contact period displaced language communities on the Alaska Peninsula and isolated Alutiiq speakers from other Yupik speakers (Krauss 1985, Leer 1985, Knecht 1990). As Philomena Knecht also pointed out, if Kodiak truly was overwhelmed by newcomers, it is strange indeed that no trace of an earlier language exists in modern Alutiiq (1990).

The Research Question

As stated earlier in the introduction, this study is aimed squarely at resolving the long-standing issue of Kachemak-Koniag cultural continuity. The archaeological record from Karluk One, and elsewhere on the Kodiak Archipelago shows that the various elements that define the Koniag tradition became adopted over the course of several centuries; from 1200 to 1400 A.D. A number of these changes occurred in the course of adapting to the onset of climatic cooling after 1400, A.D., however it is also clear that innovation and changes in Koniag material culture were steadily occurring until the advent of Russian contact in the late 18th century.

As Donald Clark has recently noted, that the implications of an *in situ* model for Koniag origins extend beyond the local prehistoric sequence (1993). If models suggesting migrations or similar discontinuity do not apply, then larger regional prehistoric sequences must be reconsidered:

> Difficulties start with the fact that if we assume linked ethnicity (language) and culture and Koniag-Kachemak continuity, this relationship must extend back to the beginning of the Kachemak tradition, or about 3400 years ago (uncalibrated). For many, early Eskimo (Norton and related Choris), to which Kachemak show some crossties,

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> is seen as having developed out of the Arctic Small Tool tradition. However, there is no relationship between the Kachemak tradition and the ASTt (Denbigh Flint Complex). It is difficult to see two diverse entities, Denbigh ASTt and the Kachemak tradition, as a single ancestral Eskimo culture. There rests a contest between the two, and the very origins of Eskimos are at stake in this model (1993:10).

The other object of this dissertation is to examine the nature of culture change. Previous discussions of population movements and diffusion, and functionalist explanations have been put forward to explain the configuration of cultures on the North Pacific, however none of these attempt to explain the timing and rate of culture change over time. The environment was a catalyst for culture change; however environmental factors by themselves do not cause cultural evolution.

Accordingly, I will move beyond the local cultural historical framework and view the prehistoric sequence against the perspective of a developing and interdisciplinary body of complex systems theory. Cultural evolution can be effectively modeled in terms of an open dynamic system involving developmental feedback between human culture and the opportunities and constraints of the natural environment. As an example of an open dynamic system, human culture is demonstrably similar to other complex systems in nature. The archaeological record from Karluk One has effectively demonstrated that cultural development most likely occurred *in situ* on the Kodiak Archipelago. It is now incumbent upon us as anthropologists to show how and why those changes occurred.

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Chapter 2: Theoretical Approaches to Cultural Evolution

Introduction

Over the course of the history of anthropological research on the Kodiak Archipelago, reconstructions of the prehistoric sequence have usually focused upon attribute analysis of artifacts, and the distribution of various sets of cultural traits in south Alaska. Artifact types are more or less directly linked to a given group of people, and a change in an assemblage has been taken to mean that a new group of people have arrived. Explanations of culture change has most often been relegated to diffusion, migration or a combination of these. In 1988 Dick Jordan and I proposed that late prehistoric culture change on Kodiak occurred primarily in situ, while not denying diffusion through a North Pacific interaction sphere (Jordan and Knecht 1988). At first glance this would not seem to be a particularly radical idea, however it remains controversial (Dumond 1994, Workman 1994). Viewed against the background of anthropological theory, the Kodiak debate is remarkably out of date.

Workers dealing with other areas of the North Pacific, such as the Northwest Coast, have moved well beyond migration debates to consider what socioeconomic factors are involved in the evolution of ranked complex hunter-gatherer societies. The object of this chapter is to place a model of in situ cultural change on the Kodiak Archipelago into a larger theoretical context of cultural evolution developed by anthropologists as well as theory developed by other disciplines concerned with understanding the dynamics of change.

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Explaining Social Complexity on the Northwest Coast

For anthropologists, the Indian societies of the Northwest Coast have become known as classic examples of complex hunter-gatherers. When compared to other hunter-gatherers they seemed exceptional, even anomalous, in terms of social organization, sedentism, and material culture, while groups like the !Ikung San, living in small egalitarian and mobile bands were considered a normative model for a hunter-gatherer society (Lee and Devore 1966). In recent decades it has become clear that most hunter-gatherers do not fit neatly into these developmental pigeonholes, and anthropologists have begun to recast their assumptions (Arnold 1995). More global evolutionary classifications continue to be developed (Johnson and Earle 1987). We are now often reminded that other complex hunter gatherer cultures existed elsewhere among the ethnically diverse, but developmentally similar groups along the Pacific Rim (Fitzhugh and Crowell 1988, Jordan 1988).

Research in the Northwest Coast began with Franz Boas in 1886, who helped define American anthropology and taught many of the first generation of scholars within the discipiine (Suttles and Jonaitis 1990). Because of the history of research, Northwest Coast specialists have so far produced the largest body of theory on the subject of the rise of complexity among non-agrarian peoples. Within the larger discipline, cultural evolution has been frequently viewed as a product of the interaction between social structures and economy. For example Service (1966) emphasized social organization, Fried (1967) emphasized social control. Northwest Coast theorists have tended to follow these patterns in a struggle to identify prime

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movers in a linear evolutionary process predicated upon cause and effect relationships.

The productivity of the Northwest Coast environment and the abundance of salmon is central to many studies, which have been most recently summarized by Ames (1994). Suttles (1968) made a valuable contribution by emphasizing variability of salmon abundance. Salmon runs are highly variable in space and time. Social organization and settlement patterns may have been developed as a means of coping with this abundant, but variable resource. Fladmark (1975) saw the evolution of complexity made possible by the advent of large salmon runs as streams stabilized in the post glacial period around 5,000 years B.P. The regularity and abundance of the resource led to sedentary settlement patterns. Schalk (1977) thought that economic intensification of salmon fishing was a product of increased human populations and innovations in storage methods. Social stratification grew out of a need to coordinate the harvest, processing and distribution of salmon. Matson (1983) also agreed that the intensification of salmon resources were a key to social inequality on the Northwest Coast. Places where resources occurred, such as a particular stretch of salmon stream, were owned and controlled by various social groups. Differences in productivity of these resource patches naturally led to inequality between their owners.

In recent years some researchers have moved away from adaptationist, environmental explanations toward Marxist models. Coupland (1985) put a Marxist spin on Matson's conclusions, contending that elites developed as local groups fought for control of circumscribed resources. Maschner (1992) feels that social hierarchies developed from the actions of individuals striving for prestige and reproductive advantage. He draws inspiration from Shalin's account of "hierarchic strivings' of higher primates (Shalin 1959),

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finding that the introduction of the bow and arrow forced small, independent groups into large, multi-lineage villages giving ambitious individuals the opportunity to assert political power.

Problems with Current Anthropological Approaches

The Kodiak Archipelago has many features in common with the Northwest Coast; a circumscribed, abundant marine resource base, salmon runs, and a sedentary, large, and ranked indigenous society at the time of European contact. Few models of cultural evolution on the Northwest Coast have any utility for the Kodiak Archipelago. One problem of Kodiak is that an evolutionary model must necessarily have some time depth; evolution after all, is a process of change over time. Archaeological investigations of the Northwest Coast are spatially and chronologically spotty (Ames 1994:210). Northwest Coast villages existed on a large scale, and in a ranked society excavated data from an isolated house or two may not be representative of an entire village. Unfortunately excavations are rarely on a sufficient scale to get this type of data. Therefore we do not see the needed interplay between data and theory.

Most ethnographic accounts of Northwest Coast culture are uncritically drawn from an 18th and 19th century ethnographic present. There is every reason to believe that the societal stresses common in contact situations distorted Northwest Coast cultures as it did many others. Wealth accumulated during the boom years of the fur trade may have become concentrated as the population declined with the onset of European disease. Lavish potlatching and the spectacular artwork that the Northwest Coast is famous for may have been at least partially a product of a relatively short lived fluorescence.

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A more fundamental problem with the Northwest Coast models is shared by many accounts of culture change which sidestep the complexity of the subject matter in an attempt to develop a linear cause and effect equation for cultural evolution. We can readily understand the motive, but the unintended result is reductionist as repeated attempts are made to identify a single prime mover whether it is salmon, inequality, or the bow and arrow. Using a large and detailed body of ethnographic data, Northwest Coast scholars have shown how forms of social organization and ritual function among complex hunter-gatherers. Function, however, is not equivalent to explanation. We have been shown how different social roles, ritual, and technology function in an economy, but not how such a complex system is actually formed. As we will see in the description of the Kodiak sequence, cultural complexity can arise in a bewilderingly brief period of time. How do all of the myriad functional components of a culture fall into place? There are no blueprints; there are no system architects among members of a culture who go about their business only vaguely aware of their role in the cultural system. Although we have gained a sense of what ingredients are common to complex cultures we have not been able to explain just how those factors come together to form the whole.

Goals in Archaeology

Understanding and control of the physical world through the scientific method was an important underpinning of the industrial revolution. The economically pragmatic nature of scientific work meant that so called 'hard' science and its practitioners gained a great deal of status in industrial economies. Social scientists, by contrast, are unable to easily manipulate their subject matter to quickly produce usable results. Nevertheless social scientists

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in anthropology, and archaeologists in particular, have for the past century struggled to produce a set of lawlike principles for human history.

Most evolutionary theorists see human behavior as shaped by non-human constraints and have attempted to identify prime movers. Neo-evolutionists, such as Leslie White, Julian Steward, tended to be deterministic in viewing change as something forced upon society by external ecological, technological, or demographic forces. Human beings were viewed as naturally conservative and adapted only when forced to by various circumstances. This differed from 19th century evolutionism which allowed for individual creativity to influence events.

The 'new archaeology' movement beginning in the 1960s was positivist in that it viewed explanation and prediction as equivalent (Trigger 1989). New archaeology rejected a primary focus on chronology, description and a preoccupation with accidental occurrences in favor of regularities which could be expressed as laws. These laws of human behavior would be as statable, testable, and as eternal as laws governing the physical universe. All that was needed was for archaeology to fully embrace the same scientific methods and approach used by the natural sciences. Binford assured us that culture would yield its secrets like any other phenomena:

> "Culture is multivariate, and its operation is to be understood in terms of many causally related variables which may function independently or in varying combinations. It is our task to isolate these causative factors and seek regular, statable, and predictable relationships between them (1965:205).

Despite noble intentions, no laws of human behavior, at least in the form of a linear formula, have been discovered in the thirty years since new archaeology came on the scene. In fact new archaeology more often found itself dressing trivial observations under layers of verbal formalism.

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The Role of Time

A Newtonian world view discounts the importance of time in favor of eternally functioning natural laws governed by a regular and knowable clockwork of the universe. In an effort to become more scientific, time was denigrated by new archaeology which was engaged in the Quixotic search for laws of human behavior, which like other laws governing the natural world, were timeless. For the new school, archaeologists interested in hypothesizing and testing laws of human behavior were nomothetic, archaeologists interested in pursuing culture history were ideographic (Watson et al 1971). In many departments of anthropology the pursuit of culture history was considered somehow plebeian in contrast to the loftier calling of theoretical archaeology.

Removing the time factor from consideration when constructing laws of human cultural behavior is unwise, for the course of human history is anything but uniformitarian in nature. Although humans had evolved to essentially modern form by at least 100,000 years ago, it is only since the end of the last Ice Age that what we know as cultural complexity evolved. In prehistoric chronologies it is the less complex cultures that most often have a greater time depth, and slower rates of change than their more complex descendants. Culture has evolved to the point that the level of integration and complexity on all levels of a rapidly forming global society is unprecedented. It is clear that cultural change, like other forms of evolution, is both asymmetric and unidirectional in time.

History is now used in other sciences; physics, astronomy, natural history, geology. "The incorporation of time into physics thus appears as the last stage of a progressive reinsertion of history into the natural and social

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sciences" (Prigogine and Stengers 1984:208). As Ilya Prigogine (1980) described it, traditional science, viewing the world as a set of laws, was engaged in the study of being. The science of dynamic systems is the study of becoming.

Anthropology and Systems Theory

Anthropological systems theorists view the natural environment and culture as interrelated systems, an approach that was presaged by the work of Steward (1955). He recognized that cultural evolution was a dynamic process:

> "...No culture has achieved so perfect an adjustment to its environment that it is static. The differences which appear in successive periods during the development of culture in any locality entail not only increasing complexity, or quantitatively new patterns, but also qualitatively new patterns (1955:5)".

There was an early recognition that culture is an open system in which there was an interchange of energy and information between culture and the natural environment (Hall and Fagen 1956).

The elaborate flow charts found in the literature produced by anthropological systems analysis modeled some of the ways culture fits into its environmental matrix. This line of reasoning had implications for archaeology's goal of discovering predictive laws of human behavior. Many aspects of the physical environment, composed of hugely complex, dynamic, interrelated systems of climate, geology, oceanography, solar radiation, and so on are largely unpredictable. Precisely quantifying the full complexity of culture in terms of the systems it interacts with is at best a quixotic goal. As a result Anthropological Systems Theory could be used to list processes and factors involved, but could not, and cannot explain the actual mechanics of culture change. Systems theorists overestimated regularity and downplayed variation and the extreme complexity of culture change (Trigger 1989).

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Complex Systems Theory in Other Disciplines

Anthropologists have often turned to the natural sciences for conceptual models in describing culture process for no single discipline is likely to independently generate a theory that describes the nature of change. The concept of evolution itself is a prime example of one useful borrowing. Most archaeologists agree that any theory of culture change "would be directly subordinate to a comprehensive theory of evolution that comprises all evolutionary processes"(Watson et. al 1971:68). The problem is that anthropologists have been slow to keep up with paradigm shifts in other disciplines concerned with change over time. How are we as anthropologists to approach cultural evolution in a holistic manner without falling into old reductionist traps.

Complex Systems

Anthropologists are attempting to manipulate what is arguably the most complex and incompletely known data base confronting any discipline. It is both instructive and essential for us to examine how other disciplines are learning to handle enormously complex data and interactions. Complex systems theory, or as it sometimes known in the popular press, chaos theory arose as an interdisciplinary effort to understand complex systems and their evolution.

The difference between animate and inanimate matter is primarily defined by its level of complexity. Living biological ecosystems are among the most complex systems known, and among these human culture is the most complex biological system of adaptation. The enormous range of human behavioral responses is related to human neurophysiology; neurologists have

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now generated a large body of literature on complexity theory in their effort to understand the workings of an individual brain.

Linearity

A wide variety of observable phenomena can be approximated as linear systems. A linear system can be described as the sum of its parts, in which cause and effect are proportionately related . Examples of linear systems include magnetic fields, sine waves, heat flow, stresses in materials, gravitational fields, diffusion of gases and liquids and many other aspects of the physical world (Davies 1988:24-25). The larger part of scientific effort in our century has been devoted to the study and control of linear systems.

What altered the scientific quest for unlimited predictability was a dawning recognition that there were limits in our ability to gather and measure data about many of the processes that we see going on around us. Non-linear, complex systems are more typical of our everyday experience, they can include things like the pattern of clouds in the sky, the distribution of leaves on a sidewalk, and the course of events over the day. They are examples of things that appear random, but in fact are not. There are a series of precise physical laws and many chains of cause and effect which govern the placement of a leaf on a walk, but to summarize the chain of forces that led to it requires an enormous amount of data. A large amount of information is needed to specify the state of a complex system, for the outcome of an event is extremely sensitivity to initial conditions. A similarly large amount of information is also needed to specify the state of a complex system at any given time.

Perturbations in all non-linear dynamic systems grow in proportion to time; in more complex systems they grow exponentially. Calculations on a

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system like the solar system can predict eclipses reliably many years in advance. In more chaotic systems calculations cannot keep pace with events and all power of prediction is lost. The system itself becomes the fastest computer (Davies 1989:54).

Science has thus been forced to confront limits to human knowledge, and the concomitant levels of prediction and control. Even simple non-linear systems can produce behavior which is infinitely complex. "As chaos sets in, we encounter the inadequacy of our methods, not the inadequacy of our laws" (Kellert 1993:44). This then, has been the source of archaeology's failure to arrive at linear laws of human behavior. In assuming cultural process could be expressed in the same conceptual framework as a simple linear system, we set unattainable goals for ourselves. We should reexamine of our approach to explanation, and explore explanations that view culture from an appropriate non-linear, dynamic perspective.

The Direction of Evolution

Culture is inherently dynamic, and is in a continual state of change. The fictional 'ethnographic present' employed by social anthropologists is a useful tool, but should not be confused with reality. This should also be kept in mind by the archaeologist when constructing prehistoric sequences. All dynamic complex systems, cosmological, biological, and cultural, have evolved through time toward increasing elaboration. In all cases the rise of increasing complexity is time-asymmetric; it defines an arrow of time from past to future. On all continents, small-scale societies evolved into larger complex ones (Wenke 1980). Any theory of evolution, on whatever scale, must explain the origin of this arrow pointing toward increasing complexity (Davies 1988:113).

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Measuring Evolutionary Success

It was customary during the 19th century for evolutionary pyramids to place western culture on the apex, with the implied assumption that the end product of an evolutionary process represents an improvement of some sort over the past. The notion of 'progress' has until recent times remained inextricably embedded in the concept of evolution. For scientific purposes, however, it is necessary to withhold such value laden assumptions. There is every reason to believe that a successful cultural adaptation may in fact be best measured by its long term stability. Increasing economic specialization, exchange networks, and other features that arise as a culture evolves can provide a buffer against shortages and insulate the society to some extent from an uncertain natural environment. These and similar adaptations can also create new vulnerabilities to fluctuations by casting a wider net among environmental forces, thus increasing the potential for more frequent change (Taylor 1984: 270).

Equilibrium and Self-organization

Complex systems seem to fluctuate between periods of relative equilibrium and stasis and periods of rapid change. Culture is unstable in that the system never settles into a form of behavior that resists minor disturbances entirely. In natural history this issue has been taken up by Eldredge and Gould in punctuated equilibria theory (1972). According to current theory, a complex dynamic system responds to a change in equilibrium by becoming more complex. There is a paradox in that chaos conditions, causing a fluctuation in the environment can generate an organizational response. This has been called by Prigogine and Stengers (1984) 'order out of chaos'. The organizational response of a complex system

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to a disturbance in equilibrium is known as spontaneous self-organization. According to this model:

> "Self-organization processes in far-from-equilibrium conditions correspond to a delicate interplay between chance and necessity, between fluctuations and deterministic laws. We expect that near a bifurcation, fluctuations or random elements would play an important role, while between bifurcations the deterministic aspects would become dominant "(Prigogine and Stengers 1984:208).

It is easy to see how analogous events may occur in the course of cultural evolution. Self-organization processes may explain how complex social organization can arise and function without an 'architect' or even anyone within the society being fully aware of how all the component parts function. A modern western city can be viewed as a metaphor for a type of cultural self-organization. It is composed of interacting and interdependent systems of economic links, water mains, electric lines, traffic systems, and so on that arose as the city grew. No individual was or is in control of its design. There is no manual for its operation, and yet the city manages to function, in all of its boggling complexity. Each city has certain traits in common, but is individual because of its unique history. If we were able to go back in time, and roll the film again, the city would never evolve again in the same way, and in many cases not even in the same location. Add to this the fact that all cities are ultimately dependent upon links outside their boundaries, and often co-evolve with other urban centers.

It is the sheer complexity of such phenomena as cultural evolution that makes historical contingency an important factor. We can visualize this in the classic model of toothpicks flowing downstream; at any moment one toothpick can turn sideways, blocking the next, and eventually influencing

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all. An individual's action, under the right circumstances can be decisive in human history. S. J. Gould wrote of the 'cascade of consequences' which composes evolution:

> "...history presents, as its primary fascination, this feature of large and portentous movements arising from tiny quirks and circumstances that appear insignificant at the time but cascade into later, and unpredictable, prominence. The chain of events makes sense after the fact, but would never occur the same way again if we would rerun the tape of time "(1991:29).

Any event or individual action represents a perturbation in a system, with the potential to influence the course of cultural evolution. As Gould says, "we revel in the details of history because they are the source of our being" (1991:31).

Predictability and Control

History is aperiodic in that events can never repeat themselves exactly. On small scales of time a complex system appears chaotic. On a larger scale, however, the system can be qualitatively described. In viewing the surface of the sea one might struggle fruitlessly to predict the precise timing and appearance of an individual wave. Knowing when to abandon quantitative description in favor of a qualitative analysis may be the key to approaching the boundary between meaningful generalizations and contingency.

In a qualitative description, values of specific properties of the system give way to an understanding of changes in the overall behavior of that system. Again we must address the nature of the scale of inquiry. Archaeology offers a perspective on time scales adequate to describe the qualitative nature of culture change. As our understanding increases with more data, we will be able to show how culture evolves on ever finer time scales.

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The more intricate the system, the more vulnerable it is to change. In cultural evolution, this may explain the snowballing rate of change through time. Sources of fluctuations could come from either the natural or social environment. In small scale hunting and gathering societies environmental perturbations may be more important in terms of disturbing equilibrium and generating a rise in complexity. Continued success in adaptation to natural environment, leading to population growth and disturbance in equilibrium more likely from fluctuations in the social environment. By the time a society reaches an industrial level of complexity societies social forces probably represent the primary source of change.

Information Flow and Culture Change

Most anthropologists have an intuitive idea of what cultural complexity means, but although the concept is commonly used in the literature, it is seldom defined in a precise way. A useful measure of the complexity of any system is its information content (Davies 1988). Anthropologists have long noted the relationship between cultural complexity and population size (Johnson and Earle 1987, Harris 1977, Beaton 1991; Carneiro 1967). Change is a product of information flow. Individual members of the society can be viewed as the basic components of a data bank, which when linked together form the total information content needed to operate the cultural system. The larger population aggregates which formed in late Koniag villages after 1400 probably contributed to the amount and speed of innovation and culture change during this time.

The ability of systems to organize into more complex states is dependent upon information exchange between system components. Complex systems thrive on diversity precisely because it creates the greatest

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opportunity for information input. A greater number of individuals, integrated through cultural means of exchanging information, will lead to accelerated rates of culture change over time. Linking cultures in the contexts of trade, warfare, intermarriage, in short, any contact where information is exchanged, must in turn increase the potential for change. Cultures that interact inevitably reach a similar level of development as they evolve together. Social environments then are a key aspect of human ecology, and a crucial catalyst for change. The size of an integrative network is both an indicator and a cause of cultural complexity.

Most commonly cited archaeological correlates of cultural complexity, such as status related items, are in fact various means of transmitting information. Status signals are subtle, pervasive, and highly specific, although the meaning of status items changes through time. The more complex the culture is, the more artifacts associated with transmitting information may be sensitive to change.

Co-evolution of Neighboring Societies

No human cultures exist without eventually affecting others. Cultural evolution of a particular society must be understood in the context of contemporaneous cultures with which it interacts. Neighboring societies on the North Pacific had fundamental effects on each other, sharing genes, pathogens, technology, raw materials, and ideas. The sea provided the means for long distance transportation and communication between coastal peoples. The marine environment is characterized by abundant but unevenly distributed resources. This provided additional incentive for contact through trade. The exchange network utilized by the Koniag stretched for long

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distances, west to the Aleutian Islands, and east ward to the cultures of the American Northwest coast.

Qualitative Predictions about the Archaeological Record

The archaeological record from the Kodiak Archipelago suggests that over time periods of relative stasis grow progressively short. The prehistoric sequence is characterized by principle of punctuated equilibrium. Quantitative description may be the best way to identify the archaeological correlates which indicate the rate of change a culture is undergoing at any one time. Qualitative description is needed to make useful generalizations given address the limitations to precision caused by the sheer complexity of the factors involved

Given the frequent relationship between culture change and environmental fluctuations one might expect a greater diversity of human culture stimulated in areas of great environmental dynamism. The North Pacific for example is extraordinarily dynamic in terms of meteorology, tectonics, and oceanography. Short term fluctuations were probably buffered by relatively small cultural adjustments. More major environmental changes, such as that engendered by climate shift, would have correspondingly greater effects among all the component systems, including human culture.

In the prehistoric sequence on the Kodiak Archipelago breaks in chronological periods coincide with periods of large scale environmental fluctuation. The transition from the Ocean Bay to the Kachemak phase took place around 3500 years B.P. during the neo-glacial, period. The Kachemak phase transitioned to the Koniag phase during the next, although somewhat less drastic drop in temperature during Little Ice Age following 1400 A.D.

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Rapid onset of environmental changes needed a correspondingly rapid adaptation reflected in a relatively narrow section of the archaeological record. On the whole, we see an overall pattern of punctuated equilibrium, with changes in house form, settlement pattern, and artifact assemblages all co-occurring.

Villages of unprecedented size rose along the salmon streams like the Karluk and Ayakulik Rivers as sea mammal hunting became more difficult during the Little Ice Age. Changes in material culture are associated with this newly focused subsistence, as well as an overall trend toward more utilitarian material culture. Other changes in material culture are associated with the transmission of social information necessitated by new settlement patterns. Material culture associated with social information flow vastly increases in numbers and elaboration during this period, reflecting a rise in the complexity of social organization. Ritual regalia associated with feasting and exchange is more in evidence, perhaps as the need for ratifying social roles increased (Donta 1994). Labrets, associated with social signaling of status and social roles such as age-grade also reach a peak in numbers and variety in the years following the establishment of the large settlements. Artifacts less immediately associated with status and ceremonialism tend to demonstrate more continuity from Kachemak to the Koniag phase. Neighboring contemporaneous cultures along coastal Alaska made similar adjustments, probably with similar adaptations.

The correlation between climate shift and culture change should not be seen as a simple cause and effect process, but as an extremely complex set of interactions between culture and its environmental matrix. The transition from Kachemak to Koniag shortly after 1400 A.D. is associated with changes in the environment, adjustments in settlement pattern and changes in social

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interactions; in sum a rise in cultural complexity. This can be viewed against the background of complex systems theory which holds that a disturbance in equilibrium stimulates increased complexity, which is both self organized and predicated on the information content of the system.

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Chapter 3: Human Ecology of the Kodiak Archipelago

Introduction

This chapter presents a general overview of the major environmental factors that influenced the timing and nature of culture change on the Kodiak Archipelago. Anthropologists have come to a consensus that the evolution of cultural complexity is closely linked to opportunities and constraints imposed by the natural environment. Much has been written about the relationship between cultural change in the North Pacific and environmental carrying capacity. Anthropologists have looked primarily at the productivity of the marine environment and linked this abundance to the rise of social complexity. It is argued here that the tightly integrated relationship of cultural evolution with the natural environment is not simply a cause and effect relationship between carrying capacity and population density. Rather it involves a complex interplay between the opportunities and constraints characterizing the natural environment, as well as fluctuations in the ecosystem in which human culture is a part. Culture change cannot be reduced to the behaviors of component parts of the ecosystem. It is, however, compatible with them.

As discussed in the previous chapter, increasing cultural complexity is seen here as an adaptive response to disequilibrium. Such fluctuations can include, but are not limited to environmental conditions. The developmental trajectory of human culture on the North Pacific is integrated with a number of dynamic and highly complex systems; plate tectonics, oceanography, weather, and biology. The Gulf of Alaska is one of the most meteorologically and tectonicaly active regions in the world as well as one of

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the most biologically productive. The dynamics of these systems have fundamental effects on human culture.

Geographical Setting

The Kodiak Archipelago lies in the central portion of the Gulf of Alaska, southeast of the Alaska Peninsula. It is composed of 16 large islands and countless smaller islets. The total area encompassed by the Kodiak Archipelago is roughly 7,500 mi^2, more than the combined areas of Delaware, Rhode Island and Connecticut (Campbell 1992, Capps 1937).

Kodiak Island is the largest island, covering an area of about 3,600 mi^2. Kodiak has a generally mountainous topography, with peaks in the interior exceeding 1,200 m in elevation. More moderate relief exists on flat-bottomed glacial valleys, and on glacial deposits that form lowland shores, capes, and peninsulas. Drainages on Kodiak Island usually flow in a northwest or southeast direction, following glacially scoured valleys (USFWS 1987:52). With the exception streams like the Karluk, Frazier, and Ayakulik (Red) rivers, which flow from large glacial lakes, streams tend to be shallow, short, and steeply graded.

Afognak Island, located just north of Kodiak Island, covers 708 $miles^2$, and is slightly less rugged. Peaks on Afognak approach elevations of 700 m (Campbell 1992). Other large islands in the Archipelago have a similar topography. They include Sitkalidak, 116 mi^2, Raspberry, with 76 mi^2, and Shuyak Island with an area of 69 mi^2.

The coastlines of the Kodiak Archipelago are highly complex, with numerous straits, elongate fjords, bays, inlets, and lagoons. Because of this, no area of Kodiak Island lies more than 15 miles from the sea (Capps 1937). The Archipelago's outer coastlines are characterized by rocky cliffs and steep headlands punctuated by small cobble or boulder pocket beaches. Long gravel

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spits, small lagoons, and mud flats exposed during low tides can be found along the lower energy coastlines deep inside the many bays and inlets.

The length and configuration of the shorelines of the Kodiak Archipelago tend to maximize the amount and variety of biological habitat as well as human access. Kodiak Island alone has at least 1,274 miles of coastline (Campbell 1992:7). This number actually fluctuates by many thousands of square miles with every tide. The advantages provided by the geography of the Kodiak Archipelago in terms of human access to resource areas, and prehistoric social integration can perhaps be best understood by reference to boat travel, by the historically known kayak and angyaq, or their earlier equivalents. The Archipelago seems suddenly much smaller when viewed from the water. Uyak Bay, for example has roughly 100 miles of shoreline, yet the widest crossing is about 5 miles; a relaxed paddle of about an hour by modern kayaker, and no doubt was covered more quickly by Native kayakers with a lifetime of experience.

For prehistoric peoples, a good settlement location offered ready boat access to open sea habitats of larger marine mammals, as well as resources, such as bird rookeries and shellfish beds that are available in more protected waters. Although the Archipelago is frequently battered by winds and high seas, a number of embayments and sheltered areas are available in most locales, often with varied angles to the prevailing wind direction. The net result is that there is always water quiet enough for kayakers to be found somewhere in the Archipelago. The calmest waters, deep inside fjords and embayments, are resource rich, but are less desirable as settlement locations. Fed by streams from the island's interior, inner bays are less saline, and are prone to freezing during winter months. Such sea ice presented Native inhabitants of Kodiak with the worst of both worlds. It prevented boat access,

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covered littoral resources, and was seldom thick enough to walk on. The productive ice edge fishing and hunting that is important elsewhere in the Arctic was seldom possible in Alutiiq country, with the possible exception of a few fresh water locales.

Prehistoric sites of any age are absent from the high energy coastlines, unless there is an embayment or point of land that could break the wind. This is particularly true along the Alaska Peninsula side of the Shelikof Strait, where otherwise very desirable locations, featuring well drained soils next to fresh water streams, may lack occupation sites because of the difficult surf conditions that predominate. High waves can be easily handled by a kayaker; but become dangerous when they become steep enough to break, such as in the surf zones typically adjacent to high energy coastlines. Alaska Peninsula village sites on the Shelikof Strait are located on the northern shores of embayments, on small pocket beaches between rocky headlands. There, prehistoric mariners could find shelter from the strongest winds, which sweep unimpeded down the strait from Cook Inlet.

Geology

Geologically, the Kodiak Archipelago is an extension of the Kenai Peninsula, which lies 60 km to the north (Capps 1937; USFWS 1987). Originally part of a single mountain chain, these land masses are located along a crustal subduction zone, where the North American Plate is underthrust by the northward moving Pacific Plate (Hayes and Gori 1989; Rodgers 1990). Sedimentary and metavolcanic rocks scraped off the surface of the Pacific Plate as it plunged downward into the earth, formed the Kenai Peninsula and the Kodiak Archipelago. The two areas were then separated by subsequent glacial scouring. Most of the bedrock on Kodiak Island consists of

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shale, formed from muds in former offshore trenches, as well as graywacke, formed in more turbid waters (USFWS 1987).

Exposed bedrock in the Karluk Lake and River drainage area consists of slates, argillites, and conglomerates (Barsh 1985). At the head of Karluk Lagoon, the geology changes to severely stressed and weathered volcanic rocks, mostly quartz diorites. Sheer cliffs of poorly consolidated rock exist along the shorelines north and south of Karluk Lagoon, along with small pocket beaches of granite boulders. Slope failures are frequent, and rock falls from the cliffs are a daily occurrence. Karluk Lagoon and Sturgeon Lagoon, 6 km to the south, are the only habitable areas among the exposed coasts on Southwestern Kodiak Island.

The geology of the Archipelago presented prehistoric peoples with a limited choice of useful lithic raw materials. Attempts to determine the chronology of ground slate and chipped stone technologies in this region of the North Pacific have been complicated by the fact that these technologies seem to be more closely linked to material availability (McCartney 1974:79, Workman 1980:55-56). It is not surprising then, that locally available sedimentary rocks, such as slate and graywacke, compose the bulk of prehistoric lithic assemblages. Like food resources on the Archipelago, lithic resources are locally abundant but patchy in their overall distribution.

Slate is an ideal material for a maritime people, for it can be quickly ground into a long, very straight and thin edge ideal for cutting soft textured fish meat and sea mammal fat. Even a steel knife blade is slowed and even dulled by animal fat. A well oiled slate blade would resist the sticking of animal fat. By contrast a relatively irregular blade of a chipped stone tool is robbed of much of its efficiency. The edge on slate blades can be sharpened quickly, and the edge angle modified easily when called on as a skin scraper.

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At least one chert quarry, located in Malina Bay on Afognak Island, was used prehistorically. Chert may also have been occasionally recovered from glacial till. The chert indigenous to the Kodiak Archipelago is brick red, with occasional green mottling, and tends to step-fracture easily. Cryptocrystalline rock better suited for stone knapping can be found on the adjacent shores of the Alaska Peninsula. Non-local cherts are a significant component of even the earliest chipped stone assemblages on Kodiak. Basalts from the Alaska Peninsula are a common component of lithic assemblages during the Koniag phase. Obsidians were imported to Kodiak from the volcanic Aleutian Islands and perhaps even more distant sources in British Columbia in small quantities during the Kachemak and Koniag phases.

Greenish gray diorite, a favorite lithic material for manufacturing of oil lamps is found in some locations, as is silicified slate chipped and ground to make adze blades. Siltstone and sandstone, used for sharpening tools is also available on Kodiak. Other lithics available locally include small amounts of sub-bituminous coal, which exist in the fossil bearing sandstones in the Sitkalidak and Narrow Cape geological formations (Connelly 1978: 757). Merck noted small amounts of coal on a 1790 visit to a Native village on the Rolling Bay site on Sitkalidak Island (1980:99). Such local sources may account for some of the coal, referred to as jet in the literature, which was used in making labrets, beads, insets, game pieces, and other objects during the Kachemak and Koniag phases.

Tectonics

Kodiak Island is located in one of the most active tectonic regions in the world. Between 1898 and 1975, there were 24 earthquakes which exceeded 7.0 on the Richter scale in the Alaska/Aleutian subduction zone, the scene of

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75% of Alaska's major earthquakes (Davies 1986; Rodgers 1990). Tsunamis are commonly generated by earthquakes measuring over 6.5 in magnitude; they behave like a sudden high tide and frequently are more devastating to cultural environments than the quakes themselves.

The Alaskan earthquake of 1964 was the largest ever recorded in North America. Based on evidence from sediment and peat cores, geologists estimate that a tectonic event of that magnitude, termed great events, could be expected to occur in the Kodiak Island area approximately once every 800-1,000 years (G. Carver, personal communication, 1990). The Kodiak Archipelago has shorter recurrence intervals for earthquakes than Prince William sound to the east. So called 'large' events occur on a average of about every 60 years for the Kodiak Island area (Davies 1981; Carver and Gilpin 1993). Cook Inlet, in contrast, has an interval of 177-632 years between large earthquakes. A Native elder on the Kodiak Archipelago, therefore, could reasonably expect to experience at least one large earthquake in the course of his or her life.

A tsunami associated with such an event has been recorded in the archaeological record at Karluk One, where a layer of sterile marine gravels lies on top of house floor 10, which dates from around 1250 A.D. This event was also reflected in the peat stratigraphy of Karluk Lagoon where there is an abrupt contact between freshwater and salt water peat species. Such changes in peat forming plant communities reflect sudden changes in relative elevation above sea level associated with earthquake events. An earlier large event at Karluk date between 1280 and 1000 years B.P. (Carver and Gilpin 1993). Besides the potentially destructive effects of this event on human lives and property, the lagoon ecology was also affected.

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During the 1964 event, a hinge line appeared in southeastern Kodiak Island, extending northeast along its mountainous axis (Pflaker and Rubin, 1967). Subsidence occurred on the west side of the hinge line, and uplift on the east, in continuance with existing trends. Over the long term, however the position of the Kodiak Archipelago on the edge of the Pacific plate has resulted in uplift. This effect is more pronounced on the Island's eastern coasts.

Ocean Bay sites from 4,000 to 6,000 years B.P. can be found a considerable distance from the modern shoreline. In Chiniak Bay, old marine terraces are now located several kilometers from the coast, along the margins of flat-bottomed valleys that were once the heads of bays. On the northwestern coasts of Afognak and Kodiak Island bordering the Shelikof Strait, uplift has reduced the depth, or even completely drained lagoons which once existed at the mouths of streams and rivers.

Gradual uplift is also reflected in prehistoric faunal middens, as shellfish become increasingly scarce in late prehistoric middens situated on lagoons. Today sea urchins and clams are very rare or absent in Karluk Lagoon, but judging by faunal remains, these shellfish were apparently locally abundant as late as 1200 A.D. This situation is similar to that observed at Malina Creek; where the edges of the former lagoon, now completely gone, can be seen outlined by marine terraces.

Volcanism

Although the Kodiak Archipelago does not have any volcanoes, there are 22 active volcanoes on the adjacent Alaska Peninsula and in the eastern Aleutians. Ten of them have erupted in recent times (Kienle and Swanson 1983). Some of the effects of volcanism on prehistoric populations has been

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summarized by Dumond (1979) and by Workman (1979). The most violent eruption in historic times was the Katmai eruption of 1912, which covered a large portion of central Kodiak Island with 30 to 60 cm of ash. Several Native villages on the Alaska Peninsula were permanently abandoned in the wake of this eruption. Although the Karluk area is the closest portion of Kodiak Island to the Katmai eruption, it was spared significant ash fall by a strong northwest gale.

Studies of the consequences of that event indicate that ash falls can have catastrophic consequence for local ecosystems and human health. Ecosystems on the Kodiak Archipelago were permanently altered by the ash fall. Ponds and small drainages were filled in and the tree line advanced miles south, probably because the deeper soil profile allowed tree roots better anchorage against the wind. In general, however, the ecosystem recovered fairly quickly. Except for those regions on the Alaska Peninsula closest to the Katmai caldera, there was a remarkable recovery in the years following 1912. By 1920, salmon runs, heavily impacted by ash related stream siltation, had recovered completely (Dumond 1979:385, Eicher and Rounnsfell 1957).

Don Dumond carefully considered the impact of volcanism on the prehistoric record of the Alaska Peninsula, and concluded that recurrent volcanic events could have been an important factor in overall subsistence and settlement strategies. A single volcanic event, however was unlikely to have destroyed the resources of an entire territory, and that the individual volcanic events reflected in the soil horizons on the Alaska Peninsula were irrelevant to culture history (1979:391). The archaeological record from the Kodiak Archipelago, however, suggests that volcanic events should be considered in terms of their relative scale. While plant and animal populations certainly recover, specific ecological niches, such as lagoons,

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ponds, and estuaries can be altered or lost forever after a large ash fall. This in turn can permanently force the move of long term settlement locations. For example the large ash fall, or perhaps a series of ash falls around 3,800 B.P. filled in estuaries and apparently led to the abandonment of at least two Ocean Bay sites.

At KAR-31, we encountered a layer of weathered tephra, originally interpreted as a silt deposit, that separated the Ocean Bay levels from those of early Kachemak age (Jordan and Knecht 1988). A similar tephra lay on top of KOD-363, a deep Ocean Bay site on the other side of the island, which was subsequently determined to date from about 3,800 years B.P. (Knecht 1993; Lou Gilpin, personal communication, 1993). In 1993, I encountered what appeared to be the same tephra layer at Malina Creek, on Afognak Island, on top of a Late Ocean Bay deposit. In all three sites, the tephra marked the terminal occupation of Ocean Bay peoples at the site. The distribution and depth of the tephra suggests that it represents not one, but a series of repeated ash falls over a period of time. A number of closely spaced volcanic events apparently occurred around 3,800 years ago (Gilpin, personal communication, 1994). The sites were located on what had been low energy lagoons in Ocean Bay times; siltation, and perhaps infilling of the lagoons may well have led to the abandonment of those sites. This may account for problems archaeologists have had in locating substantial transitional layers between late Ocean Bay and Early Kachemak in the same site.

Pumice and scoria generated by volcanoes on the Alaska Peninsula has long been used by Kodiak Island Natives for abraders in making ground slate tools and other items. Pumice fragments of different colors and textures have been recovered in assemblages throughout the prehistoric sequence, although there has been no attempt to link particular pumices, or their mineral

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signatures to specific volcanic events. Katmai pumice, which is thrown up as flotsam on local beaches, is still used by today's village residents to polish iron stoves.

Volcanism's effect on the human ecology of the Kodiak Archipelago, although periodically disruptive, has been beneficial to human population in the long run, because of the formative role volcanism plays in soil formation. Terrestrial plant resources and drainage patterns, and associated ecosystems are of course affected by soil development.

Soils

The Kodiak Archipelago is characterized by high precipitation, steep topography, frequent exposed bedrock, a lack of aquifers, and thin soils (Buck et al.: 1981). Virtually all the soils on Kodiak Island are formed from the weathering of volcanic ash (USFWS 1987:61). Soils in the Karluk region are classified as dystric cryandepts, cold-temperature soils which have formed from volcanic ash. Locally termed 'butter-clay', these soils are bright tan in color, and resemble clayey silts in texture. Typically, these soils are 30-40 cm deep, and overlay the clays and gravels of the glacial drift. Because of their color, and stoneless, homogenous nature, these soils present the archaeologist with an ideal horizon marker, against which middens and other culturally derived features are clearly visible (Dumond 1971, 1979).

According to the oral tradition, barabara pits were excavated through this soil to reach the glacial till; a practice which has been confirmed in by the archaeological record. The till provides a much better substrate for a house floor than the butter clays, which when wet, turn into something that has been best described by Kodiak construction crews as 'baby shit'.

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Soil drainage was naturally one of the key variables affecting settlement location. Midden mounds grew with reuse, and became man-made land forms that were perched high above surrounding water tables. Occasionally, the midden mounds blocked drainages, and small freshwater ponds formed behind them. It is the anaerobic conditions created by freshwater pooling behind middens that preserved the organic artifacts recovered from Karluk One and the Malina Creek site. The top meter or so of the middens remained habitable, despite the damp conditions below. Dwellings from all time periods, have features designed to deal with water seepage; gravel lenses, covered drainage ditches, and sub-floor cisterns; these are discussed in more detail in Chapter 4.

The Terrestrial Environment and Resources

A limited number of land mammal species are Native to the Kodiak Archipelago (Table 3:1), of these, the brown bear was probably most important to the prehistoric economy. Bear skins, with the head and paws removed, were used for bedding in Koniag barabaras. Bear meat is consumed on occasion, although the taste can be affected by the quantity of fish eaten by the bear. Bear fat and oil has different qualities than that obtained from sea mammals and was especially prized. Bear hunting was too dangerous, however, for it to be a reliable food source on a regular basis.

While bear bone is thick and dense, and ivory unavailable in quantity, was used in the manufacture of harpoon and arrow points. One of the most important products obtained from bears was its gut, which was strong and wide enough to be easily sewn into the waterproof garments used by kayakers, as well as waterproof bags and coverings. A waterproof bag now at Harvard's

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Peabody Museum was made from the membrane covering a bear's lungs. It was collected from the village of Akhiok during the 19th century.

Other land mammals were utilized occasionally, primarily for their furs. Fox remains are usually present in prehistoric faunal assemblages, although never in abundance. Most of the birds important to the Alutiiq were found on the sea and on coastal rookeries. Well into the 20th century eagle nests were raided for their eggs, and baby eagles were raised as pets and for their feathers, which were used in the fletching of darts and arrows. Eagle wings were also used as brooms in Koniag households well into living memory. Ptarmigan were probably hunted prehistorically, although their skins are not seen in ethnographic clothing.

Table 3:1 Native Land Mammals of the Kodiak Archipelago

Common Name	Taxon	Utilization
Brown bear	*Ursus arctos*	Skin, meat, fat, gut, bone
Ermine, weasel	*Mustela erminea*	Skin
Land otter	*Lutra canadensis*	Skin
Red fox	*Vulpes vulpes*	Skin, bone
Little brown bat	*Myotus lucifugus*	None recorded
Northern bog lemming	*Synaptomys borealis*	Occasional use of seed caches
Tundra vole	*Microtus oeconomus*	Occasional use of seed caches

A wide variety of terrestrial plants are used for food and medicine by the contemporary Alutiiq, reflecting practices that probably extend well into the prehistoric past (Russell 1991, 1993). According to oral traditions and ethnohistorical accounts, plant foods were important to the Koniag economy (Table 3:2), however plant harvesting has left few traces in the archaeological record, with the result that the role of terrestrial plants in the subsistence economy has undoubtedly been underestimated. Merck made the following observations during his visit to Kodiak in 1790:

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> The women do most of the work here. From the end of June to the 20th of July the women collect sarana [Kamchatka Lily]. In September they gather roots, markarsha. From August to September they pick berries...There is a kind of sorrel which they squash and boil until it is thick. They store it in holes in the ground in layers, together with whale blubber, for the winter. (Merck 1980: 106).

Roots, such as that of the Kamchatka Lily, provided an important source of carbohydrates to the Koniag diet. They were harvested with bone root picks or sometimes by locating the caches gathered by rodents (Russell 1991). Wood, bark, spruce root, and rye grass were all important in Koniag manufacturing and building construction. A long list of plant species were also used for medicinal purposes (Gideon 1989: 51-53, Russell 1992, Fortuine 1989).

Table 3:2 Major Traditional Food Plants of the Kodiak Archipelago
(After Russell 1991)

Common Name	Alutiiq	Taxon	Subsistence Utilization
Cow Parsnip	Ugyuuteq	*Heracleum lanatum*	Peeled stalks, May and June
Nootka Lupine	Akataqutaq	*Lupinus nootkatensis*	Roots, Spring and Summer
Angelica	Uriisaaq	*Angelica Lucida*	Roots, early Spring
Kamchatka Lily	Arpaayak	*Fritillaria camschatcensis*	Roots, August or September
Sour Dock	Quunarliq	*Rumex*	Stems and leaves, May to June
Wild Onion	Luuguaq	*Allium schoenoprasum*	Stems and bulbs, May to August
Fireweed	Cillqaq	*Epilobium augustifolium*	Shoots, Summer

Of the many berries that were harvested, Salmonberry (*Rubus spectabilis*), or *alagnaq* , and Blueberry (*Vaccinium ovalifolium*), or *atsaq* were probably the most important. Berries were used as a sweetener in seal oil, to preserve the berries for long periods. Paleobotanical samples from the housefloors at Karluk One have not yet been analyzed, however, fairly large deposits of seeds were sometime encountered on house floors, and in

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surrounding midden deposits. We had long assumed that these were salmon berry seeds, (passed down to us by the Koniag), however a seed sample from house floor 9 has been identified as Bearberry, (*Arctostaphylos uva-ursi*), (A. Wennekens to Frederica de Laguna 1985). A traditional delicacy, called *akutaq* is made by mixing raw berries, mashed fermented fish eggs, and seal oil (Russell 1991, Melsheimer 1981), providing a potent dose of protein and calories.

Although the northern third of the Archipelago is wooded with large stands of Sitka spruce, (Picea sitkensis) the forests are fairly recent in age, and are thought to date from no earlier than 800-1,000 years ago. There are some village sites located within the forested area, however there is no evidence that the sites were forested at the time of occupancy. For the majority of prehistoric peoples, driftwood was relied on for fuel, construction and manufacturing material. Small stands of balsam cottonwood (Populus balsamifera), exist in sheltered areas on the Archipelago, but cottonwood appears to have been of limited use in manufacturing. Cottonwood stands were probably relied on in construction of dwellings in interior areas, such as Karluk Lake and River, the Ayakulik River, and Olga Bay.

Climate

The Gulf of Alaska is one of the most meteorologically dynamic regions on earth, with weather patterns primarily affected by a steady passage of storm systems along the Aleutian storm track. During the winter season, a storm system crosses the Gulf of Alaska on the average every four to five days (Wilson and Overland 1986: 31). A large amount of interannual variability is the norm, determined by global movements of air masses: Siberian-north

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Alaskan high pressure systems can block the normal passage of storms, and very cold winter air can suddenly settle over the Gulf.

Ernest Burch (1988) has pointed out that Eskimo speaking people do not in fact inhabit the coldest regions of North America. Much colder temperatures were endured by Athabaskan speaking Indians in the continental boreal forest of interior Alaska and Canada (Burch 1988:41). What Eskimos have adapted to is wind. Severe wind stress is common to all of the Eskimo and Aleut territories. In most cases, probably including the Kodiak Archipelago, Eskimo speakers are the only people ever to have lived in their respective areas. The term wind chill expresses the fact that the loss of body heat increases geometrically with increases in wind speed (AEIDC 1975: 165-166). Heat loss is greatly increased if the skin has been dampened by water or perspiration. As Philomena Knecht has noted, the challenge for marine hunters was to stay dry, by venting excess heat safely (1993:6). Specialized clothing, water craft, and physiological adaptations, were developed over many centuries, enabling Eskimo and Aleuts to successfully manage wind stress.

The Kodiak Archipelago is located in the windiest portion of the Gulf of Alaska; winds are considered 'calm' only 8% of the time (AEIDC 1975: 152). Wind speeds of 50 to 75 knots with gusts approaching 100 knots are fairly common. Wind speeds of 80 knots or more occur about once every two years, while a sustained wind of over 100 knots can be expected about once every 25 years (Buck et al. 1975). Winds are highly variable in velocity and direction, depending on the relative position of the Aleutian low pressure system (Wilson and Overland 1986: 39). Local topography can block or greatly accelerate local winds. Severe wind conditions can, and often do, shift on an hourly basis.

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The Kodiak Archipelago has a maritime climate, with small temperature variations, and is characterized by high humidity, precipitation, and frequent fog or dense cloud cover. The Japanese Current warms the surrounding waters to create a climate that averages about 40° F. Summer temperatures rarely exceed 75°F, and winter readings rarely go below 0° F (USFWS 1987:52). The July 10° C isotherm has been used to distinguish the boundary between what is considered the Arctic and sub-Arctic regions (Hausler-Knecht 1993, Stager and McSkimming 1984:27). The average July temperature for the Kodiak Archipelago is only 1-2° C above that mark. Kodiak Island, on the average, can expect about 100 days a year of 2 mm of rain or more. A rain-shadow effect associated with the mountainous interiors causes more precipitation on the eastern side of the islands, where some areas receive more than 300 cm yearly (Karlstrom and Ball, 1969). The Karluk area is located on the driest part of Kodiak, and receives only 58 cm of precipitation a year.

Weather conditions on the Kodiak Archipelago have major impacts on surrounding marine ecosystems, affecting salinity, nutrient mixing, water temperature, sea level, and current directions. One severe storm episode can alter ocean stratification, water properties, and nutrient transport. The variability in biological marine populations has been linked with the concurrent variability in weather conditions (Wilson and Overland 1986: 50). Local freshwater runoff also affects the salinity, circulation, sedimentation, and ultimately the productivity of marine estuaries, such as Karluk Lagoon (Mann and Lazier 1991).

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The Marine Environment and Resources

Marine ecosystems are enormously complex, the result of the tightly integrated relationships between marine biology and the physical characteristics of oceans. A lengthy discussion of marine ecosystems is well beyond the purposes of this thesis, however, terrestrial factors are usually given precedence in paleo-environmental reconstructions; and the sea is too often considered more or less a constant among the variables that affected human prehistory. In fact, marine ecosystems are subject to high levels of variability in relative productivity. The relative abundance of the marine ecosystem surrounding the Kodiak Archipelago is evidenced by the large numbers of whales, seals, sea lions, sea otter, porpoise, sea birds, and salmon; all of which are predators feeding on a high or apex trophic level. These species, which formed the foundation for the prehistoric economy of the Kodiak Archipelago, are immediately affected by changing conditions in the marine environment.

Much of the variation in the productivity of a marine environment is a function of water movement. Decomposition of organisms and the subsequent release of nutrients tends to take place in deep waters of the ocean floor. Water movement is, therefore, necessary for nutrient recycling (Mann and Lazier 1991). The waters in south Alaska are particularly high in nutrients. This is the result of several important mixing processes, all of which are important to maintaining the marine biomass.

The Aleutian trench, formed by tectonic processes, runs along the continental shelf on Kodiak's east side. Mineral-rich materials rise from the depths in upwellings that are largely driven by wind stress on the surface of the sea (Reed and Schumacher 1987, Schumacher and Reed 1986). Nutrient

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mixing is also affected by the Alaska current which runs just offshore of the Archipelago, as well as the relative volume of freshwater runoff (Parsons 1986). Seasonal temperature thermoclines in the ocean determine the depth of mixing, and the associated location of predator species. The formation of a stable thermocline can be suppressed by storm activity and thus delays plankton blooms on a seasonal basis (Parsons 1986:562). Longer term processes, such as cyclical changes in current movements, water temperature, and climate have profound effects on primary production, which in turn affects feeders further up the marine food chain.

Human Nutritional Requirements and the Marine Environment

Because of the limited nature of terrestrial resources, human subsistence on the Kodiak Archipelago was necessarily dependent on the resources provided by the marine environment. Human beings, as relatively new members of the marine ecosystem, are not as physiologically well adapted to marine food sources as other large mammals dependent upon maritime subsistence.

The marine biomass of the Kodiak Archipelago is enormous, however, food resources such as fish, shellfish, bird meat and eggs are high in protein, but low in fats and carbohydrates that provide the calories necessary for humans to process proteins. High protein diets only increase the need for fat and carbohydrates. A diet that derives more than 15% of its kilocalories from protein exposes humans to health risks that begin with hypertrophy of the liver and kidneys (Cophram Forbes and Habicht 1978:253-258; Whitney and Hamilton 1981:115).

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Table 3:3 Nutritional Values of Selected Native Foods

(From Jacobs 1951:933-974)

Species and Portion	**Protein K/Cal/gm**	**Fat K/Cal/gm**	**Carbohydrate K/Cal/gm**
Fresh Meat, Mammals			
Seal (March)	129.6	16.2	0.0
Whale (July)	94.4	6.3	0.0
Caribou (March)	106.4	10.8	0.0
Sea Mammal Fat and Oil			
Seal oil	0.0	**900.0**	0.0
Seal fat	2.8	**884.7**	0.0
Whale oil (Baleen whale)	0.0	**897.9**	0.0
Salmon, Dried			
King salmon	204.0	**224.1**	26.8
Dog salmon	222.8	10.8	---
Salmon, Fresh			
King salmon, head	18.4	**63.9**	---
King salmon, middle	85.6	29.7	0.0
King salmon, tail end	22.0	**75.6**	36.4
Fish Eggs, Fresh			
King salmon	121.6	**135.0**	26.8
Herring	94.4	1.8	4.8
Birds			
Puffin	106.8	22.5	9.6
Cormorant, legs	95.2	17.1	7.6
Eider duck	49.2	9.9	68.8
Murre	21.2	22.5	128.8
Ptarmigan	102.8	12.6	0.0
Terrestrial Plants			
Salmonberries	6.4	3.6	56.4
Sourdock	14.8	2.7	40.8
Seaweeds			
Alaria	6.4	3.6	74.4
Agarium	15.6	1.8	77.2

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Humans thus have relatively specific nutritional requirements that were met only by consuming a wider range of foods than those typically relied on by other apex predators in the marine ecosystem. Carbohydrates are scarce among the foods native to the Kodiak Archipelago; the processed root of the Kamchatka lily would have been one of the best sources but is unlikely to have provided the necessary carbohydrates for a large population, particularly one with a high protein diet. Calories derived from sea mammal fat were an essential dietary supplement (Yesner 1981, Erlandson 1988, Knecht and Shoeninger 1988).

Philomena Knecht and Margaret Shoeninger of Harvard University compared stable isotope ratios of bone collagen in human and animal remains from prehistoric sites on Kodiak Island (1987). Isotope ratios of nitrogen and carbon reflect the relative position of the animal on the food chain as well as its primary food sources. Human samples from Larsen Bay and Karluk were expected to reflect the different resource profiles available in those locales; Larsen Bay with more sea mammals, Karluk with more fish. In fact, the values for these populations were very similar, reflecting a high position on the food chain, one most consistent with the consumption of marine mammals (Knecht and Shoeninger 1988: 7). Among other animals, the nearest equivalent isotope ratios to those observed in Koniag skeletons was found in the killer whale, which also feeds on fish and sea mammals.

Sea Mammals

Sea mammals must be considered among the most dangerous animals to hunt, as tearing of the skin kayak, or even the fragile gutskin clothing of a kayaker by the struggles of a harpooned sea mammal could result in soaking or immersion in the cold waters of the sea. Even today, such immersion is

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often followed by death by hypothermia. Only the brown bear is more dangerous to a hunter armed with traditional weapons. However, it is sea mammal hunting that made human habitation of the Arctic coast possible. The complex of specialized adaptations associated with sea mammal hunting, material culture, settlement patterns, and social organization; defines much of Eskimo/Aleut culture and identity. The staple food for the Koniag consisted of dried salmon dipped in sea mammal oil which provided both calories and protein; the ability to optimize use of fish resources was always balanced by the constraints imposed by human caloric requirements (P. Knecht 1986).

Seven species of migratory baleen whales summer in the Gulf of Alaska; the gray whale passes close by the Kodiak Archipelago on its way to the Bering Sea (Table 3:4). Prehistoric whalers in the Kodiak Island area hunted humpback, fin, minke, and gray whales. Grey whales, humpback whales, and fur seals all migrate off the east coast of the Archipelago, following the Alaska Current (Calkins 1987). Baleen whales feed directly on planktonic organisms; which as primary producers are affected by currents, water temperature, and mixing. The location of sea mammal migration routes has been found to be temperature sensitive, presumably because of the effect of thermoclines on plankton blooms (ADFG 1985, Hood and Zimmerman 1987). Like other Eskimo whalers, the Koniag probably targeted sub-adults (McCartney 1993; Savelle and McCartney 1991). Smaller whales present less danger to the whaler and a thinner layer of fat increased the efficacy of whaling poison that was delivered on the slate lance tips.

Harbor seals and steller sea lions are year round residents of the Kodiak Archipelago, and are concentrated at haulout areas. Sea otters are common, and were probably abundant prehistorically to the point of nuisance. Unlike

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other sea mammals they lack fat, being protected from the cold water by waterproof fur. Sea otters were used by the Koniag for their fur, although they may have also been eaten. Porpoises were important as a food resource, and for their sinew, which was preferred for lashing kayak frames because of its strength. Hides from sea lions and seals were also necessary for covering the kayak and angyaq; nine large seal skins were required for a kayak; 36 for an angyaq (Moonin 1981). Fewer of the larger sea lion hides were needed, however care had to be taken to avoid thinly healed wounds left in the hide from the mating season.

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Table 3:4 Marine Mammals Probably Taken During the Koniag Phase

Whales

Common Name	Taxon	Location	Seasonality
Gray whale	*Eschrichtius robustus*	Nearshore waters in spring, offshore in fall, some summer residence	Late April, and November
Fin whale	*Balaenoptera physalus*	Inshore of continental shelf	April to September
Sei whale	*Balaenoptera borealis*	Nearshore waters	May to August
Minke whale	*Balaenoptera acutorostrata*	Nearshore waters	April to October
Humpback whale	*Megaptera novaengliae*	Nearshore waters	April to November
Beluga	*Delphinateris leucas*	Nearshore waters on Shelikof Strait; from Cook Inlet stock	Summer

Small Cetaceans

Pacific white-sided dolphin	*Lagernorhynchus obliquidens*	Offshore waters	Spring and summer
Dall's porpoise	*Phocoenoides dalli*	All coastal waters	Year-round residents
Harbor porpoise	*Phocoena phocoena*	Harbors, bays, river mouths	Year-round, more abundant in summer

Pinnipeds

Steller sea lion	*Eumetopias jubatus*	All coastal waters, haulouts, rookeries	Year round residents
Northern fur seal	*Callorhinus ursinus*	Offshore waters, east coast	Spring migration, some sub-adults summer in Barren Islands
Harbor seal	*Phoca vitulina richardsi*	Nearshore waters, haulout areas; rivers and lakes during summer salmon runs	Year round residents;

Mustelids

Sea Otter	*Enhydra lutris*	Nearshore waters, kelp beds	Year round residents

(Alaska Department of Fish and Game 1985; Calkins 1986; Haggerty et al. 1991)

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Table 3:5 Important Fish Species Utilized During the Koniag Phase

Anadromous Fish

Common Name	Taxon	Seasonality
King Salmon	*Oncorhynchus tshawytscha*	May to July
Pink Salmon	*Oncorhynchus gorbuscha*	July to September
Red Salmon	*Oncorhynchus nerka*	July to August
Silver Salmon	*Oncorhynchus kisutch*	August to December
Dog Salmon	*Oncorhynchus keta*	August to October
Dolly Varden Trout	*Salvelinus malma*	May to August

Nearshore Fish

Halibut	*Hippoglossus stenolepis*	Spring and Summer
Pacific Cod	*Gadus macrocephalus*	Spring and Summer
Herring	*Clupea harengus pallasii*	Spring

(Alaska Department of Fish and Game 1985; Amorosi 1987; Hood and Zimmerman 1987)

Fish resources on the Kodiak Archipelago are seasonally abundant; Table 3:4 indicates when various species would have been most available to Koniag fishermen. The seasonality of anadromous fish is characterized by the sudden appearance of spawning salmon at stream mouths, followed by a lengthy period during which the 'spawned out' salmon slowly die. Stragglers, sometimes appearing long after the main run is over, can further extend the seasonal availability of fish. Village elders on Kodiak often prefer to harvest late season salmon because they are less oily and dry more quickly.

The seasonality given reflects the availability of fish who remain in fresh water after the spawning run is over; silver salmon in particular remain in deeper rivers and lagoons well into the winter, perhaps because of their large size. During the dead of winter, eagles, sometimes by the hundred, converge on the places where the last silver salmon remain. I have seen silver salmon on the upper Karluk River in edible condition well into

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December. Silver salmon, in the streams where they run, are the most reliable source of fish during the winter months.

Offshore fish are also seasonally available to line fishermen. Halibut and cod move into very deep waters to spawn in the fall and winter. The largest cod, and often the largest halibut, tend to stay in deeper waters throughout the year. Herring are vulnerable to human fishermen only when they school in near shore waters during the spring spawning season. A large number of other species of nearshore and rock fish were also at least occasionally used by the Koniag. A survey of these populations in Kodiak bays revealed several characteristics of nearshore fish; they are scarcer in winter, larger fish inhabit greater depths, and fewer fish were found near the heads of bays (Rogers, Rogers, and Rosenthal 1987: 403-5).

Marine Birds

At least 147 bird species utilize the estuaries and marine shorelines in the Gulf of Alaska, with populations in the millions (DeGange and Sanger 1987:479). Archaeological faunal remains from Kodiak Island sites indicate 40 species were utilized by prehistoric peoples (Friedman 1934, 1935, Haggarty et al. 1991). Many seabirds are concentrated in nesting colonies which line cliffs and nearshore sea stacks. The Kodiak Archipelago has the greatest number of bird colonies in the Gulf; 238 nesting colonies contain an estimated 378,000 birds (Sowls, Hatch and Lensink 1978). Birds provided the Koniag with meat, skins, and eggs; bird bone and beaks were also utilized in manufacturing various artifacts. The relative productivity of marine birds is highly variable and influenced by weather, type of nest site, predation, and food supply (DeGange and Sanger 1987: 514).

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Littoral Resources

The extensive and complex coastline provides a variety of habitats for the plants and animals of the intertidal littoral zone. The productivity of the marine environment in the region contributes to an enormous biomass that occupies the littoral zone. However the local abundance and community structures of the inter-tidal area is highly variable. Factors that affect the productivity of inter-tidal communities for human use are exposure to disturbance, such as earthquake events, waves, salinity, and turbidity (O'Clair and Zimmerman 1987:305). A sub-zero cold snap which occurs during a minus tide can kill all the non-burrowing invertebrates in an area, particularly one exposed to wind chills.

In 1989, while surveying the coasts of the Alaska Peninsula I saw rotting mats of dead mussel beds, along with the hollow shells of dead barnacles; they had been killed by a cold snap the previous winter. Tectonic uplift of a shoreline can also devastate an inter-tidal community; recovery from such a disaster takes about three years, but only in cases where new habitat is available on the uplifted shore (O'Clair and Zimmerman 1987: 327). Long term uplift on the Kodiak Archipelago can gradually change the salinity gradient in locations such as Karluk Lagoon, and reduce or eliminate marine inter-tidal communities that formerly existed in these relatively protected waters.

Seaweed was harvested from the inter-tidal zones and eaten by Alaska Natives, including the Alutiiq, however, this is poorly documented. Marine invertebrates such as mussels, limpets, chitons, sea urchins, octopus, snails, barnacles, cockles, and a variety of burrowing clams were harvested throughout the prehistoric sequence on the Kodiak Archipelago. Shellfish

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remains tend to preserve well, and eroding shells are often one of the first visual clues of a midden deposit. Broadly speaking, it seems that lenses of shellfish, periwinkles, or sea urchin remains are more common in Kachemak phase sites that others. Lenses of shellfish remains can be dense but seem to represent episodic use; anyone who has consumed shellfish knows that a meal or two can yield an impressive pile of shells.

In no case, however, are there the large shell mounds that are seen in other maritime cultures. In prehistoric sites in California, shellfish were an important protein resource, constituting up to 90% of the protein intake, which was supplemented by carbohydrate rich plant resources (Erlandson 1988). Prehistoric populations had abundant protein resources other than shellfish although most food resources were seasonal in nature. Historic sources suggest that shellfish were turned to during the winter when dried fish supplies became scarce (Holmberg 1985:41). Laughlin (1968, 1972), and Yesner (1980) pointed out that shellfish could be harvested by children and the elderly, enabling these groups to contribute substantially to the resource base of the larger group.

Children and elders, however would better serve their society by harvesting Kamchatka lily roots or by snaring murres, which are rich in carbohydrates. The fact remains, however, that prehistoric peoples on Kodiak did not need more protein; large quantities of protein only increases caloric requirements, and shellfish as a starvation food would only suffice on a very temporary basis. As one writer pointed out, a small land mammal, such as a white-tailed deer, contains more calories than a metric ton of shellfish (Osborn 1980:740). Given this, and judging by modern village practices, it seems entirely possible that shellfish were consumed simply because people enjoyed the taste. This may account for the shellfish remains seen in sites

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lining the shores of the salmon rich Karluk Lake. Some may have been transported overland several miles from the nearest salt water. It is also likely that a freshwater bivalve common in Alaskan lakes and quiet streams was eaten there; *Anodonta beringiana* reaches up to 30 cm in length.

One disadvantage in shellfish consumption is the occasional presence of paralytic shellfish poisoning (PSP), resulting from periodic blooms of several species of algae which cause powerful toxins to be stored in the tissues of filter feeders such as clams and mussels. PSP acts on the nervous system with symptoms ranging from numbness to lack of muscle coordination; death can result from respiratory paralysis within 12 hours of consumption (UAF Extension service: 1992). Some species, like butter clams, can retain toxin in their flesh for up to three years. Among the Koniag, there was probably a body of folk knowledge that helped prevent deaths from PSP, however the historic record indicates that it was far from foolproof. The most famous example of deaths from PSP occurred at Peril Cape in 1799, when a party of Koniag sea otter hunters on a return trip from Sitka stopped for the night and feasted upon mussels; at least 80 died within two hours (Davydov; 1977: 177; Fortuine 1989:54; Holmberg 1985: 43).

Tides and Currents

A thorough understanding of tides was a skill crucial to maritime hunter-gatherers. Salmon runs occur only on incoming tides. Marine mammals schedule their activities around tides; seals and sea lions typically haul out on a low tide, whales feed at the mouths of passes and bays as outgoing tides attract feed species. Minus tides provide the best access to the important resources of the littoral; shellfish, edible seaweeds, octopus, chitons, periwinkles, large snails, limpets, sea urchins, and sea cucumbers.

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Tides can be affected by bottom configurations, atmospheric pressure changes, and wind velocity and direction. Tidal changes greatly influence the size, configuration, and direction of waves, which for the Koniag meant access to marine resources.

One can survive in a kayak in high seas, as long as the waves do not 'curl' which can crush a kayak deck. Successful hunting and fishing in high seas is another matter, however. Incoming tides generally increase wave height near the shoreline; when wind direction opposes the direction of tidal flow, large, steep waves can be generated in a matter of minutes. Conversely, outgoing tides can sometimes help flatten incoming seas. Crossing bodies of water like Shelikof Strait, or making the kayak passage from the Kodiak Archipelago to the Barren Islands and the Kenai Peninsula was an exercise in understanding the timing and direction of tidal currents and using them to advantage.

The role of deep water and near shore currents in nutrient mixing and as a habitat for migrating marine mammals has been already mentioned. It should also be noted that currents provided prehistoric peoples with another vital resource driftwood. The North Pacific current flows eastward from Asian waters toward the Gulf of Alaska, and joins the Alaska Current which is a counter-clockwise rotating gyre, moving from the Queen Charlotte Islands, along the south Alaskan coasts toward Kodiak. As a result, prehistoric beachcombers had access to wood and other flotsam from Asia and the Northwest Coast of North America. On Kodiak and the adjacent coast of the Alaska Peninsula it is not unusual to see on the same beach coconuts and bamboo from Asia mixed with red cedar logs from south east Alaska, and an occasional redwood log from the Pacific Northwest. The amount of driftwood on a given coastline is variable, although large logs can be found

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on nearly any beach. Some beaches, like that on Sturgeon Lagoon just north of Karluk Lagoon, are positioned in such a way that maximizes the amount and variety of flotsam.

Driftwood was apparently available throughout the prehistoric sequence, although there is some evidence that it increased in size and quantity over time, probably as coastal forests spread and matured along the North Pacific. One can see a gradual increase in the average size of post molds in structures dating from around 6,000 years B.P., through the succeeding Kachemak and Koniag phases. The size and quantity of available driftwood logs may have been a factor in this sequential change in house types over time. Nearly all of the planks encountered in the Koniag housefloors at Karluk One and at Malina Creek were of split red cedar, the nearest source of which lies south of Yakutat Bay.

Driftwood was important to the prehistoric economy as a fuel for heating houses and in cooking. Unlike the Eskimos of the higher Arctic, the Alutiiq did not need to burn sea mammal oil for heat but did use oil in stone lamps for light. Sea mammal oil, therefore, could be saved for a dietary supplement, food preservative, and skin boat waterproofing for skin boat coverings.

As George Quimby has pointed out (Quimby 1985), the currents also dropped Japanese shipwrecks on the coasts of Alaska and the Northwest Coast, as many as 15 per century based on historic records. The Japanese had iron since A.D. 500. Ship timbers bearing iron spikes probably began arriving on south Alaskan beaches shortly after this date. Iron bladed carving tools were found in prehistoric levels of the Ozette site in Washington (Quimby 1985: 13) and iron stains were also seen on a stem hafted tool from late prehistoric levels of the Uyak site (Heizer 1956). Iron is also well documented

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from prehistoric Eskimo sites across the Arctic, where it may have been traded through Siberia, and from Norse sources in the Eastern Arctic (McCartney 1988).

Iron artifacts were not recovered from Karluk One, however, I believe that the presence of iron in Koniag, and probably Late Kachemak assemblages can be safely assumed. The use of iron needles, which have long ago rusted away, may account for the fact that bone needles have never been found in Koniag contexts, despite their fairly common occurrence in Ocean Bay and Kachemak sites where bone is preserved. Excavations at the Awa'uq refuge rock site, which dates to the first days of Russian contact produced some lumps of rusted iron, some of which may have been acquired previous to Shelikof's arrival in 1784. Davydov's writings (1977:186 [orig. 1807]) also mention the use of drift iron, "In earlier years the Koniagas used as work tools a stone ax, sharpened shells, or sharpened pieces of iron. This metal was known to the savages long before the arrival of the Russians; they occasionally found metal objects washed up by the sea and prized them greatly".

Cultural Effects on the Natural Environment

In all complex systems evolutionary change can affect the characteristics of all the entities involved and the relationships between them (Prigogine and Stengers 1984). Humans are not passively affected by the natural environment, but as players in the environmental system, also affect it. This has become abundantly clear since the advent of the industrial revolution, with the advent of culturally caused changes in sea levels and global climate. Human impacts on the environment however have existed in all human/ environmental relationships, with the scale of human impacts

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on the environment contingent upon the relative complexity of the cultural system involved. Prehistoric human impacts on the natural environment of the Kodiak Archipelago were probably significant, as humans represent a major predator species in the maritime ecosystems. Steller sea cows may have been pushed from their original range in south Alaska by early sea mammal hunters to the uninhabited Commander Islands where they were quickly exterminated by Russian fur hunters in the 18th century.

Human predation on sea otters may also have altered natural marine communities (Simenstad, Estes, and Kenyon 1978). Sea otters consume sea urchins, which in turn feed upon marine algae, including kelp. When sea otters are driven away by overhunting an area, for example in the waters in front of a village, the urchin populations explode, destroying the kelp bed, which shelters a large biological community. In some cases, substantial shoreline erosion was linked to the disappearance of kelp beds. It is also possible that selection pressures on some salmon species by prehistoric fishermen altered natural patterns.

Human Ecology and Culture Change

The human ecology of the Kodiak Archipelago is characterized by extremes both in the relative abundance of resources, and in the constraints on human use of those resources. Fluctuations in environmental conditions are the norm in the Gulf of Alaska and exist on many different scales, from the relatively predictable rhythm of daily tides and annual seasonality to sudden and unpredictable violent events ranging from storms to volcanic eruptions, earthquakes, and tidal waves.

Adapting to environmental change is of course important for any culture. However I would suggest that the environment of the western Gulf

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of Alaska is more dynamic than most in terms of the number, intensity, and variety of environmental events that one can expect to experience in a human lifetime. Prehistoric cultures appear to have developed strategies for dealing with the natural disturbances of the equilibrium of village life as oral histories of two such events in this century suggest.

When the skies became black following the Katmai eruption in 1912, elders immediately directed villagers to begin to fill all available containers with water (Dumond 1979, KANA oral history files 1987). Shortly afterward, the ash fall turned the streams milky with sediment, making fresh water undrinkable. The water reserves no doubt saved lives until the villages were evacuated a week after the ash fall. Experience was similarly instrumental in saving lives following the Good Friday earthquake of 1964. Elders in Old Harbor and Kaguyak directed their fellow villagers uphill as the sea level in the bays in front of the village suddenly dropped, prior to arrival of the tsunami which demolished both villages. Had either the Katmai event or the 1964 earthquake been so unusual as to be unknown in the living memories of the people, then the consequences would have been far worse.

Similar bodies of knowledge no doubt helped Natives adapt to smaller and less spectacular, but potentially deadly natural events. More important than the immediate effects on human populations were the impacts of violent natural events on local ecosystems. Many such disturbances could be dealt with by moving to a new village location. Because of a cultural adaptation to variability, natural disasters were unlikely to knock a traditional Native culture off of its feet. The Alutiiq seemed to have been quite resilient in the face of natural disasters, probably much more so than the modern western cultural landscape that occupies this volatile region today.

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It seems likely that the most formidable challenge posed by the ecology of the Kodiak Archipelago was the extreme seasonality of most food resources. From mid-May through August, food resources had to be acquired and processed in such a way to allow long term preservation. In a radiographic analysis of human long bones recovered from Kachemak phase sites, Steffian and Simon (1993) found that Harris lines were common in numerous individuals, which they interpret as a sign of metabolic stress resulting from seasonal food shortfalls. They quite reasonably suggest that several factors may have been at work winter storms that prevented access to resources, fluctuations in storable fish, sea mammals, and plant resources, and the presence of PSP in shellfish.

Another potential variable should be included in this list, however, for during the long winter months food also had to be distributed or rationed intelligently. In a society predicated on sharing, hospitality, and the ratification of status through feasts that emphasized these values, the temptation to be profligate with stored food would have been strong, even expected. It may even be argued that acquiring status and maintaining the alliances that bind social structures was worth the price of going without food for a time. The social costs of inevitable and divisive conflicts that would have resulted from even a suspicion of food hoarding by closely spaced neighbors in a hungry village may well have been higher than that incurred by seasonal starvation.

Winter feasting (and fasting) by the Koniag is well documented in the ethnohistoric record (Gideon 1989: 44-45, Merck 1980: 100). Davydov, in citing the Alutiiq terms for the months of the year, records that February was called "Kypnyakhchik" translated as "cutting the iukola (dried salmon) into strips" (1977: 186), and also made the following observation:

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> "From this it will be seen that the months are named after various phenomena in nature, and this in its turn produces months of uneven length. For example Kypnyakhchik is the longest month for its covers the whole period during which the islanders are short of food supplies and eat only shellfish or pieces of the remaining iukola—which, however, few have left. "

Dealing with seasonal food shortages probably required the Koniag to balance the need to conserve winter stores resources with the requirements of maintaining their social organization, or 'keeping the peace'. The evidence for seasonal scarcity suggests that despite the abundance of the marine environment, there was perhaps less room for error in subsistence strategy than we might imagine at this distance. Fluctuations in resource availability, along with the nutritional need for calories to balance protein, would have placed a premium on a diverse economy. Although complete economic reliance on a single species was probably never possible, shifts between the relative percentages of species in the diet are reflected in the archaeological record, most likely reflecting environmental changes coupled with human demography. Maintaining the skills and technologies for harvesting a wide variety of resources made these shifts in subsistence a viable means of adapting to fairly substantial ecosystem changes, such as those brought on by major climatic change.

In looking at the archaeological record of the Kodiak Archipelago, it appears that in the process of shifting an economic focus, material culture relating to subsistence activity would change, however it tended be a variation on a time tested model rather than a totally new item of material culture. Archaeologists quite naturally classify prehistoric cultures on the basis of what survives in the archaeological record; durable material remains of stone and bone are most often associated with subsistence pursuits. House

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forms, settlement patterns, and faunal middens are also closely tied to the natural environment. We should therefore not be amazed that the chronology of archaeologically known cultures is often synchronous with large scale changes in the natural environment (Table 4:1).

More conservative aspects of culture--likely to exhibit more continuity during a period of climatic change; religion, language, and the like, are largely invisible to archaeologists and must be inferred through links to ethnographically known cultures. Tracing these links becomes a process of tracing the evolutionary development of tool types and house forms through time. In the Central Gulf of Alaska, a sudden appearance of new forms on the archaeological horizon has usually led to a scramble to locate a source of immigrants or to shadowy 'influences' and 'traits' that emanate from various cultural hinterlands.

Some of this is predicated on the idea that among non-western cultures evolutionary change occurs on a slow and generally steady rate, despite abundant evidence to the contrary that all change, inclusive of natural evolution, western history, or the physical history of the universe for that matter, has occurred at anything but a steady rate. Like other phenomena, cultural evolution on the Kodiak Archipelago is a tale of successively shorter periods of relative equilibrium, punctuated by short episodes of more rapid change.

Ocean Bay; an Early Maritime Culture

According to archaeological evidence thus far, initial human occupation of the Kodiak region apparently occurred at somewhat later than more southerly areas of the North Pacific rim. Kodiak Island's earliest reliably dated sites, from the Ocean Bay I phase, date to 6200 ± 70 B.P (Nowak

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1979) and 6080 ± 90 B.P. (P. Knecht 1991). First described by Clark (1966, 1979), Ocean Bay I assemblages are dominated by tools of chipped stone. Microblade cores, microblades, bifaces, stemmed points, and bi-pointed points are common in the lowest levels of Ocean Bay I sites, along with occasional examples of ground slate lance points. Ocean Bay II phase assemblages are defined by an increasing preference for ground slate lances and flensing knives which occur around 5,000 B.P., about the time microblade manufacture was apparently discontinued

Recent discoveries of sites with preserved bone artifacts and faunal remains have confirmed that Ocean Bay peoples were accomplished maritime hunters and fishermen (P. Knecht 1991). Bilaterally barbed bone harpoons with twin line guards are reminiscent of forms recovered from Northwest Coast sites. Two fragmentary human remains, the oldest ever found in Alaska, include partial dental arcades which fall in the range of variation typical of Eskimo/Aleuts, although the sample is too small to determine the ethnic affiliation of Ocean Bay peoples with certainty. However the presence of ground stone oil lamps seems to also indicate that Ocean Bay settlers were the ancestors of Aleut/Eskimo peoples who inhabit the region today. Composite bone fish hooks and grooved cobbles are similar to those observed in assemblages throughout the sequence. Faunal remains include those of large sea lions, seals, sea-otter, and whale. Shellfish remains, including blue mussel, butter clams, chitins, limpets, and sea urchins are also abundant.

Some terrestrial species are also represented, such as brown bear and fox, as well as caribou, native only to the Alaska Peninsula. Tools and debitage of exotic chert, chalcedony, and basalts also came from the Alaska Peninsula, indicating that the Ocean Bay peoples possessed sufficient

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watercraft and skills to routinely traverse the thirty mile Shelikof Strait, famous among mariners as one of the most storm-tossed bodies of water in the world. Notably absent are labrets and toggling harpoons, both artifacts which occur in the subsequent Kachemak and Koniag phases.

Housefloors of Ocean Bay peoples are vividly defined by thin layers of bright red ocher. The earliest dwellings appear to be tent-like structures, probably constructed from sea-mammal hides over a wooden frame. By 5,000 B.P., semi-subteranean structures also appear; possibly utilized on a seasonal basis. Ocean Bay sites have been found at various locations around Kodiak Island, as well as the adjacent shore of the Alaska Peninsula, however discoveries remain too sparse for settlement patterns to emerge. Recent geological work has determined that the east side of the island has been rising at a rate averaging about 2mm annually, or one meter every 500 years. Several well preserved Ocean Bay sites have been subsequently discovered on former shoreline terraces, now located far from the sea as lagoons and bays were drained by the gradual uplift.

The population during Ocean Bay times seems to have been substantial, fueled by a technologically sophisticated economy which took full advantage of Kodiak's diverse and abundant marine resources. Technologies and houseforms throughout the roughly 4,000 years of the Ocean Bay I and II phases showed changes, but profoundly less change than would occur in the 4,000 years to follow.

The transitional stages leading from the Ocean Bay to the Kachemak phase, which had occurred by 2,500 B.P. are not well documented, and may represent a relatively short period of time, perhaps only a century or two. Only one Kodiak Island site has has thus far yielded a carbon date of 3263 ± 61 B.P. (Clark 1966), and a similar situation has been encountered on the Alaska

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Peninsula, where no sites have been found from the time period ranging from 2800-1800 years B.P. (G. Clark, 1977, Crowell 1990). In multi-component sites, such as at KAR-031 near Karluk Lagoon, 40 centimeters of weathered tephra, generated by active volcanoes on the Alaska Peninsula, separates the Ocean Bay layers from Kachemak phase strata. It is possible that a period of active volcanism resulted in a smaller, or at least less archaeologically visible population. The transition itself, like that of the Kachemak-Koniag transition, was probably associated with the neoglacial period which began around 3200 years B.P.. Temperatures dropped precipitously during this time, and it is reasonable to assume that the changes in house forms and subsistence technology were in response to those changing conditions. At any rate, most Kachemak sites in the Kodiak Island area have basal dates which tend to cluster around the 2000 B.P. range.

Table 3:6 Climatic and Cultural Sequences on the Kodiak Archipelago (Mann and Hamilton 1993, Wiles 1992).

Approximate Time Period	Climatic Profile	Archaeological Culture
1710 A.D. to present	Warming trend	Late Prehistoric Koniag, Historic
1440 A.D.- 1710 A.D.	Little Ice Age - cold	Late Koniag
500 A.D.- 1440 A.D.	Drier & warming	Late Kachemak, Early Koniag
1200 B.C. - 500 A.D.	Neoglacial - cold,wet	Early & Middle Kachemak
3000 B.C.- 1500 B.C.	Temperature decline	Ocean Bay II (Late)
5000 B.C. - 3000 B.C.	Hypsithermal- warm	Ocean Bay I (Early)
12,000 B.C. - 5,000 B.C.	Glacial retreat	-----------?-------------

The Kachemak Tradition

Kachemak phase sites were often intensively occupied for long periods of time, as evidenced by deep middens of shellfish and other faunal remains. Houses were semi-subterranean, single-roomed structures, sometimes with

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small alcoves on one or more corners of the house. Clay lined pits, perhaps used to store fish and other foodstuffs are found in Kachemak dwellings. Settlements tend to be clustered groups of from one to forty housepits and sites seem to have been most intensively occupied near overlapping habitats of marine animals.

Floorplans of Kachemak dwellings are closely similar in size and form within sites, but vary somewhat on the intra-site level. Steffian (1991) has excavated 16 Kachemak structures at the Uyak site, 13 of which were dwellings ranging in size from 15 to 35 sq. m. The dwellings featured 6 m long entrance tunnels, centrally located slate slab hearths, and slightly raised earthen platforms along one or more walls. A single Kachemak dwelling on the Crag Point site, excavated in 1986, lacked entrance tunnels and featured twin hearths which were located near an interior wall.

While Kachemak sites, houseforms and assemblages retain many common features, stylistic diversity seems to reach its peak during this time. During late Kachemak times, an increasing number of artifacts and raw materials appear which are exotic to the island. Some items appear to have been manufactured by neighboring socieities; harpoon points identical to thos recovered from Bering sea and Aleutian Island sites are frequently found in late Kachemak contexts. Labrets, beads, and similar decorative items were made from jet, from various regional sources on the Alaska Peninsula and the Kenai Peninsula (Steffian 1991: 20).

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Chapter 4: The Karluk One Site

Resources and Geography of the Karluk River and Lagoon

The place-name 'Karluk' appears in the earliest Russian historical accounts (Shelikhov 1981), and is derived from the Alutiiq *iqalluk,* the term for fish (Ukatish, Leer and Taff 1980). The Karluk River is the most productive in the Archipelago, with runs of salmon and other anadromous fish lasting from May through October. Silver salmon, arriving during the last runs of the season, can survive in deep holes through much of the winter. All five species of salmon native to Alaska run in the Karluk River. This is true for only one other stream on the Archipelago, the Ayakulik River. Both streams end in small lakes, needed for the juvenile phase of Red Salmon.

The Karluk River, located on the southwestern portion of Kodiak Island, is the largest stream in the archipelago (Barsh 1985:1). Flowing from Karluk Lake, it passes through 33 km of banked glacial till, flat boggy areas, and finally through low, irregular hills as it empties into Karluk Lagoon (Plate 1). The river is shallow, one can easily wade across the stony bottom in most places, and averages about 100m wide.

Karluk Lagoon forms the mouth of the Karluk River and is a shallow estuary about 5 km long and .5 km across at its widest point (Rodgers 1990:10). The lagoon is separated from Shelikof Strait by a long, narrow spit composed primarily of granite beach cobbles (Plate 1). The source material for the spit comes from high granitic cliffs that tower above a high energy coastline stretching north from Karluk Lagoon.

Although a slight anchorage exists in front of Karluk lagoon, Shelikof Strait drops off quickly to depths of 200 to 300 m (Barsh 1985:1). The bottom is

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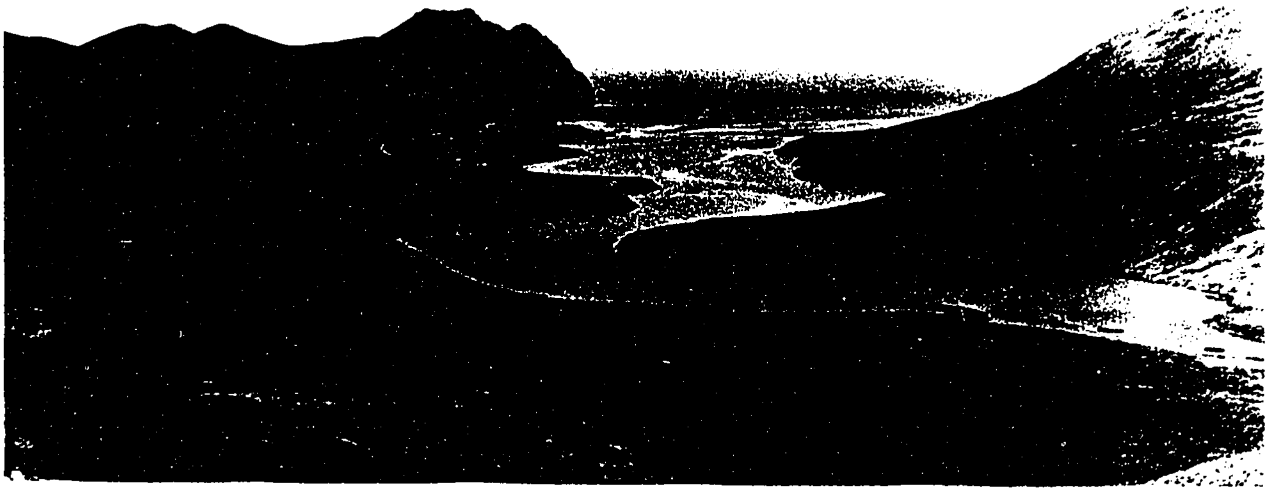

Plate 1: Aerial view of Karluk Lagoon and Shelikof Strait

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Figure 3: Location of the Karluk One site
and KAR-31 on Karluk Lagoon

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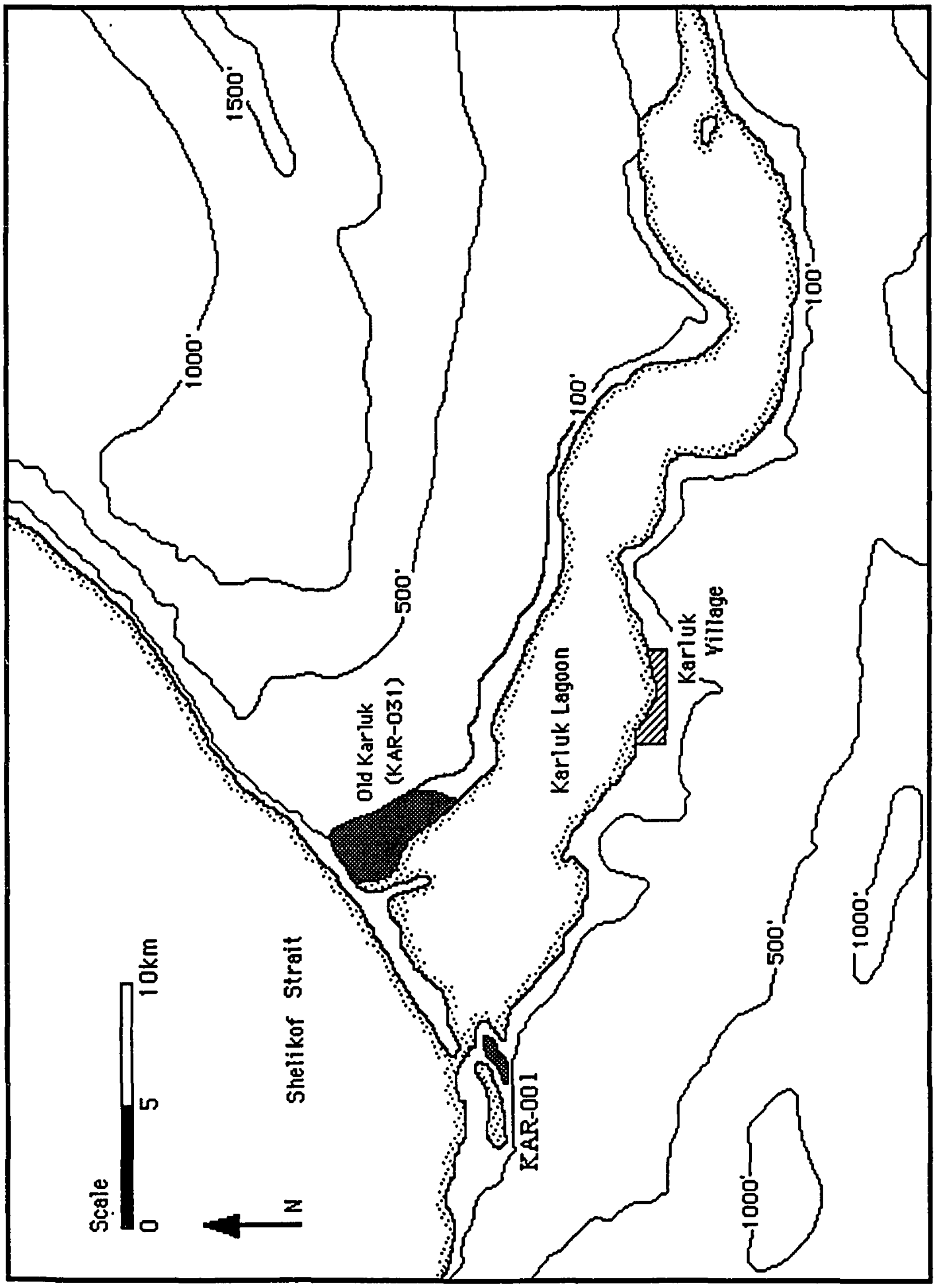

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covered by silty clays, deposited by the Strait's westerly tides and currents. The shore lines adjacent to Karluk Lagoon are high energy, and generally lined with high cliffs. A cobble pocket beach exists at Tanglefoot Bay, about one mile to the south of Karluk Lagoon, however surf conditions make landing by small boats difficult. No prehistoric sites have been located in Tanglefoot Bay.

Sturgeon Lagoon is located 6 km south of Karluk Lagoon, and is the nearest habitable section of coastline. Site survey carried out by myself and Glenn Sheehan in 1983 revealed several Kachemak villages, and only about six Koniag barabara pits on the lagoon. The Kachemak phase settlements date from a time when Sturgeon Lagoon was less infilled by sediment. Pink salmon and dog salmon are the only salmon species that run in the lagoon today.

Because of its fish resources, Karluk was one of the first villages occupied by Russian fur traders, and was noted by Shelikhov as "a well populated spot" (1981:46-47). Lisianski counted 34 barabaras at Karluk in 1804, estimating that about 18 persons per barabara, for a population of about 680 (Lisianski 1814:193). Fleets of kayaks sent out to hunt sea otter for the Russian American Company would stop at Karluk to take on dried salmon. Using Native labor, the Russians harvested and dried as many as 300,000 fish annually during the early 19th century (Gideon 1989:39). The true measure of the Karluk River's salmon was reflected in the enormous catches made by the salmon canneries beginning in the 1880's. According to a U.S. Fish Commission Report, "Karluk is the most important salmon fishing station in Alaska, yielding fully one-half of the entire catch of the Territory" (Bean 1890:9). In 1889 alone, 3,000,000 salmon were caught at Karluk (Bean 1890:20). These numbers reflect the runs of red salmon; large numbers of the other

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four species were also present, but were not considered commercially valuable at the time.

Other food resources are less abundant around Karluk Lagoon. The nearest sea mammal haulout area to Karluk lies seven miles to the north, where substantial sea lion rookeries exist near the base of Cape Ugak. Seals and sea lions are common visitors to the mouths of both Karluk and Sturgeon Lagoons during salmon runs. Halibut, cod, and rockfish are abundant in the offshore waters in the area during the summer months. There are no bird rookeries today in the immediate Karluk area.

Changes in the configuration of Karluk spit occur during winter storms, which are both frequent and violent. These storms routinely generate wave heights exceeding 10 m on Shelikof Strait. Storms of extraordinary ferocity, which occur perhaps every century or so, result in changes in location of the lagoon mouth. Archaeological evidence demonstrates that changes in the lagoon mouth, as well as shifts in the location of main current channels in the lagoon have influence settlement location. The deepest middens, as well as those with the greatest time depth are at KAR-31, suggesting that the lagoon mouth was most often located on the north shore. The base of the site yielded a radiocarbon date of 4900 ± 100 B.P. (Beta 11245), which when calibrated yields a calendar date of 3696 B.C. (Jordan and Knecht 1988:239, Mills 1994:144). Kachemak, early Koniag, and historic deposits are also present at the site.

According to oral tradition, at the time of Russian contact in 1784, the lagoon mouth was on the north side, adjacent to Old Karluk and the KAR-31 site (Figure 3). This is supported by archaeological evidence of early contact material and historic structures, including a sod walled fortification built by the Russians (Figure 4). The historic structures at KAR-31 correlate with

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Figure 4: Site plan of Russian era structures
on the KAR-31 site, Old Karluk

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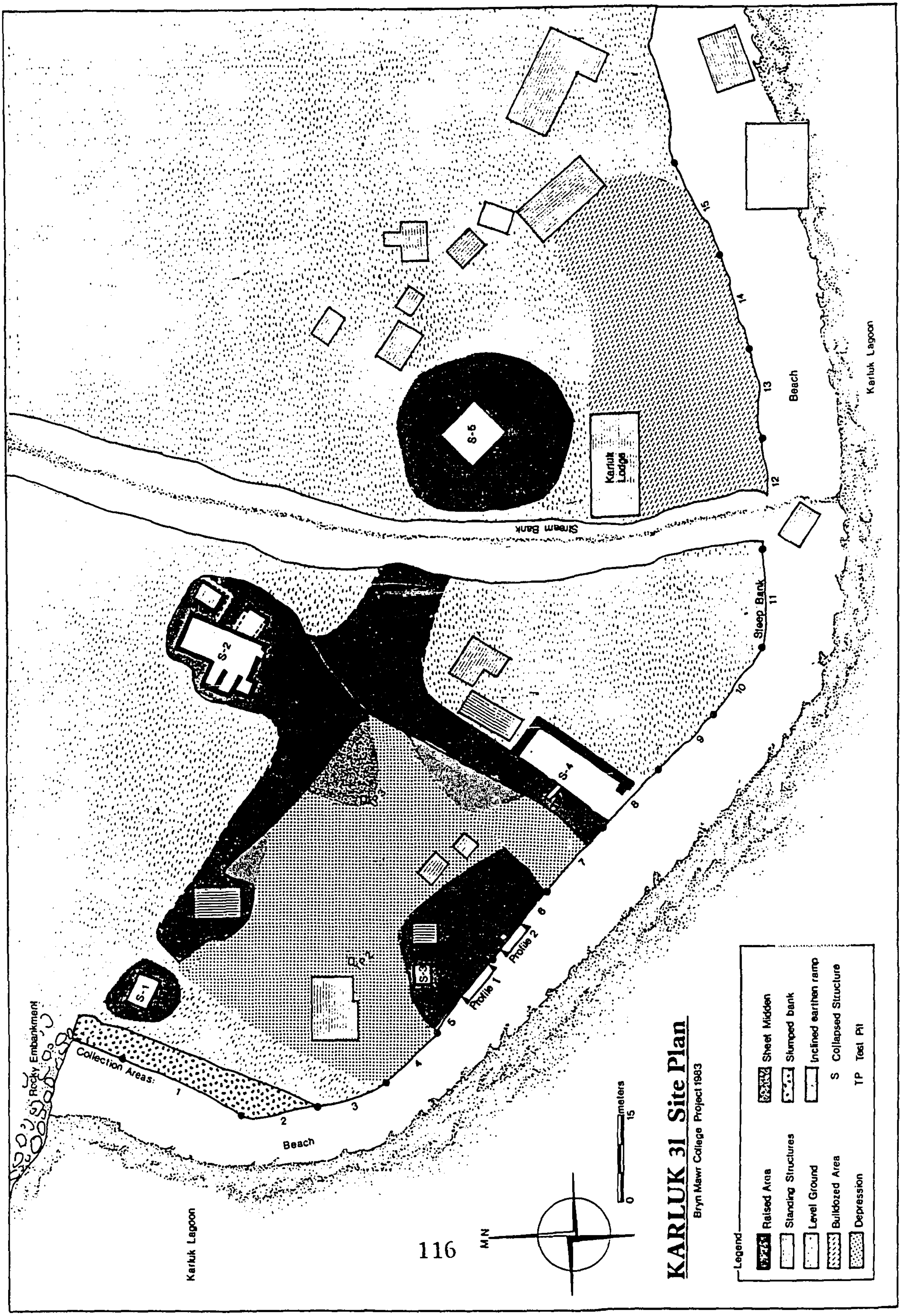

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Plate 2: Aerial view of KAR-31 and the Village of Old Karluk

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Gideon's 1804 description of the Karluk artel (Gideon 1989; Knecht and Jordan 1985). Sometime before 1850, the lagoon mouth location shifted to the south side, probably due to a storm. The southern entrance to the lagoon, as well as the remnants of the earlier one on the north side can be clearly seen a 1974 aerial photograph (Plate 5).

During the late 19th century, the spit was the scene of intense exploitation by American cannery operators of Karluk's salmon runs (Roppel 1989). Seven canneries lined the spit, which had a miniature railroad track down its center (Plate 3, 4). Over fishing forced the canneries to close by the early 20th century. The abandoned cannery buildings remained a source of building materials for Karluk villagers for much of the next century. Two Alutiiq villages existed behind protection of Karluk Spit during the late 19th century. Old Karluk, so named because it was the first location of the Russian settlement, was on the north side of Karluk Lagoon, and New Karluk was on the south side. The two villages were joined by a pedestrian suspension bridge which was built across the lagoon exit on the south shore.

In January of 1978 the Karluk area was struck by a violent storm with winds exceeding 100 knots. The suspension bridge was destroyed, as were many of the remaining cannery buildings on the spit. Residents recall that 20 foot breaking waves pushed beach sediments across the mouth of the lagoon, closing it and damming its rising waters behind the spit. Under normal circumstances the lagoon's old north exit would have probably have given way again to form a new mouth; it was the lowest part of the spit, and the old channel was still extant. Unfortunately, a 6 meter high wall of boulders had been placed across it by cannery operators during the late 19th century, using a gang Chinese laborers. The waters continued to rise for a day, then suddenly broke to form a new lagoon exit at a point near the middle of the spit, where

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Plate 3

Karluk Spit and salmon canneries in 1897

The Karluk One site can be seen at the foot of the slope on the right side of the photograph. (National Archives: Albatross Collection)

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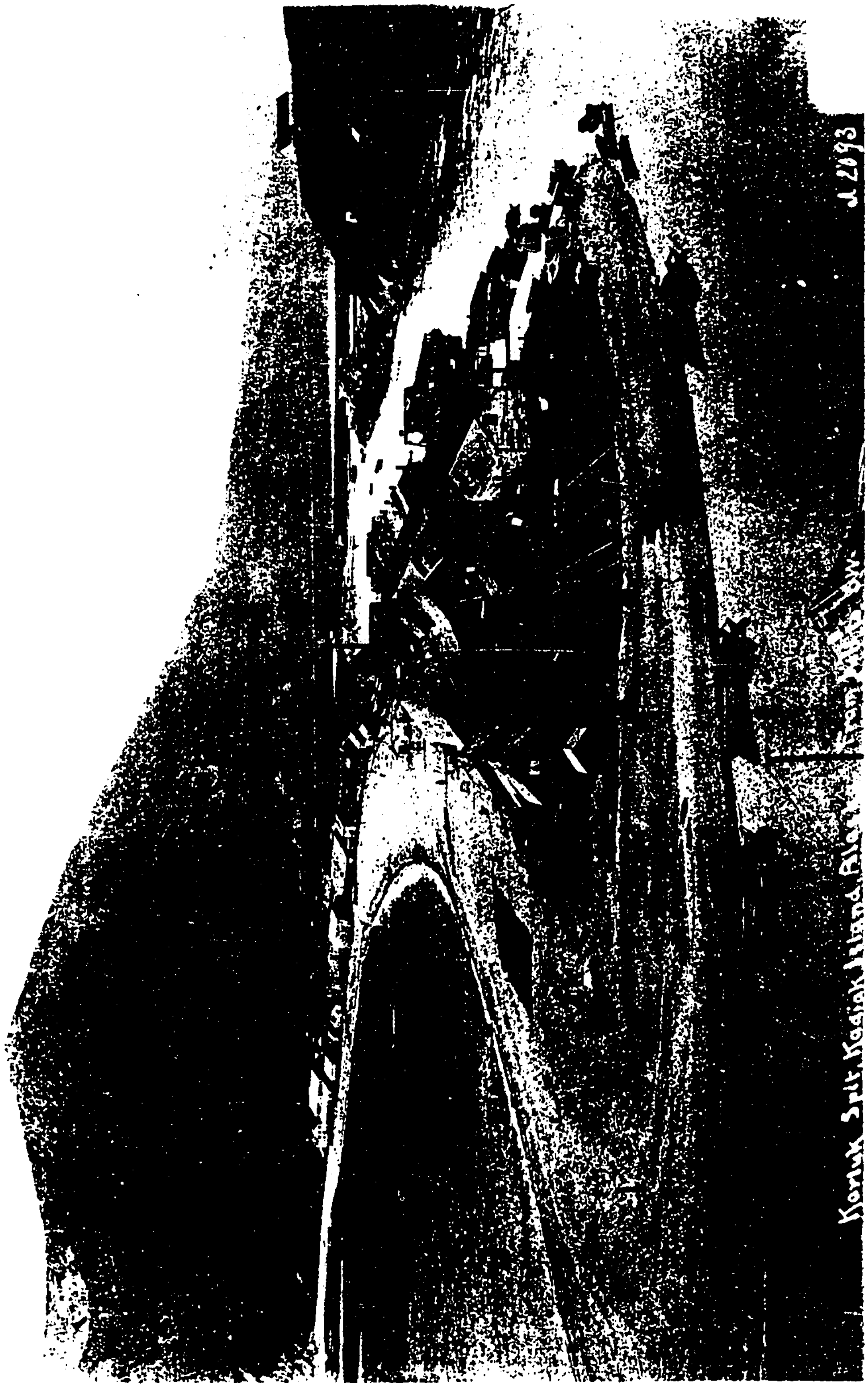

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Plate 4

The Karluk River adjacent to the Karluk One site c.1889
(National Archives: Albatross Collection)

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it had been thinned, then overwashed by the storm surge. A 1984 aerial photograph shows the conformation of the lagoon as it was when fieldwork began at Karluk One, as well as former river channels (Plate 6). The village of Karluk was moved to a new location further into the lagoon shortly after the 1978 storm, where it remains today with a population of about 60 (Plate 7).

Karluk was largely unaffected by the 1912 Katmai eruption and ash fall. A strong northwest gale kept the ash fall from reaching the Karluk area and it is invisible in the soil profile. Earlier prehistoric ash falls are evident in soil profiles taken on the 40 m bluff overlooking Karluk One. At least four distinct prehistoric volcanic events were recorded in tephras sampled by geologists in 1994 (Beget; personal communication 1994).

During the 1964 earthquake a hinge line developed along the mountainous spine which stretches in southeast-northeast direction down central Kodiak Island. Uplift occurred east of the line and subsidence on the west side of the island (Rogers 1988). The entire island was displaced toward the southeast (Whitten 1972). Within the general study area, Karluk Lake fell more than the Karluk River drainage and Karluk Lagoon, which were tipped seaward (Barsh 1985). Subsidence at Karluk Lagoon was estimated to be 46 cm.

The Karluk river slowed as a result of subsidence and the spit has been exposed to more tidal action. Erosion has made the lagoon more shallow in recent years as reductions in current velocity has deposited greater amounts of sediment (Rodgers 1990). Deeper holes and channels favored by breeding salmon have been filled in many places. Salt water penetrates a greater distance into the lagoon, also altering the marine ecology. Marine eel grass has steadily choked the waters of the lagoon, making travel difficult by skiff except during high tides. Mud flats have become stabilized by the marine

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Plate 5:

1974 Aerial View of Karluk Lagoon
(After Rodgers 1990)

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Plate 6:

1984 Aerial View of Karluk Lagoon
Note 1978 storm breach of Karluk
Spit just north of the Karluk One site
(After Rodgers 1990)

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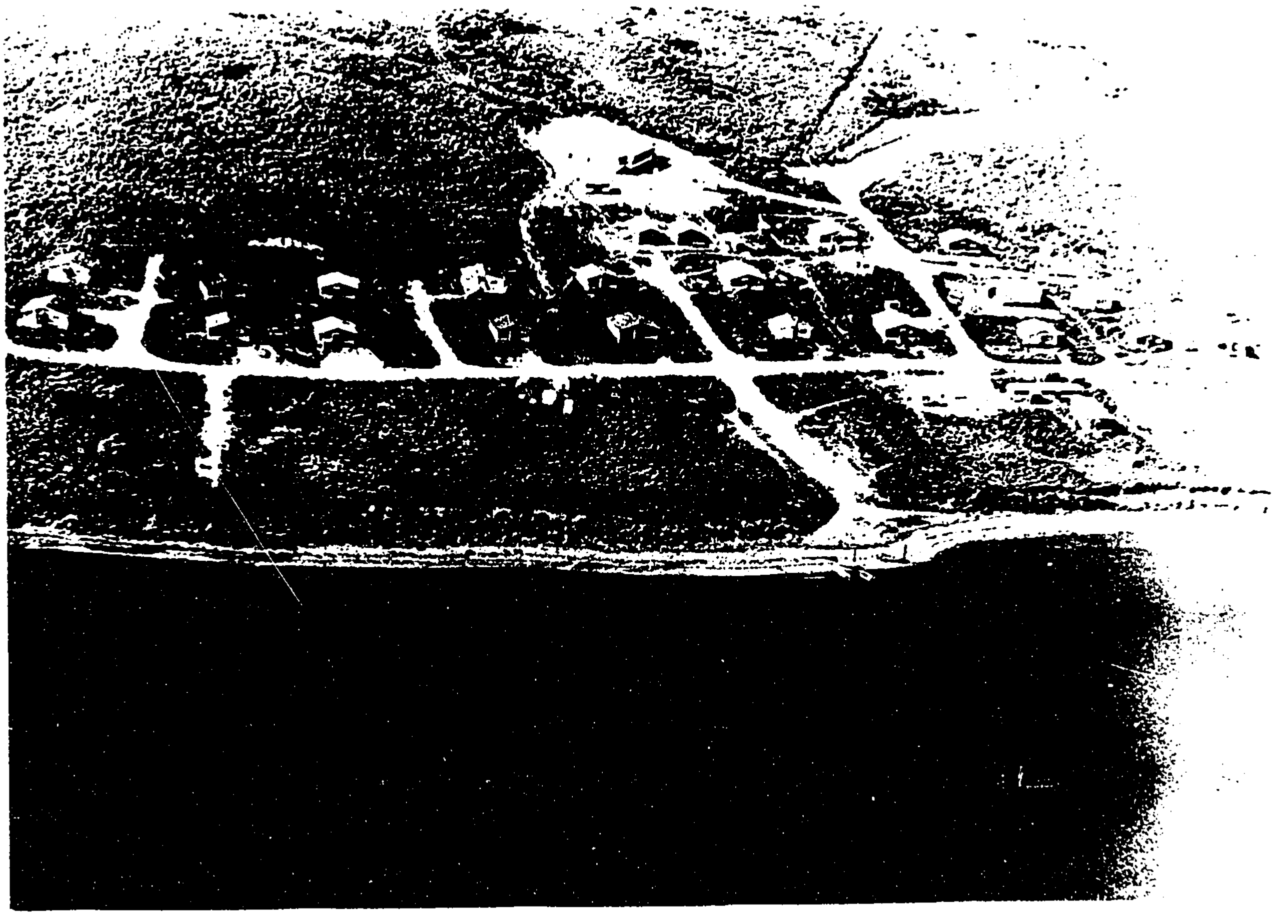

Plate 7: Modern Village of Karluk in 1984

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vegetation. Prehistoric earthquake events also altered land levels and would have had similar effects on the lagoon and its human inhabitants.

Since 1978 the lagoon outlet has moved steadily south, exposing Karluk One to direct wave action, particularly during high tides. In 1988 the high tide level, shown in oblique aerial photographs was only 27 meters from the edge of Karluk One (Rodgers 1988:88). By 1994 the high tides directly abutted the base of the site. The poorly consolidated archaeological middens are quickly eroded by the combined action of frost, tides, waves and occasional vandalism by site looters. It was against this background of the inevitable loss of the site that Bryn Mawr began its research program. In the ten years since the work began at Karluk One, thirty meters of the north end of the site, with an average depth in excess of 4 meters, has been eroded. For every cubic meter excavated in the field seasons since 1983, at least 20 have been lost to the sea.

The Karluk One Site

The name 'Karluk One' is derived from a designated site number, as determined in the state-wide numbering system for archaeological sites maintained by the Alaska State Historic Preservation Office. Karluk One's official designation is KAR-001, the first site on a list from the Karluk Quadrangle map published by the USGS. Previous publications have referred to the site as KAR-1 (Jordan and Knecht 1988; Jordan 1994); Karluk 1 (Fitzhugh and Crowell 1988) and New Karluk (Donta 1994). Karluk One is located on the south shore of the mouth of Karluk Lagoon, within the abandoned village of New Karluk (Figure 3). Several other prehistoric components, sites, and historic structures are located at New Karluk. Karluk One will be used to refer specifically to the Koniag wet site.

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Plate 8: Aerial view of the Karluk One site in 1983, facing south

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The Karluk One site is a small point of land, composed entirely of archaeological deposits, resting between a fresh water pond and the former bank of the outlet to Karluk Lagoon (Plate 8). When work began in 1983 the Koniag deposit at Karluk One was 125 meters long, 4.2 meters deep, and averaged about 20 meters wide (Jordan and Knecht 1988; Jordan 1994:154). Since that time there has been continuous loss from the north end of the site because of marine erosion. It seems likely that for the majority of the time that Karluk One was occupied, from about A.D. 1200 to 1978, it was adjacent to the outlet of the lagoon. One of the world's largest salmon runs was located only meters from the front doors of the site's occupants.

Accordingly the site was densely occupied. Prehistoric houses were located so close together that it was sometimes difficult to tell where one structure ended and a new one began. This trend continued into the historic period (Plate 9). Frederick Milan's 1953 test excavations at the site were constrained by the presence of tightly packed houses and outbuildings on the site. Abandonment of the site after the 1978 storm and the subsequent erosion of the side of the site facing the sea revealed the true archaeological potential of Karluk One only in the early 1980s.

Drainage patterns at Karluk One were altered by the 4-5 meters of midden, soils, and fire cracked rock that accumulated in 800 years. A freshwater pond now exists between the site and the base of the surrounding hills. Similar ponds formed behind other Koniag midden sites on the archipelago and act to preserve the middens that form them by creating anaerobic conditions that prevent decay of wood in the site. Karluk One, however, remains unique in terms of its depth and the concurrent volume of material that has been preserved by its combined human history and geomorphology.

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Excavation at Karluk One

In 1983 Kevin Smith spent much of the field season drawing a single site profile at Karluk One and installing a pair of 1 meter test pits at the base of the site. Controlled surface collections were also made on the erosion face and beach next to the site. It was obvious that well preserved deposits extended from about 50 centimeters below the surface all the way through to the lowest levels. The stratigraphy was complex with layers of floorboards, soddy soils, lenses of firecracked rock and faunal middens. Although preserved by moisture the soils were damp, but not flooded. For an excavator it was much like troweling through a peat deposit. A total of 624 artifacts were found at Karluk One during the 1983 season, 130 of which were made from wood, bark, hair, and baleen and other organic materials. Many of the objects were being seen for the first time and their functions were unknown to us. Clearly the site was worth a major effort to recover this rare data before erosion destroyed it entirely.

In 1984 under Dick Jordan's direction we installed a block of six 2 meter units in front of the abandoned village co-op building, where Kevin's 1983 profile had been located (Plate 10). The stratigraphy became easier to interpret with a block excavation. It became evident that we were looking at discrete Koniag housefloors, separated from one another by reflooring episodes (Plate 11, Figure 5). After a housefloor had formed a thick deposit of wood chips, faunal debris, sea mammal oil, and general domestic detritus, a fresh layer of soil was thrown upon it. Larger support posts were salvaged for reuse in the new house. Smaller floor boards and posts were buried along with the floor. Similar reflooring episodes have subsequently been noted in excavating houses from earlier time periods. Typical Koniag housefloors apparently averaged about 10-15 cm thick before re-flooring was deemed necessary.

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Plate 9

Former Schoolhouse and other frame buildings on the Karluk One site c. 1925

(Federal Archive Collections: Seattle)

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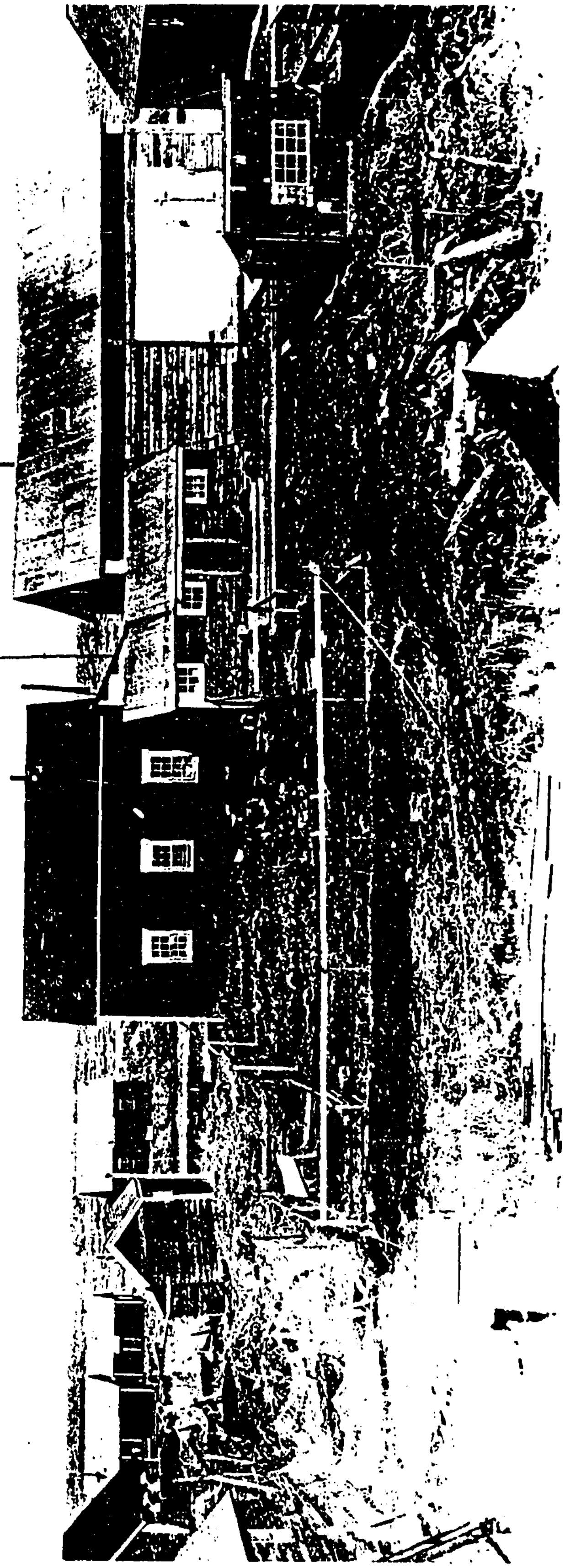

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The 1984 excavation blocks were excavated to a depth of 2.4 meters, and exposed portions of six successive Koniag housefloors and associated features. The soils were a mass of preserved wood chips, rye grass, twigs, and other debris, and were impossible to screen. Trowels were used to remove all housefloors, as well as most roof and wall sods. Some of the deeper and nearly sterile roof and wall sods were occasionally skim shoveled. Faunal remains were bulk sampled when a lens of shellfish and fishbone was encountered, and occasional finds of larger faunal bone were also bagged. Wood chips, posts, and floor boards were sampled, but not routinely recovered. Detailed maps were made of all features and point provenience was taken for all significant artifacts. Debitage and slate scrap was recovered in level bags by square. Samples were also taken of insects, plant remains, feathers, fur, human hair, grass, as well as bulk samples of house floors for future analysis. Another 1,853 artifacts were added to the collection in 1984, including spectacular finds: baskets, figurines, masks, and everywhere the glint of well preserved wood.

In 1985 I directed the installation of an additional seventeen 2 meter excavation units, placing them in a U-shaped configuration around the edges of the 1984 block. Six of the units were excavated to the base of the site, 4.2 meters below the surface. The units in the center of the block were chosen for deep excavation to avoid creating a four meter high wall of potentially unstable midden. The site's occupational history and formation processes became clear during the course of the 1985 work. The 1985 excavations generated another 4,271 artifacts.

A special processing desk became necessary on site to properly wrap each artifact along with its provenience data. Wooden artifacts were wrapped in foil, then placed in a zip-lock plastic bag to preserve their moisture. The

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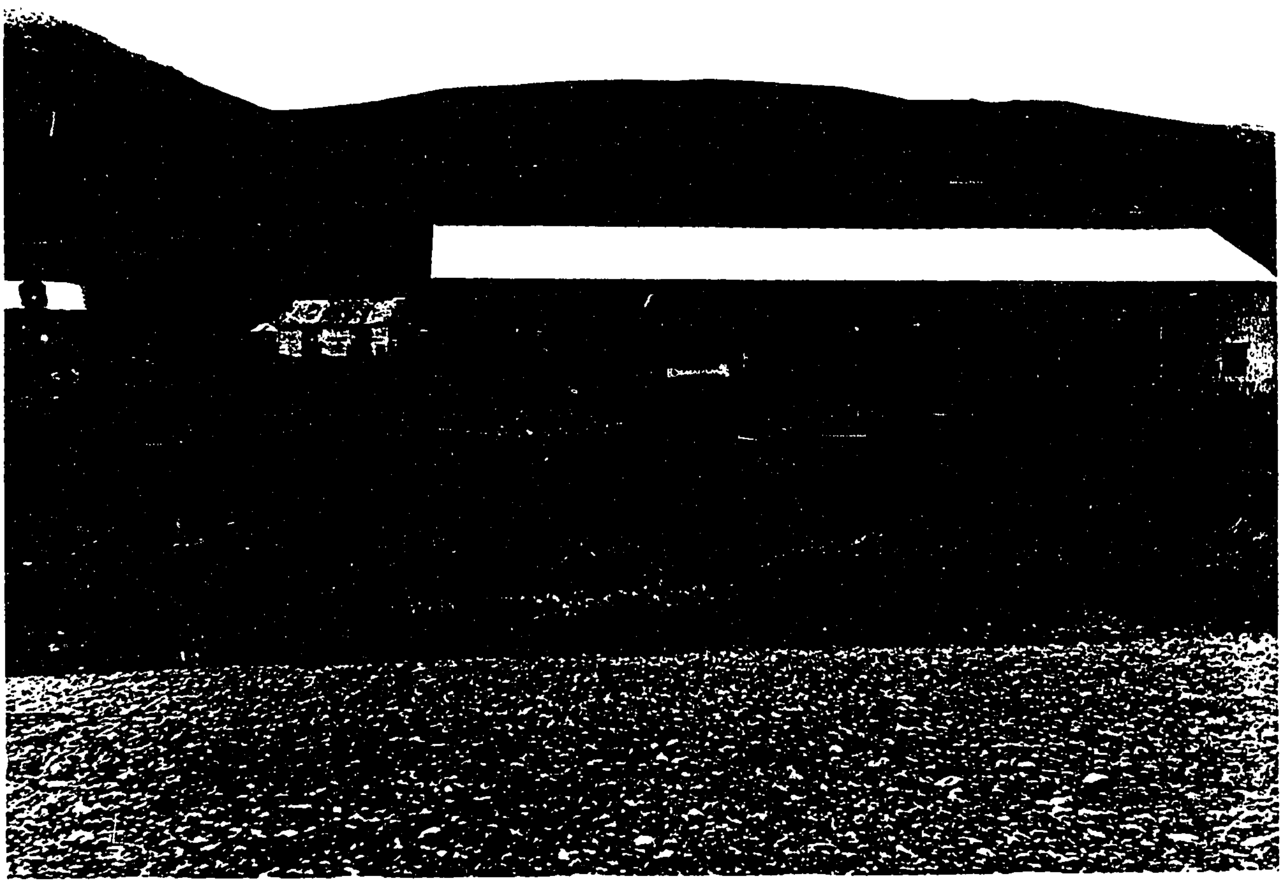

Plate 10: Location of 1983 profile test and 1984-85 excavation block under the former Karluk Fisherman's Co-op Building

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prehistoric wood looked new but in fact was held together by water; when dry it could fall to pieces in a matter of minutes or hours. After a day's excavation the day bag of registered artifacts was taken to a small fresh water pond located on the hill overlooking the site. Sealed in gallon size zip locks, then plastic trash bags, the artifacts floated in the pond until packed for the return trip to Bryn Mawr. Particularly spectacular finds were placed in a special cooler so they could be shared with our neighbors in Karluk and in presentations made at season's end in Karluk and Kodiak.

In all, more than 4,000 artifacts were individually mapped *in situ* at Karluk One during the 1983-85 field seasons. Extraordinarily favorable conditions for organic preservation were a major factor in contributing to the size and variety of the collection. More than 40% of the artifacts found at Karluk One were made of wood, bark, spruce root, grass, and other rarely recovered organic materials. Large field crews, with as many as 25 excavators removed more than 160 cubic meters of midden.

In 1987 Jordan directed another season at Karluk One, excavating another thirty-three 2 meter units, six of which were excavated to the lower levels of the site. The collection, numbering about 5,000 pieces has been unavailable until recently, but is being cataloged by myself at this time. In 1994 I directed a rescue archaeology project at Karluk One, which resulted in the recovery of between 5-10,000 additional pieces. Although the ongoing analysis of these collections is not presented here, the conclusions of this study have been checked against the later data whenever possible.

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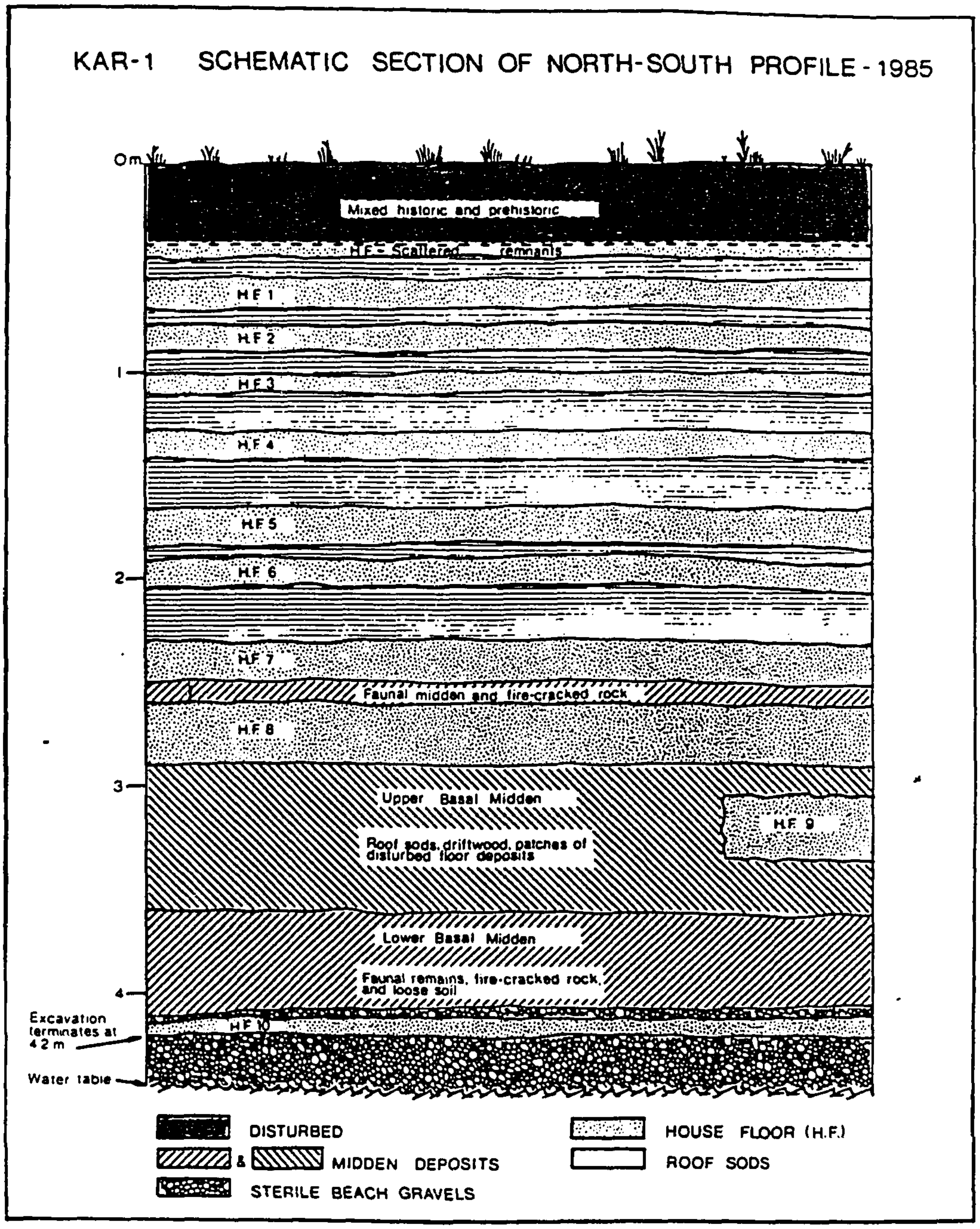

Figure 5: Schematic Plan of Karluk One Stratigraphy
(After Jordan and Knecht 1988)

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Plate 11: South wall profile of 1984 excavation block with exposed floorboards of successive housefloors

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Housefloors and Features at Karluk One

The top 50 cm of the site was disturbed by construction over the past century and the use of heavy equipment in building the suspension bridge, co-op building, and other projects in New Karluk beginning after World War II. This top layer contained a mixture of modern, historic, and prehistoric materials (Figure 5). Historic artifacts from the Russian period included gunlocks for flintlock and percussion muskets, trade beads, and mid-19th century English ceramics. The historic Russian assemblage was similar in many respects to that from KAR-37, the historic village site located about one mile to the east on Karluk Lagoon (Knecht and Jordan 1985). Historic materials from the American cannery era were also abundant in the top 50 cm of the site and dated from the late 19th to the early 20 century. In addition to American historic artifacts, Chinese ceramics, coins, and other items reflect the large number of Chinese laborers employed by the canneries.

Prehistoric artifacts in the top layer include poorly preserved wooden artifacts, most of which were apparently brought up from deeper anaerobic layers of the site by construction activity, particularly in the vicinity of the former co-op building. Partial remains of a housefloor were found just below the top layer and were a probable source of the prehistoric artifacts in the disturbed zone.

The first complete housefloor encountered at Karluk One, housefloor 1, contained no historic artifacts. Based on its stratigraphy, housefloor 1 very likely dates to the decades before sustained Russian contact in 1784, probably around A.D. 1750. A earlier radiocarbon date from birch bark has been rejected on the basis of its disconformity with other dates taken from the site

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(Table 4:1). Housefloor 1 was the first of a series of seven discrete housefloors that represent reflooring episodes of a single Koniag barabara.

Table 4:1 Calibrated Radiocarbon Dates from the Karluk One Site

Lab Number	Provenience	Material Dated	Radiocarbon Date B.P.	Radiocarbon Date A.D.	Re calibrated Date A.D.
Beta-8942	Erosion Face	Charcoal	370 ± 50	1580 ± 50	1480
GX-14670	House floor 1	Birch Bark	545 ± 70	1405 ± 70	1405 [rejected]
Beta-15014	House floor 6	Wood Plank	290 ± 60	1660 ± 60	1639
Beta-15015	House floor 8	Wood Plank	480 ± 80	1470 ± 80	1431
Beta-25599	House floor 9	Wood Plank	630 ± 50	1320 ± 50	1304,1371,1384
Beta-15016	House floor 10	Wood Plank	740 ± 80	1210 ± 80	1270
Beta-25600	Base of Site	Wood	780 ± 60	1170 ± 60	1259

The reflooring events reflected in housefloors 1-7 took place over the space of slightly over a century. Housefloor six yielded a calibrated radiocarbon date of A.D. 1639, based on a wood floor plank. The barabara featured a central room, truncated on its front side by the erosion face, as well an adjoining side room on its south side (Figure 6-12). Portions of an additional side room were found, and at first were thought to represent an additional side room. It later became clear that this room in fact joined another, as yet unexcavated barabara, which was eventually exposed in the 1987 excavations. The density of occupation at Karluk One is evidenced by the fact that these two barabaras were placed about one meter apart from each other. Reflooring episodes were also in evidence in the second barabara.

The barabara represented by housefloors 1-7 had several features in common with two other complete Koniag barabaras excavated at the c.1840 KAR-37, or Nunakhakanak site (Knecht and Jordan 1985), and at KOD-450, the Awa'uq Refuge Rock. A central hearth is about one meter in diameter and ringed with stones. In the case of the Karluk One hearth in housefloors 1-7, the hearth stayed in the same location throughout the dwellings history.

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Figure 6-14: Maps of house floors 1-10 at the Karluk One site
(After Boden 1985, Goldman 1985)

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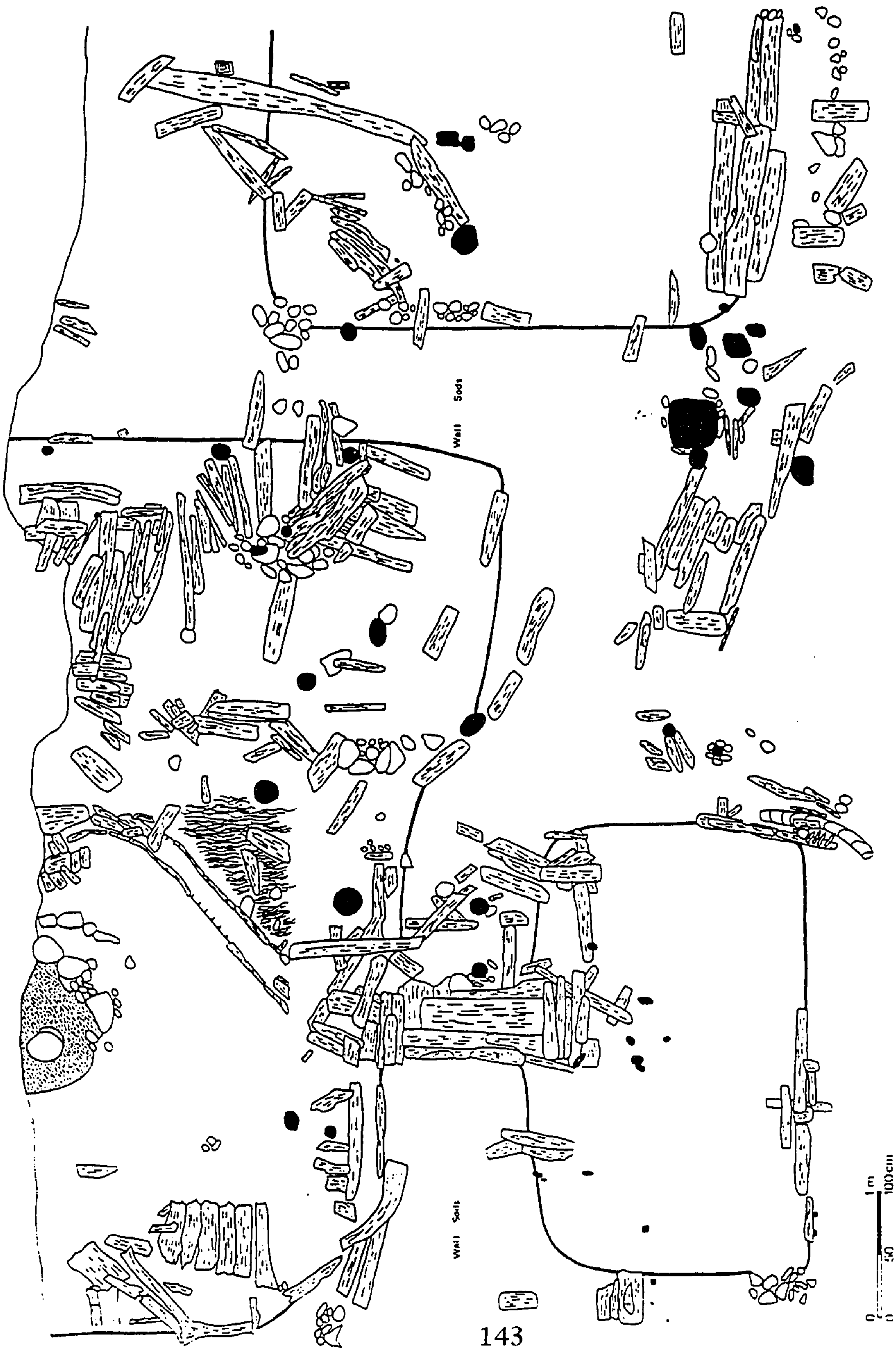

HOUSE FLOOR 1

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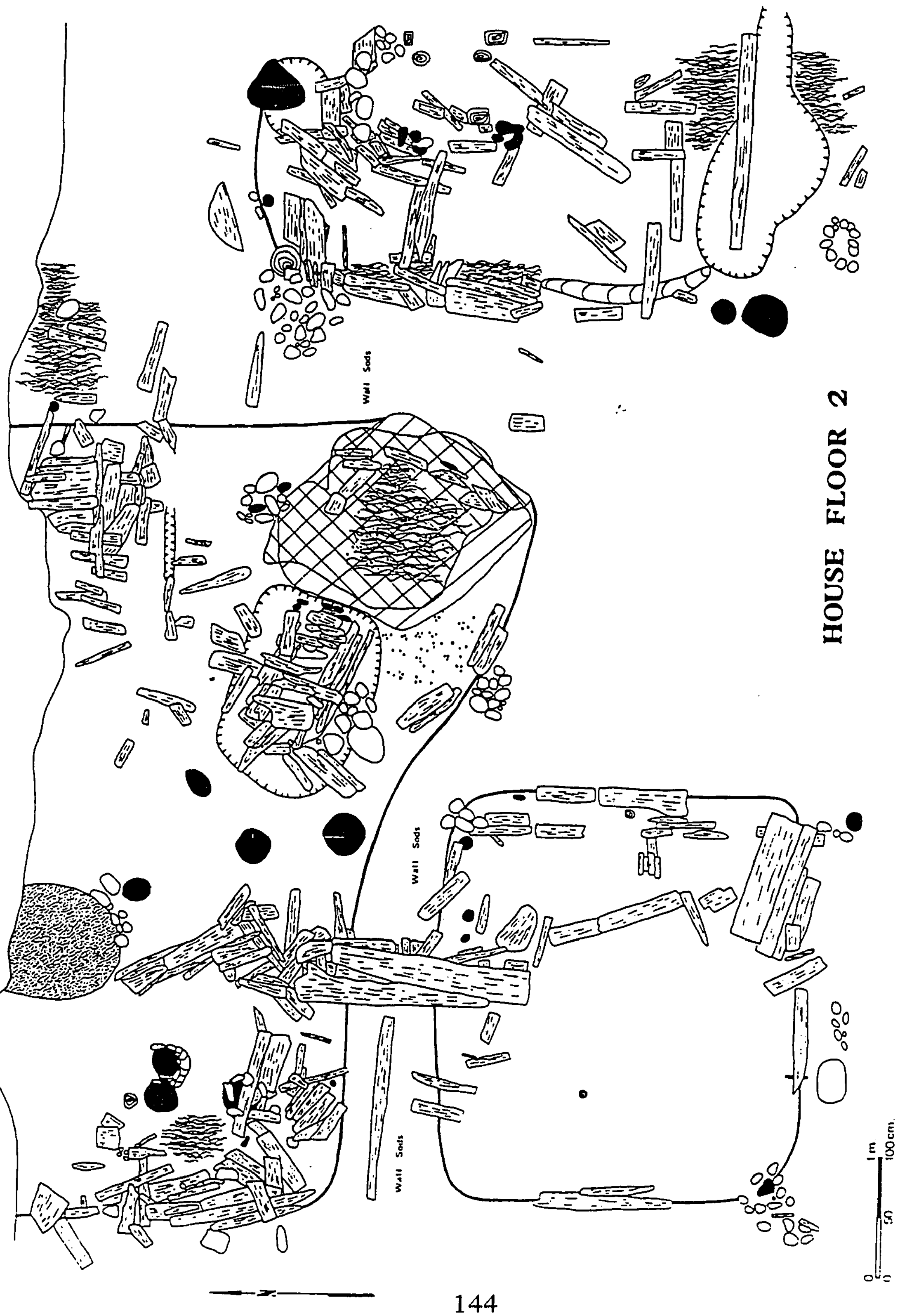

HOUSE FLOOR 2

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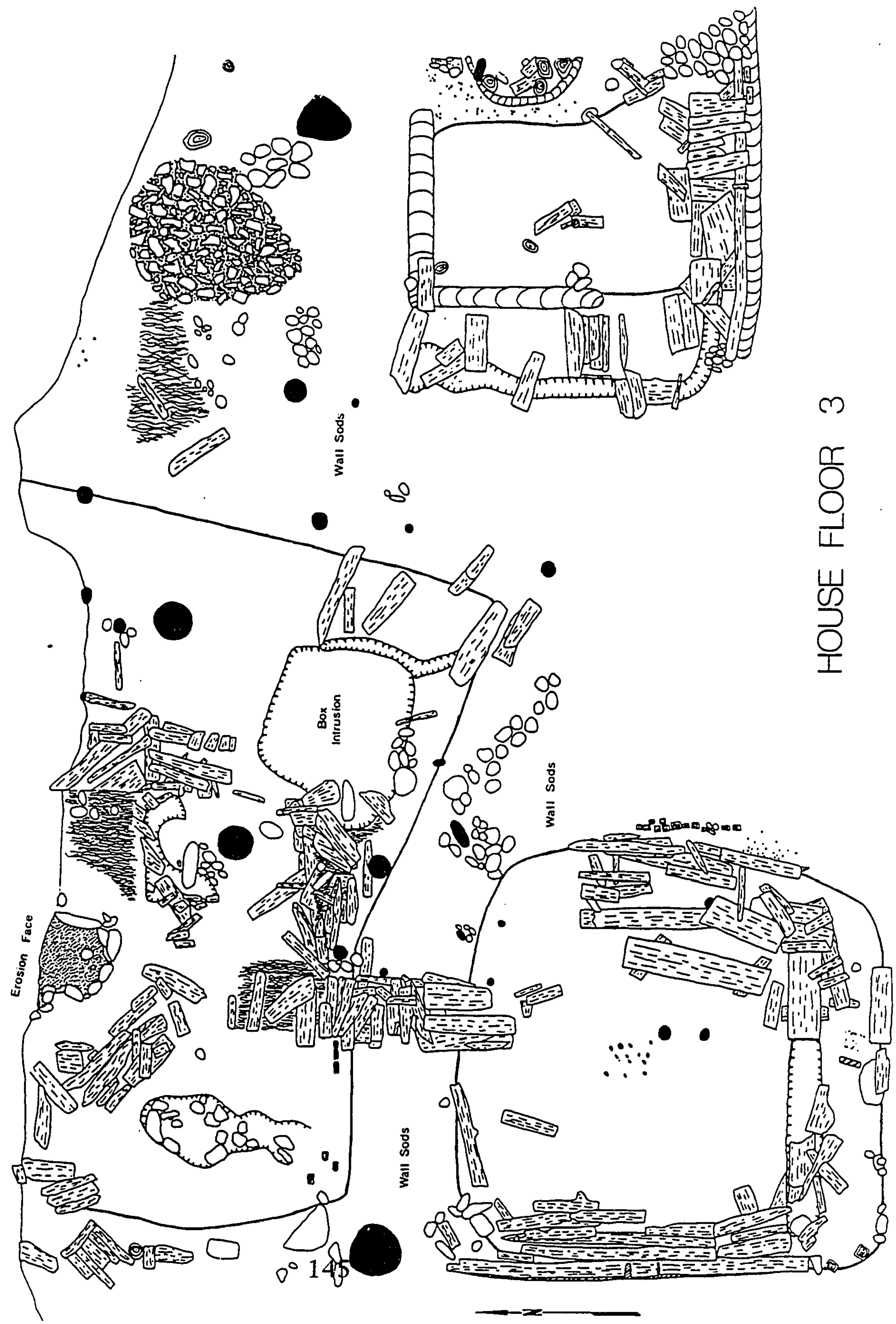

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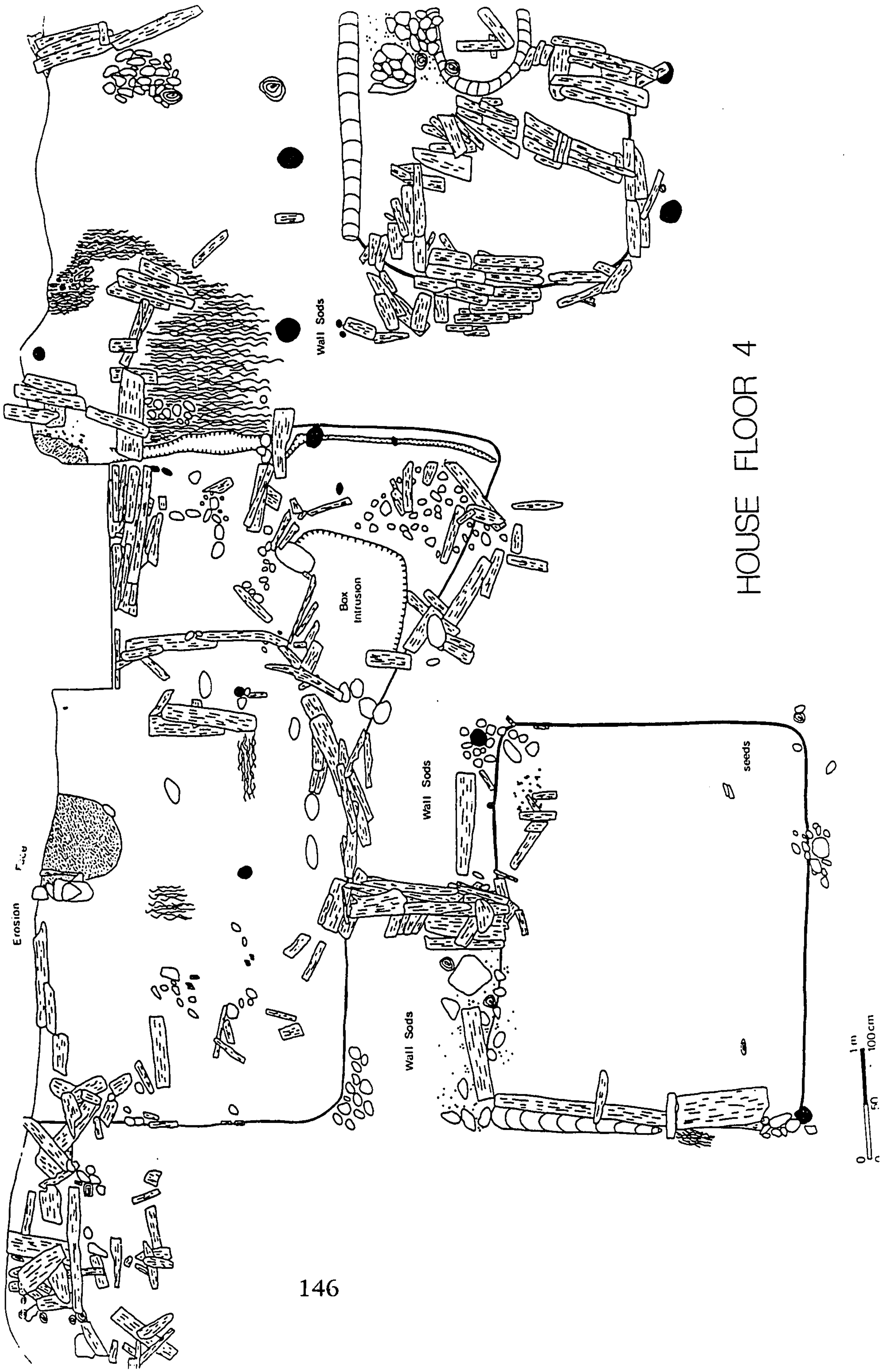

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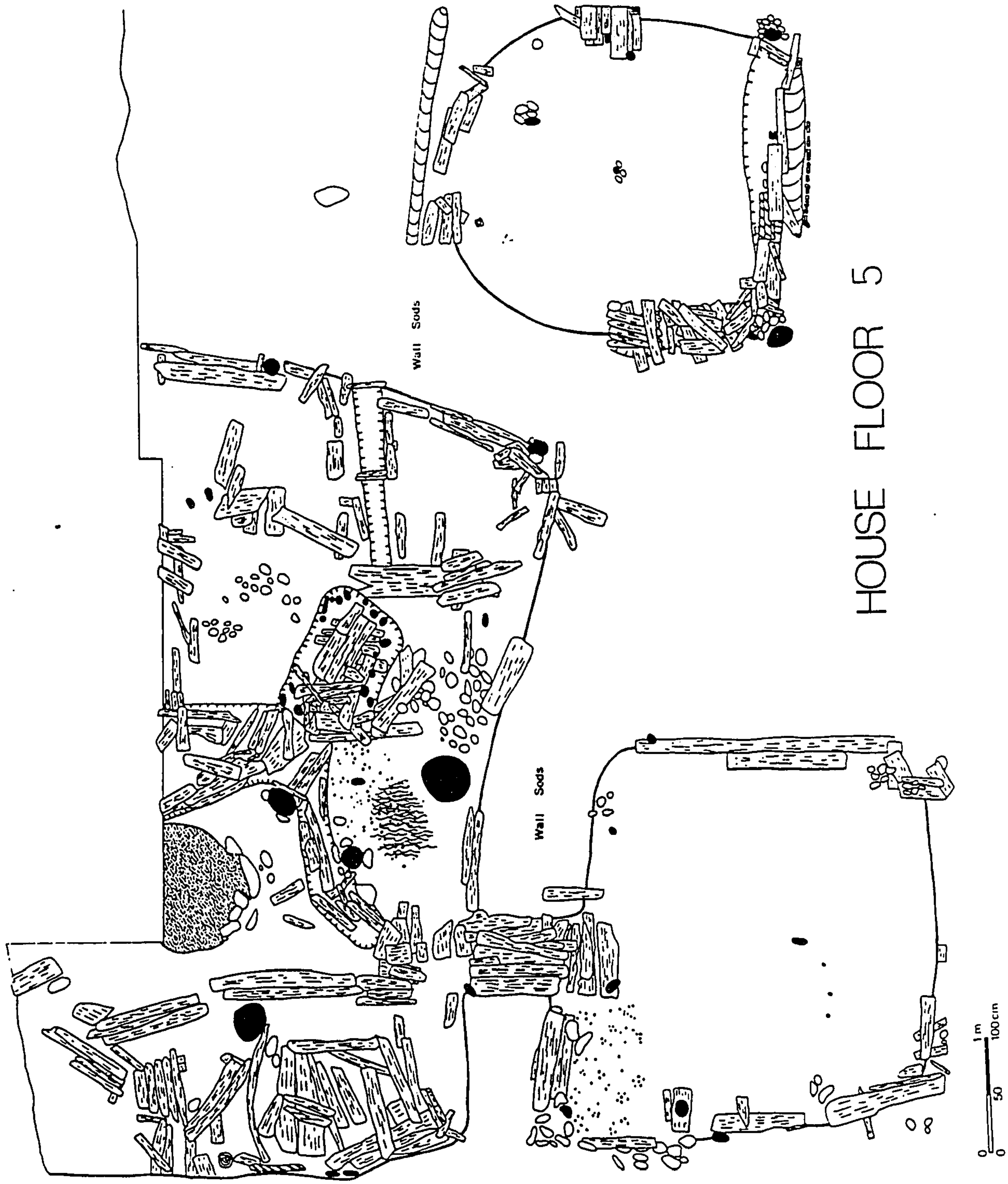

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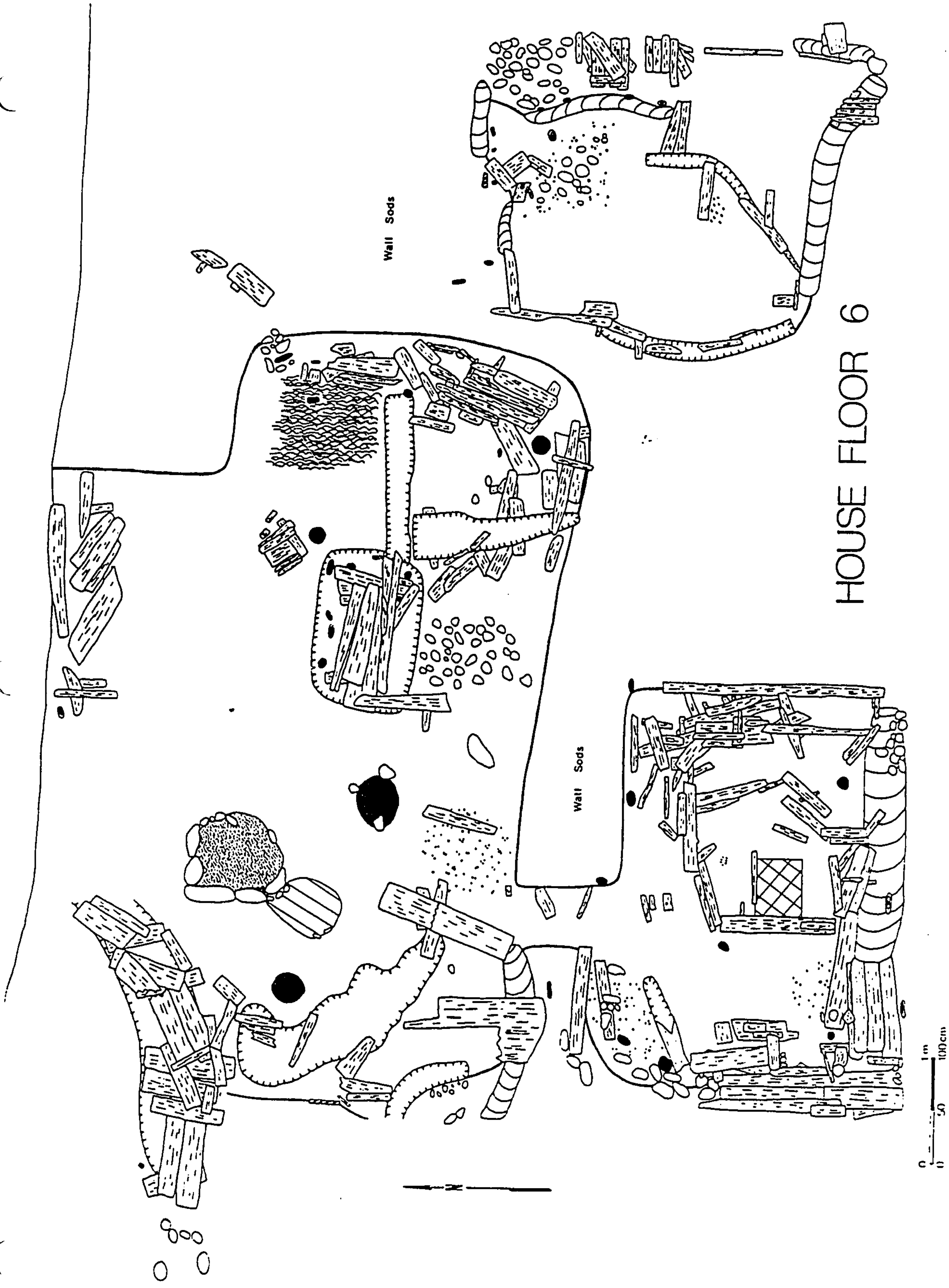

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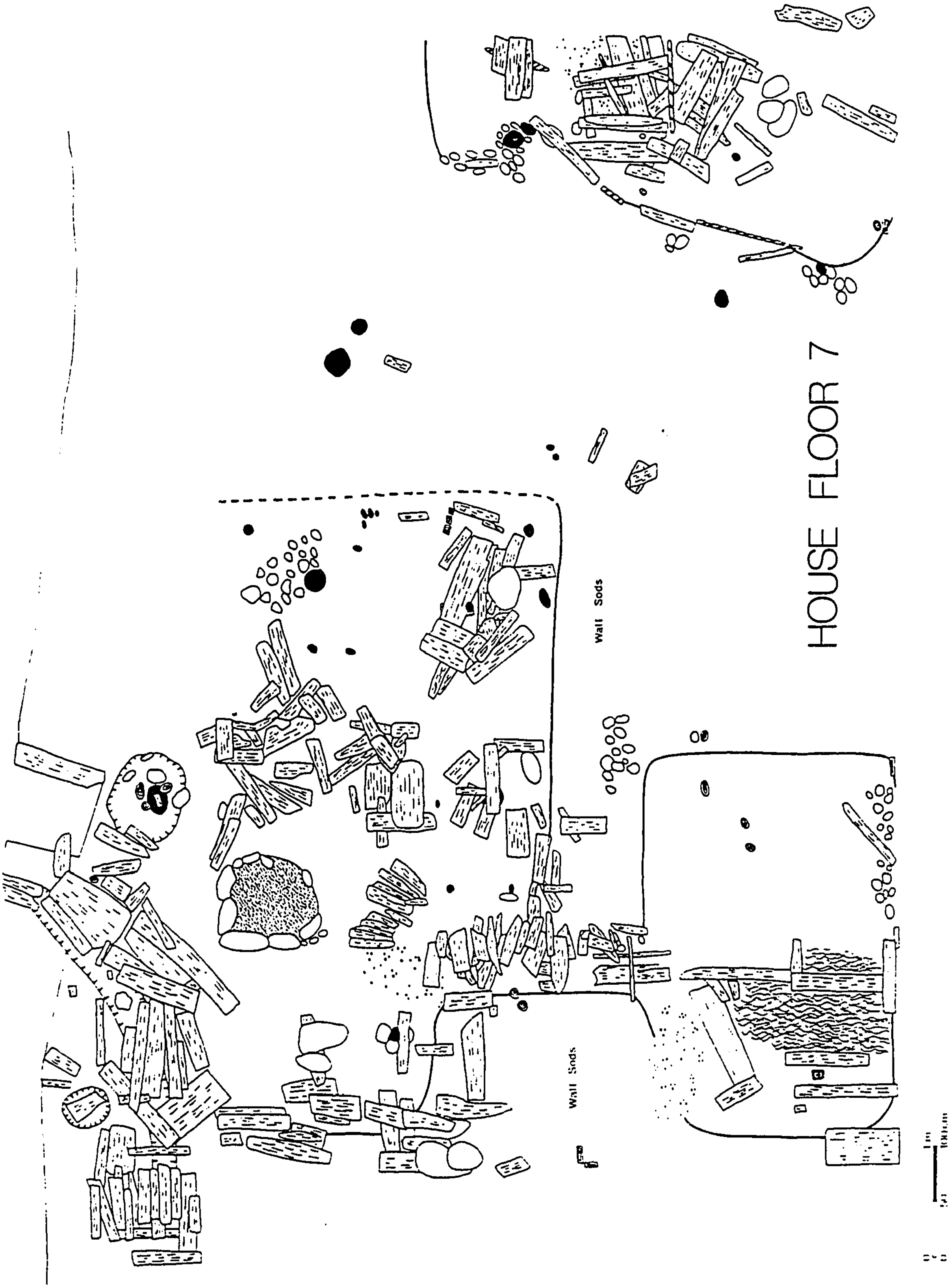

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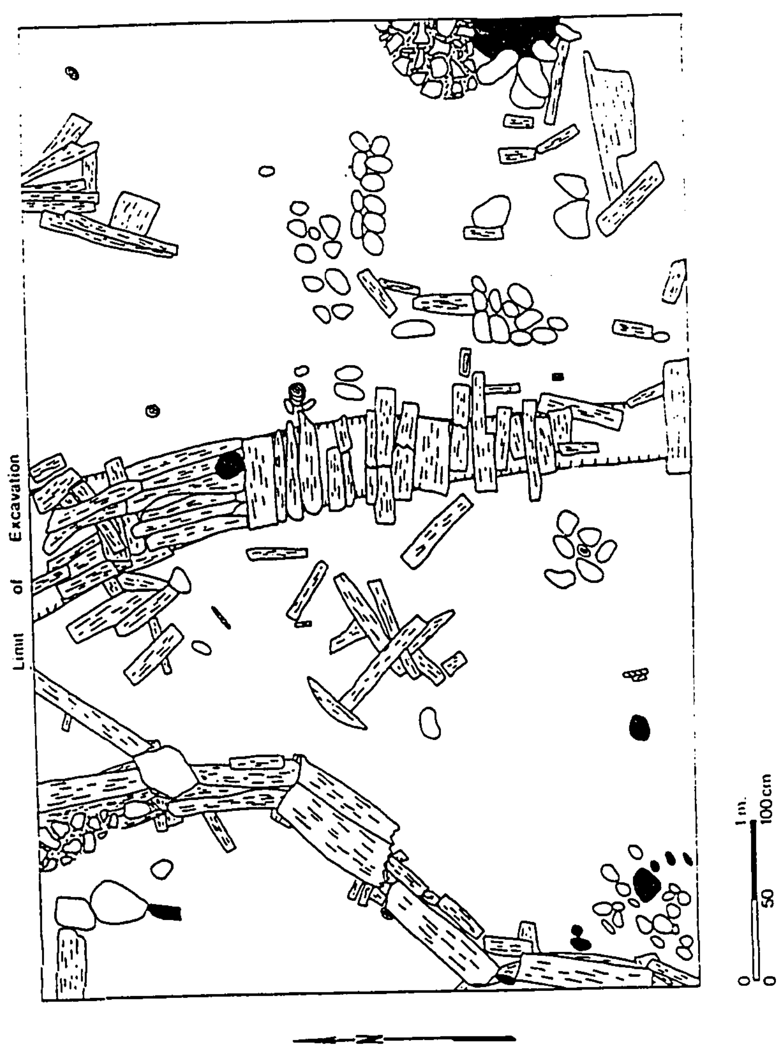

HOUSE FLOOR 8

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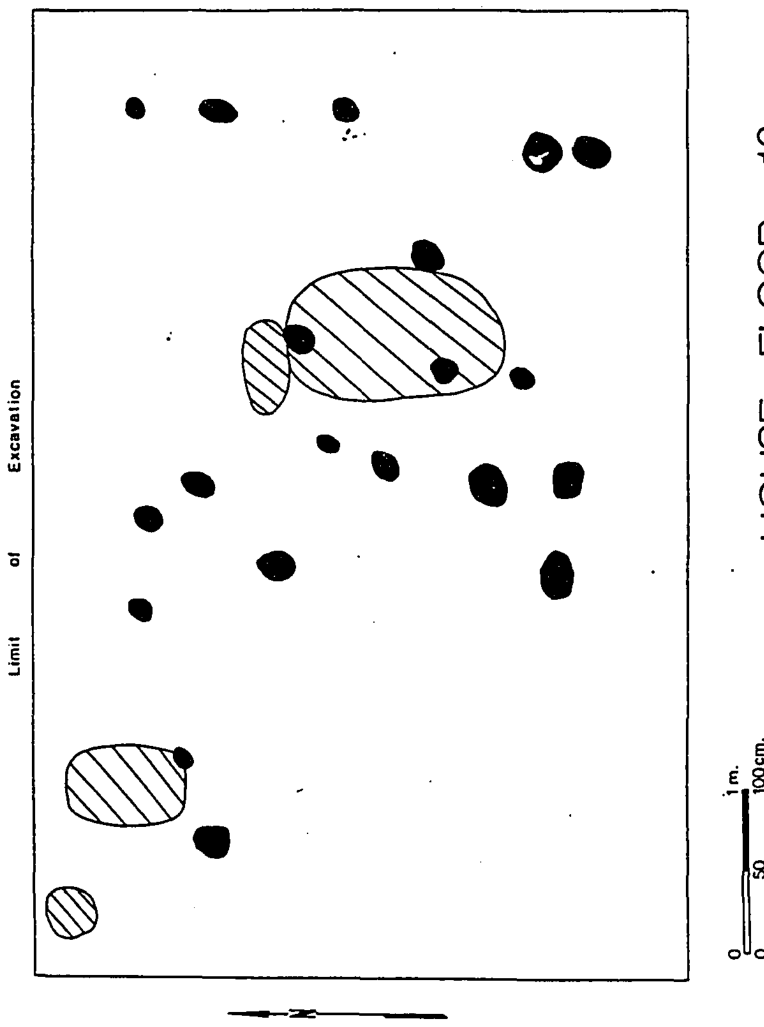

HOUSE FLOOR 10

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If an archaeologist had been unlucky enough to place a one meter square test pit precisely on the location of the housefloor 1 hearth, the excavator would have encountered an unbroken column of largely sterile charcoal nearly two meters deep. Entrances to barabara side rooms are short, usually about one meter long, and face the central hearth. A single outside doorway on a Koniag barabara nearly always faces the nearest body of water, such as the stream or lagoon where the settlement is located.

At Karluk One barabara floors are defined by densely packed soils, heavily mixed with small wood chips. Rolls of matted rye grass are common, particularly near the edges of rooms. Short planks split from driftwood logs and rarely smoothed by an adze were also found lining the edges of rooms. Most of the planks appear to be split from cedar, which splits easily. Planks also line passageways to side rooms and are used to cover sub-floor drainage ditches which drained the central room. Discarded or broken artifacts, such as large vessel bottoms, shields, and boat parts were also frequently used to cover drainage ditches. Lenses of beach gravel covered some areas of the barabara floors, which may have also been a means of alleviating dampness.

Long upright posts supporting the roof were not found among the wooden structural remains at Karluk One, which suggests that they were routinely salvaged from abandoned buildings for reuse. Empty post molds in the floor also indicate salvage. Post molds in Koniag barabaras seldom form a predictable, linear pattern along major walls. This may indicate that the bases of at least some major structural members supporting the roof were not buried far into the floor but rested against it, perhaps on a horizontal plank. There also was relatively little evidence of disturbance of deeper housefloors from activities of later occupants of the barabara.

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Other feature found in housefloors 1-7 include rectangular storage boxes with walls made from small posts driven into the floor, with floors made from short split planks. Measuring roughly 1.5 meters long and 1 meter wide, the boxes originally stood about 60-70 cm high above the surrounding barabara floor. These features were found on housefloor 2, housefloor 5, and housefloor 6. In each case, the box was located near the southeastern corner of the central room of the barabara. The housefloor 2 storage box was dug into the floor to a depth of 40 cm, disturbing housefloors 3 and 4 below. The other storage boxes were excavated only to a depth of about 10 cm. Lacking wood preservation, the storage boxes would be nearly invisible archaeologically. Plank storage boxes were also found associated with lower housefloors, dating to about A.D. 1250 in the 1994 excavations.

Storage boxes were also sometimes found lidded with short planks, which were in turn held in place by large cobbles. Strips of baleen were found lining the base of one storage box. Identical plank boxes were found in late Koniag contexts at Malina Creek. Most of the storage boxes found at Karluk One were empty except one found on housefloor 2. The housefloor 2 storage box was covered by short split planks and contained a number of artifacts in a jumbled arrangement. The box held a full sized wooden mask in the form of a bird, a mask hoop, a wooden banya dipper, and a stone maul (Plate 13).

A unique storage feature was found only on housefloor 2. Located in the southeast corner of the barabara, behind the plank storage box was a pile of alder branches about two meters in diameter (Figure 7). The alder branches were well preserved, still retaining original bark, and were about 10 cm deep. On top of the alder were several layers of salmon bones, with oily bits of meat and skin still attached. The salmon remains may have represented the

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bottom of a much larger cache of salmon, which may have been dried before storage.

Another form of storage feature was found on the west wall of the central room of the housefloor 1 barabara. A storage box made by enclosing a 30 cm square area with short wooden planks, imbedded into the wall about 50 cm from the barabara floor. The box contained a large oil lamp, stored in an upside down position. All lamps found in situ in Koniag barabaras, at Karluk One, KAR-37, and at KOD-450, were found upside down. Elder informants say that keeping an oil lamp turned upside down when not in use kept the spirit of lamp from escaping.

The artifact assemblage recovered from housefloors 1-7 and associated sod layers and middens included some elements missing from earlier levels; grooved splitting adzes, socketed fish harpoon valves, wooden gaming discs, ulu blades perforated for hafting, slate rods, anthropomorphic figurines, miniature masks, tabular wooden labrets, and grooved labrets. The bottom two meters of Karluk One, including housefloor 8 and earlier levels also produced an assemblage with some diagnostic artifacts: incised pebbles, scarfed fish harpoon valves, stemmed ulu blades, and slate lance points with a pronounced medial ridge. These differences in assemblages, which seem to have occurred at about A.D. 1450 are discussed in more detail later.

Housefloor 8 was partially exposed in a block of 2 meter units which uncovered a portion of the central room of a large barabara (Figure 13). The calibrated radiocarbon date for this level, taken from a floor plank was 1470±80, with a calendric date of about A.D. 1431. Housefloor 8 was by far the thickest of the housefloor deposits found at the site, with an average depth of 25-30 cm. There was no evidence for reflooring episodes in this structure like those we observed in the later dwellings. It is not known if this barabara had

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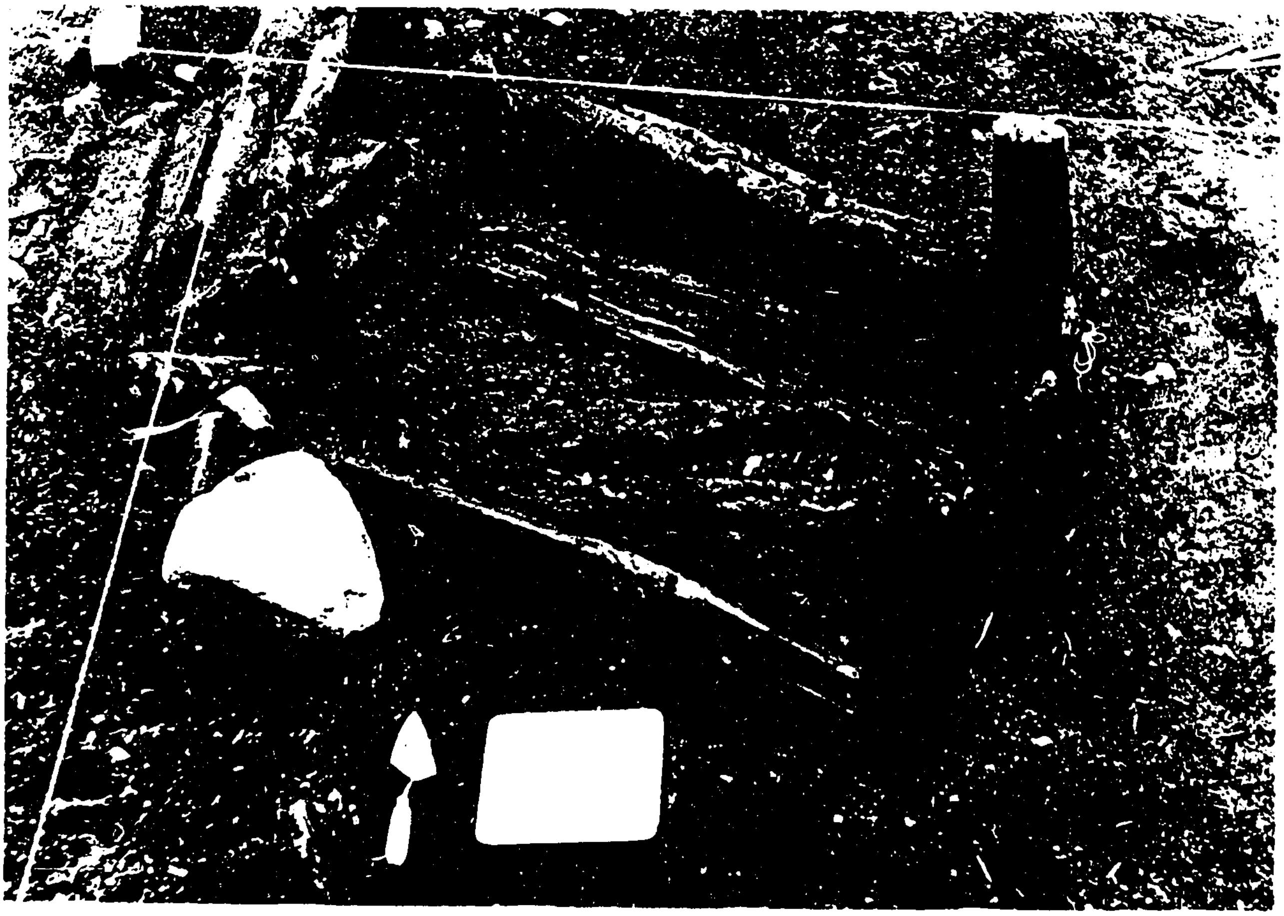

Plate 12: Plank lined storage box *in situ* on house floor 6

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Plate 13

Mask, mask hoop, water dipper, stunning club, and other items in a plank lined storage box on house floor 5

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side rooms. Two plank covered drainage ditches existed in the central room, one of which measured nearly one meter in width. Several basal fragments of large bentwood tubs were used along with the split planks to cover these features.

A very large post mold near the southeast corner of the block lined with cobble post packing also suggests that the barabara associated with housefloor 8 was quite large. The floor was very well defined and composed of compacted soils, wood chips, fish bone, and quantities of fire-cracked rock.

Under housefloor 8 was a 75 cm thick layer of midden containing roof sods, driftwood, and patches of disturbed floor deposits. A portion of housefloor deposit, housefloor 9, was intact within what was termed the upper basal midden. Housefloor 9 was similar in compaction and texture to other housefloors and was about 20 cm thick. A plank from housefloor 9 yielded a calibrated radiocarbon date of A.D. 1320±50. There was not enough of the floor left intact to distinguish house plan or features. Beneath the upper basal midden began the lower basal midden, which was a 40 cm thick layer of fire-cracked rock, faunal midden, and loose soil.

A layer of sterile beach gravels 4 cm thick was evenly distributed on top of housefloor 10, which was exposed by a block of six 2 meter excavation units (Figure 14). These gravels are completely sterile. The nature of this deposit is not consistent with a reflooring episode, and may reflect an earthquake with occurred in the Kodiak area known to have occurred between A.D. 1000 and 1280 (Gilpin, Knecht and Knecht 1994). Similar sterile beach gravels can be seen between peat layers in Karluk Lagoon dated to this period.

A wooden post fragment from housefloor 10 yielded a calibrated radiocarbon date of A.D. 1210 ± 80. An additional date was taken from thin twigs and bark on the housefloor to control for the old wood effect yielded a

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calibrated radiocarbon date of A.D. 1300. Housefloor 10 represents the remains of a single room, rectangular barabara measuring about 6 meters long and 5 meters wide. The floor is thinner than those seen in the multiple room structures, measuring about 10 cm thick. It is also characterized by small pits filled with sea urchin remains, and faunal midden is imbedded with the wood chips of the floor. The barabara most closely resembles those seen in Kachemak sites, such as Uyak and Crag Point. The artifact assemblage is also late Kachemak in character, with artifacts such as Three Saints Bay barbed points

Human Remains

Physical anthropologist Charles Untermohle excavated and reported on several burials encountered in 1985 (Untermohle 1987). No identifiable human burials were encountered within the housefloors at Karluk One with the exception of the poorly preserved bones of an newborn infant found tucked under the floorboards of housefloor 1. Two complete human burials, representing the remains of at least three individuals were found in the soddy areas near barabara walls. Two individuals in poorly preserved condition were found south, or behind the rear wall of the housefloor 1 barabara. Both were found to have been disturbed by historic construction, but appear to have been in a flexed position on a layer of split wooden planks. Planks may have also covered the burials. Several grave goods were found in association with this burial including fragments of a poorly preserved wooden anthropomorphic mask, two small grass baskets, and a bone labret. Remains of a barbed bone arrow point was found in the neck of one individual. Cut marks also were present on the ribs. Both individuals appeared to be adolescent males and may have been victims of warfare. A

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miniature mask of cottonwood bark found in a nearby square may have also been associated with this burial.

A second burial was found north of the housefloor 3 barabara. The burial is intrusive into this layer, and seems to be prehistoric. The skeleton had been disturbed by digging of house posts and in more recent time by erosion. Found partially eroding out of the site, some post cranial skeletal elements had already been lost when the burial was found. It represented a flexed burial of an adolescent female and was also placed on a single layer of split wooden planks. No grave goods were found associated with this burial.

Isolated human bones are frequently encountered in prehistoric housefloors and general site middens in nearly all sites in the Archipelago. Karluk One was no exception with a number of isolated human bones found in housefloors and in faunal middens. Some may represent fragments of burials disturbed in the course of house construction, others may have been intentionally curated as war trophies or as a gesture of respect to the dead.

Before digging at Karluk One began, we met with elders in the village of Karluk to discuss procedures to follow should we encounter human remains, we were not intentionally looking for but nevertheless expected we would find at some point. We were given permission to excavate and study the remains provided they were returned as quickly as possible to Karluk for reburial. In keeping with this agreement, Philip Kugsruk and I reburied all the human remains found at Karluk One from 1983 to 1985 on a hill overlooking the site. A list of the isolated human remains found at the site is below.

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Table 4:2 Isolated Human Remains found at the Karluk One Site

Unit	Context	Element
Sq. 4	House 4, roof sods	Right ulna and radius
Sq. 6	Housefloor 5	Cranial fragments and teeth, 1.5 year old child
Sq. 20	Housefloor 8	Cranial fragment; facial portion
Sq. 19	(cat no 2153)	Human tooth
Sq. 21	Housefloor 8	Left humerus

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Chapter 5: Artifacts Associated with Subsistence

Introduction

The artifacts discussed in this and following chapters are classified into eight functional categories. For ease of comparison these categories are an expanded version of those used by Clark (1974). This chapter will consider artifacts associated with subsistence: primarily fishing and hunting gear as well as boat parts and accessories. Chapter 6 will discuss domestic and household artifacts; Chapter 7 manufacturing tools and implements; chapter 8, gaming pieces and toys; and Chapter 9 will describe artifacts associated with personal adornment, ceremony, warfare, and miscellaneous artifacts.

These chapters are primarily concerned with the form and function of Koniag material culture in the Karluk One assemblage, as well as diachronic changes in artifact types and attributes after A.D. 1200. A summary discussion of the changes in Koniag material culture will be presented in Chapter 10.

In most cases artifacts found on the surface or where the context is questionable are omitted from this discussion. Historic artifacts, found on the site surface and in disturbed soils within 50 cm of the surface are also omitted. Artifacts listed in tables are in order of increasing depth. Alutiiq names are given where possible, and are drawn from elder informants from Kodiak Island.

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Fish Hooks (Iqsiit)

Bone Fish Hook Shanks

Table 5:1 Bone Fish Hook Shanks

Catalog	Artifact Type	Material	Context
987	Fish hook shank	Bone	House floor 1
988	Fish hook shank	Bone	House floor 1
4377	Fish hook shank	Bone	House floor 2
2352	Fish hook shank	Bone	House floor 3
3070	Fish hook shank	Bone	House floor 4
6883	Fish hook shank, large	Bone	House 5 roof sod
872	Fish hook shank, large	Bone	House 5 wall sod
4780	Fish hook shank	Bone	House 5 wall sod
1168	Fish hook shank, large	Bone	House floor 5
4962	Fish hook shank	Bone	House floor 5
5618	Fish hook shank	Bone	Lower basal midden

Two-piece bone fish hooks occur throughout the prehistoric sequence of Kodiak Island. Koniag phase bone hook shanks appear to be similar to those of the Kachemak period, although the Koniag specimens exhibit more expedient workmanship. Hook shanks were most often manufactured from mammal ribs, taking advantage of the natural curvature of the rib, as well as a conveniently shaped notch for attachment of the hook barb at the rib's proximal end.

Hook shanks in the Karluk One assemblage cluster into two types, a small and a very large variety. The smaller type of hook shank is represented by five complete bone specimens that range from 6 cm to 11 cm long (Plate 14:E-I). Two fragmentary specimens also appear to represent smaller hook shanks. Small knobs facilitated attachment on the proximal, or line end of the hook, and a groove on the distal end of the shank for was made for attachment of the barb. One specimen, the largest of the group, has grooves cut into both ends for line and barb attachment (Plate 14:I).

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A very large, perhaps special purpose, variety of bone fish hook is represented by three bone shanks. One of these was made from a large land mammal rib, most likely that of a brown bear, and measures 22 cm long (Plate 14:U). The line was held fast with the aid of an attachment knob, below which is a pair of notches cut inside the arch of the shank. A nearly identical specimen was recovered in a late Kachemak context at KAR-31 on the north side of Karluk Lagoon (Jordan and Knecht 1988). Two knobbed proximal end fragments also represent very large bone hook shanks, however these fragments lack any additional notching (Plate 14:S-T).

Two-piece bone fish hooks were used into historic times, and are represented in 19th century ethnographic collections from Kodiak in the Danish National Museum in Copenhagen (Birket-Smith 1941:Figure 23), and at the Lowie Museum in California. Clark recovered bone fish hook shanks in Koniag deposits at Rolling Bay and at Kiavak (1974:59). His specimens closely resemble the smaller variety hooks shanks described above. The very large variety of fish hook shank is currently unique to the Karluk assemblage.

Wooden Fish Hook Shanks

Table 5:2 Wooden Fish Hook Shank s

Catalog	Artifact Type	Material	Context
3957	Fish hook shank	Wood	House floor 3
4457	Fish hook shank	Wood	House floor 4
5222	Fish hook shank	Wood	House floor 8
6135	Fish hook shank	Wood	Upper basal midden

Two wooden fish hook shanks are identical in form and similar in size to shanks made from bone (Plate 14:A-B). They are 6 and 7 cm long. Three other wooden specimens consist of long, thin, carefully shaped sticks, and represent shank components of a different hook type (Plate 15:E-G). The body of these shanks is only slightly bent. Small knobs exists on the proximal, or

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line ends of the shanks. The distal ends are also flattened for line attachment The shanks are 12 to 17 cm long and made from a dense wood, probably Pacific Yew.

Fish hook types may have been species-specific. Faunal remains from Karluk One reflect a diverse fishing economy, in which a number of species; predominantly cod, halibut, and salmon were used. Fish hooks were probably used in off-shore, deep water fishing, rather than in the shallows of the river and lagoon. Most of the hooks are too large for any species but cod or halibut. Attaching a barb to the longer wooden shanks would yield a completed hook highly reminiscent of composite wooden fish hooks recovered from wet sites along the Northwest Coast (Croes and Blinman 1980). Composite wooden fish hooks were also used by Bering Sea Eskimos; complete specimens exist in the Nelson collection (Fitzhugh and Kaplan 1982:97).

Bone Fish Hook Barbs

Table 5:3 Bone Fish Hook Barbs

Catalog	Artifact Type	Material	Context
4171	Fish hook barb	Bone	House floor 3
3408	Fish hook barb	Bone	House floor 6
2826	Fish hook barb	Bone	House floor 6
2499	Fish hook barb	Bone	House floor 6
4520	Fish hook barb	Bone	House floor 7
5976	Fish hook barb	Bone	House 8 roof sod
5551	Fish hook barb	Bone	House floor 8

Bone fish hook barbs from Karluk One are fairly uniform in appearance, ranging from 4 to 5.5 cm long (Plate 14:J-R). They are made from dense terrestrial mammal bone, and each has a single barb. None of the bone fish hook barbs from Karluk One feature the concoidal shape and encircling groove on the proximal end, commonly found on hook barbs from

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Plate 14

Composite fish hook parts

Object	Description	Catalog #
A	Fish hook shank, wood	193/3957
B	Fish hook shank, wood	193/4457
C	Fish hook shank, bone	193/4962
D	Fish hook shank, bone	193/4780
E	Fish hook shank, bone	193/5618
F	Fish hook shank, bone	193/3070
G	Fish hook shank, bone	193/2352
H	Fish hook shank, bone	193/987
I	Fish hook shank, bone	193/5618
J	Fish hook barb, bone	193/987
K	Fish hook barb, bone	193/3408
L	Fish hook barb, bone	193/6828
M	Fish hook barb, bone	193/988
N	Fish hook barb, bone	193/5976
O	Fish hook barb, bone	193/2826
P	Fish hook barb, bone	193/2499
Q	Fish hook barb, bone	193/4171
R	Fish hook barb, bone	193/5551
S	Large fish hook shank, bone	193/872
T	Large fish hook shank, bone	193/1168
U	Large fish hook shank, bone	193/6883

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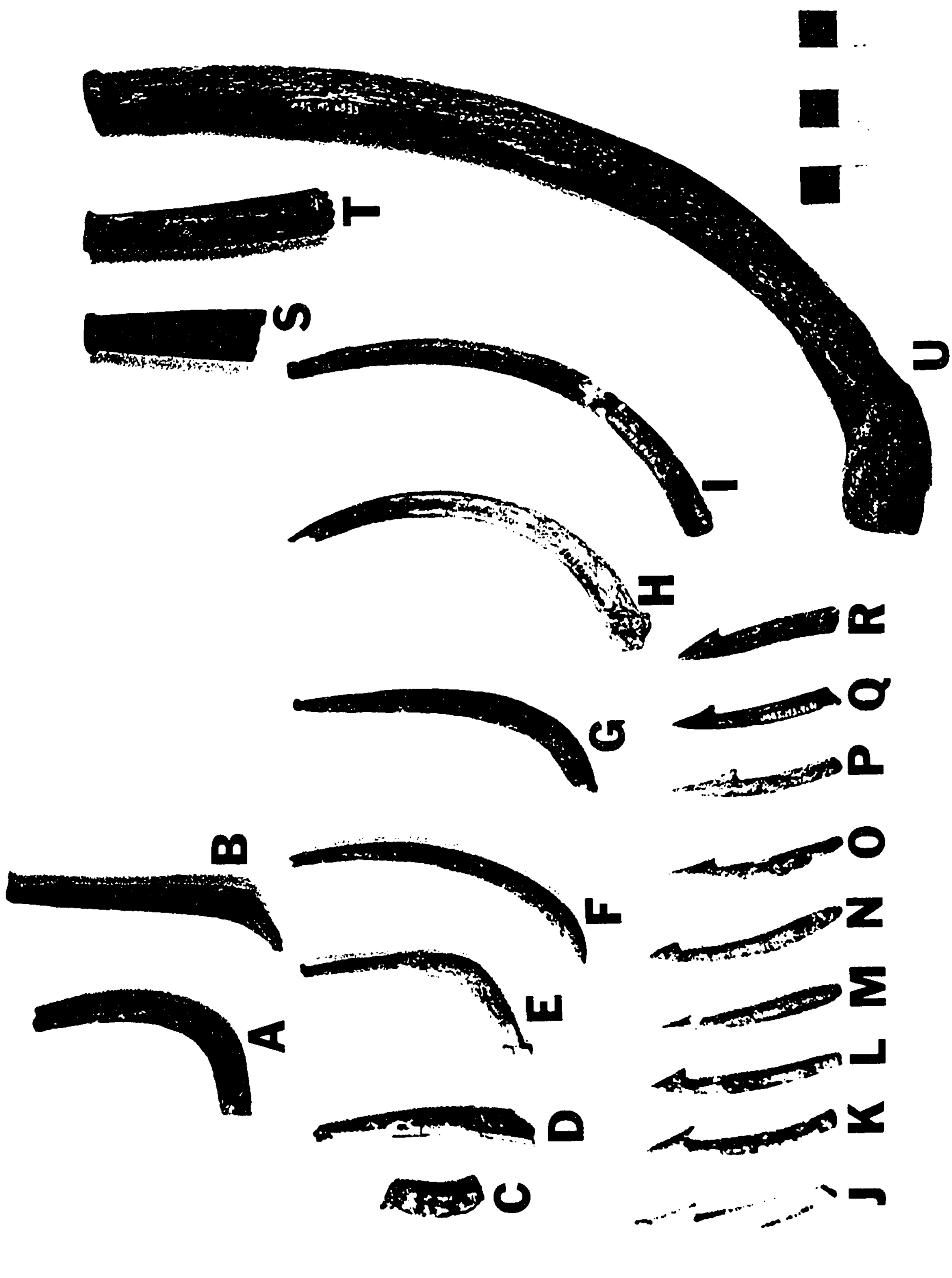

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Kachemak phase sites (De Laguna 1930:Plate 43, Heizer 1956:187). Koniag phase fish hook barbs from Karluk One and elsewhere lack the double barbs and back barbing occasionally seen on Kachemak hook barbs.

All the fish hook barbs were probably intended for use in conjunction with the smaller variety of bone shank described above. Clark found 12 hook barbs at Rolling Bay, and 1 at Kiavak. The greater number of hook barbs from Rolling Bay relative to Karluk One probably reflects a correspondingly greater reliance on deep water fishing at Rolling Bay.

Wooden Fish Hook Barbs

Table 5:4 Wooden Fish Hook Barbs

Catalog	Artifact Type	Material	Context
3340	Fish hook barb	Wood	House floor 1
4130	Fish hook barb	Wood	House floor 1
2754	Fish hook barb	Wood	House floor 3
2765	Fish hook barb	Wood	House floor 3
3112	Fish hook barb	Wood	House floor 5
2788	Fish hook barb	Wood	House floor 5
6329	Fish hook barb	Wood	House floor 8
5531	Fish hook barb	Wood	House floor 8
5207	Fish hook barb	Wood	House floor 8
5035	Fish hook barb	Wood	Upper basal midden
5242	Fish hook barb	Wood	House floor 9A
5243	Fish hook barb	Wood	House floor 9A
6480	Fish hook barb	Wood	Upper basal midden
5320	Fish hook barb	Wood	House floor 10

At least 14 fish hook barbs in the Karluk One assemblage are carved of wood. Only complete specimens were identified as hook barbs, because fragmentary examples are impossible to distinguish from wooden awl tips or other whittled sticks. These wooden hook barbs may have articulated with any of the hook shank forms described above. Although not identified in the collection, Y-shaped halibut hooks featuring wooden barbs are attested ethnographically among the Koniag (Birket-Smith 1941:Fig. 22, Larry Matfay,

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personal communication, 1990). I have seen only one complete ethnographic halibut hook from Kodiak Island. Collected in the Old Harbor area and now in a private collection; it closely resembles Northwest Coast hooks except for the style of the figures rendered in the hook, which are distinctively Alutiiq.

Ten wooden hook barbs consist of tapered points that range from 2 to 8.5 cm long (Plate 15:H-Q). The proximal ends of the barbs vary stylistically: on three specimens the proximal ends have been carefully flattened and notched (Plate 15:K,P,Q); five have minute knobs for attachment to a shank (Plate 15:H,J,M,N,O); and two have proximal ends which lack any additional modification (Plate 15:I,L).

Four very similar fish hook barbs probably represent a specific functional type. These are all sharply pointed at both ends, tapered slightly, and deeply notched near the thicker end (Plate 15:A-D). They are well made of a dense wood, probably Pacific Yew, and are 7 to 8 cm long. While the precise use of this barb type is unclear, the angle of attachment seems best suited for a straight-backed or slightly curved shank. These articulate very nicely with the slightly curved wood fish hook shanks described above .

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Plate 15

Wooden fish hook components

Object	Description	Catalog #
A	Fish hook barb, wood	193/3340
B	Fish hook barb, wood	193/5207
C	Fish hook barb, wood	193/5531
D	Fish hook barb, wood	193/5035
E	Fish hook shank, wood	193/5222
F	Fish hook shank, wood	193/6758
G	Fish hook shank, wood	193/6135
H	Fish hook barb, wood	193/2788
I	Fish hook barb, wood	193/2765
J	Fish hook barb, wood	193/4130
K	Fish hook barb, wood	193/6480
L	Fish hook barb, wood	193/2754
M	Fish hook barb, wood	193/5242
N	Fish hook barb, wood	193/5243
O	Fish hook barb, wood	193/3112
P	Fish hook barb, wood	193/6329
Q	Fish hook barb, wood	193/5320

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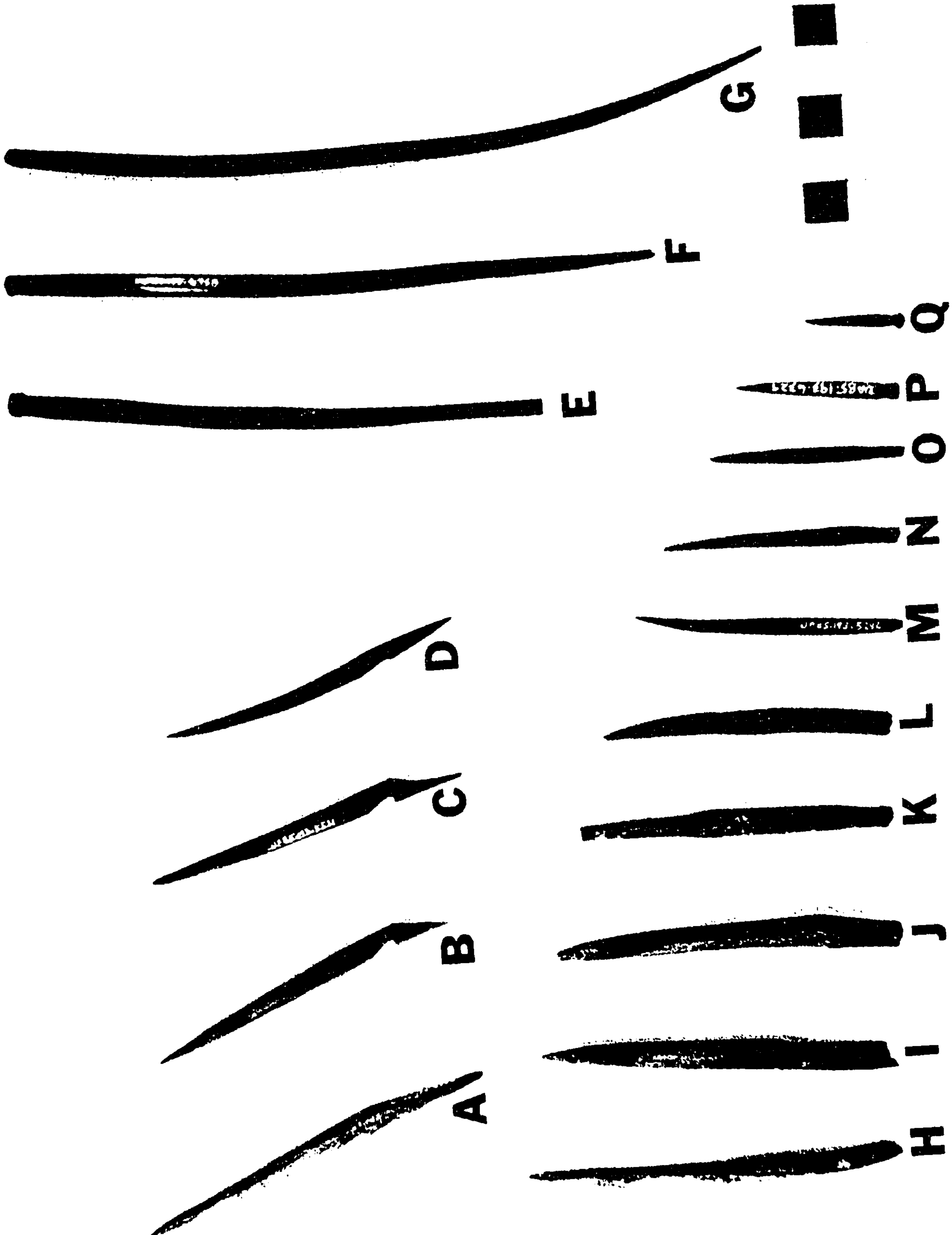

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Wooden Fishing Rig Components

Table 5:5 Wooden Fishing Rig Components

Catalog	Artifact Type	Material	Context
3914	Fish rig spreader	Wood	House 2 wall sod
2961	Fish rig spreader	Wood	House floor 2
2997	Fish rig spreader	Wood	House floor 2
3943	Fish rig spreader	Wood	House floor 2
4386	Fish rig fragment	Wood	House floor 2
1593	Fish rig fragment	Wood	House floor 3
4373	Fish rig fragment	Wood	House floor 4
4407	Fish rig fragment	Wood	House floor 4
1131	Fish rig; snood	Wood	House floor 4
4966	Fish rig spreader	Wood	House floor 6
2505	Fish rig spreader	Wood	House floor 6
3201	Fish rig spreader	Wood	House floor 7
5793	Fish rig spreader	Wood	House floor 8
5001	Fish rig spreader	Wood	House floor 8
4987	Fish rig fragment	Wood	House floor 8
4991	Fish rig fragment	Wood	House floor 8
6406	Fish rig fragment	Wood	House floor 8
6447	Fish rig spreader	Wood	House floor 8
5422	Fish rig fragment	Wood	Upper basal midden
6129	Fish rig spreader	Wood	House floor 9A
6886	Fish rig fragment	Wood	Lower basal midden

Wooden Fishing Rig Spreaders

Rig spreaders consist of a long whittled stick, with a small attachment knobs carved on both ends. These knobs are identical to those utilized on fish hook shanks; they are ovate in overall shape with one side of the knob flattened. Five complete examples of rig spreaders range from 35 to 15 cm long (Plate 16:A-E). Another six rig spreaders have been fractured near one end, but are long enough to be distinguished from other wooden fishing gear like hook shanks or snoods (Plate 16:A-F). Three spreaders retain traces of surface paint; two are painted black, and one red.

Rig spreaders were used in fishing for bottom feeders, such as halibut or cod. Hooks were attached on short leaders to both ends of the spreader. Carved knobs on either end prevented the leader from slipping off, and a

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Plate 16

Fishing rig spreaders

Object	Description	Catalog #
A	Fishing rig spreader, wood	193/3943
B	Fishing rig spreader, wood	193/
C	Fishing rig spreader, wood	193/5793
D	Fishing rig spreader, wood	193/6759
E	Fishing rig spreader, wood	193/2961

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Plate 17: Ethnographic Fishing Rig Spreader and Grooved Cobble from Kodiak Island

Lowie Museum; Alaska Commercial Company Collection

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grooved cobble hung from a short line on the center of the rig spreader and rested on the bottom. In this manner, the baited hooks on either end of the rig spreader were suspended about 40 cm above the bottom, the same distance used in modern Halibut line fishing rigs. Rig spreaders were also used by Indian fisherman of the Northwest Coast (Stewart 1982:39). On the Northwest Coast, the line from the rig spreader was attached to a surface float, and the rig was left in place. It is not known whether this was done among the Alutiiq.

A rig spreader from the Alaska Commercial Company at the Lowie Museum was described and illustrated by Heizer (1952:16, Plate 17). The Karluk One examples are the only ones known from an archaeological context; however Clark may have found a fragmentary example at Rolling Bay (1974:264, Plate 47:C)

Wooden Snood

Snoods were used in deep water fishing, particularly when several hooks were hung from a single line; a technique often employed in cod fishing. A snood provides reinforcement to the line in much the same manner as a modern steel leader. The Karluk One assemblage includes a single complete snood. It is made of a hard wood, and is 11 cm long (Plate 18:L). A carefully carved round knob is present on the proximal end. The body of the snood is u-shaped in cross-section and slightly curved. A small knob exists on the distal end. The knob is flat on one side and resembles the attachment knobs on the wooden hook shanks and rig spreaders described above.

Snoods, an article of fishing tackle used to reinforce line near the hook, are known from the Northwest Coast (Stewart 1982:38). On Kodiak a snood

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Plate 18

Wooden fishing rig components

Object	Description	Catalog #
A	Fishing rig component fragment, wood	193/4987
B	Fishing rig component fragment, wood	193/
C	Fishing rig component fragment, wood	193/
D	Fishing rig component fragment, wood	193/4386
E	Fishing rig component fragment, wood	193/6406
F	Fishing rig component fragment, wood	193/
G	Fishing rig component fragment, wood	193/6447
H	Fishing rig component fragment, wood	193/
I	Fishing rig component fragment, wood	193/4407
J	Fishing rig component fragment, wood	193/
K	Fishing rig component fragment, wood	193/
L	Complete snood, wood	193/1131

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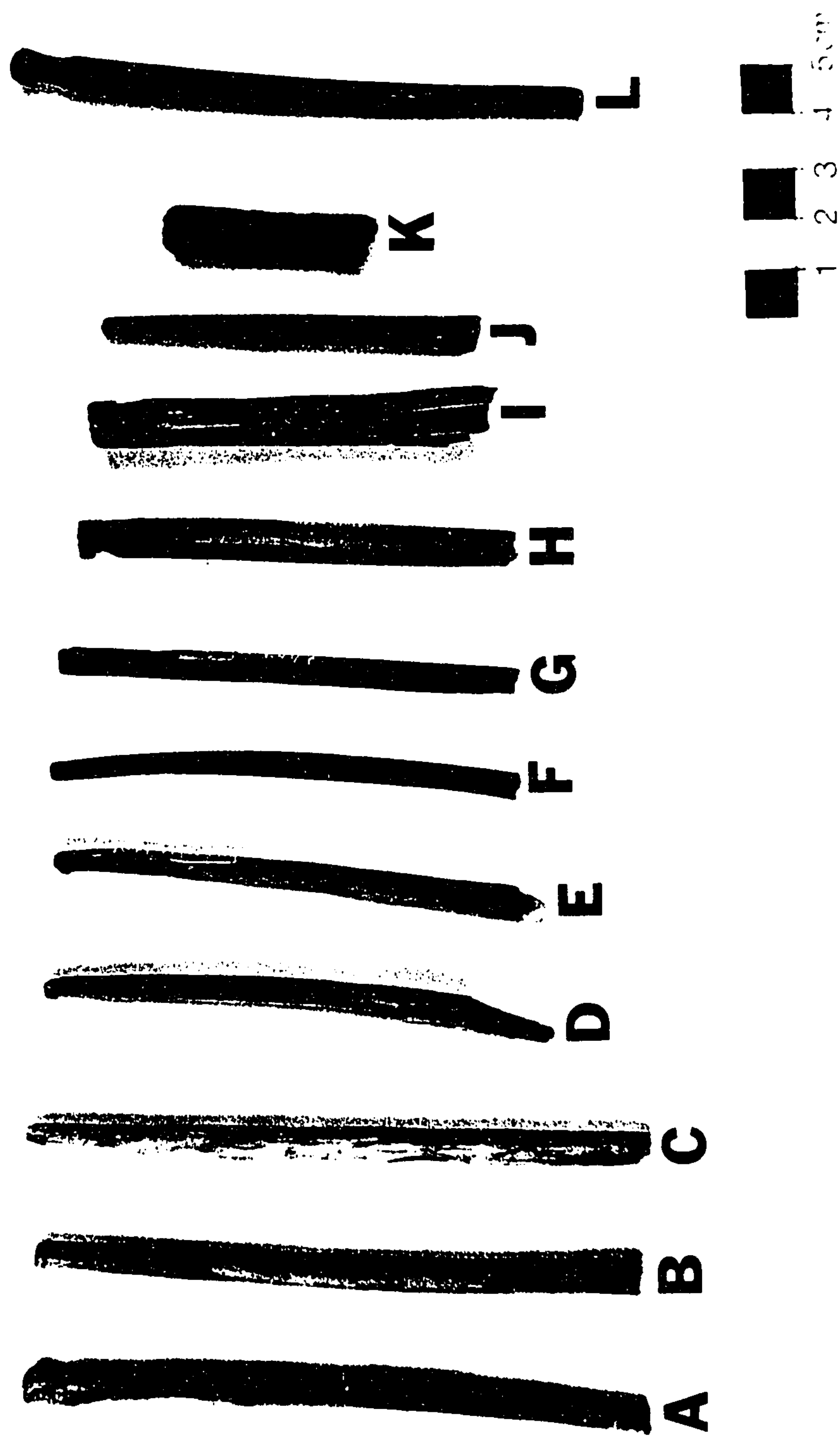

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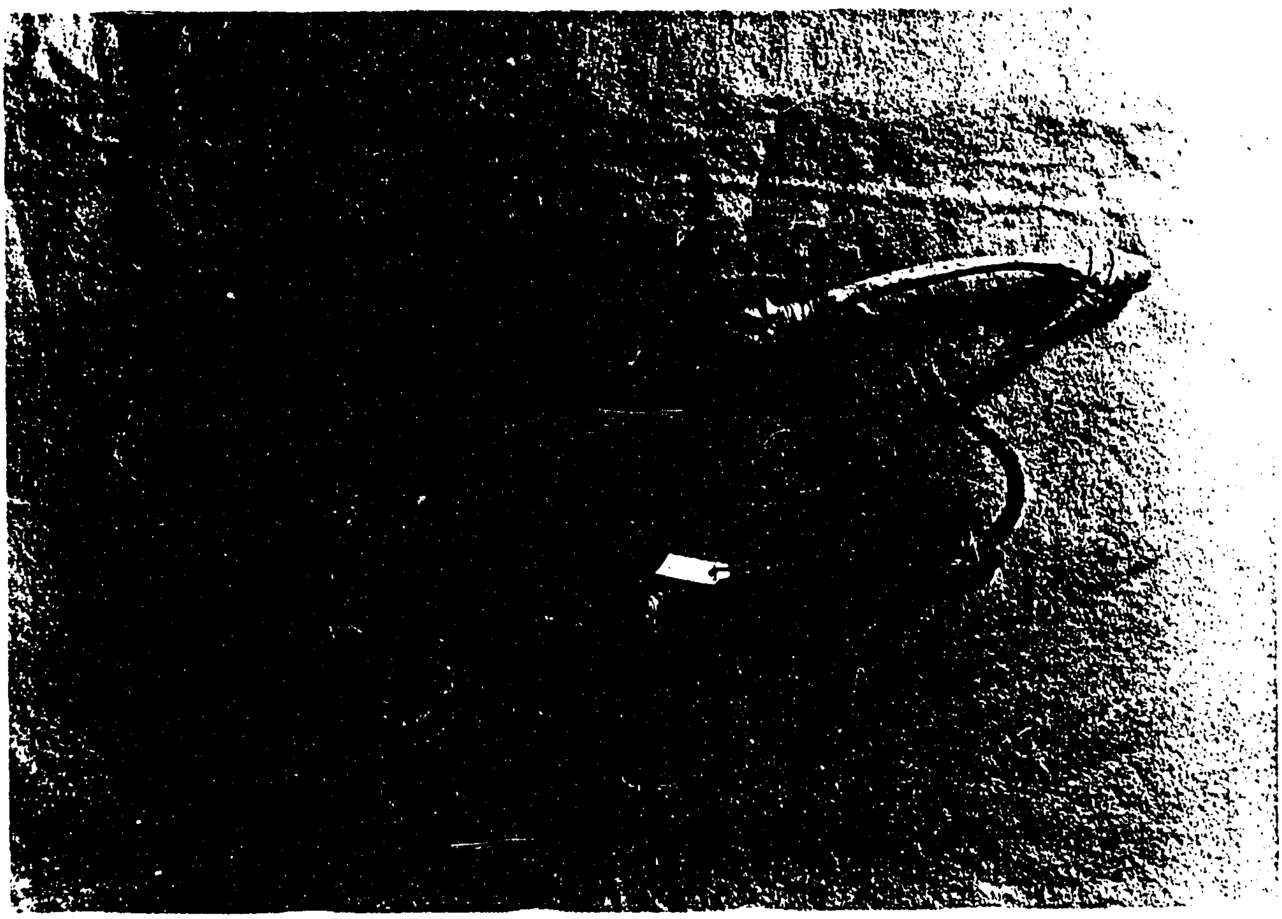

Plate 17: Ethnographic snood and bone fish hook from Kodiak Island

Lowie Museum; Alaska Commercial Company Collection

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still attached to a leader and composite bone hook was collected by Holmberg in 1851 and illustrated by Birket-Smith (1952:Fig 23). A similar specimen exists in the Alaska Commercial Company collections now at the Lowie museum (Plate 19). The snood from Karluk One is the only known prehistoric example.

Wooden Fishing Rig Fragments

There are ten fragments of wooden shafts with a carved attachment knob at one end (Plate 18). They represent fishing gear components such as hook shanks, snoods, or rig spreaders, but are too fragmentary for further identification.

Sinkers (*Yaamartat*)

Notched Stone Pebbles

The sinker and net weight collection from Karluk One is dominated by 113 notched stones made from flat, water-worn graywacke beach pebbles (Plate 20:A-H). They range in size from 3 to 8.5 cm long. All have been notched by chipping and some grinding at both ends of the long axis. Clark (1974:68) suggests that most notched pebbles were used in deep water fishing rather that as seine weights. Evidence from Karluk One partially supports this hypothesis, as notched stones were never recovered in clusters, as would be expected from a seine. The only notched stone in ethnographic collections from Kodiak Island is associated with the deep water fishing gear (Heizer 1952).

Nevertheless it seems likely that at least some of the notched stones from Karluk One were utilized in fish seines. Although Clark (1974:68), thought that notched stones would cause a seine to bunch, a simple tug on

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Plate 20

Stone sinkers

Object	Description	Catalog #
A	Notched pebble sinker, graywacke	193/
B	Notched pebble sinker, graywacke	193/
C	Notched pebble sinker, graywacke	193/
D	Notched pebble sinker, graywacke	193/
E	Notched pebble sinker, graywacke	193/
F	Notched pebble sinker, graywacke	193/
G	Notched pebble sinker, graywacke	193/
H	Notched pebble sinker, graywacke	193/
I	Bark Wrapped stone, birch bark, graywacke	193/1415
J	Naturally perforated graywacke pebble, w/birch bark cordage still in place	193/6334

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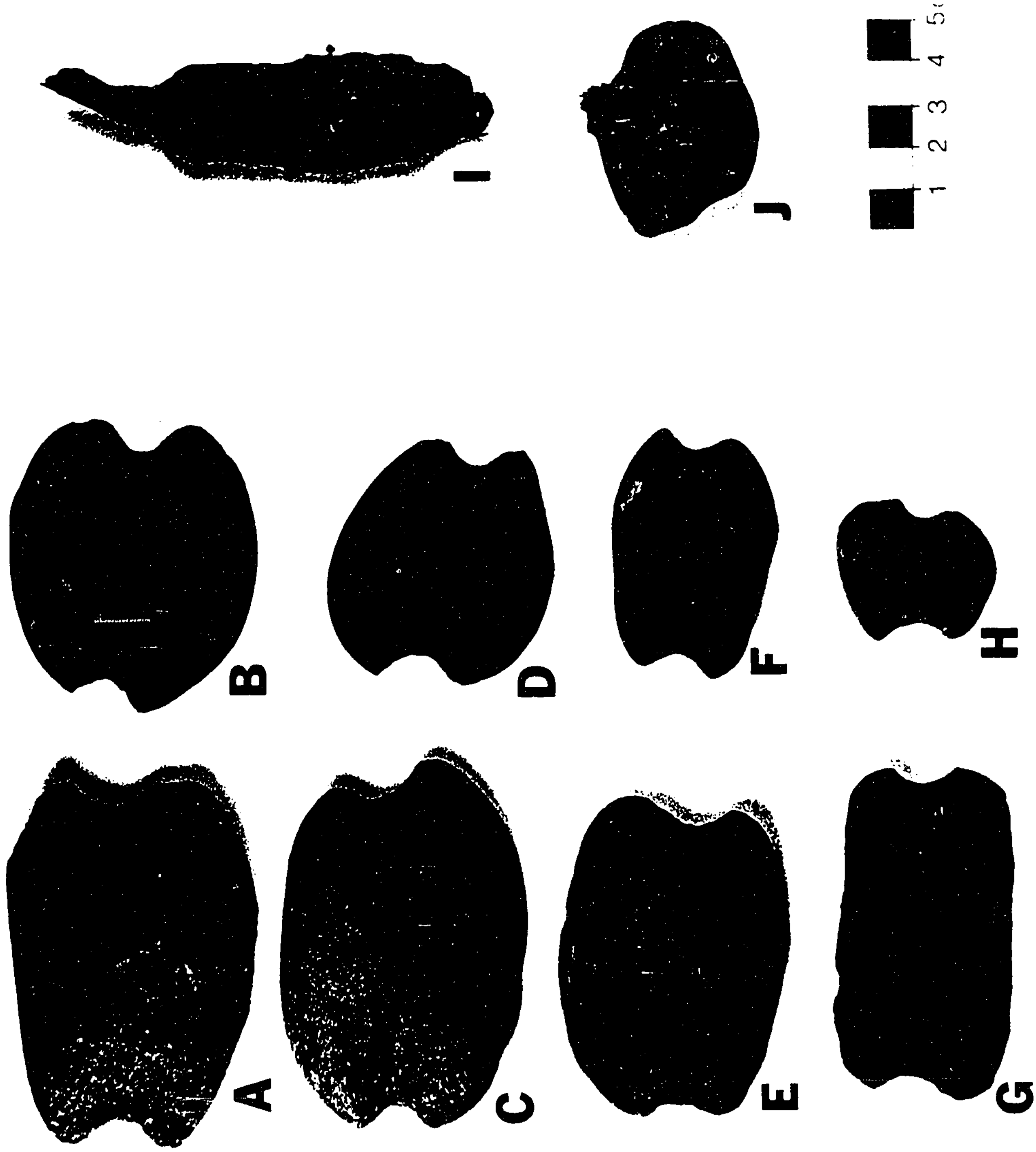

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the weighted line once the seine is in place might have alleviated this problem. This would work well if the weighted line were on the river bottom, as it would be in the shallow Karluk River. It is also worth mentioning that most of the notched stones from Karluk One are not heavy enough to be of use in seining a relatively large, strong fish such as salmon. They would be of use in seining smaller species, such as the Dolly Varden Trout which is abundant in Karluk Lagoon, or perhaps herring which occur in offshore waters.

The utility of notched stones as net weights is further confirmed by Nelson (1983:189), who found them in use on herring seines among the Bering Sea Eskimo, and by Bockstoce (1977:53), who illustrates a net weighted with notched stones collected in Northwest Alaska in the early 19th century.

Other possible functions of notched stones are described in ethnohistorical accounts of Koniag hunters netting sea mammals, and ducks in flight. Davydov gave the following account of Koniag hunters using nets to catch seals (1977 :221, [orig.1810-1812]):

> When the tide is in a net is stretched across in front of the rocks on which the seals are basking in such a way that the current will not carry it away. The net is about eight sazhens long [17m] and one sazhen [2.13m] wide. Small stones are attached to the bottom edge and floats attached to the top so that the net stays upright in the water. When it is pulled taut the hunters sit on the rocks and shout and imitate the seals' calls and wave a decoy consisting of an inflated sealskin. When the animals see the decoy on the rocks they think that it is a seal, and come over to see it. The man waving the seal skin, in the position demanded by the placing of the net, now throws a stone into the net. The animals take fright, dash away and get tangled in the net.

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According to Kodiak oral tradition, ducks were caught with nets on steep banked, narrow stretches of the Karluk River. Davydov observed such a hunt in action in the early 19th century (1977:228):

> Ducks are also caught with nets or counterweights. For this method a narrow strait is chosen, or a narrow river mouth, across which a net is stretched in the following manner: one end of a rope attached to the top side of the net is tied to the bank and a man sitting on the side of the opposite shore holds the other end of this rope. The net is then in such a position that its lower edge is almost touching the water. This method of hunting is only employed in the mornings at sunrise, and in the evenings at sunset. For at the first time the ducks are flying from the sea into the bays and sounds, and at the latter time of day they are flying off to spend the night on shore. Ducks usually fly very quickly, and some species fly so low over the water that in the twilight some always get caught in the net, which is then immediately lowered in the water, thus trapping the birds. When this catch has been removed the net is raised again in expectation of another flight.

Other Sinkers

Table 5:6 Sinkers

Catalog	Artifact Type	Material	Context
1813	Spacer bar sinker	Bone	Disturbed
1814	Spacer bar sinker	Bone	Disturbed
1020	Plummet sinker	Whale bone	House floor 2
1415	Bark wrapped stone	Graywacke/ Birch bark	House floor 3
1970	Spacer bar sinker	Bone	House floor 4
4898	Spacer bar sinker	Whale bone	House floor 6
2832	Plummet sinker	Whale bone	House floor 6
6334	Pebble sinker	Graywacke/ Birch bark	House floor 8
5772	Spacer bar sinker	Whale bone	House 8 roof sod

Unmodified Pebble-Sinker

One sinker is made of a graywacke pebble with a natural hole near one edge (Plate 20:J). A coiled strip of birch bark wrapped tightly through the hole indicates that this pebble was used in an opportunistic manner as a sinker or

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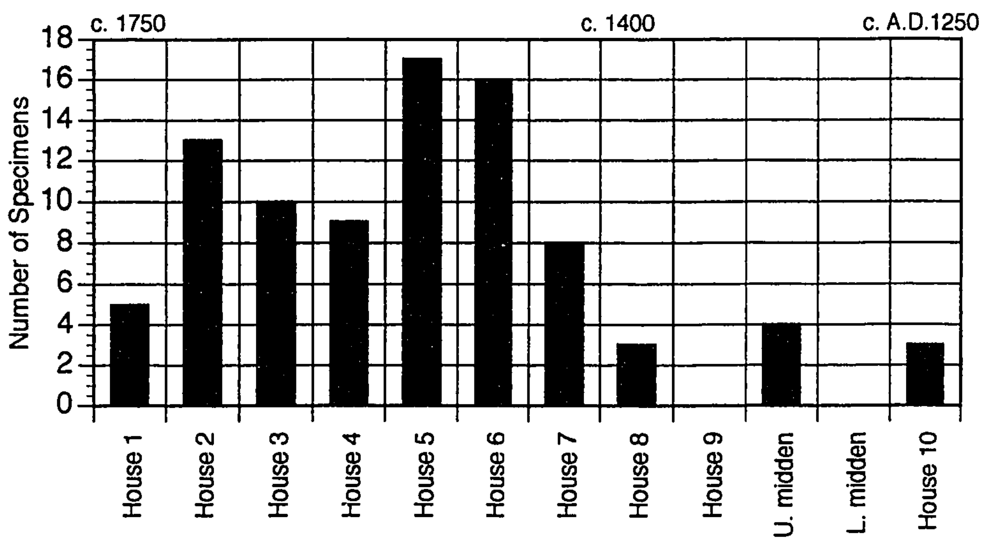
Chart 1: Provenience and Frequency of Notched Pebble Sinkers at the Karluk One Site.



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net weight. The pebble itself, measuring 5.5 cm long, is otherwise unmodified.

Bark Wrapped Stone

A type of sinker unique to the Karluk One assemblage was made from a roughly oval shaped fragment of a graywacke stone, seven cm long (Plate 20:I). It has been slightly retouched along the broken side, with several flakes removed; probably to give it a more even shape. The stone was then completely wrapped in birch bark, and enclosed by twisting the long ends on either side. Presumably, line could have been tied to one or both ends of the bark wrapping. This type of sinker could have served as a spacer-bar sinker for a seine. Six additional specimens of this sinker were found at Karluk One during the 1994 season excavations. Without the preservation of the birch bark wrapping, this variety of sinker would be nearly invisible in the archaeological record.

Grooved Cobbles

Table 5:7 Grooved Cobbles

Catalog	Artifact Type	Material	Context
991	Grooved Cobble	Granite	House 1 roof sod
4301	Grooved Cobble	Granite	House floor 1
3366	Grooved Cobble	Granite	House floor 2
4006	Grooved Cobble	Granite	House 4 wall sod
4413	Grooved Cobble	Granite	House floor 4
847	Grooved Cobble	Granite	House 5 roof sod
3410	Grooved Cobble	Granite	House floor 6
3699	Grooved Cobble	Granite	House floor 6
6398	Grooved Cobble	Unident. lithic	House floor 8

Grooved cobbles are present throughout the prehistoric sequence on Kodiak. Sinkers of this type were probably used in deep water fishing when a large sinker was required to anchor a long line against sub-surface currents.

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Plate 21

Grooved cobbles

Object	Description	Catalog #
A	Grooved cobble, granite	193/3366
B	Grooved cobble, basalt	193/6378
C	Grooved cobble, basalt	193/991
D	Grooved cobble, granite	193/1836
E	Grooved cobble, granite	193/48
F	Grooved cobble, granite	193/4413

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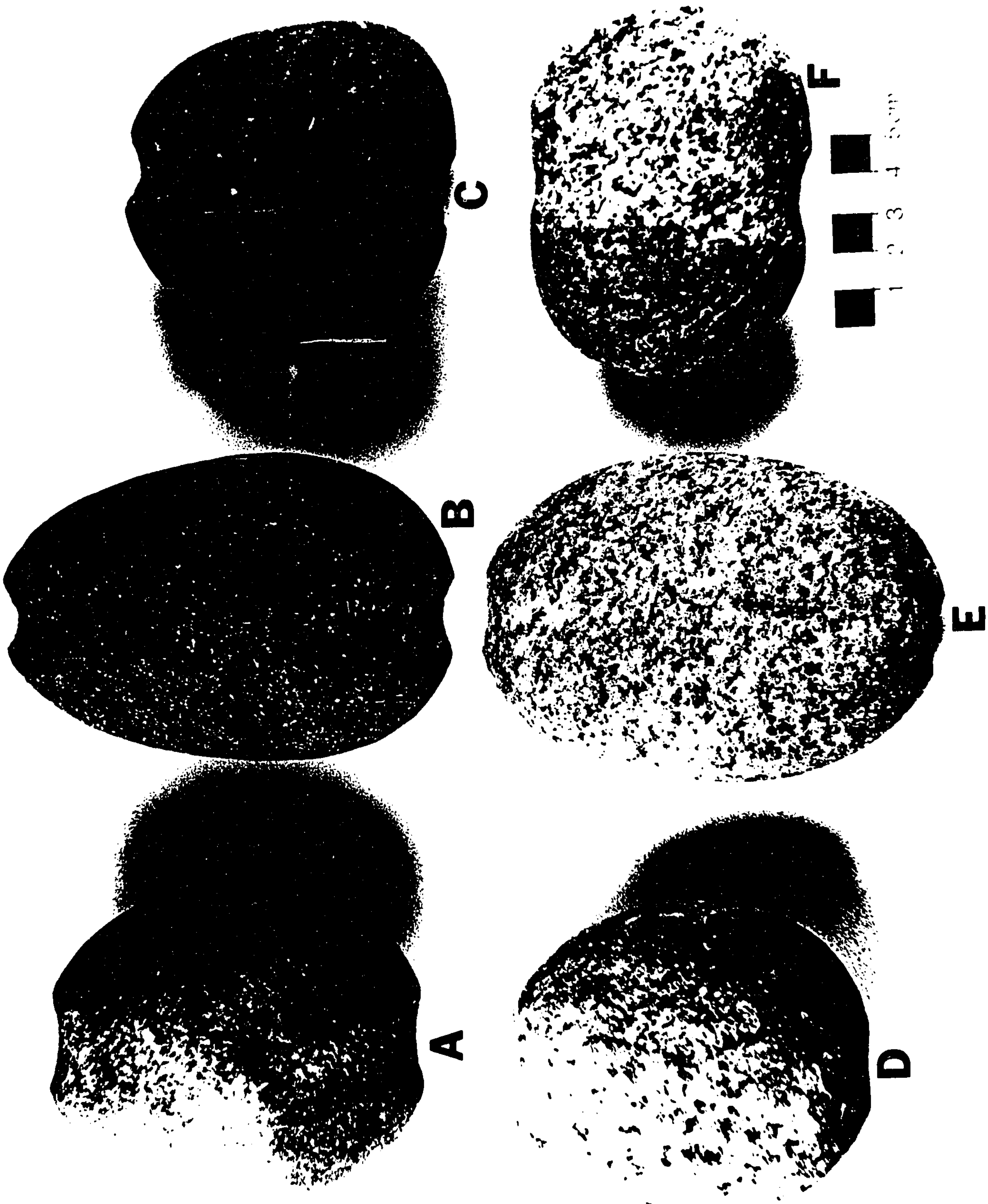

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The halibut/cod rig illustrated by Heizer utilized a grooved cobble as a sinker (1952:Plate 17). The number of grooved cobbles found at Karluk One seems roughly proportional to the number of bone fish hook components. This was also the case in the Rolling Bay and Kiavak collections (Clark 1974:67). A number of grooved granite cobbles were also found on the Awa'uq Refuge Rock. Lead weights used today by sport fishermen for deep water halibut fishing weigh about the same as most grooved cobbles. A fairly heavy weight is needed to pull line and bait through subsurface currents, which can often run at speeds of ten knots or more. Grooved cobbles lack sufficient mass to function effectively as an anchor weight for a seine.

One of the grooved cobbles from Karluk One has pecked grooves which completely encircle the short axis. The majority have grooves which go around the long axis of the cobble.

Bone Plummet Sinkers

Two plummet shaped sinkers are made of sea mammal bone (Plate 22:A, B). They measure 7 and 11 cm long, and both have a small knob carved at the end of the long axis for line attachment. Specimens of the same size and form, were recovered, although not identified, by Clark in other Koniag phase sites (1974:Plate 23:S,T). These weights may have been used with light tackle in line fishing, or possibly with bird nets. Use as bola weights in bird hunting is possible, however the use of bolas in bird hunting is unrecorded among the Koniag, who preferred to hunt waterfowl with bow and arrow, or by trapping them with snares and nets (Davydov 1977:228).

Spacer-Bar Sinkers

Spacer bar sinkers were used as seine weights. Tied end to end, they prevent the seine from bunching up during use. They are known

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ethnographically from the Bristol Bay area. Of the seven examples found at Karluk One, five are made of sea mammal bone and range from 10.5 to 14 cm long. Each has small attachment knobs on both ends of the long axis (Plate 22:E-I).

Heizer (1956:188) illustrates seven spacer-bar sinkers from the Uyak site, identifying them as 'grooved and beveled bone objects'. Heizer's specimen 'p' closely resembles the knobbed types found at Karluk One. Other spacer-bar sinkers from the Uyak site have a shallow groove encircling the midsection, which may prove to be a diagnostic attribute of Kachemak spacer-bar sinkers. This would be consistent with the more careful elaborate manufacture of other Kachemak bone artifacts that otherwise resemble their subsequent Koniag counterparts.

Two additional spacer-bar sinkers were found in surface collections at Karluk One. They differ from those recovered from confirmed prehistoric contexts in that they have small holes at each end, and lack attachment knobs (Plate 22:C,D). One of these is made from antler, the other from sea mammal bone.

Net Floats

Table 5:8 Net Floats

Catalog	Artifact type	Material	Context
2936	Net float	Cottonwood bark	House floor 1
4637	Net float	Cottonwood bark	House floor 5
433	Net float fragment	Cottonwood bark	Profile 1; 197 cm bd.

Net floats identified in Karluk One assemblage are made of cottonwood bark. They are long ovals in both shape and cross-section (Plate 23:A-C). One float is complete, measuring 10 cm long. It has a 3 cm wide slot on one edge, with small notches on each end of the slot. Two other net floats of the same

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Plate 22

Plummets and spacer-bar sinkers

Object	Description	Catalog #
A	Plummet, whale bone	193/2832
B	Plummet, whale bone	193/1020
C	Spacer-bar sinker, bone	193/1814
D	Spacer-bar sinker, antler	193/1813
E	Spacer-bar sinker, whale bone	193/5772
F	Spacer-bar sinker, whale bone	193/2160
G	Spacer-bar sinker, whale bone	193/4898
H	Spacer-bar sinker, whale bone	193/6827
I	Spacer-bar sinker, whale bone	193/1970

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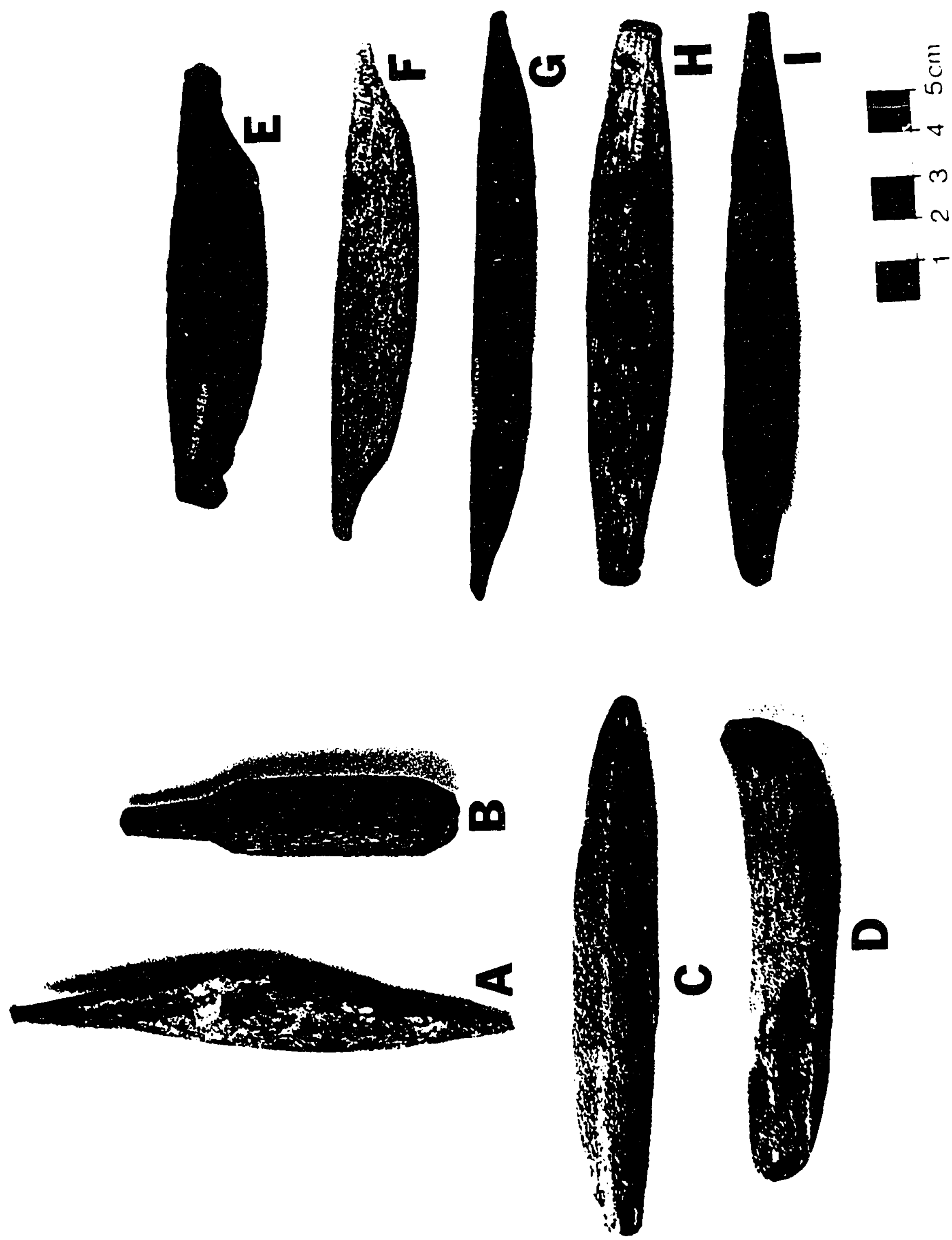

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Plate 23

Net floats

Object	Description	Catalog #
A	Net float fragment, cottonwood bark	193/2936
B	Net float fragment, cottonwood bark	193/437
C	Net float, cottonwood bark	193/6725
D	Net float, cottonwood bark	193/4637

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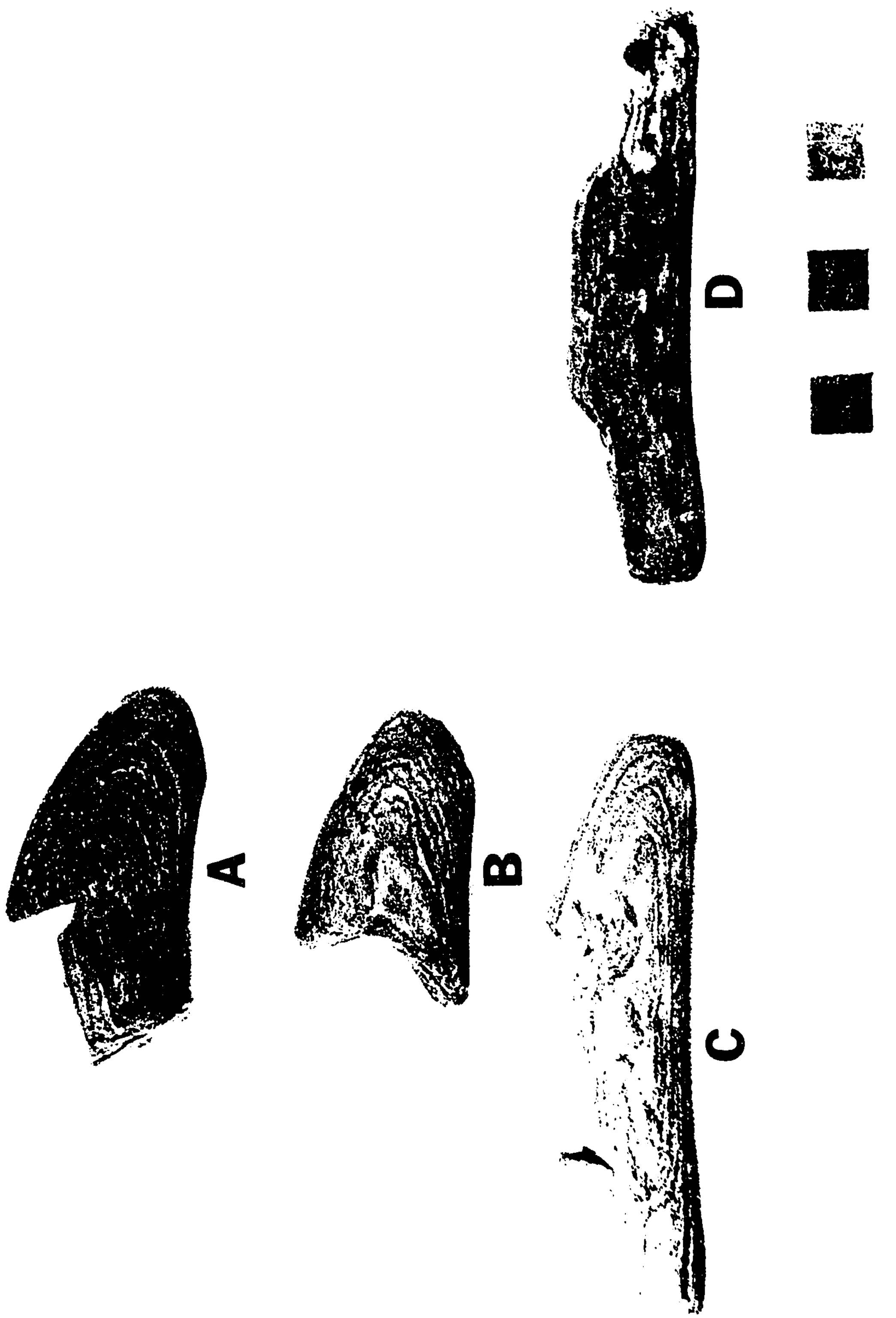

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type are fragmentary (Plate 23:A, B). Similar net floats were recovered from Aleutian burial caves by Hrdliçka (1944), and by Clark at the Rolling Bay (1974:265).

One bark float is a bar shaped piece of cottonwood bark with holes on either end for attachment (Plate 23:D). As in the case of spacer-bar sinkers, the shape of this net float would also prevent unwanted bunching of a seine.

Fishing Lures

Table 5:9 Fishing Lures

Catalog	Artifact Type	Material	Context
2617	Fishing lure	Bone	House floor 5
1227	Fishing lure	Fossil Ivory	House 7 roof sod
5003	Fishing lure	Bone	House floor 8

Three fishing lures, carved effigies of small fish, were found at Karluk One. One lure was manufactured from a sliver of a land mammal long bone, and measures 7.5 cm long (Plate 24:A). Carved details on this piece include a crudely shaped tail, eye, mouth, and a hole in the dorsal area for line attachment. Another, more finely rendered lure was made from sea mammal bone, and is 8 cm long (Plate 24:B). This lure was rendered with considerable realism. The tail, fins, and mouth carefully carved and eyes are represented by tiny bone insets. An attachment hole was placed in the dorsal fin.

The third fishing lure is somewhat more abstract. It is fish shaped and lacks any anatomical detail (Plate 24:C). It is made of fossil ivory, and is 5 cm long. Four holes were drilled in this lure, on both the shorter and longer axis. Two parallel grooves near the tail may have been intended for the purpose of tying on bits of feather or similar material. Similar lures, collected ethnographically from the Yukon-Kuskokwim Delta, exist in the Nelson collection (Fitzhugh and Kaplan 1982:96). Given that the Karluk One lure

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Plate 24

Fish lures

Object	Description	Catalog #
A	Fish lure, bone	193/5003
B	Fish lure, whale bone	193/2617
C	Fish lure, fossil ivory	193/1227

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was made from fossil ivory, and its distinctive form, it is possible that this specimen originated in the Bering Sea Region.

Composite Fish Harpoon Points

Composite fish harpoon points are known from at least four archaeological sites on Kodiak Island; the Uyak site (Heizer 1956), late Kachemak levels at Crag Point, and from the Karluk One site. Of the sites where they have been found, composite fishing harpoon points are by far the most numerous at Karluk One. They are analogous in form and function to composite points used by other North Pacific societies, particularly on the Northwest Coast, where they were used in salmon fishing (Emmons and De Laguna 1991:108-9; Stewart 1973:136).

According to ethnohistorical accounts, the Koniag also relied on spear fishing to harvest salmon. One 18th century account of Koniag fishing mentions that " in the streams they kill fish with darts" (Shelikhov 1981:78). A mid-19th century observer was more specific:

> At a certain time of the year every one of these [salmon] species moves from the ocean up to the rivers and streams in such numbers that they are easily speared with an iron nails or a rod with a point of bone, and this is the usual way of catching them (Holmberg 1985 [orig. 1855-63]:46).

The Koniag fishing harpoons were designed to toggle after completely penetrating the body of the fish. They would have been particularly effective in spearing salmon, which have relatively soft skin and flesh, from which even a very large barb will tear loose. The fishing harpoons would have toggled securely against the small hole made by the long, narrow, foreshaft.

The Koniag composite harpoon was typically made from dense bone, and was composed of two articulating halves, or valves, as they are referred to

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in the Northwest Coast literature, of unequal length. The shorter half of the point was nested into a countersunk depression in the longer component. The two valves were then bound together to form the complete socketed point, which was set onto the end of a long bone foreshaft. Similar bone foreshafts were used in conjunction with composite fish harpoons among the Southern Tlingit (Emmons and De Laguna 1991:108).

Items subject to heavy use and breakage, like dart shafts, kayak keelsons, and other items of Koniag material culture, were frequently made of ingeniously joined composite parts. Composite designs although somewhat more labor intensive, made equipment repair easier, and are most often observed on hunting and fishing gear, where speedy repair makes good economic sense.

In the case of composite harpoon points, their design is well suited for the frequent collisions with rocks that would have occurred anywhere along the Karluk river system. Fish harpoons were probably used in the same manner as those ethnographically known among Northwest Coast groups; where the harpoon is thrust, rather than thrown, into densely packed schools of salmon. The salmon may have been artificially crowded behind weirs constructed of wood and/or boulders. Prehistoric V-shaped rock alignments can still be seen adjacent to Koniag sites on the upper reaches of the Karluk River. When the harpoon was in use, only the tip of longer valve would suffer battering, and require sharpening. Longer halves of composite points appear to have been discarded after repeated sharpening reduced the point tip nearly to the counter-sunk nest of the smaller valve.

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Composite Fish Harpoon Valves; Socketed

Table 6:10 Socketed Fish Harpoon Valves

Catalog	Artifact Type	Material	Context
1325	Harpoon valve;socketed	Bone	House floor 1
3002	Harpoon valve;socketed	Bone	House floor 2
2722	Harpoon valve;socketed	Bone	House 2 wall sod
2721	Harpoon valve;socketed	Bone	House floor 2
3371	Harpoon valve;socketed	Bone	House floor 2
4363	Harpoon valve;socketed	Bone	House floor 2
1592	Harpoon valve;socketed	Bone	House floor 3
2391	Harpoon valve;socketed	Bone	House floor 3
1772	Harpoon valve;socketed	Bone	House floor 3
1785	Harpoon valve;socketed	Bone	House floor 3
2350	Harpoon valve;socketed	Bone	House floor 3
4402	Harpoon valve;socketed	Bone	House floor 3
1799	Harpoon valve;socketed	Bone	House floor 4
4627	Harpoon valve;socketed	Bone	House floor 4
2376	Harpoon valve;socketed	Bone	House floor 4
3139	Harpoon valve;socketed	Bone	House 6 roof sod
3716	Harpoon valve;socketed	Bone	House floor 6
1233	Harpoon valve;socketed	Bone	House floor 7
4254	Harpoon valve;socketed	Bone	House floor 7
6896	Harpoon valve;socketed	Bone	House floor 7
2526	Harpoon valve;socketed	Bone	House floor 7
4916	Harpoon valve;socketed	Bone	House floor 7
4510	Harpoon valve;socketed	Bone	House floor 7
2865	Harpoon valve;socketed	Bone	House floor 7
5174	Harpoon valve;socketed	Bone	House 8 roof sod
6370	Harpoon valve;socketed	Bone	House floor 8
6428	Harpoon valve;socketed	Bone	House floor 8
6341	Harpoon valve;socketed	Bone	House floor 8
6032	Harpoon valve;socketed	Bone	House floor 8
6011	Harpoon valve;socketed	Bone	Upper basal midden
5323	Harpoon valve;socketed	Bone	House floor 10

Of the socketed fish harpoon valves, eleven are long valves that range from 3.5 to 9 cm long (Plate 25:A-J). Six sharply pointed, socketed, shorter valves fit neatly into the countersunk outlines of their longer counterparts (Figure 15). Three of these shorter valves are in complete condition, and range from 2.5 to 4 cm long (Plate 25:K,L,N).

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Figure 15: Construction and use of two-piece socketed fish harpoon valves

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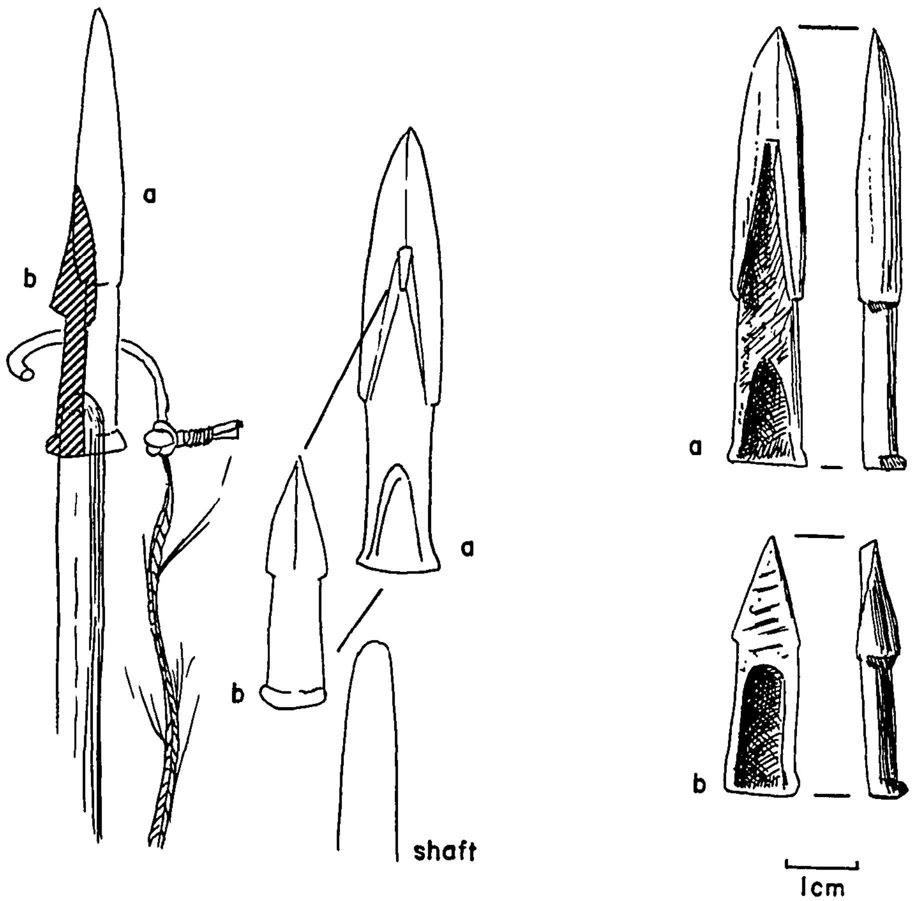

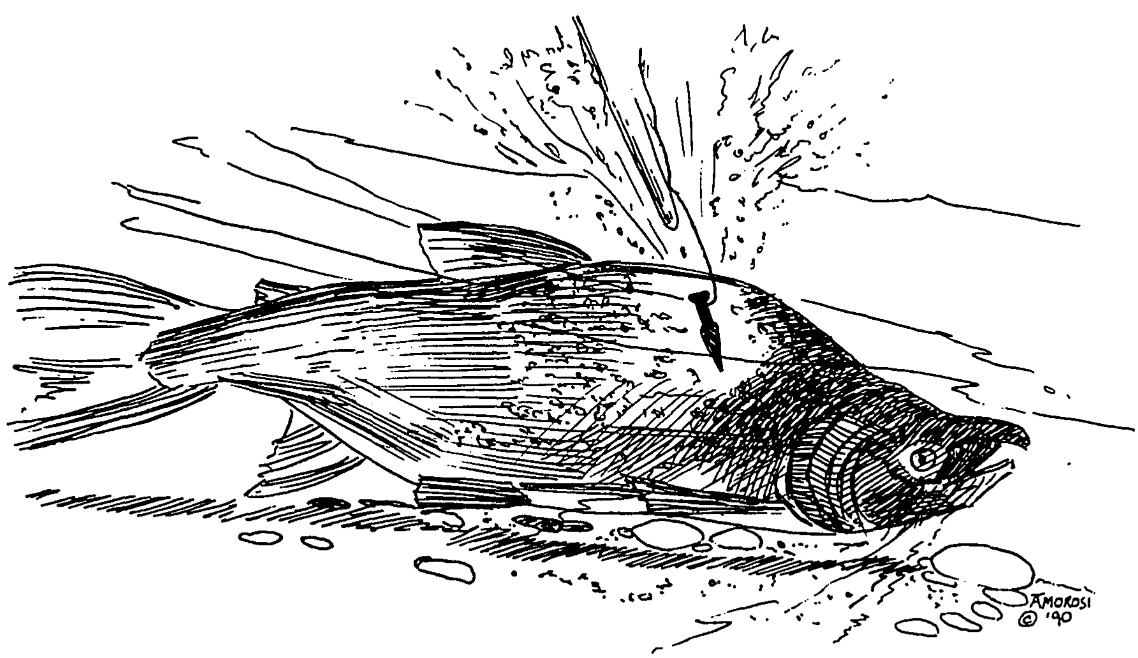

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Plate 25

Socketed fish harpoon valves

Object	Description	Catalog #
A	Socketed fish harpoon valve, bone	193/1592
B	Socketed fish harpoon valve, antler	193/2865
C	Socketed fish harpoon valve, antler	193/4402
D	Socketed fish harpoon valve, antler	193/1795
E	Socketed fish harpoon valve, antler	193/3716
F	Socketed fish harpoon valve, antler	193/2350
G	Socketed fish harpoon valve, antler	193/2391
H	Socketed fish harpoon valve, antler	193/1785
I	Socketed fish harpoon valve, antler	193/3002
J	Socketed fish harpoon valve, antler	193/1233
K	Socketed fish harpoon valve, short component; antler	193/4363
L	Socketed fish harpoon valve, short component; antler	193/2721
M	Socketed fish harpoon valve, short component; antler	193/3139
N	Socketed fish harpoon valve, short component; antler	193/3469

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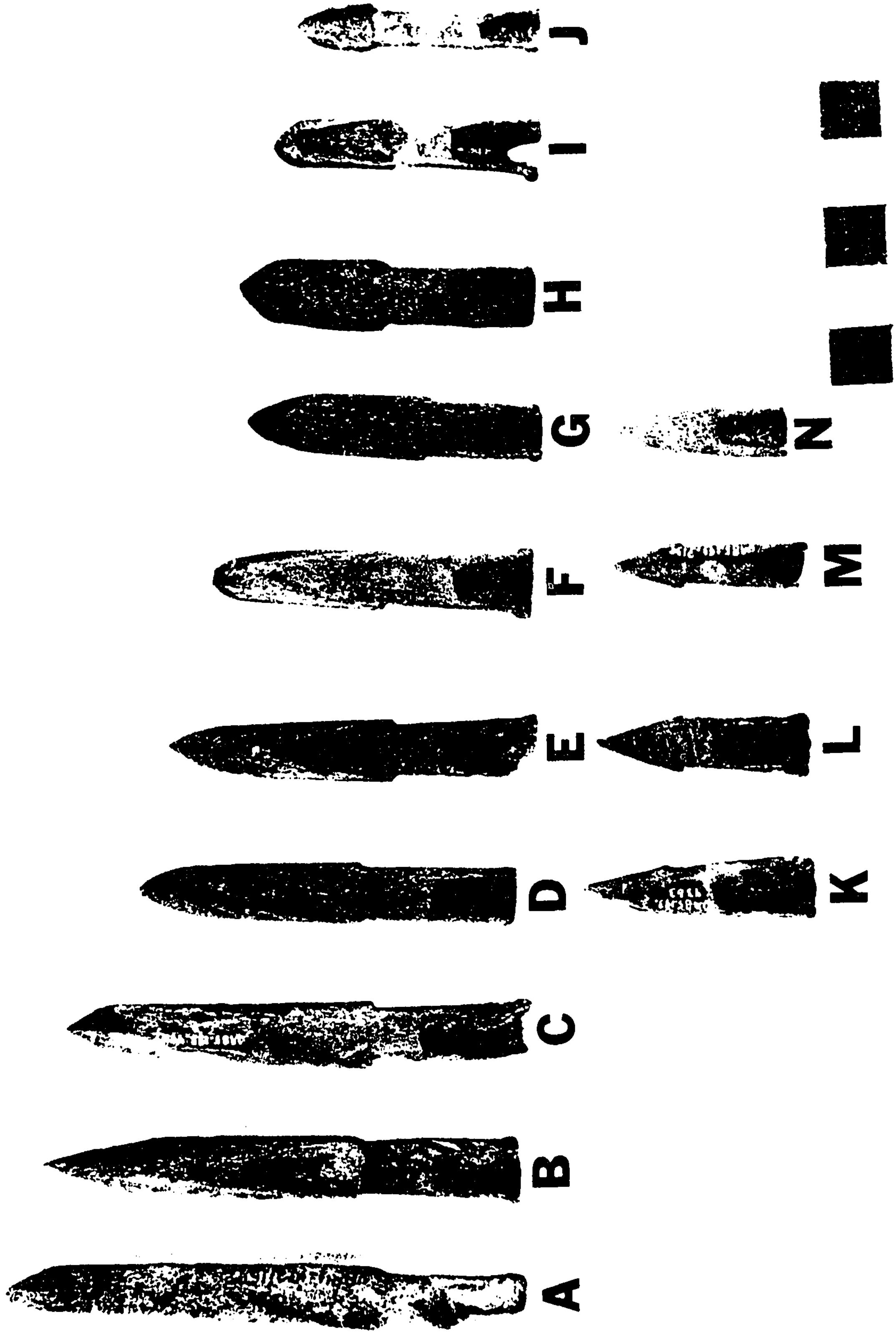

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Composite Fishing Harpoon Points; Scarfed

Table 6:11; Scarfed Fish Harpoon Valves

Catalog	Artifact Type	Material	Context
5167	Harpoon valve;scarfed	Bone	House 7 roof sod
5985	Harpoon valve;scarfed	Bone	House 8 roof sod
5994	Harpoon valve;scarfed	Bone	House 8 roof sod
4996	Harpoon valve;scarfed	Bone	House floor 8
5202	Harpoon valve;scarfed	Bone	House floor 8
5538	Harpoon valve;scarfed	Bone	House floor 8
5789	Harpoon valve;scarfed	Bone	House floor 8
5796	Harpoon valve;scarfed	Bone	House floor 8
5798	Harpoon valve;scarfed	Bone	House floor 8
6379	Harpoon valve;scarfed	Bone	House floor 8
6396	Harpoon valve;scarfed	Bone	House floor 8
6408	Harpoon valve;scarfed	Bone	House floor 8
5572	Harpoon valve;scarfed	Bone	House floor 9A
6504	Harpoon valve;scarfed	Bone	House floor 9B
6174	Harpoon valve;scarfed	Bone	Upper basal midden
6469	Harpoon valve;scarfed	Bone	Upper basal midden
6498	Harpoon valve;scarfed	Bone	Upper basal midden
6141	Harpoon valve;scarfed	Bone	Lower basal midden
6520	Harpoon valve;scarfed	Bone	Lower basal midden
6191	Harpoon valve;scarfed	Bone	House floor 10
6192	Harpoon valve;scarfed	Bone	House floor 10
6533	Harpoon valve;scarfed	Bone	House floor 10

A three-piece variant that employs a harpoon valve with a scarfed base was found only on the lower house floors at Karluk One, and can be considered a diagnostic artifact of early Koniag assemblages (Chart 2). In this point type, the long component is made of two articulating pieces. The socket of the longer valve is contained in a small piece (Plate 26:S) that is dovetailed into a scarf joint at its base . This may have acted to further prevent permanent damage to the point in collision with rocks. The half-dovetail joint would give on impact, so the point would tend to telescope inward rather than fracture. The shorter valve of the three-piece point is

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Figure 16: Construction of three piece scarfed fish harpoon valves

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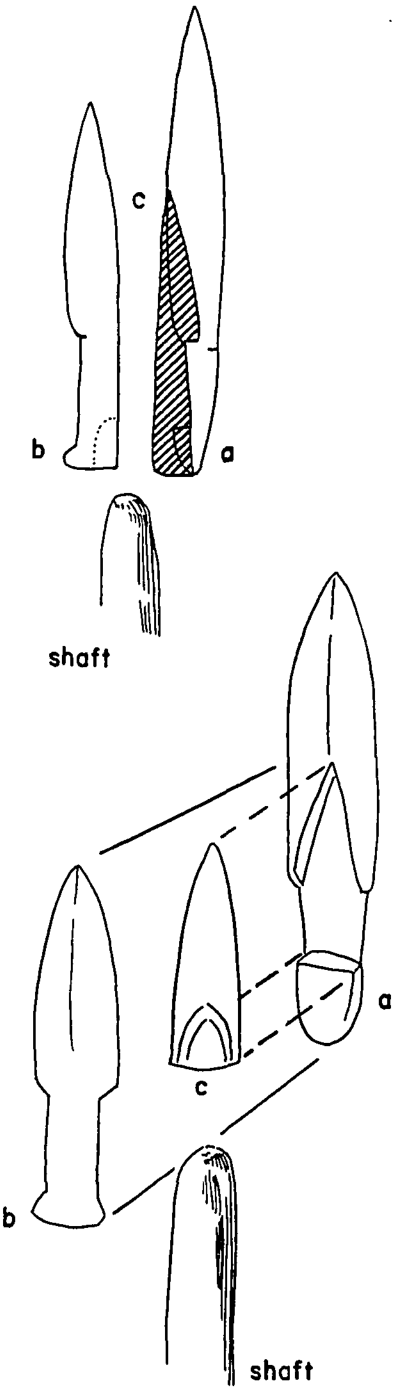

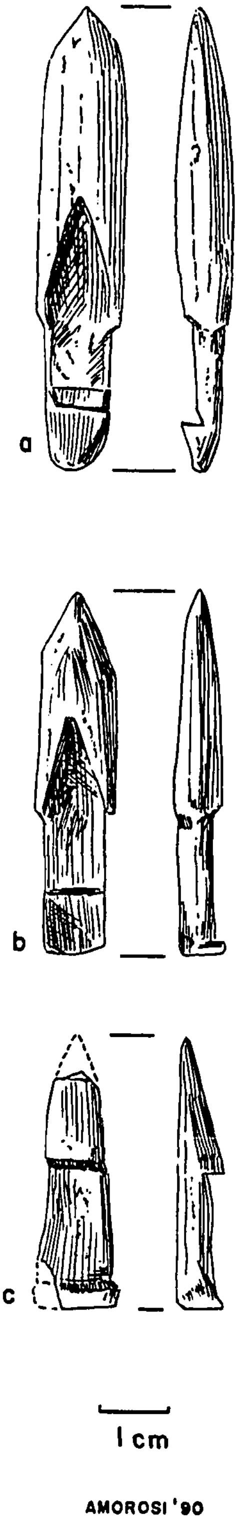

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Plate 26

Fish harpoon valves with a scarfed base

Object	Description	Catalog #
A	Fish harpoon valve w/scarfed base, antler	193/6469
B	Fish harpoon valve w/scarfed base, antler	193/5572
C	Fish harpoon valve w/scarfed base, antler	193/5994
D	Fish harpoon valve w/scarfed base, antler	193/6174
E	Fish harpoon valve w/scarfed base, antler	193/5798
F	Fish harpoon valve w/scarfed base, antler	193/5202
G	Fish harpoon valve w/scarfed base, antler	193/6712
H	Fish harpoon valve w/scarfed base, antler	193/6396
I	Fish harpoon valve w/scarfed base, antler	193/5789
J	Fish harpoon valve w/scarfed base, antler	193/5167
K	Fish harpoon valve w/scarfed base, antler	193/6720
L	Fish harpoon valve w/scarfed base, antler	193/6408
M	Fish harpoon valve w/scarfed base, antler	193/6141
N	Fish harpoon valve w/scarfed base, antler	193/5796
O	Fish harpoon valve w/scarfed base, antler	193/6379
P	Fish harpoon valve w/scarfed base, antler	193/6504
Q	Fish harpoon valve w/scarfed base, antler	193/4996
R	Fish harpoon valve w/scarfed base, antler	193/6533
S	Fish harpoon valve w/scarfed base, small component, antler	193/6192

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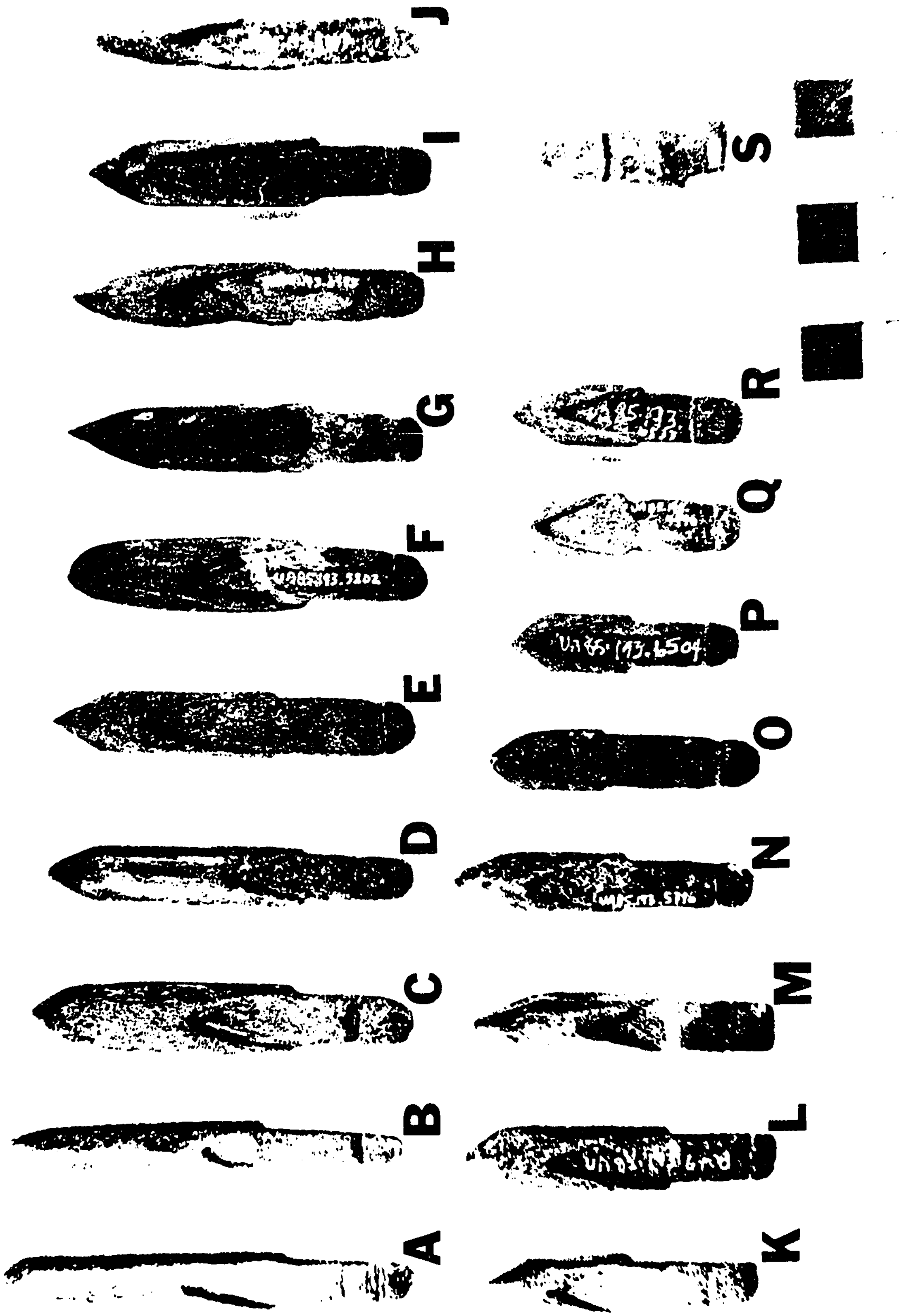

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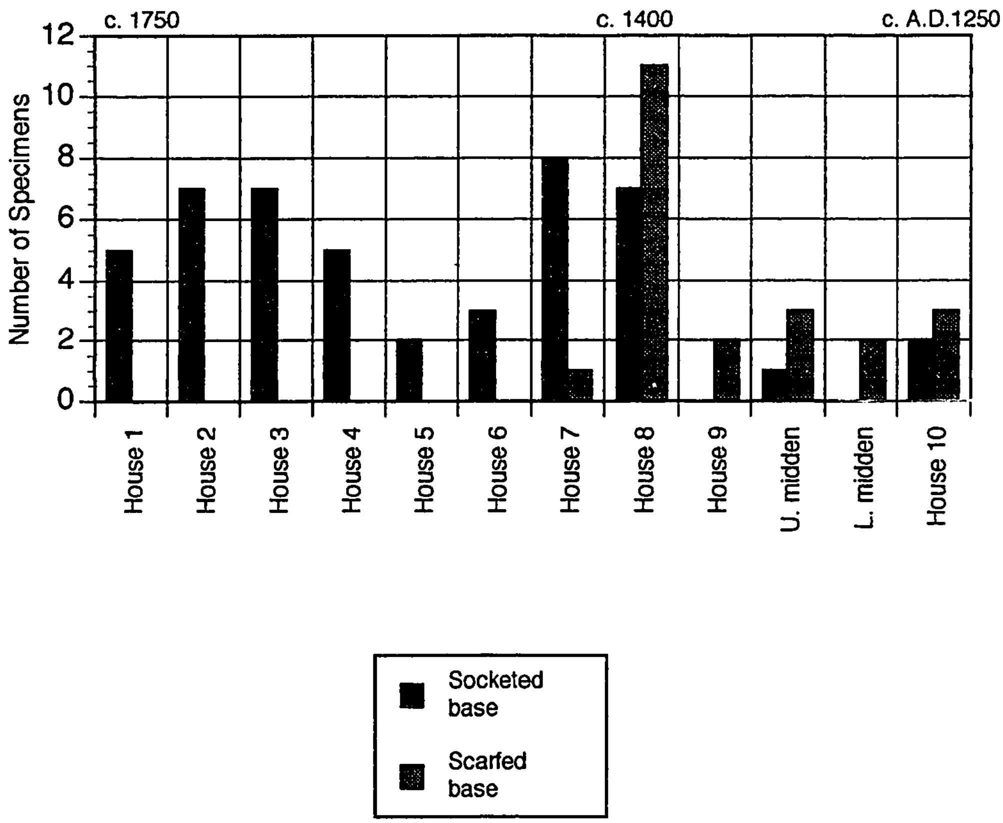
Chart 2: Changes in Fish Harpoon Valves after A.D. 1400
At the Karluk One Site



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indistinguishable from that of the two-piece points. A total of 22 scarfed point components were found, ranging from 3.5 to 6.5 cm long (Plate 26:A-R).

Heizer (1956:64), first described the function of the smaller socket piece in his analysis of the Uyak collection, which include two examples. Scarfed valves were found in 'lower levels' at the Uyak site, and socketed valves in higher levels. With the smaller piece in place, scarfed points are otherwise identical in function to the simpler, socketed forms that favored by Koniag fishermen after A.D. 1400.

Composite Fishing Harpoon Points; Spurred

Table 5:12 Fish Harpoon Valves with Spurs

Catalog	Artifact Type	Material	Context
2661	Harpoon valve w/spur	Bone	House floor 1
714	Harpoon valve w/spur	Bone	House floor 1
3015	Harpoon valve w/spur	Bone	House floor 1
3024	Harpoon valve w/spur	Bone	House floor 2
3636	Harpoon valve w/spur	Bone	House 4 roof sod
1154	Harpoon valve w/spur	Bone	House floor 5
3412	Harpoon valve w/spur	Bone	House floor 6
4081	Harpoon valve w/spur	Bone	House floor 7
6327	Harpoon valve w/spur	Bone	House floor 8
6317	Harpoon valve w/spur	Bone	House 8 roof sod
5630	Harpoon valve w/spur	Bone	House floor 10

Another variation on the basic design of the composite fishing harpoon point is represented by eight complete socketed forms with a spoon-shaped spur on the base, presumably used as an aid to toggling (Plate 27:A-F). Of all Koniag harpoon valves, this form is the most similar to Northwest Coast forms (Stewart 1982). They range long from 7 to 5 cm. One specimen of this type has been further modified, with an oval hole in the side of the socket (Plate 27:B). Seven of the eight spurred valves apparently represent the shorter half of the composite point, as they lack countersinking.

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Figure 17: Construction of spurred fish harpoon valves

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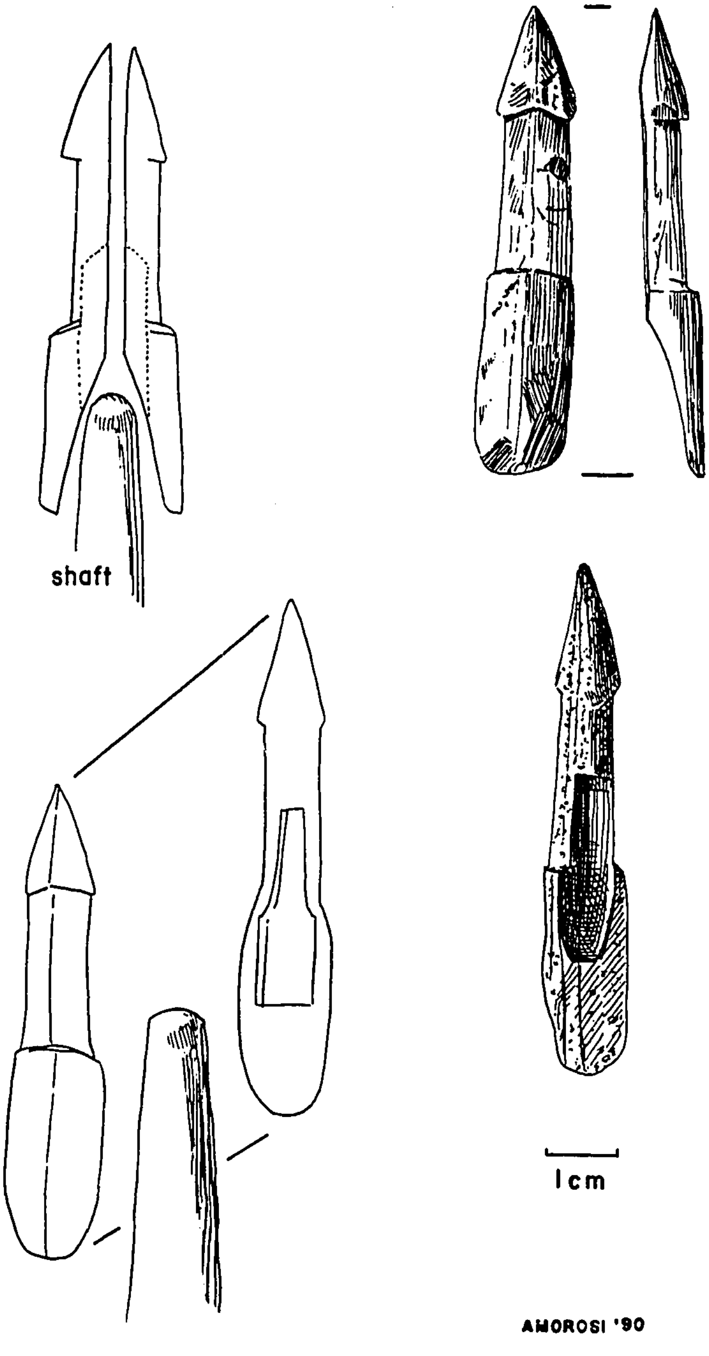

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Plate 27

Spurred fish harpoon valves

Object	Description	Catalog #
A	Spurred fish harpoon valve, bone	193/6327
B	Spurred fish harpoon valve, antler	193/3412
C	Spurred fish harpoon valve, antler	193/2661
D	Spurred fish harpoon valve, antler	193/714
E	Spurred fish harpoon valve, antler	193/3676
F	Spurred fish harpoon valve, bone	193/4081

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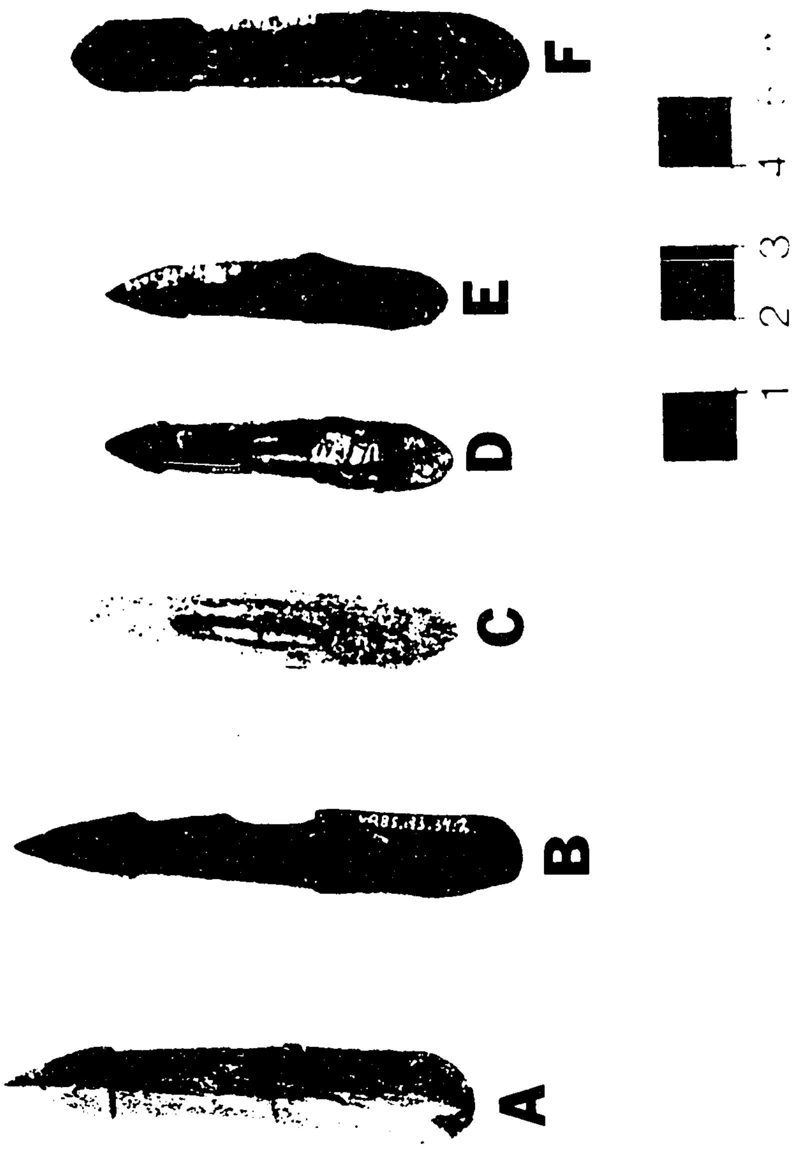

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The purpose of this spurred variant of the composite fishing harpoon point is open to conjecture, but it is possible that they were intended for a specific species other than salmon. Spurred toggling harpoons are used today to land line-caught halibut, usually those weighing 100 pounds or more.

One-Piece, Open Socketed Fish Harpoon Points

Table 5: 13 Open Socketed, One-Piece Fish Harpoon Valves

Catalog	Artifact Type	Material	Context
2162	Fish harpoon; 1 pc. open socketed	Bone	House floor 1
1419	Fish harpoon; 1 pc. open socketed	Bone	House floor 3
1651	Fish harpoon; 1 pc. open socketed	Bone	House floor 4
3643	Fish harpoon; 1 pc. open socketed	Bone	House floor 5

Four bone points in the Karluk One assemblage have an open socketed base similar to those of the composite fishing harpoon points described above but apparently functioned as open socket points (Plate 28:A-D). They are sharpened on both sides of the point tip, are not counter-sunk, and have minute barbs incised on the sides. They are longer than the two and three-piece composite points, measuring from 7 to 9.5 cm long. Although the sample is small, given their form and stratigraphic distribution they may represent an innovation in Koniag fish harpoons that was adopted sometime after A.D. 1400

Stunning Clubs

Table 5:14 Stunning Clubs

Catalog	Artifact Type	Material	Context
2942	Stunning club	Wood	House floor 1
2945	Stunning club	Wood	House floor 1
1342	Stunning club	Wood	House floor 1
1747	Stunning club	Wood	House floor 2
2798	Stunning club	Wood	House floor 5
853	Stunning club	Wood	House floor 5
4777	Stunning club	Wood	House 5 wall sod

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Plate 28

Open socketed fish harpoon points

Object	Description	Catalog #
A	Open socketed fish harpoon point, whalebone	193/1419
B	Open socketed fish harpoon point, antler	193/1651
C	Open socketed fish harpoon point, bone	193/3643
D	Open socketed fish harpoon point, bone	193/2162

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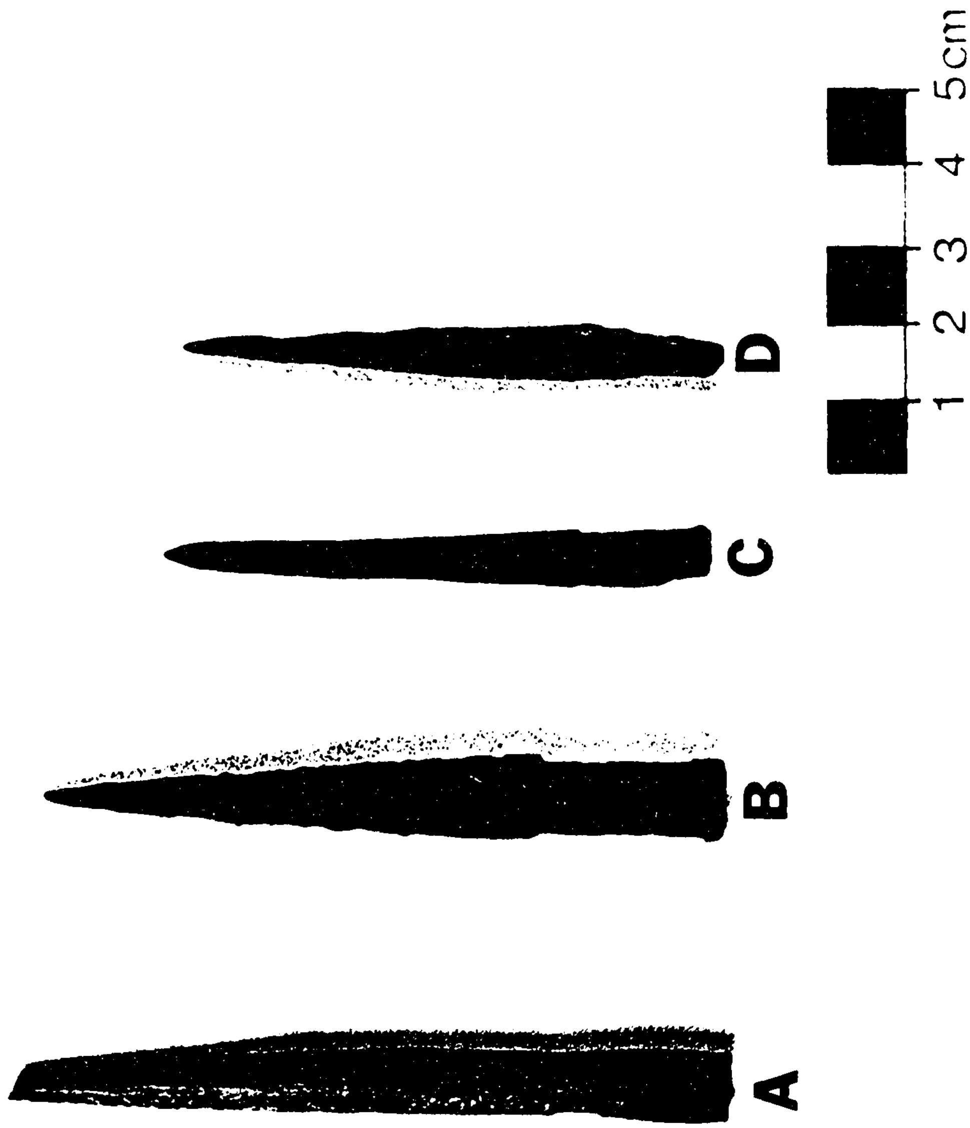

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Seven complete wooden stunning clubs were found in association with later housefloors. They range from 32 to 39 cm long, and from 2.5 to 4 cm in diameter (Plate 29:A-E). The size and mass of these clubs suggest that they were used to stun large fish, rather than sea mammals. Similar sized clubs, called 'fish billys', are still used by Kodiak fishermen. A model of Kodiak style kayak in the Lonsdale collection features a seated paddler using this type of stunning club while landing a sculpin (Krech 1989:Figure 47).

Six of the clubs feature a distinctive wedge-shaped proximal end, 1.5 to 2.5 cm wide. The function of this modification, if any, is unknown. The remaining club in the collection lacks this attribute. One club has a series of crescentic cut marks, probably to improve the grip (Plate 29:C).

Harpoon Points (*Tuqsiiq*)

Toggling Harpoon Points

Table 5:15 Toggling Harpoon Points

Catalog	Artifact Type	Material	Context
1468	Toggling harpoon point	Bone	House 6 wall sod
4846	Toggling harpoon point	Bone	House floor 7

Only two examples of toggling sea mammal harpoons were found at Karluk One. Both pieces are quite small; 4 and 5 cm long respectively (Plate 30:O,P). They are manufactured of bone, lack end blade slots, and have a single spur. They are blunt, rather crudely made, and the single closed socket is very shallow. It is possible that neither of these pieces are functional, and they may alternatively served as toys or amulets. Toggling harpoon heads are typically scarce in Koniag assemblages. Clark recovered several short toggling harpoon points in Koniag contexts at both the Kiavak and Rolling Bay sites (1974:56). They were bilaterally barbed and lacked endblade slots.

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Plate 29

Stunning clubs

Object	Description	Catalog #
A	Stunning club, alder	193/4777
B	Stunning club, wood	193/2945
C	Stunning club, wood	193/2798
D	Stunning club, wood	193/6826
E	Stunning club, wood	193/1342

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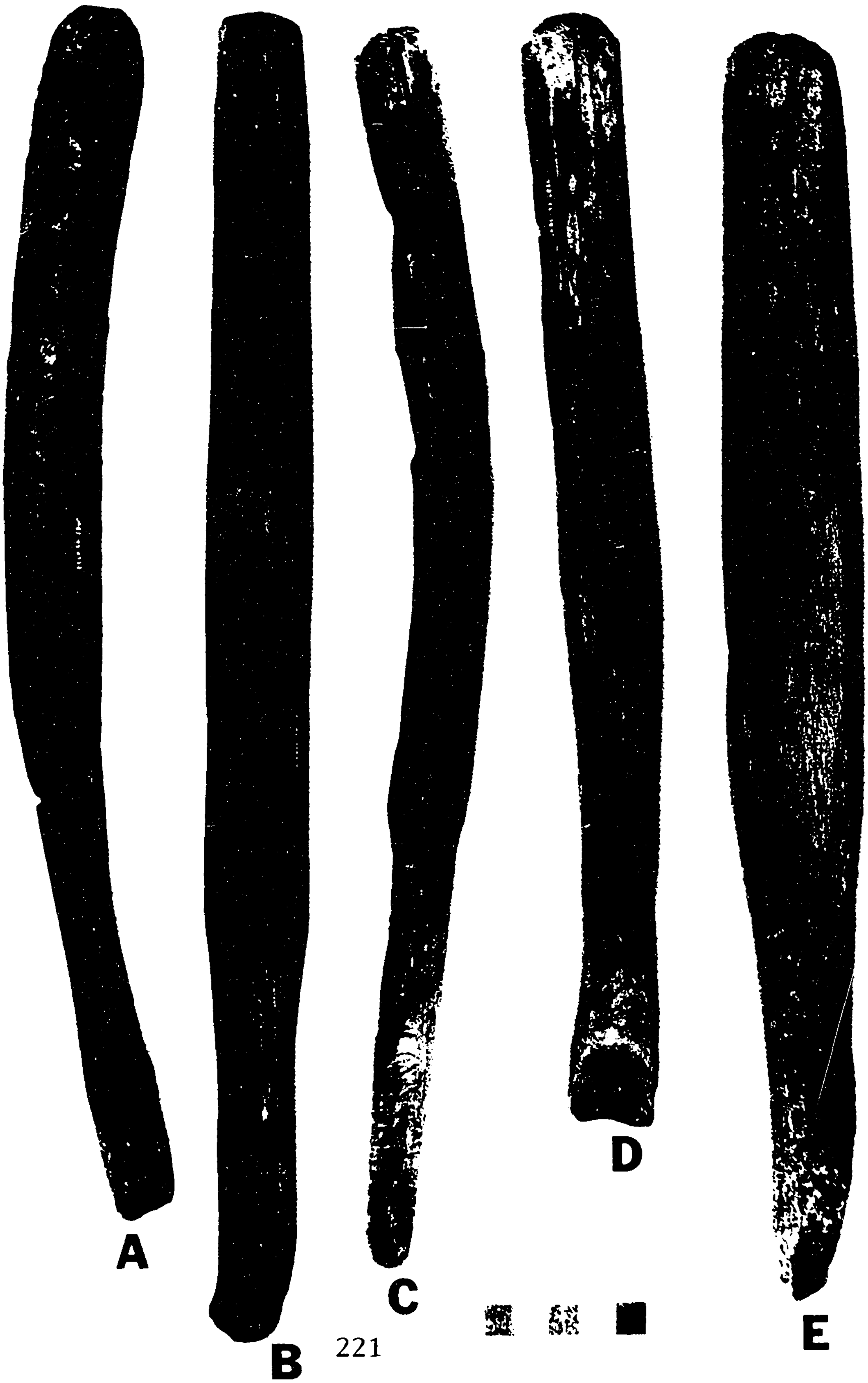

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Clark's toggling harpoon heads also show various types of bifurcated spurs. I have seen these in private collections, usually from historic Koniag sites.

Larger toggling harpoon heads, resembling those found elsewhere in the Eskimo world, are much more common in Kachemak phase assemblages at Uyak, (Heizer 1956:61) and at Kizhuyak and Crag Point sites. De Laguna also found large toggling harpoon heads in Kachemak Bay (1934:80-81). The appearance of toggling harpoon heads during the Kachemak phase seems to be associated with the general increase of Bering Sea derived material culture that occurs on Kodiak during the Medieval Climatic optimum c. A.D. 750-1300.

Single Barbed Harpoon Points

Table 5:16 Single Barb Harpoon Points

Catalog	Artifact Type	Material	Context
3319	1 barb harpoon point	Bone	House floor 1
4680	1 barb harpoon point	Bone	House floor 1
4323	1 barb harpoon point	Bone	House floor 1
4353	1 barb harpoon point	Bone	House floor 1
3168	1 barb harpoon point	Bone	House floor 6
3414	1 barb harpoon point	Bone	House floor 6
4839	1 barb harpoon point	Bone	House floor 7
6345	1 barb harpoon point	Bone	House floor 8
5570	1 barb harpoon point	Bone	House floor 9A

Barbed harpoon heads were used in conjunction with the harpoon dart by sea mammal hunters along the entire North Pacific Coast and by Yupik speakers. Such darts were made in various sizes and were launched with the aid of a throwing board or in the case of smaller darts with a bow. All of the barbed harpoon points found at Karluk One were manufactured of bone and have a distinctive wedge-shaped base perforated by an offset line hole (Plate 30:A-M).

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The point base was plugged into the end of a heavy bone socket piece; a thin lining of wood around the slot on the socket's distal end held the point snugly in place. The point was then permanently tied to a shaft in a Y-shaped configuration. The mass of the socket piece gave the weapon sufficient force to embed the point solidly into the tough skin of a sea mammal, whose struggles pulled the point from the socket. The wounded animal's escape was impeded by the dart shaft, which dragged behind it. An inflated bladder was often attached to the dart shaft, further hindering escape, and marking the location of the struggling animal. The harpoon dart, therefore, did not actually kill the animal, rather it was used to bring the animal in range of a lance or club.

The harpoon points from Karluk One are dominated by relatively short, single barbed forms, and generally come from levels that post-date A.D. 1400 This contrasts somewhat with those found by Clark at Rolling Bay and Kiavak, where all the harpoon points have multiple barbs (1974:56). Some single-barbed points were found in the upper; probably Late Koniag, levels at the Uyak site (Heizer 1956:60). Ten unilaterally single barbed harpoon points were recovered at Karluk One, ranging in size from 4 to 8 cm long (Plate 30:A-H). One point apparently was reworked from a longer, multiple barbed point, and has a second line hole which has been carefully plugged with wood (Plate 30:C). Another specimen differs slightly from the others in that it has a slightly bifurcated barb. It is possible that at least some of these points are reworked fragments of multiple barb forms.

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Plate 30

Barbed Harpoon Points

Object	Description	Catalog #
A	Single barb harpoon point, bone	193/3414
B	Single barb harpoon point, bone	193/4680
C	Single barb harpoon point, bone	193/4839
D	Single barb harpoon point, bone	193/4323
E	Single barb harpoon point, antler	193/6345
F	Single barb harpoon point, bone	193/4353
G	Single barb harpoon point, bone	193/6832
H	Single barb harpoon point, bone	193/5570
I	Double barb harpoon point, bone	193/2126
J	Triple barb harpoon point, bone	193/5628
K	Triple barb harpoon point, bone	193/5613
L	Double barb harpoon point, bone	193/4912
M	Double barb harpoon point, bone	193/5057
N	Bilateral barb harpoon point, antler	193/6889
O	Toggling harpoon point, bone	193/1468
P	Toggling harpoon point, antler	193/4846

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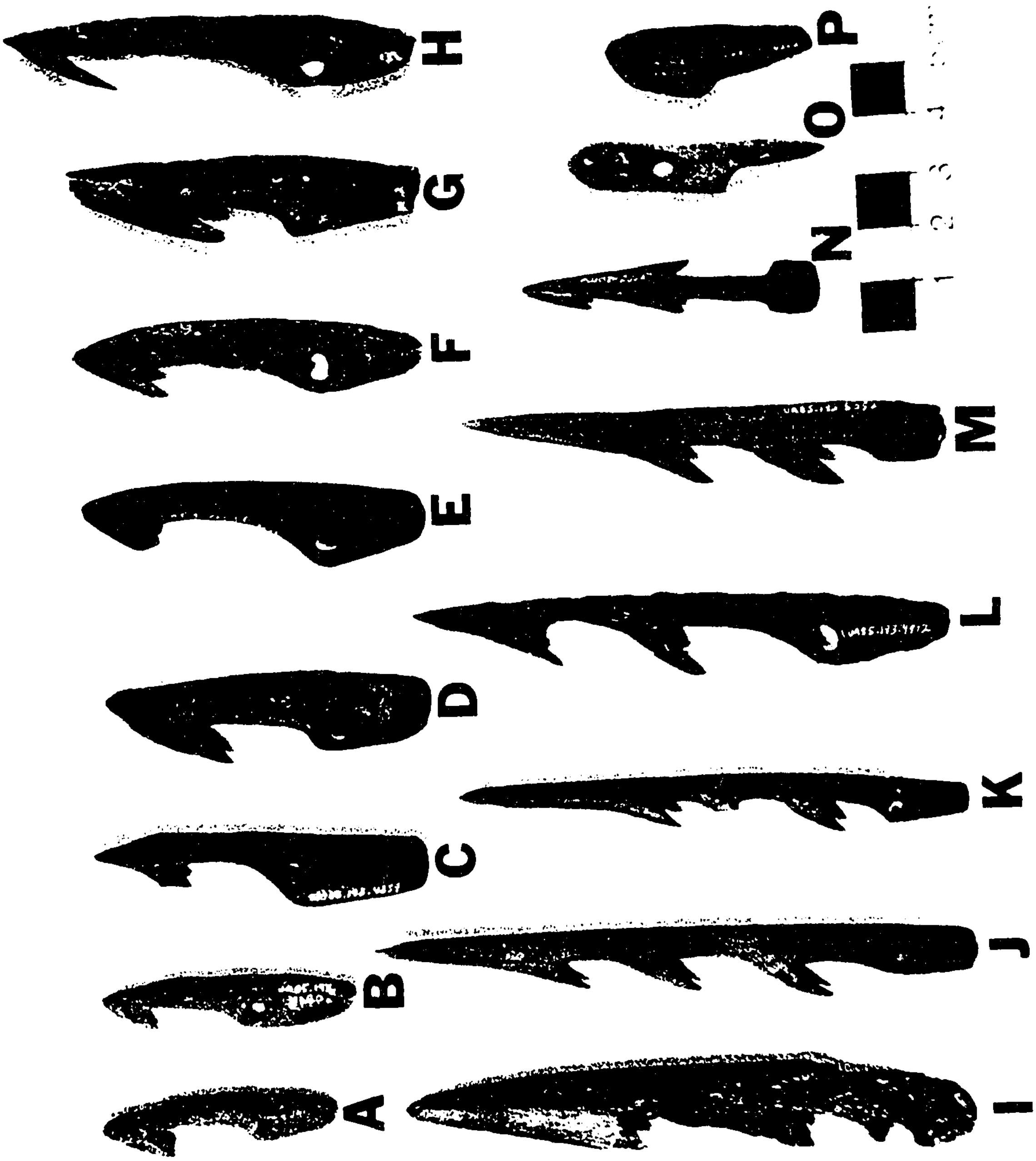

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Unilateral, Multiple Barb Harpoon Points

Table 5:17 Multiple Barbed Harpoon Points

Catalog	Artifact Type	Material	Context
2126	2 barb harpoon point	Bone	House floor 1
4912	2 barb harpoon point	Bone	House floor 7
5057	2 barb harpoon point	Bone	House floor 10
2770	3 barb harpoon point	Bone	House floor 4
5613	3 barb harpoon point	Bone	House floor 9B
5628	3 barb harpoon point	Bone	House floor 10

Three harpoon points have two barbs, and an additional three points have triple barbs, all in a unilateral configuration (Plate 30:I-M). The complete specimens range from 10 to 11 cm long. Most, but not all of them, were found in lower levels of the site. Single-barbed points are more common in the post-A.D. 1400 levels. This is consistent with an overall pattern of less attention to detail in bone artifacts through time.

Bilaterally Barbed Harpoon Point

A single bilaterally barbed harpoon point measures 5.5 cm long. It lacks a line hole, and has two barbs on one side and a single barb on the other (Plate 30:N). An identical point is attached to a sea mammal dart now in the Etholen collection in the National Museum of Finland (Varjola 1990:309:plate 530), collected in the Unalaska in the early 19th century. This suggests that the Karluk One point, found on housefloor 1, may be an import from the Aleutians. Ethnographic examples of harpoon points from Kodiak also frequently lack line holes, with the line simply tied around the center of the point.

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Barbed Harpoon Point Fragments

Table 5:18 Barbed Harpoon Point Fragments

Catalog	Artifact Type	Material	Context
553	Barb harpoon fragment	Bone	House 1 roof sod
683	Barb harpoon fragment	Bone	House 1 roof sod
2977	Barb harpoon fragment	Bone	House floor 1
1038	Barb harpoon fragment	Bone	House floor 2
2295	Barb harpoon fragment	Bone	House floor 2
2380	Barb harpoon fragment	Bone	House floor 4
4787	Barb harpoon fragment	Bone	House floor 6
4915	Barb harpoon fragment	Bone	House floor 7
5783	Barb harpoon fragment	Bone	House floor 8
6409	Barb harpoon fragment	Antler	House floor 8
5491	Barb harpoon fragment	Bone	House floor 8
4981	Barb harpoon fragment	Bone	House floor 8
5549	Barb harpoon fragment	Bone	House floor 8
5567	Barb harpoon fragment	Bone	House floor 9A
6464	Barb harpoon fragment	Bone	House floor 9A
5832	Barb harpoon fragment	Bone	Lower basal midden
6195	Barb harpoon fragment	Bone	House floor 10
5309	Barb harpoon fragment	Bone	House floor 10

Of five harpoon base fragments, four have line holes. One of these base fragments bears battering marks on its distal end, indicating subsequent reuse as a small wedge. Of the eleven barbed harpoon body fragments in the assemblage, ten represent unilaterally barbed forms and one a bilaterally barbed point. Most of the harpoon point fragments were found on levels that date before A.D. 1400. In combination with other evidence, this pattern suggests a shift toward an increased reliance on fishing and a decrease in sea mammal hunting after that time.

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Leister/Bird Arrow Prongs

Table 5:19 Leister/Bird Arrow Prongs

Catalog	Artifact Type	Material	Context
2120	Side prong	Bone	House floor 1
3970	Center prong	Bone	House 3 roof sod
3029	Side prong	Bone	House floor 3
3595	Center prong	Bone	House floor 3
3392	Side prong	Bone	House floor 5
3667	Center prong	Bone	House floor 5
3682	Side prong	Bone	House floor 5
1692	Center prong	Bone	House floor 7
3189	Side prong	Bone	House floor 7
6331	Side prong	Bone	House floor 8
6508	Side prong	Bone	House floor 9B
6173	Center prong	Bone	Upper basal midden
5061	Side prong	Bone	House floor 10

Bird arrows and to a lesser extent leisters are known from early accounts of the Koniag and are common in the major ethnographic collections (Birket-Smith 1941:Fig 15c; Varjola 1990:304). Leisters typically feature a center prong, and two prongs which curved toward the center to grip an impaled fish. Bird arrows were also tipped with a center prong, surrounded by three or more curved and barbed prongs. A cluster of additional prongs sometimes were installed further down the shaft of the bird arrow, for launching with either a bow or throwing board.

Eight side prongs in the Karluk One assemblage are made from dense bone and are unilaterally barbed (Plate 31:A-E). Three complete side prongs measure from 8 to 9.5 cm long. The fragmentary side prongs all appear to have been snapped off near the base. Seven center prongs were identified on the basis of their straight shape and bilateral barbing (Plate 31:F-J). The five complete center prongs are made from dense bone, probably that of a land mammal, and measure from 6.5 to 9 cm long.

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Plate 31

Leister or bird arrow prongs

Object	Description	Catalog #
A	Leister/bird arrow side prong, bone	193/3189
B	Leister/bird arrow side prong, bone	193/2120
C	Leister/bird arrow side prong, bone	193/6833
D	Leister/bird arrow side prong, bone	193/5061
E	Leister/bird arrow side prong, bone	193/6508
F	Leister/bird arrow center prong, bone	193/6173
G	Leister/bird arrow center prong, bone	193/1692
H	Leister/bird arrow center prong, bone	193/3667
I	Leister/bird arrow center prong, bone	193/3595
J	Leister/bird arrow center prong, bone	193/3970

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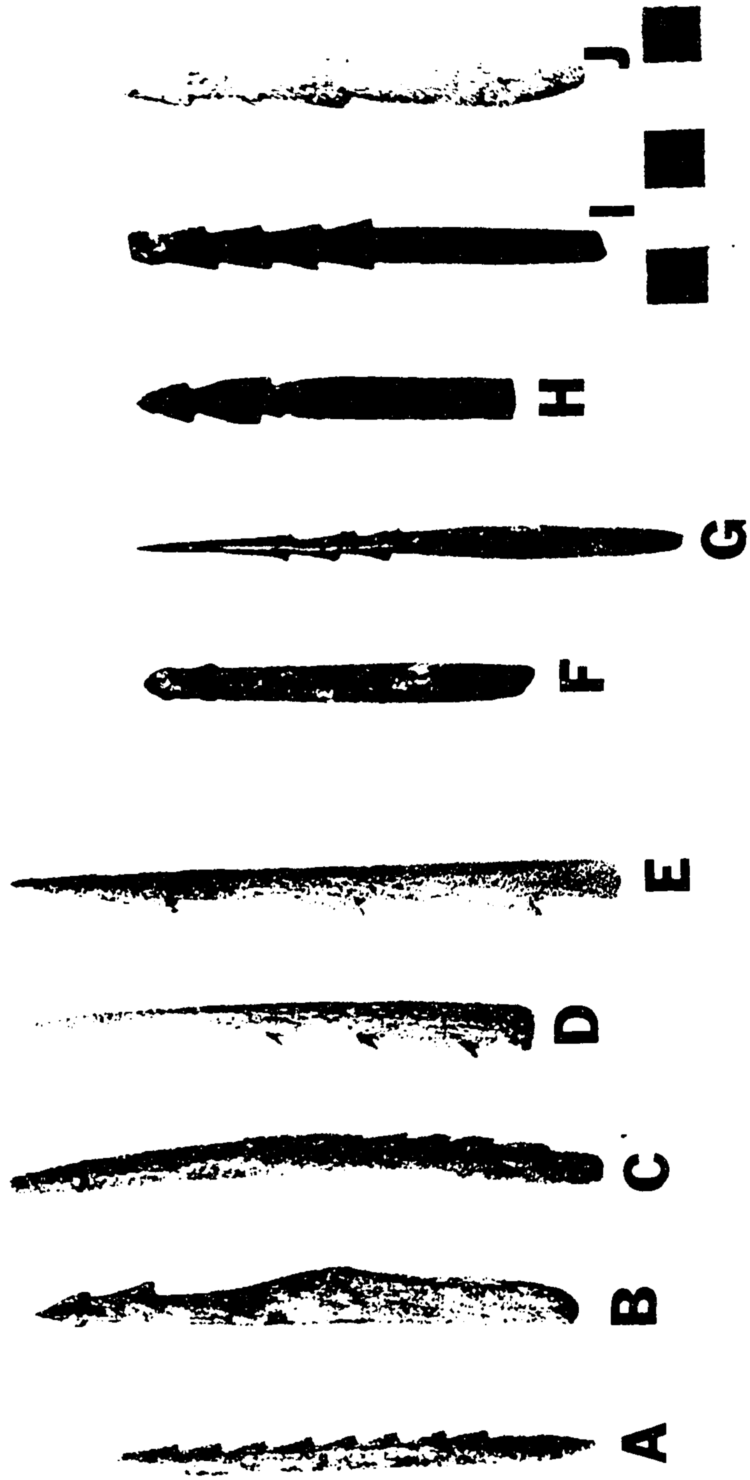

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Slate Projectile Point Preforms

Table 5:20 Slate Projectile Point Preforms

Catalog	Artifact Type	Material	Context
971	Point preform; triangular	Slate	House 1 roof sod
1871	Point preform; triangular	Slate	House floor 1
4095	Point preform; triangular	Slate	House floor 2
4144	Point preform; triangular	Silicified Slate	House floor 2
4147	Point preform; triangular	Slate	House floor 2
2733	Point preform; triangular	Slate	House 3 roof sod
2739	Point preform; triangular	Slate	House 3 roof sod
1621	Point preform; triangular	Slate	House floor 3
3035	Point preform; triangular	Slate	House floor 3
4556	Point preform; triangular	Slate	House floor 3
1614	Point preform; triangular	Slate	House floor 4
1992	Point preform; triangular	Slate	House floor 5
3122	Point preform; rectangular	Slate	House floor 5
3160	Point preform; triangular	Slate	House floor 6
3749	Point preform; triangular	Slate	House floor 6
4524	Point preform; triangular	Slate	House 7 wall sod
2068	Point preform; triangular	Slate	House floor 7
5498	Point preform; triangular	Slate	House floor 8
5680	Point preform; triangular	Slate	House floor 8
5802	Point preform; triangular	Slate	House floor 8
6215	Point preform; triangular	Slate	House floor 8
6434	Point preform; triangular	Silicified Slate	House floor 8
6570	Point preform; stemmed	Slate	House floor 8
5047	Point preform; triangular	Slate	Lower basal midden
6519	Point preform; triangular	Slate	Lower basal midden
5428	Point preform; triangular	Slate	House floor 10
5859	Point preform; triangular	Slate	House floor 10
6529	Point preform; triangular	Slate	House floor 10

Four slate preforms have been sawn and snapped. Three of these consist of thin rectangle of slate (Plate 32:A-C). The fourth has also been chipped into the shape of a triangular, stemmed point, 9 cm long and 3.5 cm wide (Plate 32:D).

Slate point preforms were shaped by chipping and grinding into roughly triangular forms, measuring from 5 to 7.5 cm long, and 2 to 3.5 cm wide (Plate 33:A,F). Although sawn and snapped preforms are also present in

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the collection, chipping is the predominant method of preform preparation. Two fragmentary slate preforms were identified as stemmed, lanceolate points (Plate 33:B).

Five large chipped and ground preforms may have been intended for either large lance points or knife blades (Plate 33:C,D,E). They are from 10 to 12.5 cm long, and 2.5 to 3.5 cm wide. Two of these large preforms have drilled holes, indicating that they are reworked fragments of ulus or flensing knives (Plate 33:C, E).

Fifteen preforms were identified by size as unfinished endblades (Plate 33:G,H,I). Complete endblade preforms measured from 4 to 6 cm long and have a basal width of 1 to 2.5 cm.

Table 5:21 Endblade Preforms

Catalog	Artifact Type	Material	Context
975	Endblade preform	Slate	House 1 roof sod
4547	Endblade preform	Slate	House floor 2
1434	Endblade preform	Slate	House floor 4
3114	Endblade preform	Slate	House floor 5
4946	Endblade preform	Slate	House floor 6
871	Endblade preform	Slate	House 6 wall sod
3416	Endblade preform	Slate	House floor 6
3907	Endblade preform	Slate	House floor 7
3424	Endblade preform	Slate	House floor 7
6344	Endblade preform	Slate	House floor 8
5679	Endblade preform	Slate	House floor 8
6070	Endblade preform	Silicified Slate	House floor 8

Triangular Endblades

The Karluk One slate projectile point assemblage is dominated by triangular endblades, and particularly abundant in the later house floors (Plate 34:A-N). This confirms Clark's suggestion (1974:54) that endblades are a diagnostic artifact of Koniag phase sites, particularly those from the second millennium A.D. Most of the Karluk One endblades closely resemble specimens recovered from Rolling Bay (Clark 1974:53).

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Plate 32

Slate blanks and point preform

Object	Description	Catalog #
A	Sawn and snapped blank, slate	193/3123
B	Sawn and snapped blank, slate	193/3122
C	Sawn and snapped blank, slate	193/3121
D	Sawn and snapped point preform, slate	193/3140

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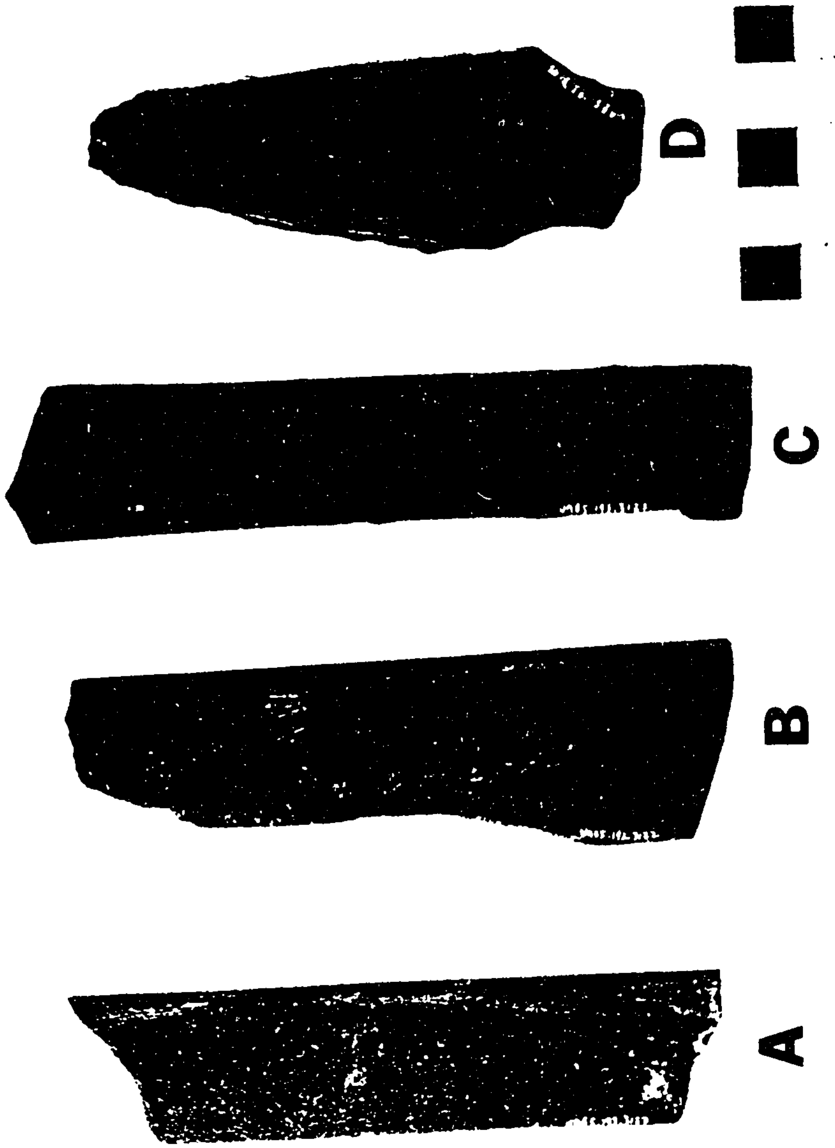

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Plate 33

Slate point preforms

Object	Description	Catalog #
A	Chipped projectile point preform, slate	193/6529
B	Chipped and ground projectile point preform, slate	193/6710
C	Chipped and ground projectile point preform, slate	193/
D	Chipped and ground projectile point preform, slate	193/6529
E	Chipped and ground projectile point preform, slate	193/3160
F	Chipped projectile point preform, slate	193/6529
G	Chipped and ground endblade preform, slate	193/
H	Sawn and snapped endblade preform, slate	193/
I	Sawn and snapped endblade preform, slate	193/

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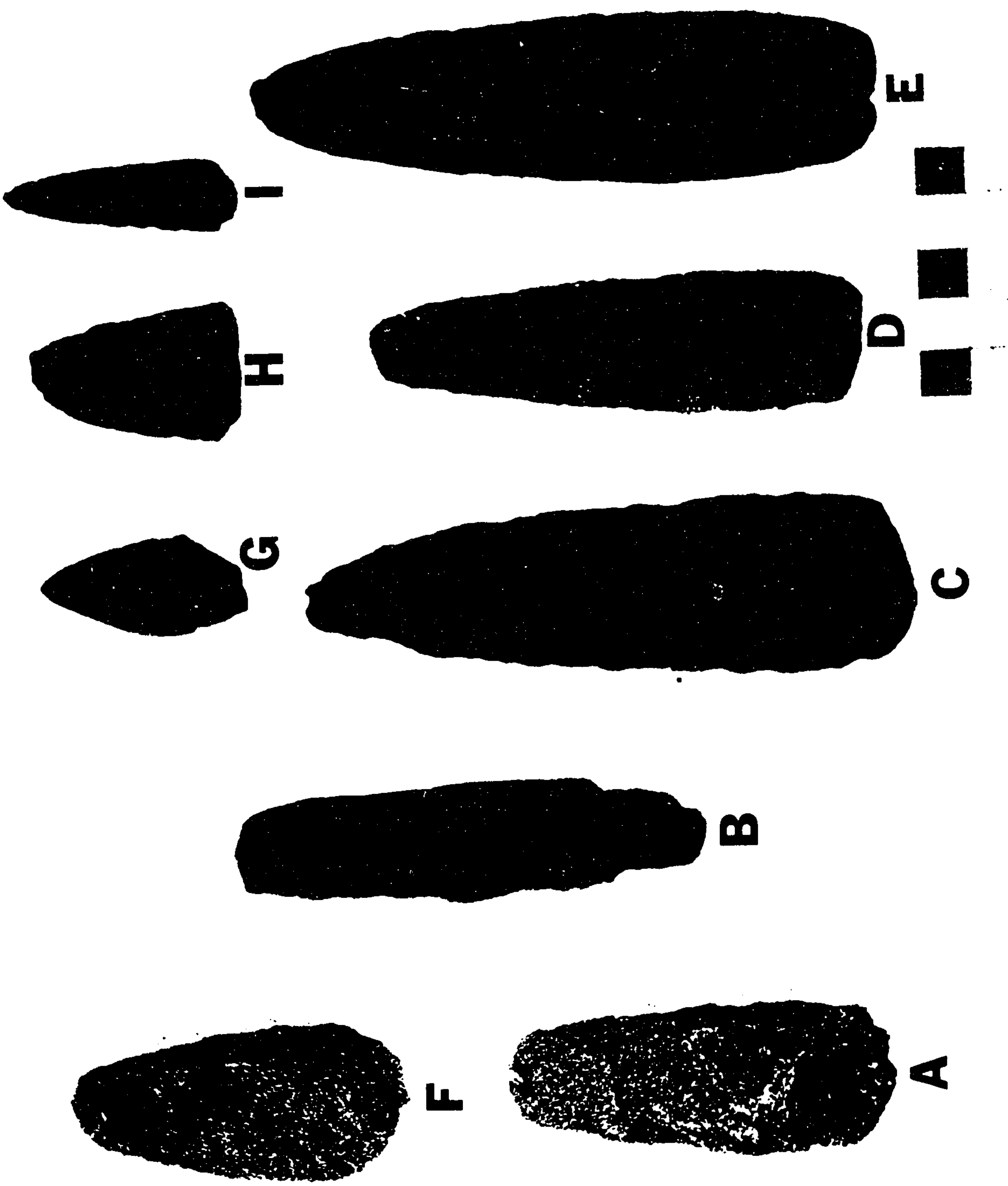

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The endblades range from 3 to 8 cm long and 1.5 to 2.3 cm wide. In addition to their triangular shape, they are distinguished by ground, bifacial facets which extend up to half the points total length. Three endblades have a slightly concave edge. The remainder have a straight base.

Five endblades of a gray-green variety of slate have a ground central flute, rather than a simple, flat facet (Plate 34:B,C,I). Knife forms of this variety of slate type are also atypical, and like other items of this material, may have been manufactured elsewhere, perhaps on the Alaska Peninsula.

The function of Koniag endblades is not precisely known. Elsewhere in the Eskimo world endblades tip toggling harpoons used in sea mammal hunting. Although 35 endblades were found at Karluk One, only two toggling harpoon points were recovered, and these lack endblade slots. Clark also failed to find toggling harpoons with endblade slots in his excavations on Koniag sites (1973:213). Toggling harpoons from late Kachemak contexts at the Uyak site are also self tipped (Steffian 1994).

Endblade slots do occur on some bone arrow points found at Karluk One and it seems most likely endblades were inserted into these arrows. Varjola (1988:27) illustrates slate endblades in barbed bone arrowheads collected in Kodiak during the early 19th century, and states that they were used for large game and in warfare. Numerous endblades were found at the Awa'uq Refuge Rock. Davydov (1977:209) described the use of arrows in bear hunting:

> ...the Koniagas always send their best hunter alone against the bears. He takes his bow and just two stone-tipped arrows, for the stone causes quite serious wounds. The hunter will lie in wait near the bear's habitual path and shoot the bear at absolutely point-blank range, after which he dodges away to the side, leaving his parka. If the bear is not killed by the first shot, and attacks then he falls upon the coat and tears it to pieces and this gives the hunter time to aim his other arrow.

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Plate 34

Slate endblades

Object	Description	Catalog #
A	Endblade, ground slate	193/6168
B	Endblade, ground green slate	193/686
C	Endblade, ground green slate	193/4236
D	Endblade, ground slate	193/2147
E	Endblade, ground slate	193/6890
F	Endblade, ground slate	193/
G	Endblade, ground slate	193/1623
H	Endblade, ground slate	193/3715
I	Endblade, ground slate	193/
J	Endblade, ground slate	193/3175
K	Endblade, ground slate	193/2386
L	Endblade, ground slate	193/2966
M	Endblade, ground slate	193/1720
N	Endblade, ground slate	193/2840

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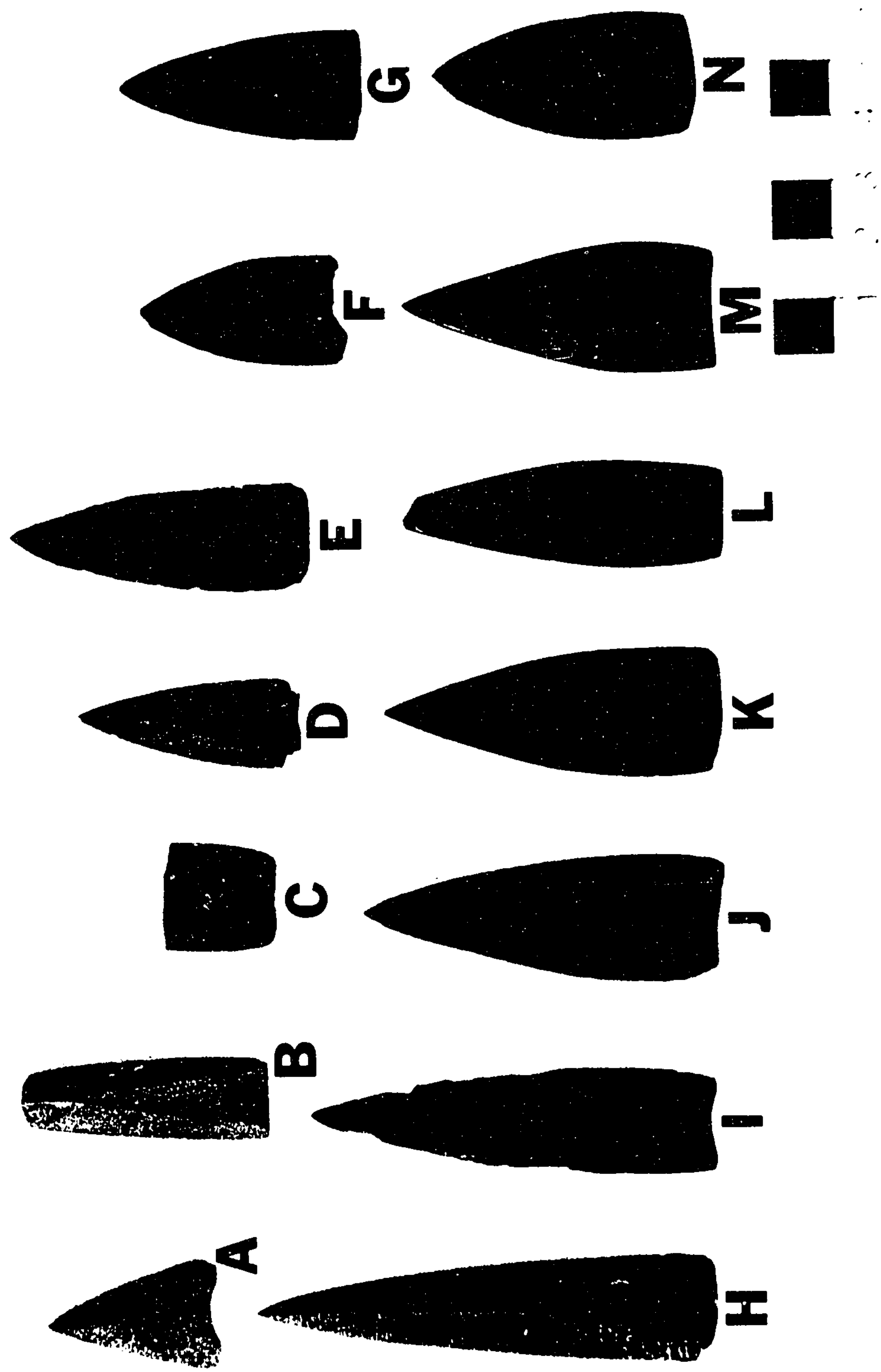

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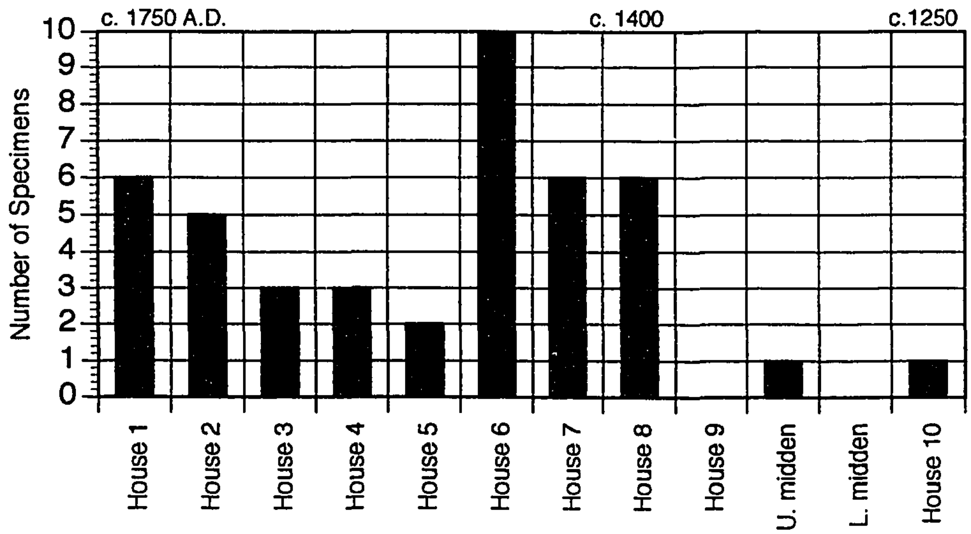
Chart 3: Provenience and Frequency of Slate Endblades and Preforms at the Karluk One Site



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Ground Slate Lance Points

Table 5:22 Slate Lance Points with a Pronounced Medial Ridge

Catalog	Artifact Type	Material	Context
6063	Lance tip;medial ridge	Slate	House floor 8
5383	Lance tip;medial ridge	Slate	Upper basal midden
6130	Lance tip;medial ridge	Slate	Upper basal midden
6169	Lance tip;medial ridge	Slate	Upper basal midden
6175	Lance tip;medial ridge	Slate	Upper basal midden
6491	Lance tip;medial ridge	Slate	Upper basal midden
6495	Lance tip;medial ridge	Slate	Upper basal midden
6512	Lance tip;medial ridge	Slate	Upper basal midden
6638	Lance tip;medial ridge	Slate	Upper basal midden
5853	Lance tip;medial ridge	Slate	Lower basal midden
6521	Lance tip;medial ridge	Slate	Lower basal midden
6526	Lance tip;medial ridge	Slate	Lower basal midden
5060	Lance tip;medial ridge	Slate	House floor 10
5327	Lance tip;medial ridge	Slate	House floor 10
5341	Lance tip;medial ridge	Slate	House floor 10
5627	Lance tip;medial ridge	Slate	House floor 10
5656	Lance tip;medial ridge	Slate	House floor 10
5855	Lance tip;medial ridge	Slate	House floor 10
6201	Lance tip;medial ridge	Slate	House floor 10
6534	Lance tip;medial ridge	Slate	House floor 10

Ten ground slate projectile points are stemmed and barbed lanceolates. These forms have a pronounced medial ridge so pronounced that it produces a diamond-shaped cross-section (Plate 21:A-H). They range from 9.5 to 11.5 cm long and from 1.5 to 2.5 cm wide. This point type is an important horizon marker for the late prehistoric period of south Alaska, and is found in both the late Kachemak and transitional Koniag contexts in the Karluk area (Jordan and Knecht 1988:254).

Lance tips with a pronounced medial ridge have a widespread distribution on the Alaska Peninsula and eastern Aleutian sites of about the same time period. They have been recovered at

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Plate 35

Slate lance tips with a medial ridge

Object	Description	Catalog #
A	Lance tip fragment, slate	193/5327
B	Lance tip fragment, slate	193/6491
C	Lance tip, slate	193/6512
D	Lance tip, slate	193/5853
E	Lance tip, slate	193/5060
F	Lance tip, w/incised figurine, slate	193/6495
G	Lance tip fragment, slate	193/5341
H	Lance tip, slate	193/6063

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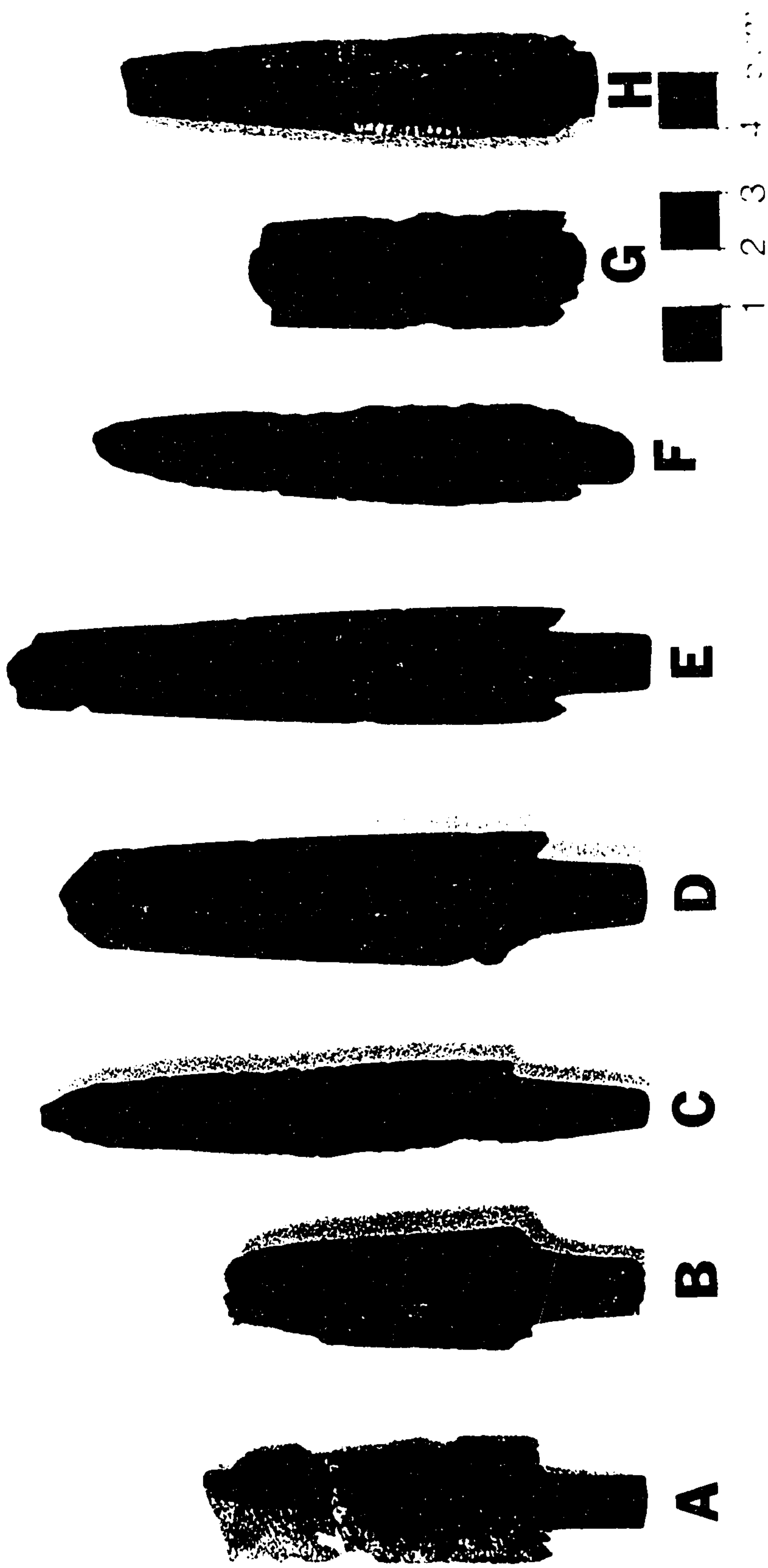

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Chulka (Turner and Turner 1974:Figure 2, No. 6), Izembek (McCartney 1974:Figure 6, a-c), Naknek (Dumond 1981: Plate XII, e) and at Kukak Mound (G. Clark 1977:Plate VII, 21-22). Of particular interest is one such point from the Karluk One assemblage that bears an incised figure near the tip. The same figure is observed on incised pebbles, also a horizon marker for the early Koniag phase (Donta 1988; Jordan and Knecht 1988).

Stemmed Ground Slate Projectile Points

There are nine stemmed and barbed points that lack a medial ridge. Lenticular in cross-section, these occur in a variety of shapes and sizes. One point fragment, recovered from the lowest levels of Karluk One, is a basal section with scars of the large barbs observed on Three Saints Bay points, associated with Kachemak phase sites (Plate 36:I). Eight stemmed points, in lanceolate and endblade forms, display more subtle barbing. Only one of these specimens, of endblade size, is complete, measuring 4 cm long and 2 cm wide (Plate 36:J). The remaining fragmentary stemmed and barbed points probably ranged from about 6 to 11 cm long.

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Table 5: 23 Stemmed Projectile Points

Catalog	Artifact Type	Material	Context
4126	Projectile Point; Stemmed	Slate	House 1 roof sod
1542	Projectile Point; Stemmed	Slate	House floor 1
1729	Projectile Point; Stemmed	Slate	House floor 1
1857	Projectile Point; Stemmed	Slate	House floor 1
2161	Projectile Point; Stemmed	Slate	House floor 1
2164	Projectile Point; Stemmed	Slate	House floor 1
2657	Projectile Point; Stemmed	Slate	House floor 1
4291	Projectile Point; Stemmed	Slate	House floor 1
4746	Projectile Point; Stemmed	Slate	House floor 1
3520	Projectile Point; Stemmed	Slate	House 2 roof sod
3434	Projectile Point; Stemmed	Slate	House 2 wall sod
3846	Projectile Point; Stemmed	Slate	House floor 2
4617	Projectile Point; Stemmed	Slate	House floor 2
4398	Projectile Point; Stemmed	Slate	House 3 wall sod
1410	Projectile Point; Stemmed	Slate	House floor 3
2604	Projectile Point; Stemmed	Slate	House 4 wall sod
4197	Projectile Point; Stemmed	Slate	House floor 4
4418	Projectile Point; Stemmed	Slate	House floor 4
4446	Projectile Point; Stemmed	Slate	House floor 4
4644	Projectile Point; Stemmed	Slate	House floor 4
4046	Projectile Point; Stemmed	Slate	House 5 wall sod
3805	Projectile Point; Stemmed	Slate	House floor 6
4031	Projectile Point; Stemmed	Slate	House floor 6
4932	Projectile Point; Stemmed	Slate	House 7 roof sod
2869	Projectile Point; Stemmed	Slate	House floor 7
4073	Projectile Point; Stemmed	Slate	House floor 7
4838	Projectile Point; Stemmed	Slate	House floor 7
5201	Projectile Point; Stemmed	Slate	House floor 8
5559	Projectile Point; Stemmed	Slate	House floor 8
6393	Projectile Point; Stemmed	Slate	House floor 8
5240	Projectile Point; Stemmed	Silicified Slate	House floor 9A
5256	Projectile Point; Stemmed	Slate	House floor 9B
5037	Projectile Point; Stemmed	Slate	Upper basal midden
5224	Projectile Point; Stemmed	Slate	Upper basal midden
5232	Projectile Point; Stemmed	Slate	Upper basal midden
6137	Projectile Point; Stemmed	Slate	Upper basal midden
6139	Projectile Point; Stemmed	Slate	Lower basal midden
5333	Projectile Point; Stemmed	Slate	House floor 10
6203	Projectile Point; Stemmed	Slate	House floor 10
6541	Projectile Point; Stemmed	Silicified Slate	House floor 10

Ten stemmed projectile points in the collection lack barbing, and vary from 3 to 10 cm long and from 1.5 to 3.5 cm wide (Plate 36:A-F).

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Plate 36

Ground slate projectile points

Object	Description	Catalog #
A	Stemmed projectile point; ground slate	193/4418
B	Stemmed projectile point; ground slate	193/2869
C	Stemmed projectile point; ground slate	193/3805
D	Stemmed projectile point; ground slate	193/6521
E	Stemmed projectile point; ground slate	193/5224
F	Stemmed projectile point; ground slate	193/1727
G	Projectile point; ground slate	193/4617
H	Projectile point; ground slate	193/5559
I	Projectile point; ground slate	193/6201
J	Projectile point; ground slate	193/4046
K	Stemmed projectile point; ground green/gray slate	193/854

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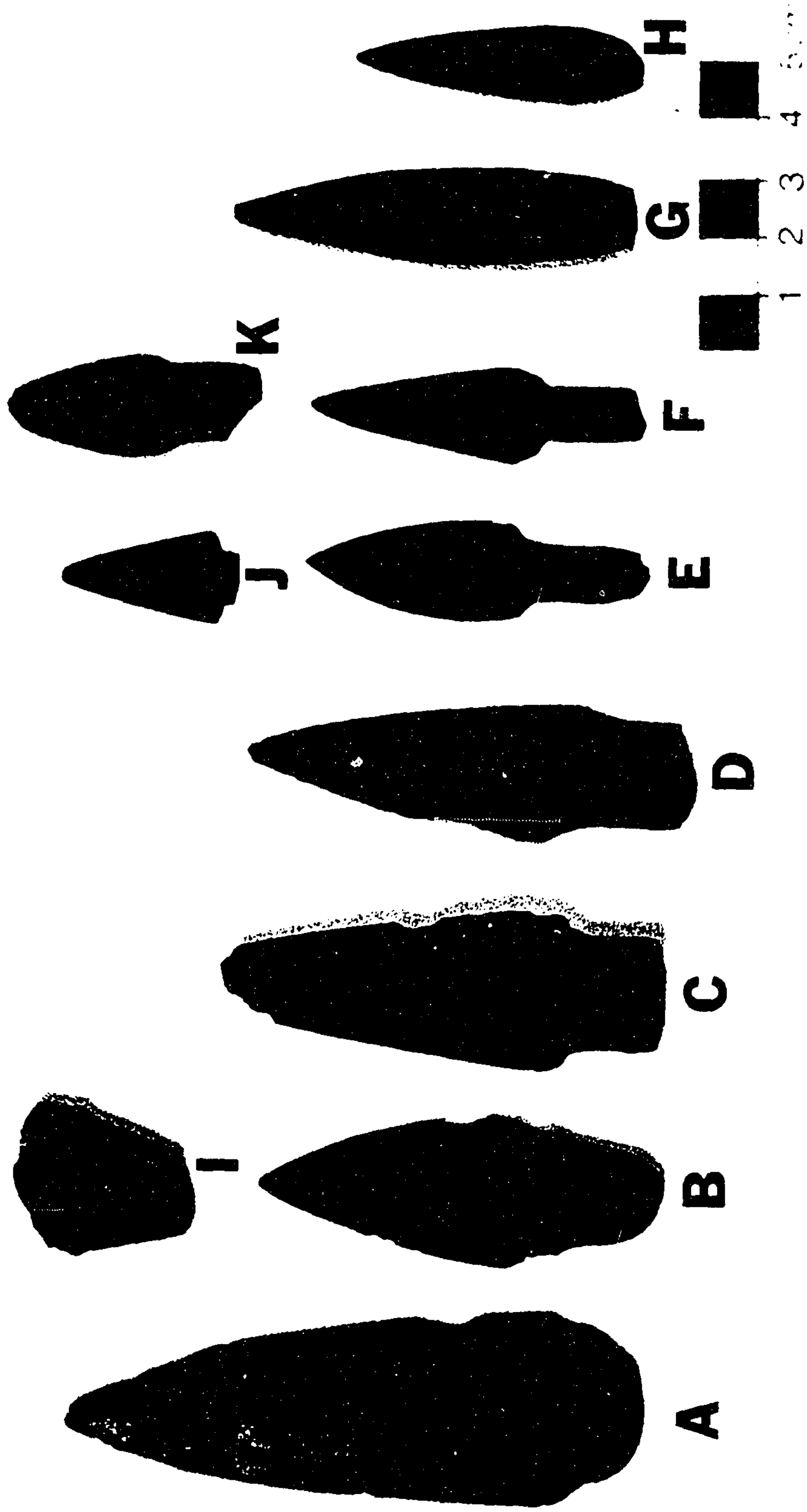

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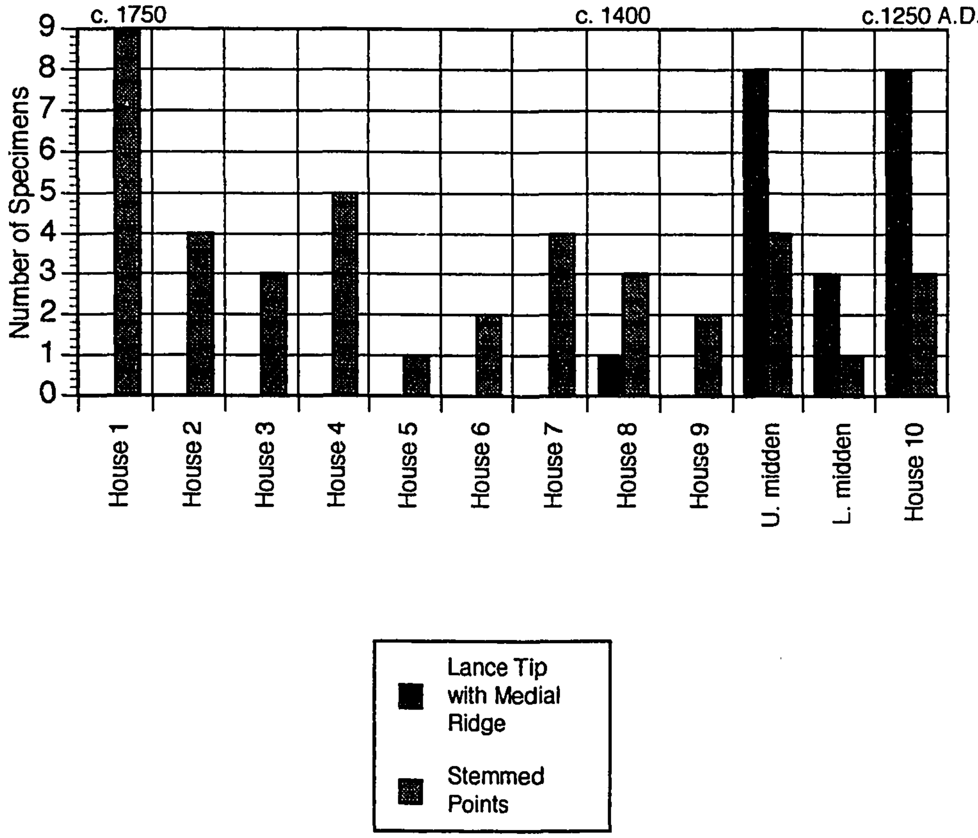
Chart 4: Slate Lance Points; Type Changes after 1400 A.D.



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Three points, two complete specimens and a basal fragment have broad stems rounded on the proximal end (Plate 36:A,B). All of these points have a subtle medial ridge.

One small point has a narrow, well defined medial ridge and a flat diamond shape cross-section (Plate 36:K). This specimen is made from a yellow-gray slate not seen elsewhere in the assemblage and is probably of non-local origin. This point is 4.3 cm long and 2 cm wide.

Two complete small ground slate points have unusually long stems and may have been used to tip detachable wooden lance foreshafts (Plate 36:E,F).

Ground Slate Leaf Shaped Points

There are two complete leaf shaped points of ground slate in the assemblage which measure 6.5 and 5 cm long and 1.5 and 2 cm wide (Plate 36:G,H). Both are bluntly edged and may be points that are finished except for final sharpening of the working edge. Another possibility is that blunt edged leaf shaped points had some special but unknown function. Two complete leaf shaped specimens described by Clark (1974:53) are also blunt edged.

Ground Slate Projectile Point Fragments

Eighteen tip fragments in the Karluk One assemblage are too small for further identification. One tip fragment of considerable size, 11 cm long by 3 cm wide, bears an incised owner's mark in the shape of a raven's foot, a motif normally associated with Yupik speakers from the Bering Sea region (Plate 37:A). It should be noted, however, that this piece was a surface find. Another rather anomalous surface find was a bilaterally barbed ground slate tip (Plate 37:B).

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Sixteen mid-section fragments of ground slate projectile points were found. Four of these are large enough to represent large bayonet lances, such as those used by Koniag whalers in historic times (Plate 37:C-F). Two of these have been very heavily chipped, perhaps in the process of reworking them to make smaller points (Plate 37:C,D). Two basal fragments of ground slate represent stemmed points, and are too small for further elaboration.

Chipped Stone Projectile Points

Table 5: 24 Chipped Stone Projectile Points

Catalog	Artifact Type	Material	Context
4287	Chipped point	Silicified Slate	House 1 roof sod
3975	Chipped point	Unident. lithic	House floor 3
4015	Chipped point	Chert	House floor 4
3402	Chipped point	Silicified Slate	House floor 6

Five projectile points of chipped stone were found at Karluk One. Chipped stone points, which dominate the earliest prehistoric assemblages in the Alutiiq area, were largely replaced by ground slate points by the late Ocean Bay period and reappear in some numbers in Kachemak phase sites (Steffian 1990). Chipped stone points, although uncommon, never completely disappeared from the material culture inventory on Kodiak Island, even into the contact period (Knecht and Jordan 1985).

Two chipped stone points in the collection are complete; the others are fragmentary (Plate 38). One complete point is made of a red chert. This material occurs in several locations in the Kodiak Archipelago: at the mouth of Uyak Bay (Capps 1937, Crowell 1986), the north shore of Malina Bay on Afognak Island (Knecht 1989:field notes), and on Raspberry Island, near the present location of the Iron Creek

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Plate 37

Slate lance blade fragments

Object	Description	Catalog #
A	Lance blade tip fragment with incised raven's foot, slate	193/6820
B	Lance blade tip fragment with bilateral barbs, slate	193/6823
C	Lance blade midsection fragment, slate	193/6203
D	Lance blade midsection fragment, slate	193/4465
E	Lance blade midsection fragment, slate	193/
F	Lance blade Basal fragment	193/3426

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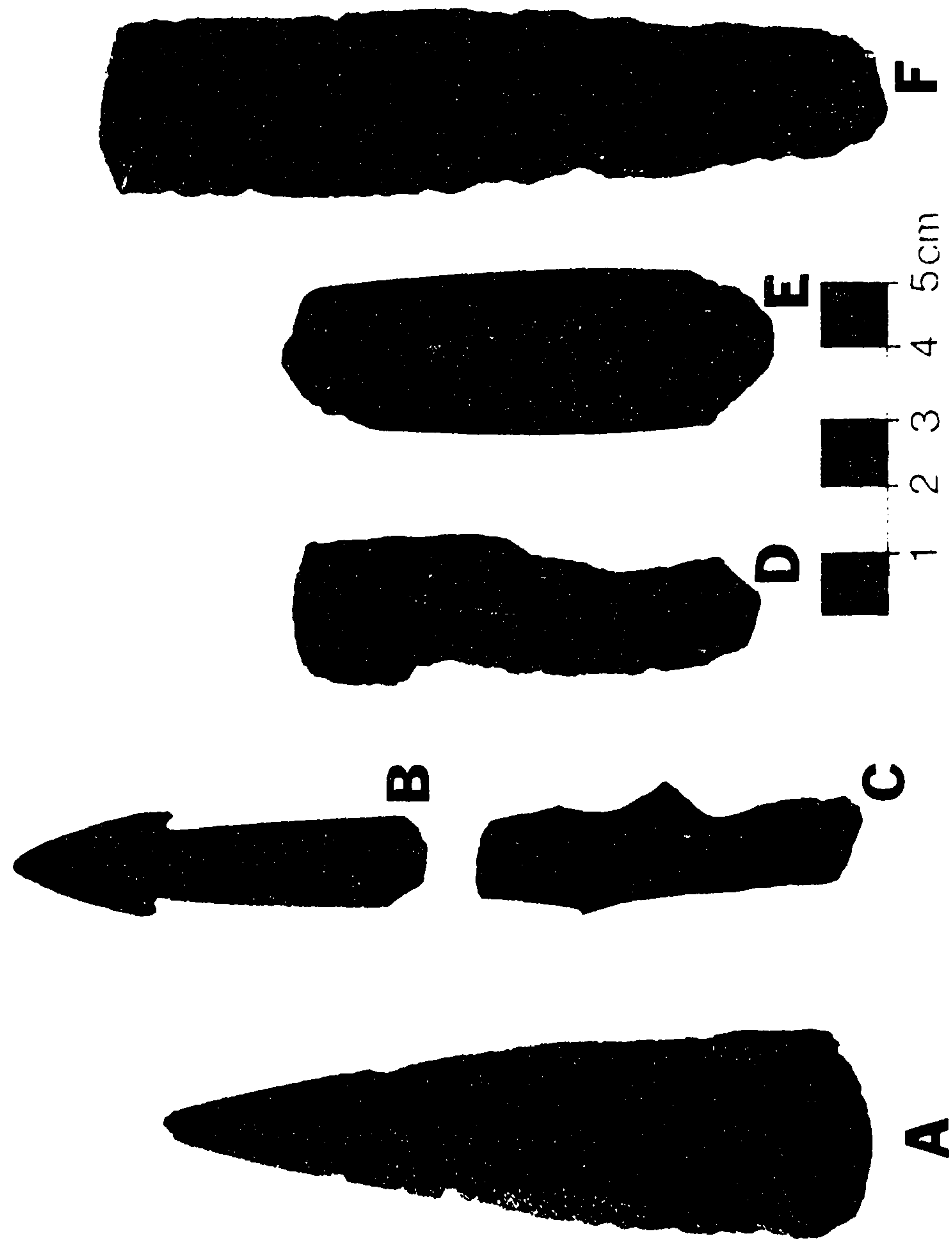

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Cannery (D. Clark:Personal Communication 1990). Of these sources, the Uyak Bay source is by far the closest to the Karluk area. The red chert point found at Karluk One is 3.5 cm long, 2 cm wide, and has a wide stem with a straight base (Plate 38:E). .

Another point of similar size, 4 cm long and 1.7 cm wide, and has a long stem which tapers to a blunt point (Plate 38:D). This point was chipped from a black basalt, a lithic material heavily represented in assemblages from the adjacent shore of the Alaska Peninsula. In some regions, for example the Chignik Lake area, black basalt almost entirely dominates stone tool assemblages.

A nearly complete projectile point was chipped from gray silicified slate. It lacks a tip, but must have measured about 6 cm long and 1.8 cm wide (Plate 38:C). This point has an off-center stem and a slightly concave basal edge. A mid-section fragment of a chipped point represents a larger variety, and is at least 3 cm wide (Plate 38:A). A medial fragment of a fifth chipped point is also present in the collection (Plate 38:B). This point is made of gray chert.

Clark (1974:55) describes Kodiak chert sources but suggests that the chipped stone points he recovered were made of materials exotic to the Kodiak archipelago. He questions the presence of any but the most rudimentary knapping skill among the Koniag. The archaeological record from Karluk One, however, does not entirely support this conclusion.

The presence of red chert debitage at Karluk One indicates that stone knapping was conducted on the site. Local sources of chert are rather prone to step fractures because of the presence of quartz intrusions and its poorly consolidated nature. Poor material is

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Plate 38

Chipped stone points

Object	Description	Catalog #
A	Chipped point; midsection fragment, basalt	193/
B	Chipped point, basal fragment, red chert	193/
C	Chipped point, basalt	193/4287
D	Chipped point, basalt	193/
E	Chipped point, basalt	193/

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probably a better explanation for poorly made tools, rather than a generalized lack of knapping ability. It should also be noted that silicified slate was extensively knapped by the Koniags to produce adze and carving tool bits.

Although projectile points appear to have been made only on an opportunistic basis, chipping of chert apparently increased in the Koniag phase after A.D. 1400 (Chart 5). Chipped points and chert debitage were also a substantial portion of the lithic assemblage from the Awa'uq refuge rock.

Harpoon Foreshafts

Table 5:24 Harpoon Foreshafts

Catalog	Artifact Type	Material	Context
2750	Foreshaft	Wood	House 3 roof sod
1442	Foreshaft	Bone	House floor 4
1721	Foreshaft	Bone	House floor 7
3192	Foreshaft	Wood	House floor 7
5861	Foreshaft	Wood	House floor 10

Bone Harpoon Foreshafts

One complete bone harpoon foreshaft and a bone tip fragment (Plate 29:A, B) may have been used with the earlier described socketed bone fishing harpoon points. The tips of the foreshafts fit snugly into the sockets of the fishing harpoon points, and their distal ends are scored with circular striations. This may be use-wear left by the socketed points as they rotated on the foreshafts. (Plates 11,12,13).

Birket-Smith (1941:137) illustrates historic examples of bone foreshafts used with small, bilaterally barbed toggling harpoon heads. At least one identical point was found in a late Koniag site near Chiniak (D. Clark, personal communication, 1989). In addition, Clark,

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Plate 39

Harpoon foreshafts

Object	Description	Catalog #
A	Fish harpoon foreshaft, bone	193/1442
B	Fish harpoon foreshaft, tip fragment, bone	193/2373
C	Harpoon foreshaft, wood	193/2750
D	Harpoon foreshaft, wood	193/5861

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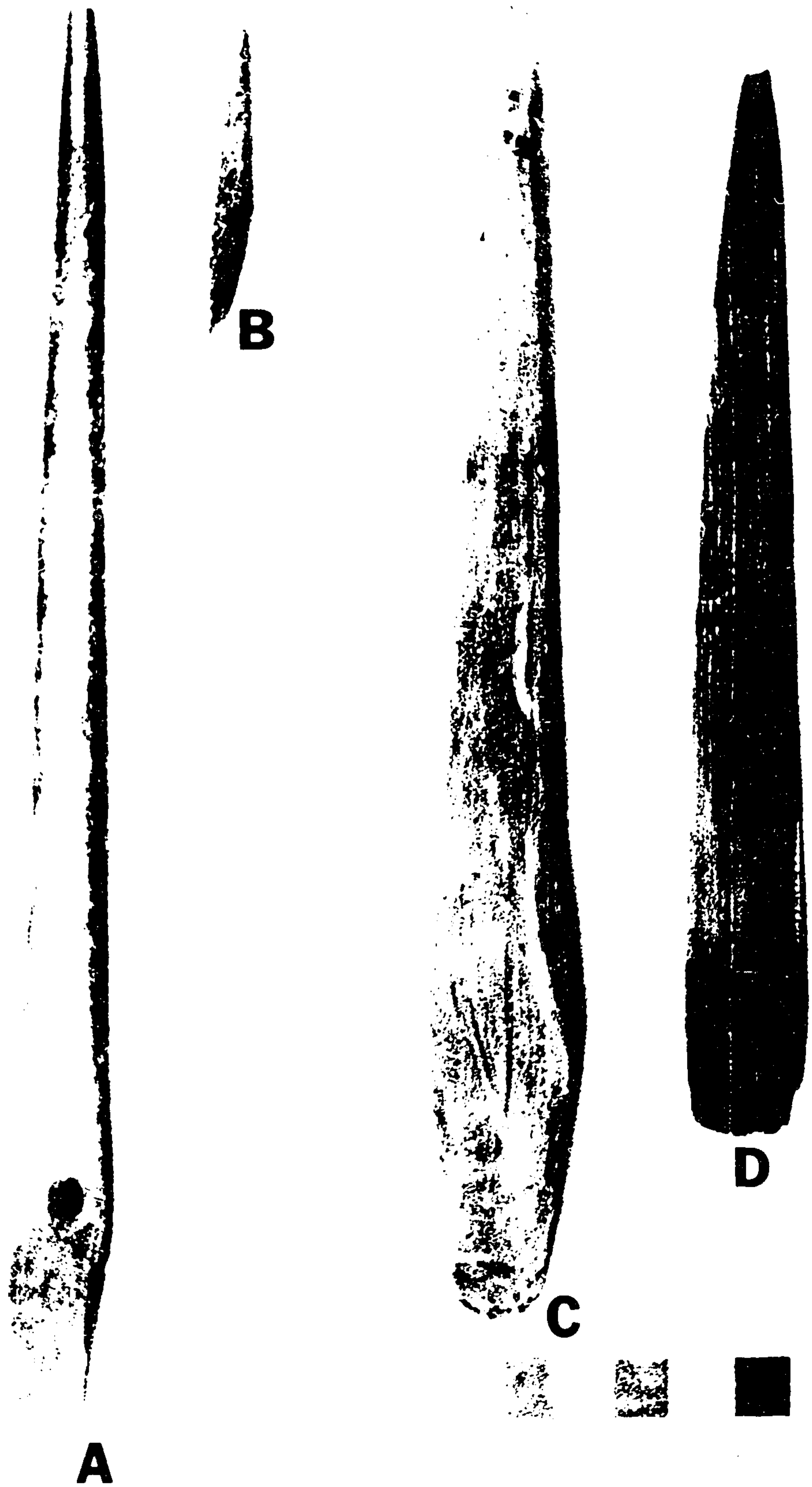

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recovered several small bone toggling harpoon points in Koniag middens at Rolling Bay (1974:Plate 18). However, no fully functional toggling harpoon points, other than the composite fishing variety, exist in the Karluk One assemblage. It is possible that the type of harpoon head illustrated by Birket-Smith is confined to the contact period.

A complete bone foreshaft, 26 cm long and circular in cross-section (Plate 39:A), has the same wedge shaped base observed on barbed harpoons. This suggests that the foreshaft was also designed to plug into a bone or wooden socket at the distal end of a harpoon shaft. In this manner the same socketed harpoon shaft used for sea mammal hunting, could have been adapted for spear fishing. A line hole near the base of the foreshaft, allowed it to be secured to the main harpoon shaft. A distal tip fragment, probably representing a similar bone foreshaft, was also recovered.

Wooden Harpoon Foreshafts

Two complete wooden harpoon foreshafts were found at Karluk One. Like the bone foreshafts described above, the precise function of these specimens is uncertain. They could have been used with fishing harpoons or a toggling harpoon points intended for sea mammal hunting. The wooden foreshafts also have a wedge-shaped base.

One wooden foreshaft bears broad whittle marks and may be an unfinished piece. It measures 23 cm long and is ovate in cross-section. Its base is slightly larger than that of other foreshafts in the collections, suggesting that it was intended for use in conjunction with a more substantial harpoon shaft, possibly for hunting larger sea mammals such as sea lions. The other wooden foreshaft is a finished specimen

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18.5 cm long. It is oval in cross-section and has a blunted tip, probably caused by use-wear.

Socket Pieces

Table 5:25 Socket Pieces

Catalog	Artifact Type	Material	Context
2941	Socket piece	Bone	House floor 1
4699	Socket piece	Whale bone	House floor 1
3026	Socket piece	Wood	House 3 roof sod
6494	Socket piece	Wood	Upper basal midden

Three bone socket pieces from Karluk One are in battered and fragmentary condition. One socket piece is represented by a basal fragment, made from dense sea-mammal bone (Plate 40:E). It is cylindrical in shape, and measures 2 cm in diameter. Such socket pieces could have been used in conjunction with a dart or harpoon-arrow. Another fragmentary sea-mammal bone specimen represents the distal end of a socket piece with a .9 cm deep socket (Plate 40:D). A third socket piece, also made from sea-mammal bone, is badly weathered but has vestigial remains of twin basal prongs.

Bone socket pieces are found in both Kachemak and Koniag Phase sites (Clark 1974:58, Heizer 1956:55). Wood socket pieces are known only from Karluk One; however, the occasional use of wood in manufacturing objects usually made from bone is fairly frequent.

Two socket pieces in the collection are made from wood (Plate 40:A, B). Both are composite halves and when articulated have the same basic form and function as their bone counterparts. They are lashed to the dart shaft with the aid of twin prongs on their proximal end. The complete wooden socket piece is 17 cm long, and 2 cm wide

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Plate 40

Socket pieces

Object	Description	Catalog #
A	Composite socket piece, wood	193/3026
B	Composite socket piece, wood	193/6494
C	Socket piece, whale bone	193/6752
D	Socket piece, whale bone	193/4699
E	Socket piece, whale bone	193/2941

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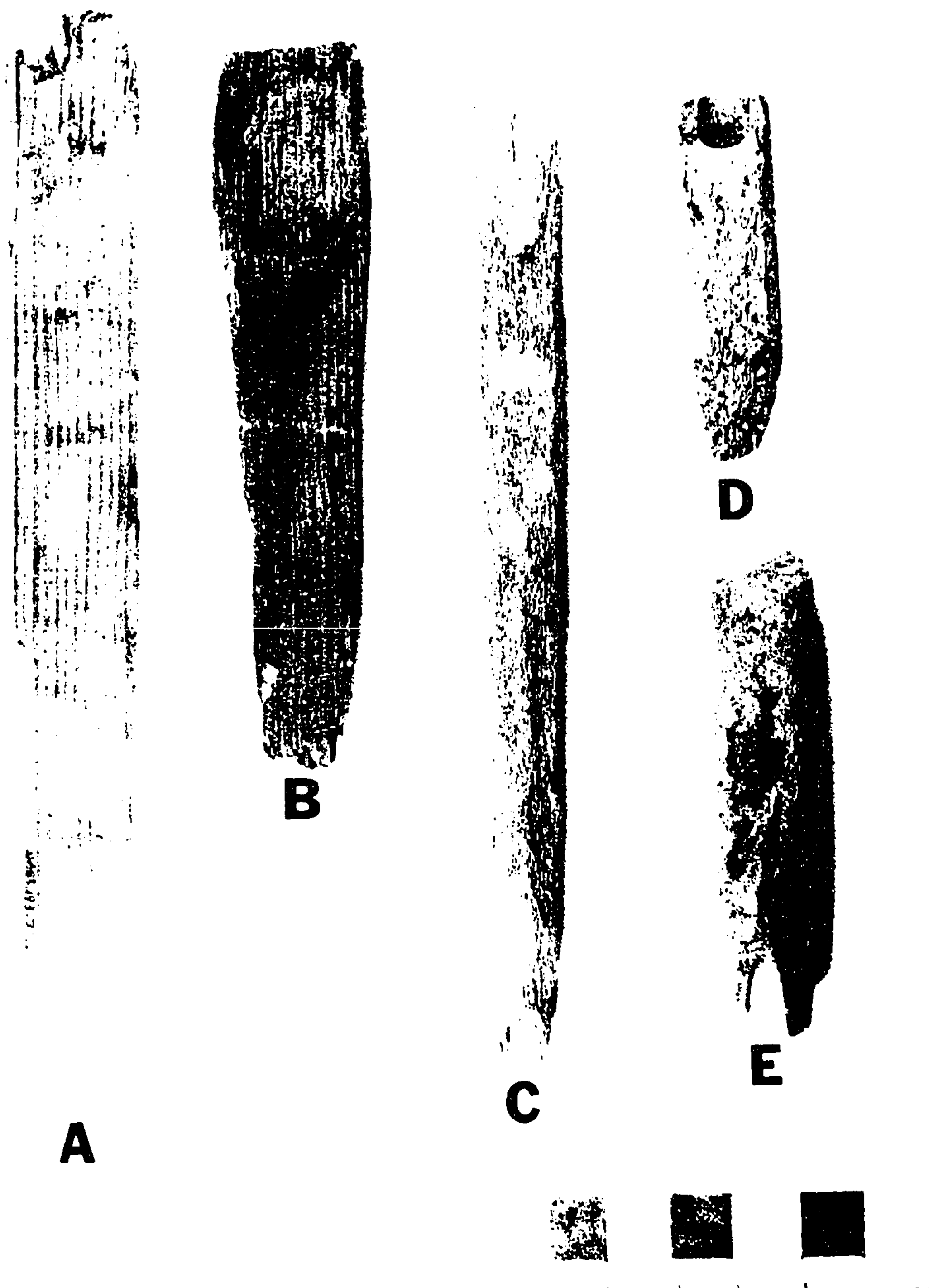

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(Plate 40:A). A groove carved near the proximal end of this specimen was probably a hafting aid. The socket on this piece is 2.5 cm deep.

Another composite wood socket piece is incomplete, broken off near the proximal end (Plate 40:B). A raised rim exists near the edge of the socket hole, probably to prevent cordage from slipping off. The socket is about 3 cm deep.

Lance Foreshafts

Table 5:26 Lance Foreshafts

Catalog	Artifact Type	Material	Context
4223	Lance foreshaft	Wood	House floor 5
5186	Lance foreshaft	Wood	House floor 8
5196	Lance foreshaft	Wood	House floor 8
5245	Lance foreshaft	Wood	House floor 9A

Three detachable lance tips, both carved from wood, were found at Karluk One. They are identical to those known from the Bering Sea ethnographic collections (Fitzhugh and Kaplan:72-73). Lances were plugged into the socket of a harpoon shaft and used to dispatch a wounded sea mammal. The lance, tipped with a stone endblade, would detach after the strike and remain in the animal. Unlike a harpoon, the lance was not attached to the shaft. A new lance could be plugged immediately in the socket for another strike if necessary.

One wood lance tip is complete, measuring 23.5 cm long, and 1.5 cm wide (Plate 41:B). Traces of red pigment are visible on the body of this specimen, which is oval in cross-section. The extreme proximal end, which plugged into a socket piece, is 1 cm wide. The distal end has a closed socket 2 cm deep which originally would have accommodated

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Plate 41

Lance foreshafts

Object	Description	Catalog #
A	Lance foreshaft, wood	193/5245
B	Lance foreshaft, wood w/red ocher paint	193/4223

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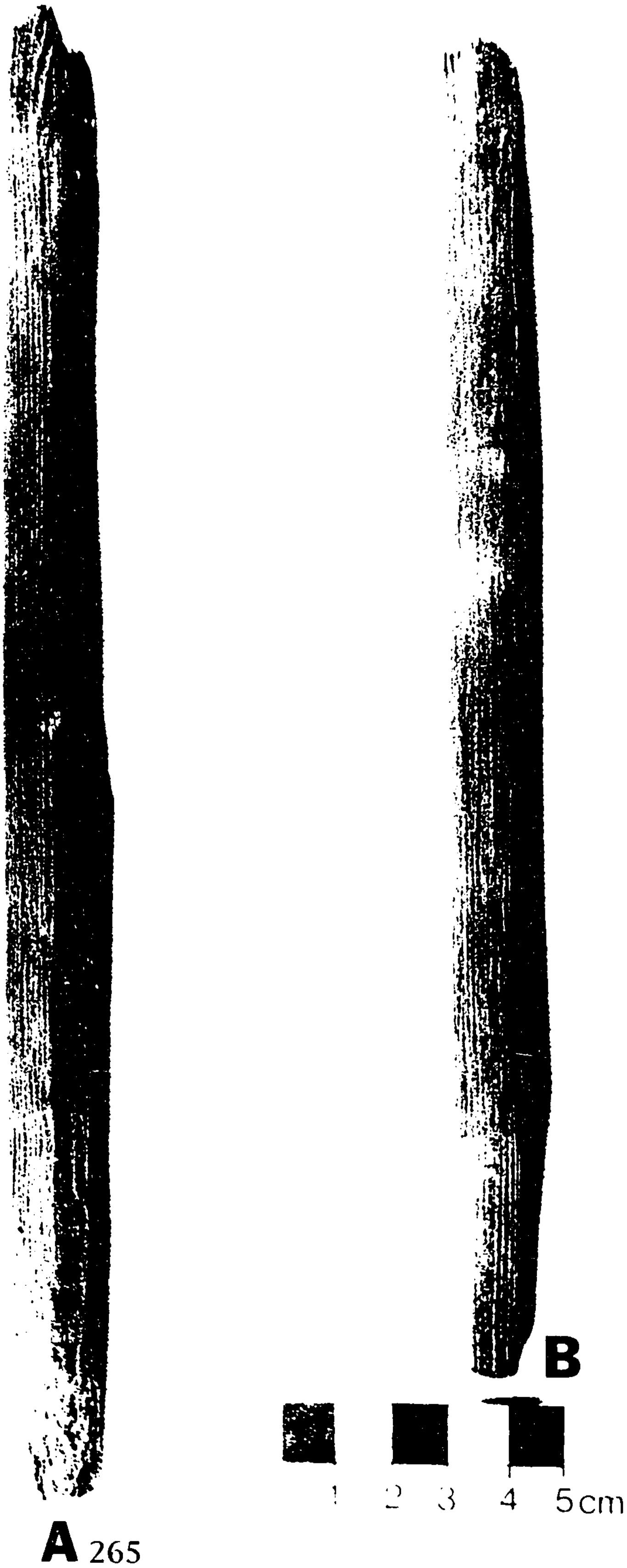

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stemmed slate endblades. Markings left by a 1.5 cm wide band of lashing exists near the socket opening.

Another lance tip is incomplete and fractured vertically down from the endblade socket (Plate 41:A). It measures 26 cm long and 2 cm wide, and is diamond shaped in cross section. The proximal end is the familiar wedge-shape observed in Koniag foreshafts and non-toggling harpoon bases.

A third lance tip, measures 15.5 cm long and 1.8 cm wide. It is in battered condition. This specimen was made of two vertically joined, composite halves.

Throwing Boards

Table 5:27 Throwing Boards

Catalog	Artifact Type	Material	Context
4722	Throwing board	Wood	House floor 1
826	Throwing board	Wood	House floor 4
2814	Throwing board	Wood	House 6 roof sod
883	Throwing board	Wood	House floor 6

Four Koniag throwing boards were found at Karluk One, the first ever recovered in an archaeological context. An additional throwing board, in complete condition, was found eroding from the site in the early 1980's by a village resident. It strongly resembled those in ethnographic collections and has a stylized sea otter carved on its ventral surface. Sadly, it was sold to a collector from out of state in 1988.

A fine example of a complete throwing board was recovered from the roof sods of house floor six (Plate 42:A). Stylistically, it resembles Koniag throwing boards from ethnographic collections (Birket -Smith 1941; King 1981; Mason 1885). It is 46.5 cm long, and 5.5

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Plate 42

Throwing boards

Object	Description	Catalog #
A	Throwing board, Wood, bone, w/ black paint	193/2814
B	Throwing board fragment, Wood	193/4722
C	Throwing board fragment, wood	193/883
D	Throwing board preform fragment, wood	193/826

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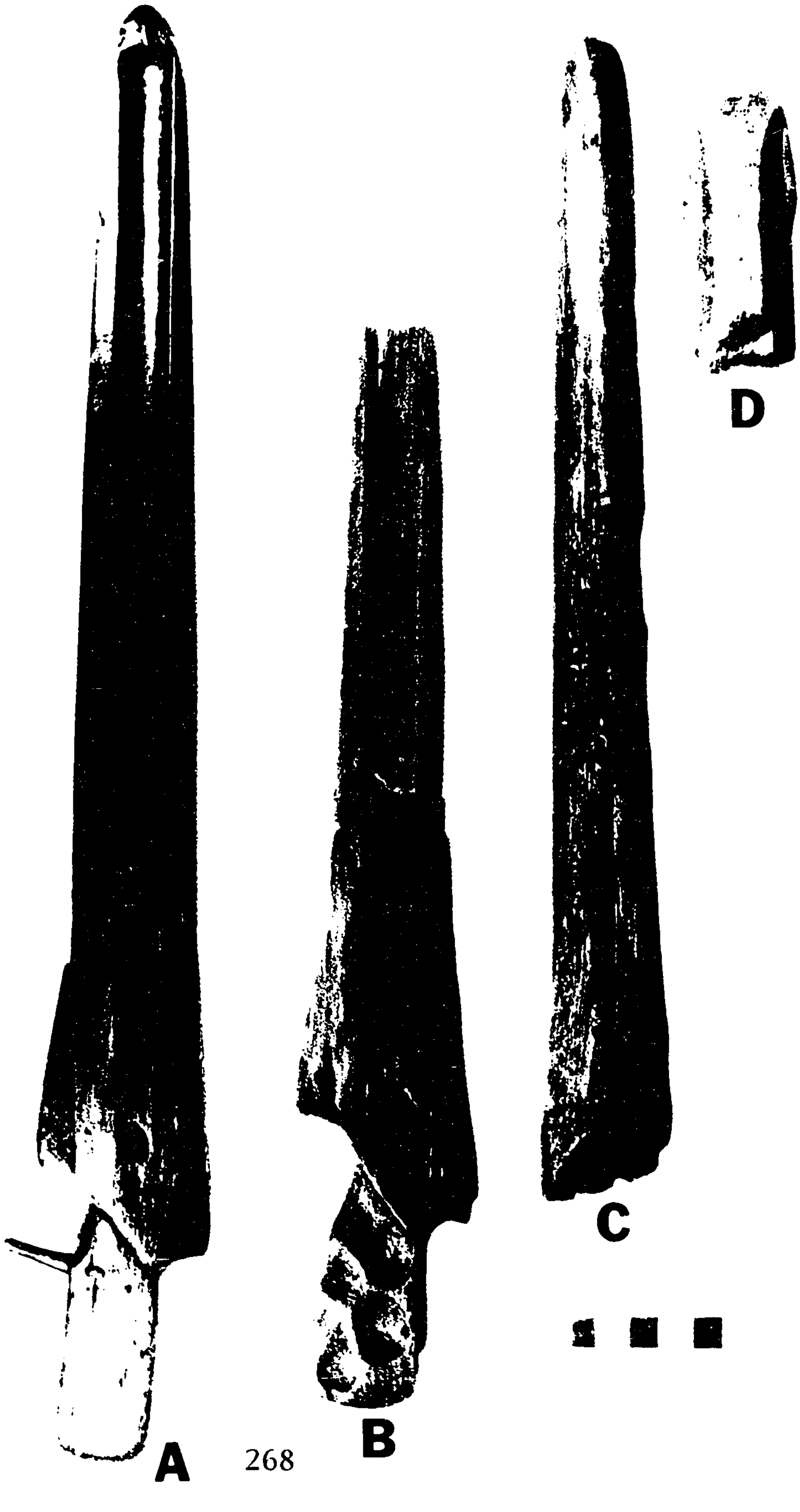

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cm in maximum width. The dart groove is 1.7 cm wide. A rectangular bone inset at the distal end of the groove has a tiny spur prevented the dart butt from slipping. The Karluk One throwing boards, like ethnographic examples, have a single bone finger peg installed in the grip and a hole on the back side for the index finger of the user.

Black pigment still adheres to much of the back side of the throwing board, which also has two closely spaced holes that may have held a bone ornament or charm. The stylized, abstract sea otter motif observed on ethnographic specimens (Birket-Smith 1941, Figure 17, King 1981:Plate 25), is not present the Karluk One throwing board, which dates to about A.D. 1640.

A second throwing board, about 3/4 complete, is represented by two articulating fragments (Plate 42:B). The grip is unusual on this specimen in that it has finely worked indentations for three fingers. The standard hole for the index finger is also present on the reverse side of the board and a hole for a single finger peg exists on the grip. The board measured 5.5 cm wide. The dart groove is 1.8 cm wide.

A third throwing board is represented by a battered specimen, missing the grip (Plate 42:C). It apparently had an inset at the distal end of the dart groove, where a rectangular hole now remains. The dart groove is 1.8 cm wide. The reverse side of the piece has a pair of holes, similar to those observed on the complete board, for attachment of an ornament or hunting charm. An 8 cm long groove is present down the center of the ventral side of the board, and may be of symbolic significance.

A fourth throwing board is represented by a distal fragment (Plate 42:D). This piece is unfinished, with an incompletely carved dart

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groove, represented by a shallow cut marks. Other lightly incised lines and small punctures on both sides of the piece were apparently guides to the carver. Lightly incised guide lines can also be seen on other unfinished wooden objects in the assemblage. The use of lightly incised guide lines seems to have been a standard practice followed by Koniag wood workers.

Miscellaneous Hunting Gear

Table 5:28 Miscellaneous Hunting Gear

Catalog	Artifact Type	Material	Context
3982	Finger Rest	Ivory	House floor 3
1122	Float inflator	Wood	House floor 4
5157	Point sheath	Wood	House 6 wall sod
4071	Drag handle	Wood	House floor 7
6309	Drag handle	Wood	House 8 roof sod
6372	Drag handle	Wood	House floor 8
5010	Drag handle	Wood	House floor 8
5571	Drag handle	Wood	House floor 9A
5649	Drag handle	Wood	House floor 10
5059	Wound Plug	Wood	House 10

One half of a composite wooden point sheath is identical to ethnographic examples in the Nelson collection (Fitzhugh and Kaplan 1982:81), as well as three specimens collected by Fisher on Bristol Bay (Crowell, personal communication, 1988: Smithsonian Cat. No. 127760-63). Such sheaths shielded the sharp edges of ground slate projectile points from the walls of skin boats and gut skin clothing. The Karluk One point sheath is 10.5 cm long (Plate 43:E). Shadows of former lashing can be seen on its exterior surface. Several other composite point sheaths were recovered during of the 1987 and 1994 excavations at Karluk One.

A wound plug was found in association with housefloor 10 (Plate 43:D). This complete artifact was made from a dense wood,

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Plate 43

Miscellaneous hunting equipment

Object	Description	Catalog #
A	Harpoon Shaft Fragment, Wood	193/6401
B	Harpoon Shaft Fragment, Wood	193/4151
C	Harpoon Finger Rest, Walrus Molar	193/3982
D	Wound Plug, Wood	193/5059
E	Projectile Point Sheath, Wood	193/5157

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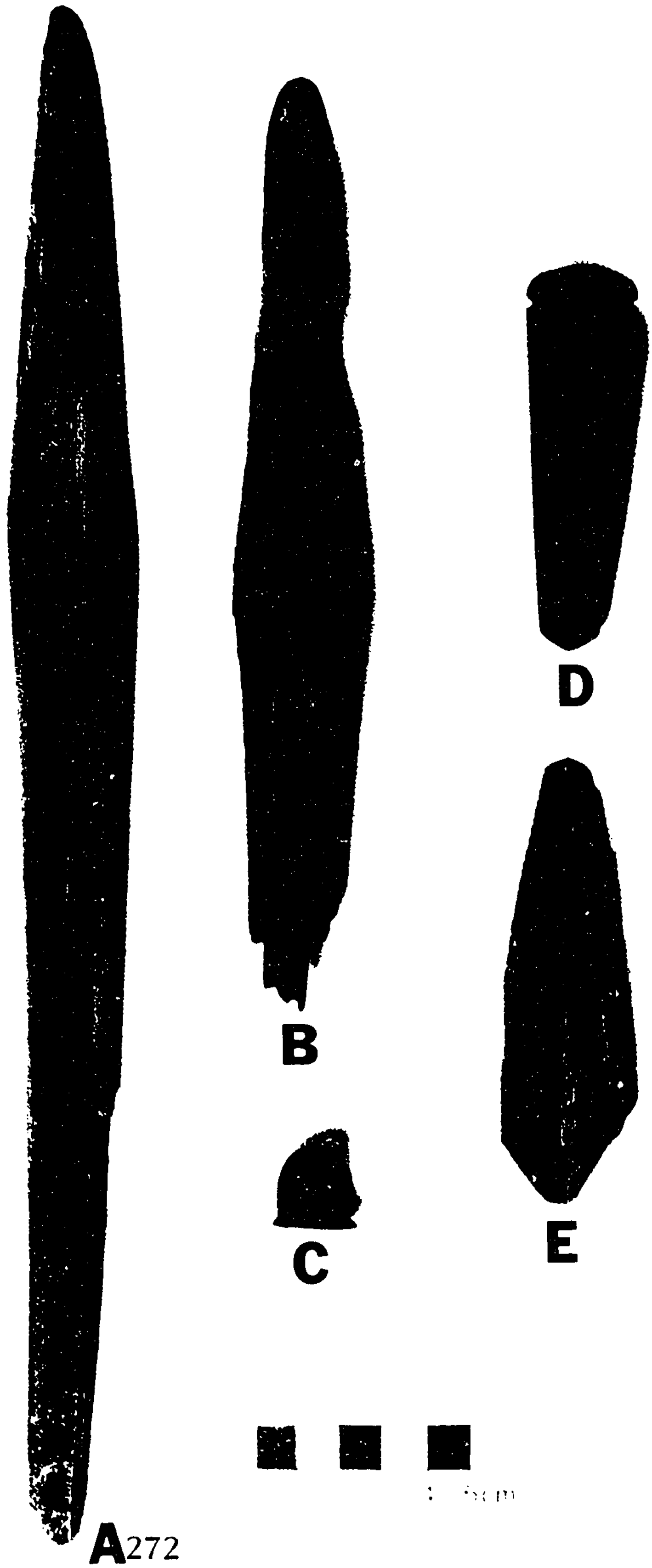

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probably Pacific yew. It closely resembles specimens from late prehistoric sites in Birnirk, Nunagiak, and Utkiavik, in North Alaska (Ford 1959:106). The plug is oval in cross-section, 9 cm long, and 2.5 cm wide. An encircling groove has been carved into the wide end. A small hole perforates the narrow end of the plug. Wound plugs were strung together when not it use.

A complete harpoon finger rest was made from a sea mammal tooth, probably a walrus pre-molar (Plate 43:C). There is an oval hole near the base for lashing to the harpoon shaft. The finger rest is 2 cm long, and 2 cm wide at the base. This piece is similar to those observed on harpoons in many northern collections.

A float inflator is represented by a wooden spool-shaped object that has been fractured in half vertically. It is 6.5 cm long, and 2.9 cm in maximum diameter. The inside is carefully hollowed out, so that when complete, the object would have resembled a short wooden tube. It was used to inflate sealskin floats, after which it would have been closed with some type of stopper which is now missing. The Karluk One specimen is identical to a complete inflator/plug recovered by Jochelson from a site on the Aleutians (1925:91, figure 65).

Dart Butts

Dart butts, the proximal segments of sea mammal dart shafts, found at Karluk One match those observed on ethnographic Koniag sea mammal hunting darts in museum collections (Birket-Smith 1941:139, King 1981:Plate 24). They are roughly conical in shape, with the widest part of the cone at the proximal end (Plate 44:A-L). The

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twelve dart butts in the assemblage also resemble a single fragmentary example found at Rolling Bay (Clark 1974:265; f).

Four complete dart butts are notched at the distal end to facilitate attachment to the rest of the shaft through a step-scarfed joint. Encircling rings, an aid to hafting of feather flights, are carved a short distance above the scarfed notch. The complete dart butts range long from 7.5 to 10.8 cm, and maximum diameters of all twelve range from 1.2 to 2.2 cm. Four still retain traces of red surface painting, and an additional piece has a faintly visible geometric design painted in black pigment.

The base, or proximal end of the dart butts is convex, with a small spot worn in the center from repeated contact with the spur at the head of a throwing board's dart groove. One dart butt fragment has been reworked into an awl by sharpening the distal end into a sharp point (Plate 44:J).

Table 5:29 Dart Butts

Catalog	Artifact Type	Material	Context
2950	Dart butt	Wood	House floor 1
2963	Dart butt	Wood	House floor 2
2340	Dart butt	Wood	House floor 3
3549	Dart butt	Wood	House floor 3
3130	Dart butt	Wood	House 5 roof sod
4863	Dart butt	Wood	House floor 5
2834	Dart butt	Wood	House floor 6
3826	Dart butt	Wood	House 6 wall sod
5159	Dart butt	Wood	House floor 6
6143	Dart butt	Wood	Lower basal midden
6197	Dart butt	Wood	House floor 10

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Plate 44

Sea mammal dart butts

Object	Description	Catalog #
A	Dart butt fragment, w/red paint, wood	193/5159
B	Dart butt fragment, wood	193/6197
C	Dart butt, fragment w/black paint, wood	193/3826
D	Dart butt, fragment wood	193/3130
E	Dart butt, w/red paint, wood	193/3549
F	Dart butt, fragment wood	193/2963
G	Dart butt, wood	193/6851
H	Dart butt, wood	193/6143
I	Dart butt, fragment w/red paint, wood	193/2834
J	Dart butt, re-worked into awl, wood	193/4863
K	Dart butt, wood	193/2340
L	Dart butt, wood	193/2950

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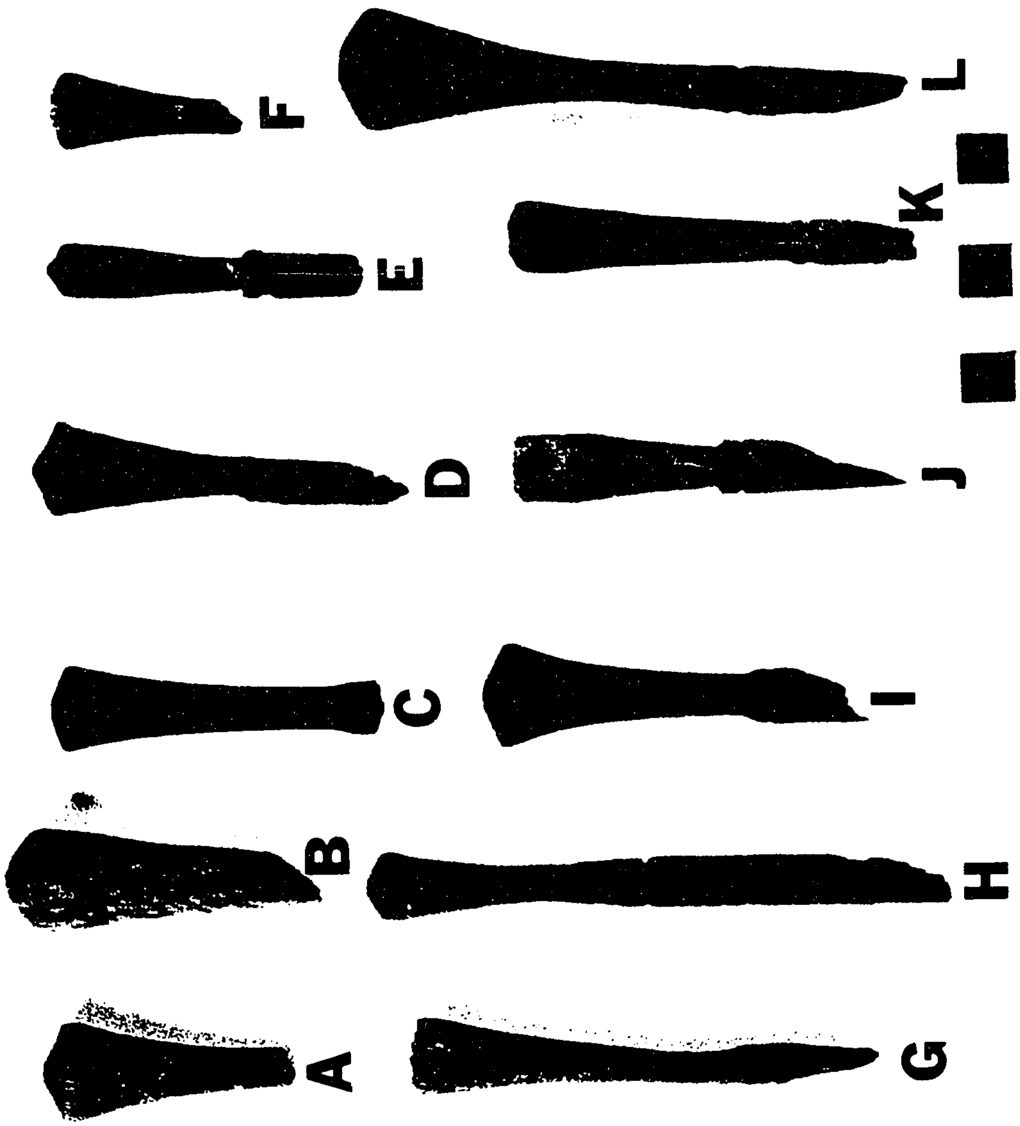

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Plate 45

Dart shaft fragments

Object	Description	Catalog #
A	Dart shaft, distal fragment, wood	193/
B	Dart shaft, distal fragment, wood	193/
C	Dart shaft, distal fragment, wood	193/
D	Dart shaft, distal fragment, wood	193/6708
E	Dart shaft, midsection fragment, wood	193/
F	Dart shaft, midsection fragment, wood	193/5317
G	Dart shaft, midsection fragment, wood	193/5544

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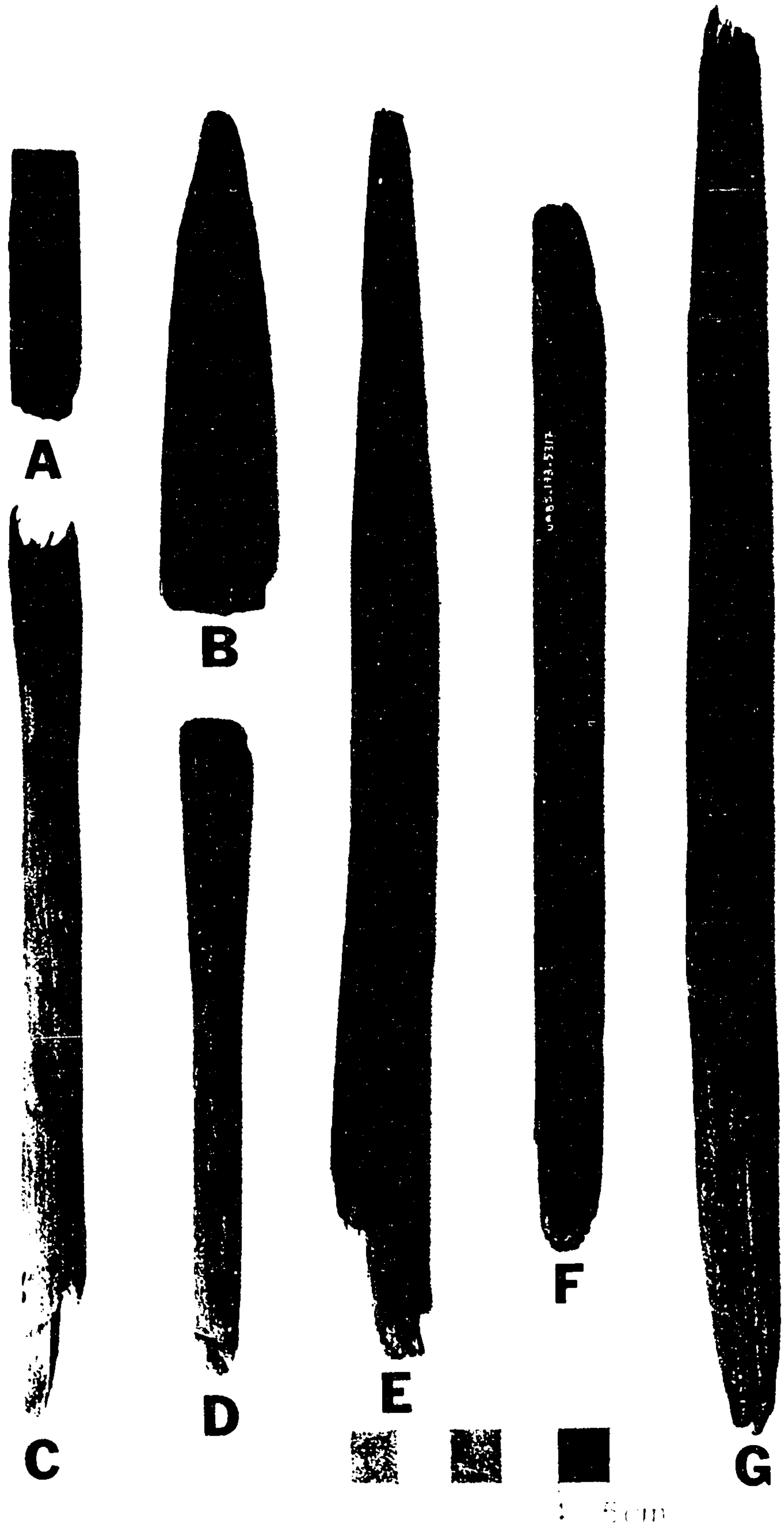

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Table 5:30 Dart Shaft Fragments

Catalog	Artifact Type	Material	Context
2132	Dart shaft fragment	Wood	House floor 1
981	Dart shaft fragment	Wood	House floor 1
3501	Dart shaft fragment	Wood	House floor 1
1002	Dart shaft fragment	Wood	House floor 1
713	Dart shaft fragment	Wood	House 1 wall sod
4359	Dart shaft fragment	Wood	House 2 roof sod
3945	Dart shaft fragment	Wood	House floor 2
4336	Dart shaft fragment	Wood	House floor 2
3944	Dart shaft fragment	Wood	House floor 2
1036	Dart shaft fragment	Wood	House floor 2
1409	Dart shaft fragment	Wood	House floor 2
3951	Dart shaft fragment	Wood	House 3 wall sod
1413	Dart shaft fragment	Wood	House floor 3
4173	Dart shaft fragment	Wood	House floor 3
4389	Dart shaft fragment	Wood	House floor 3
3616	Dart shaft fragment	Wood	House floor 3
4185	Dart shaft fragment	Wood	House floor 3
3627	Dart shaft fragment	Wood	House 4 roof sod
4214	Dart shaft fragment	Wood	House floor 5
2795	Dart shaft fragment	Wood	House floor 5
4479	Dart shaft fragment	Wood	House floor 5
2831	Dart shaft fragment	Wood	House floor 6
3418	Dart shaft fragment	Wood	House floor 6
6908	Dart shaft fragment	Wood	House floor 7
2861	Dart shaft fragment	Wood	House floor 7
1225	Dart shaft fragment	Wood	House floor 7
6312	Dart shaft fragment	Wood	House 8 roof sod
5978	Dart shaft fragment	Wood	House 8 roof sod
5181	Dart shaft fragment	Wood	House floor 8
6405	Dart shaft fragment	Wood	House floor 8
5544	Dart shaft fragment	Wood	House floor 8
5690	Dart shaft fragment	Wood	House floor 8
6612	Dart shaft fragment	Wood	House floor 8
6623	Dart shaft fragment	Wood	House floor 8
6629	Dart shaft fragment	Wood	House floor 8
5121	Dart shaft fragment	Wood	Upper basal midden
5122	Dart shaft fragment	Wood	Upper basal midden
5139	Dart shaft fragment	Wood	Lower basal midden
5729	Dart shaft fragment	Wood	Lower basal midden
5923	Dart shaft fragment	Wood	Lower basal midden
5939	Dart shaft fragment	Wood	Lower basal midden
5843	Dart shaft fragment	Wood	Lower basal midden
5274	Dart shaft fragment	Wood	Lower basal midden
5279	Dart shaft fragment	Wood	Lower basal midden
5287	Dart shaft fragment	Wood	House floor 10
5300	Dart shaft fragment	Wood	House floor 10
5317	Dart shaft fragment	Wood	House floor 10
5621	Dart shaft fragment	Wood	House floor 10

Scarfed Dart Shaft Fragments

A total of 31 body fragments of dart shafts have been classified because their diameters, which range from 1 to 1.9 cm, match those on ethnographic shaft fragments. It is probable that at least some of these shafts were used in conjunction with fish harpoons. All of these pieces

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have been carefully carved and smoothed (Plate 45:F,G). Surface pigment remains on five pieces; three are black, one red, and another is gray-green.

Eight of the dart shaft fragments in the collection have a step-notched scarf joint on one end, like those seen on the proximal end of dart butts described above. Dart shafts were composed of a number of joined segments for ease of manufacture and repair. On ethnographic specimens, joinery was covered by tight birch bark wrapping and then by a tightly wrapped coil of braided sinew (Birket-Smith 1941). The sinew wraps were in turn connected by braided sinew cordage, which would hold the pieces of the dart shaft together in the event of fracture. A broken dart shaft, therefore, could be mended by replacing a relatively short component rather than the entire shaft. This might also prevent warping of the shaft during storage.

In the Arctic literature, Eskimo craftsmen have been justly celebrated for their skills in joinery, which is often attributed to a scarcity of wood. With driftwood more abundant on Kodiak, it is likely that joinery was a method of economizing the time spent on equipment maintenance.

Nine distal ends of dart shafts taper down to a sharp wedge, designed to fit between the twin prongs of a bone or wood socket piece (Plate 45:A-E). The diameters of the distal shaft fragments range from 1 to 1.8 cm. In five examples, additional countersinking is present up the sides of the shaft for additional support of the prongs of a socket piece (Plate 45:A-D). One fragment retains much of its original red surface painting. This piece also has a long horizontal fracture, which was

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evidently repaired with the aid of tight sinew lashing, the coiled dents of which are still evident on the surface of the piece.

Harpoon Shaft Fragments

Table 5:31 Harpoon Shafts

Catalog	Artifact Type	Material	Context
4151	Harpoon Shaft Fragment	Wood	House floor 3
4640	Harpoon Shaft Fragment	Wood	House floor 5
6401	Harpoon Shaft Fragment	Wood	House floor 8

Three harpoon shaft fragments were identified through comparison to complete Koniag harpoons in Smithsonian's ethnographic collections. The archaeological specimens are proximal ends, with oval cross-sections. Two pieces represent medium sized harpoon shafts, about 2.8 cm in maximum diameter (Plate 43:A,B). Another fragment of a heavier harpoon shaft has a diameter of 3.5 cm.

Bow (Qitguyak) Fragments

Table 5:32 Bow Fragments

Catalog	Artifact Type	Material	Context
811	Bow fragment	Wood	House 3 wall sod
4458	Bow fragment	Wood	House floor 4
1677	Bow fragment	Wood	House floor 6
6022	Bow fragment	Wood	House floor 8
6368	Bow fragment	Wood	House floor 8
6462	Bow fragment	Wood	House floor 9A
5253	Bow fragment	Wood	House floor 9B
6510	Bow fragment	Wood	Upper basal midden
6147	Bow fragment	Wood	Lower basal midden
5631	Bow fragment	Wood	House floor 10

Ethnographic Koniag bows have been described by Birket-Smith (1941:140-142), who illustrates a slender example which lacks sinew backing. This would seem to corroborate Davydov's (1977:204)

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Plate 46

Bow fragments

Object	Description	Catalog #
A	Bow end fragment, wood	193/
B	Bow end fragment, wood	193/6368
C	Bow midsection fragment, reworked into a wedge, wood	193/
D	Bow midsection fragment, reworked into a wedge, wood	193/
E	Bow end fragment, wood	193/5631
F	Bow end fragment, wood	193/6510
G	Bow end fragment, wood w/red paint	193/1677
H	Bow end fragment, wood w/red paint	193/4458
I	Bow end fragment, wood w/red paint	193/811

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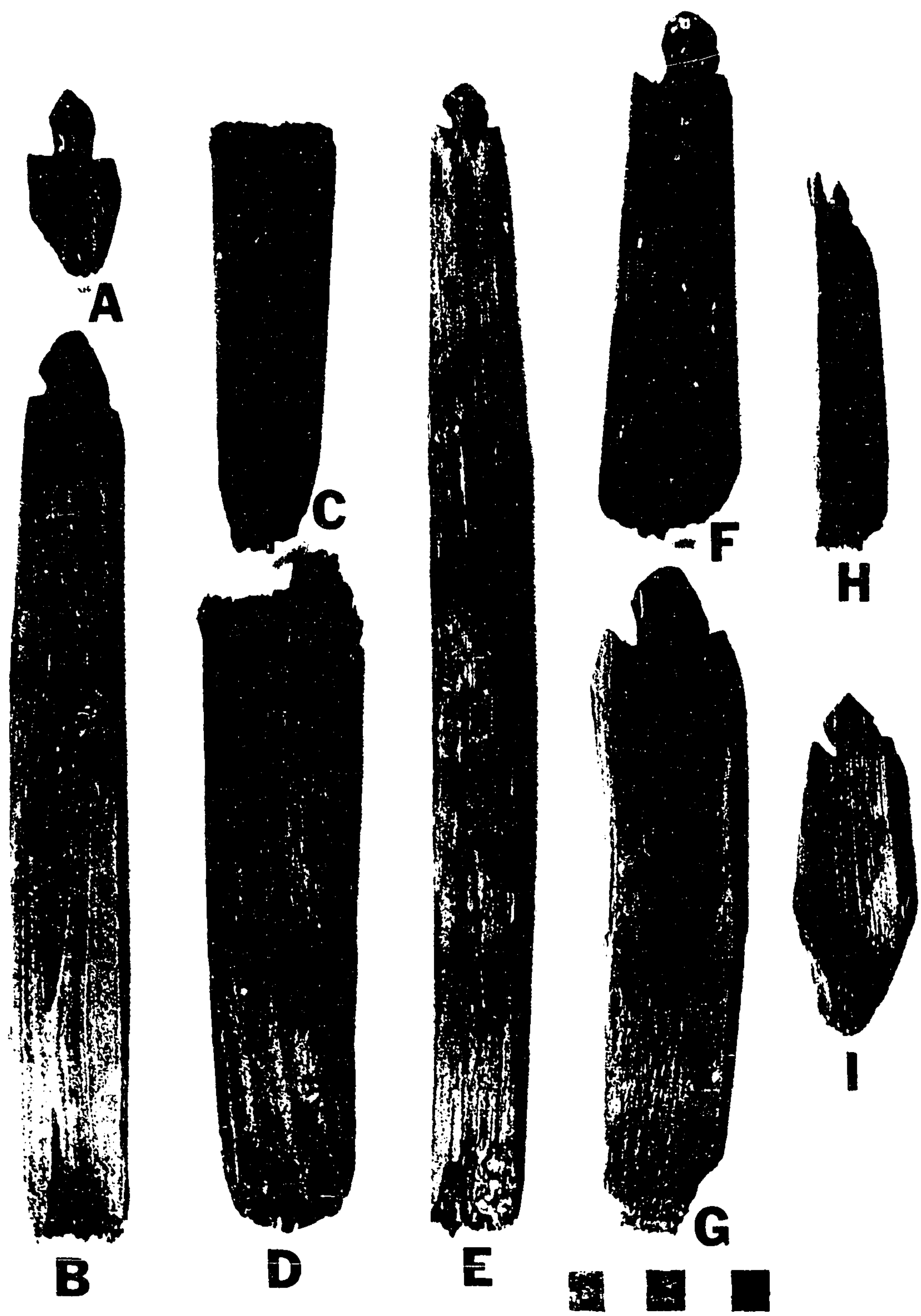

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description of Koniag bows as 'very simple and fragile.' The use of a more powerful recurved, sinew-backed, bow sufficiently powerful to kill brown bear is known from late 19th century collections from Kodiak (Heizer 1952:12; Krech 1989:100), and from oral tradition (KANA oral history files).

According to Native elders, bows were used as late as the 1930s in archery games and in hunting. In the early years of the 20th century, bows were made of Pacific yew and were carefully smoothed with a piece of chipped glass. Smoothing was necessary, as any cut or dent on the bow's surface could cause the dense wood to suddenly shatter, reportedly breaking into sherd-like slivers. According to informants, reinforced bows were backed with a thick braid of sinew that had to be occasionally tightened by twisting with a stick. In the village of Akhiok one elder hunter preferred to use such a bow and frequently soaked it in a stream to prevent the sinew from becoming dry and brittle.

The bow fragments in the collection range from 0.6 to 1.1 cm thick. Nine were identified by the presence of a distinctive diamond shaped nock on one end (Plate 46:A,B,E-I). When a wooden bow is made, it must be strung to determine if the curvature is even. Variation in wood density and grain can contribute to an uneven curvature which can be rectified by slight shortening of the bow. This may account for the relatively large number of short fragments of nocked ends in the Karluk One assemblage. Four of the nine bow fragments are made of very dense wood, probably Pacific yew, while five others are of spruce. Three bow fragments retain traces of red surface pigment. Two bow fragments have many long cut marks on both sides, perhaps from the removal of sinew backing (Plate 46:D, G).

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Arrow Shaft Fragments

Table 5:33 Arrow Shaft Fragments

Catalog	Artifact Type	Material	Context
2130	Arrow shaft fragment	Wood	House floor 1
702	Arrow shaft fragment	Wood	House floor 1
1888	Arrow shaft fragment	Wood	House 2 roof sod
4140	Arrow shaft fragment	Wood	House 2 roof sod
3927	Arrow shaft fragment	Wood	House floor 2
1041	Arrow shaft fragment	Wood	House floor 2
1622	Arrow shaft fragment	Wood	House floor 3
1780	Arrow shaft fragment	Wood	House floor 3
1050	Arrow shaft fragment	Wood	House floor 2
829	Arrow shaft fragment	Wood	House floor 4
1126	Arrow shaft fragment	Wood	House floor 4
1132	Arrow shaft fragment	Wood	House floor 4
1802	Arrow shaft fragment	Wood	House floor 4
2415	Arrow shaft fragment	Wood	House floor 4
877	Arrow shaft fragment	Wood	House floor 6
3743	Arrow shaft fragment	Wood	House floor 6
2844	Arrow shaft fragment	Wood	House floor 6
2525	Arrow shaft fragment	Wood	House floor 6
6907	Arrow shaft fragment	Wood	House floor 7
6911	Arrow shaft fragment	Wood	House floor 7
5165	Arrow shaft fragment	Wood	House floor 7
6307	Arrow shaft fragment	Wood	House 8 roof sod
5500	Arrow shaft fragment	Wood	House floor 8
6358	Arrow shaft fragment	Wood	House floor 8
5362	Arrow shaft fragment	Wood	House floor 8
5363	Arrow shaft fragment	Wood	House floor 8
5697	Arrow shaft fragment	Wood	House floor 8
6620	Arrow shaft fragment	Wood	House floor 8
6622	Arrow shaft fragment	Wood	House floor 8
6625	Arrow shaft fragment	Wood	House floor 8
6626	Arrow shaft fragment	Wood	House floor 8
6115	Arrow shaft fragment	Wood	House floor 9A
6647	Arrow shaft fragment	Wood	Upper basal midden
5928	Arrow shaft fragment	Wood	Lower basal midden
5276	Arrow shaft fragment	Wood	Lower basal midden
5313	Arrow shaft fragment	Wood	House floor 10
5757	Arrow shaft fragment	Wood	House floor 10

Nine proximal arrow shaft fragments with a simple u-shaped nock are identical to those in late 19th century ethnographic collections (Krech 1989:Figure 10). In this respect, Koniag specimens are very similar to arrows made elsewhere in the Eskimo world, including

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Plate 47

Arrow shaft fragments

Object	Description	Catalog #
A	Arrow shaft fragment; proximal, wood	193/1377
B	Arrow shaft fragment; proximal, wood	193/4874
C	Arrow shaft fragment; proximal, wood	193/6715
D	Arrow shaft fragment; proximal, wood	193/6402
E	Arrow shaft fragment; proximal, wood	193/6714
F	Arrow shaft fragment; proximal, wood	193/6266
G	Arrow shaft fragment; distal, wood	193/5276
H	Arrow shaft fragment; mid-section, wood	193/6028
I	Arrow shaft fragment; distal, wood	193/1915

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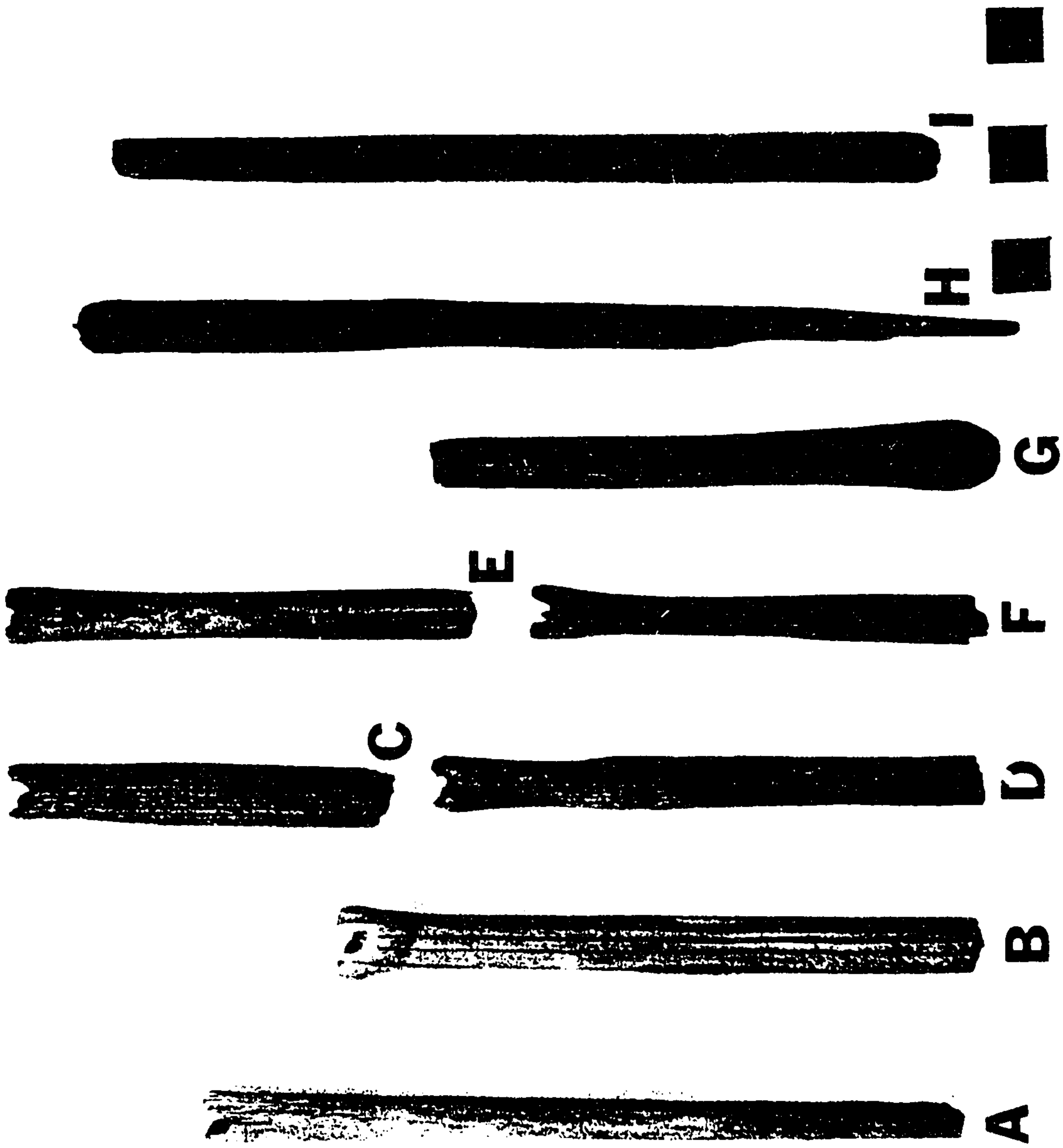

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those from the Bering Sea area. The nocks carved on Karluk One arrow shafts do not exceed 0.4 cm wide and depth (Plate 47:A-F). One specimen features a painted black band, which encircles the shaft a short distance below the nock (Plate 47:D). The cross-section of all the proximal arrow shaft fragments is round, but tapers into an oval shape toward the nock.

Ten distal fragments of arrow shafts have a variety of modifications (Plate 47:G-I). Seven have a blunt end, with a small central hole to accommodate the conical stem of an arrow point, which probably made changing points a simple matter. An additional distal shaft fragment appears to be self-tipped with a blunt, knob shaped point, (Plate 47:G). These are similar to bird blunts, which are used to kill without puncturing the skin. Two other distal fragments have long tapered ends which show signs of battering. They may have been self tipped by simply whittling them to a point.

A total of 18 wood shaft fragments have been identified as arrow shafts, based on diameter, and similarities in manufacture with the nocked fragments. Shaft fragment diameters measure from 0.8 to 1 cm. Nearly all the fragments are circular in cross-section, although a few, possibly from near the nock, have oval cross-sections. Six fragments retain traces of surface painting, three black, and three red.

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Bone Arrow Points (Rruu'et)

Table 5:34 Arrow Points

Catalog	Artifact Type	Material	Context
4677	Arrow point	Bone	Burial
2155	Arrow point	Bone	House floor 1
4684	Arrow point	Bone	House floor 1
4725	Arrow point	Bone	House floor 1
2726	Arrow point	Bone	House 2 roof sod
4629	Arrow point	Bone	House floor 2
2472	Arrow point	Bone	House floor 5
3400	Arrow point	Bone	House floor 6
922	Arrow point	Bone	House 7 wall sod
4967	Arrow point	Bone	House floor 7
1514	Arrow point	Bone	House floor 7
1509	Arrow point	Bone	House floor 7
6315	Arrow point	Bone	House 8 roof sod
5868	Arrow point	Bone	House floor 10

Fourteen bone arrow points a conical stems on the proximal end, designed to plug into the central holes on the distal end of the wooden arrow shafts. (Plate 48:A-I,K,L). It is not known whether any additional lashing was used to hold the points in place. Arrow points of this type are abundant at the Uyak site (Steffian 1994). Five arrow points are conical in shape, with two complete examples measuring 4.4 and 5.8 cm long, and 0.7 cm wide (Plate 48:B,C). Three other points are missing their basal stems.

Three bone arrow points are shaped like the component half of a composite fishing harpoon point, but have the tapered basal stem of an arrow point. Two of these points have countersinking for a smaller half (Plate 48:E,F). The other appears to be unfinished (Plate 48:D). Whether these points are reworked fishing harpoons, or were a type of fishing harpoon fired from a bow is unclear.

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Plate 48

Arrow points

Object	Description	Catalog #
A	Arrow point, bone	193/1514
B	Arrow point, bone	193/1509
C	Arrow point, bone	193/2726
D	Arrow point, bone	193/6315
E	Arrow point, reworked fish harpoon valve, bone	193/922
F	Arrow point, bone	193/3400
G	Arrow point, whale bone	193/4629
H	Arrow point, whale bone	193/4684
I	Arrow point, antler	193/4725
J	Arrow point with end-blade slot , whale bone	193/5868
K	Arrow point, bone	193/4967
L	Arrow point, antler	193/2155

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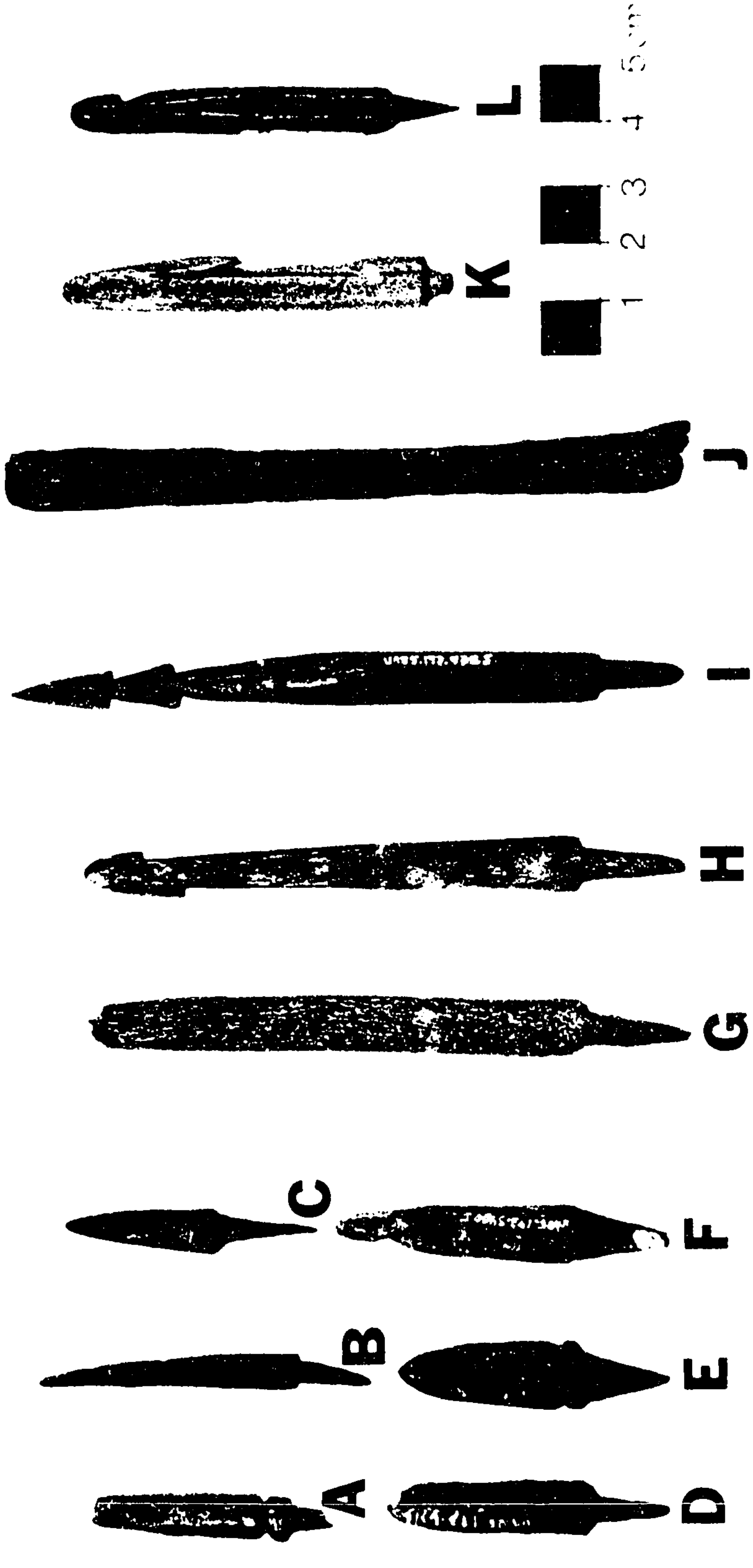

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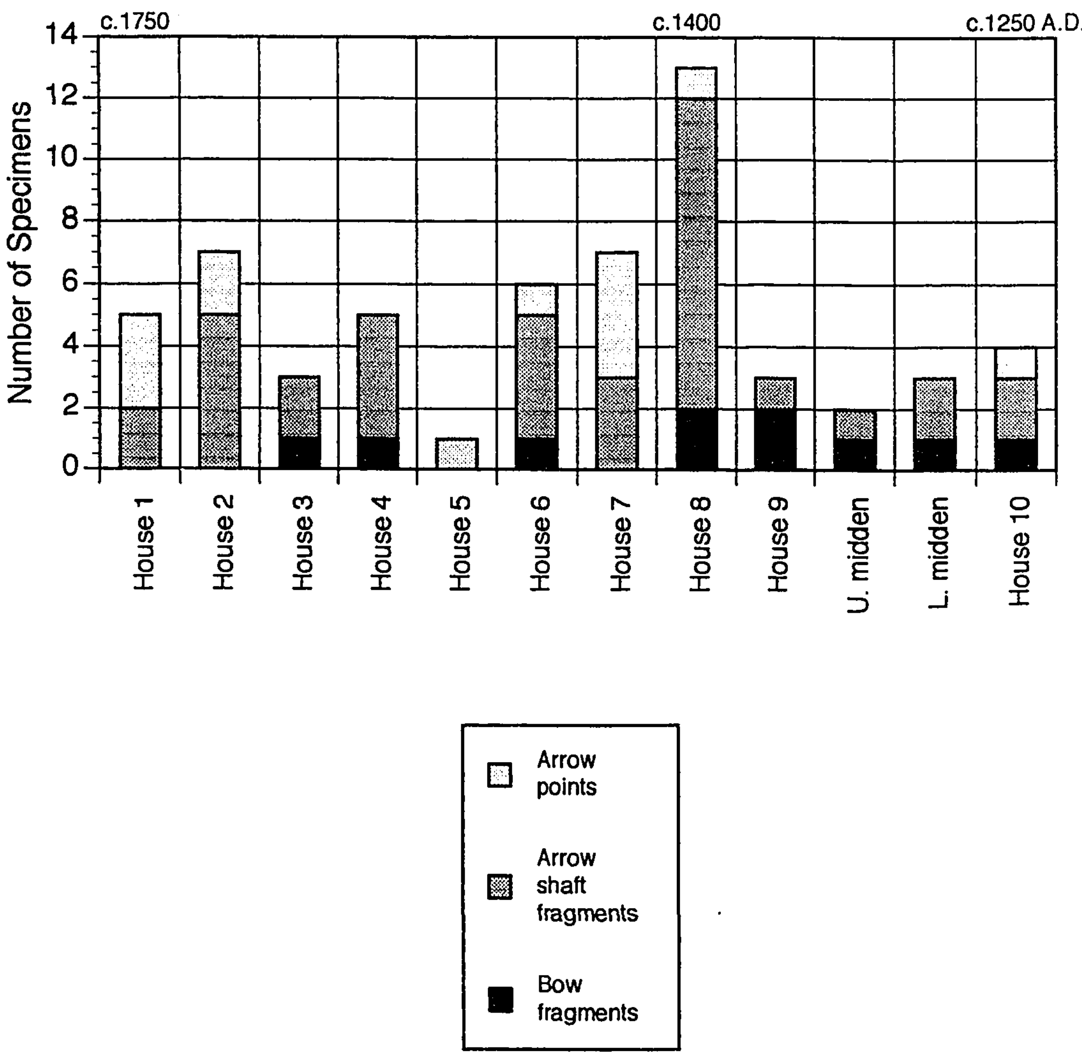
Chart 5: Provenience and Frequency of Archery Related Artifacts at Karluk One



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Two arrow points of similar size, 6.7 cm long, and 0.7 cm wide, have blunt tips and a single unilateral barb (Plate 48:K,L). Three arrow points are of a longer variety. Two are made of sea mammal bone, the other from dense land mammal bone or antler (Plate 48:G-I). Two of these are complete points, measuring 10.5 and 11.5 cm long and .9 and 1 cm wide. A third point is missing the tip. All three of the longer points have sturdy conical stems which measure 0.6 cm in diameter.

A single fragmentary point made from sea mammal bone has an end blade slot and at least one barb (Plate 48:J). It may represent a bear arrow points, which featured endblade slots, as described by Birket-Smith (1941:144). Barbed arrow points seem to be under represented in Koniag assemblages. It may be that because of their specialized use in bear hunting and warfare that they were curated in a differential manner; perhaps stored and/or disposed of away from the barabara. This pattern was also observed in the late Kachemak household assemblages at the Uyak site (Steffian 1994).

Snare Pins

Table 5:35 Snare Pins

Catalog	Artifact Type	Material	Context
2152	Snare pin	Wood	House floor 1
3077	Snare pin	Wood	House 4 wall sod
857	Snare pin	Wood	House floor 5
2020	Snare pin	Wood	House 6 roof sod
5805	Snare pin	Wood	House floor 8
5183	Snare pin	Wood	House floor 8
5009	Snare pin	Wood	House floor 8
5558	Snare pin	Wood	House floor 8
5119	Snare pin	Wood	Upper basal midden
5120	Snare pin	Wood	Upper basal midden
5419	Snare pin	Wood	Upper basal midden
5420	Snare pin	Wood	Upper basal midden
5038	Snare pin	Wood	Upper basal midden

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Snare pins are made of wood and shaped rather like miniature railroad spikes. A total of 15 specimens were found at Karluk One. These pins are generally well carved and range from 4.7 to 12.8 cm long (Plate 49). Snare pins are round to oval in cross-section, and a narrow, u-shaped open socket is found opposite the notched side of the head of the pins. Identical specimens were recovered by de Laguna in excavations at Palutat Cave, on Knight Island in Prince William Sound (de Laguna 1956:231, plate 51; fig. 14). She identified them as wooden hooks used as trigger mechanisms on traps. Alternatively, they may have been placed in the ground to anchor snares. Similar pins are attached to baleen snares collected by Fisher (Smithsonian cat. no. 72513). According to oral tradition, snares were used to trap puffins; the snare being placed over the entrance to the puffins burrow and the entangled puffins were then clubbed. Puffin skulls recovered from historic Koniag middens at the Aleutka Bay site on the Kurile islands all appear to have suffered cranial damage consistent with clubbing.

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Plate 49

Snare pins

Object	Description	Catalog #
A	Snare pin, wood	193/
B	Snare pin, wood	193/5183
C	Snare pin, wood	193/5805
D	Snare pin, wood	193/
E	Snare pin, wood	193/
F	Snare pin, wood	193/5120
G	Snare pin, wood	193/5009

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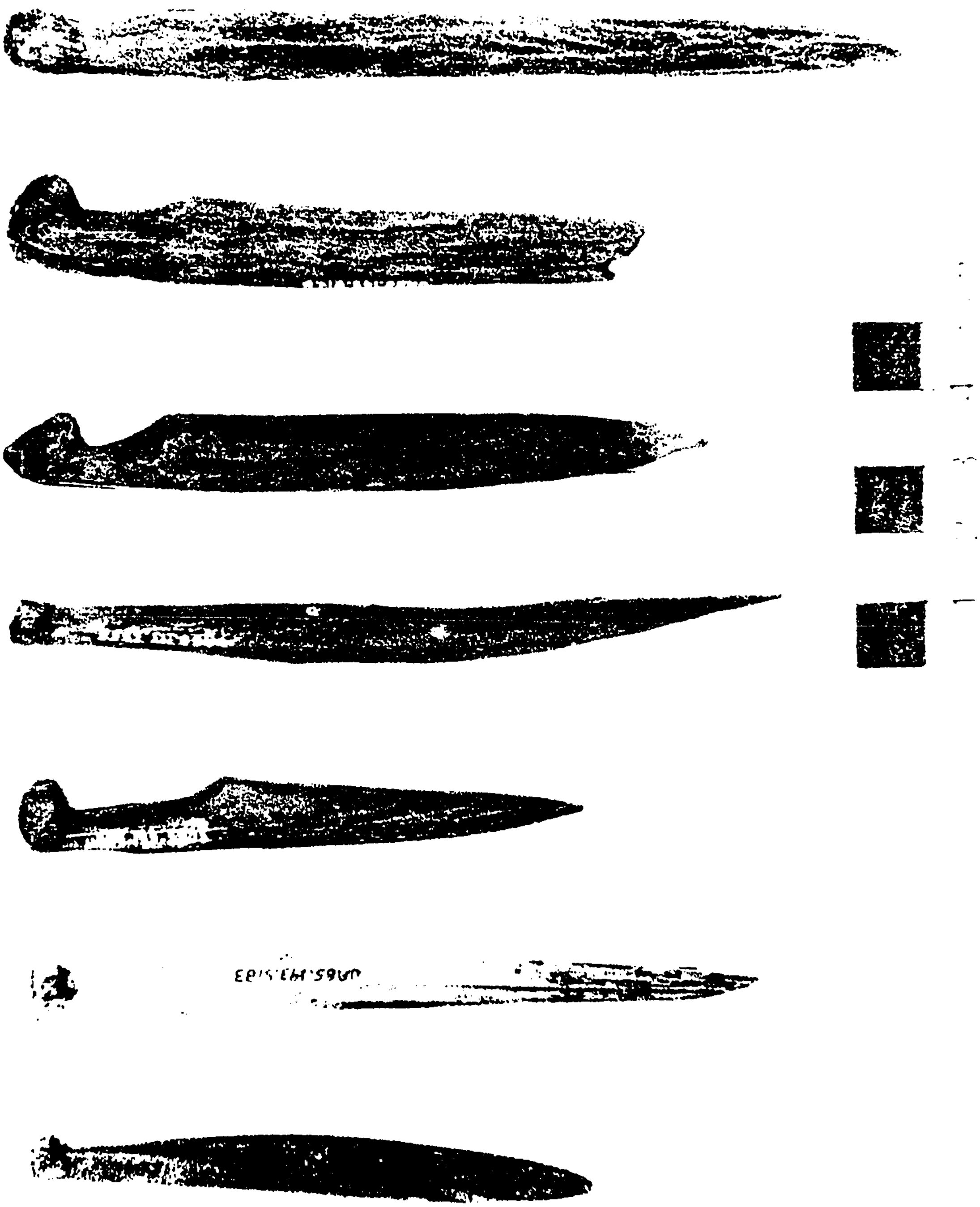

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Clam Knives

Table 5:36 Clam Knives

Catalog	Artifact Type	Material	Context
1296	Clam knife	Bone	House 1 roof sod
2543	Clam knife	Wood	House floor 1
4693	Clam knife	Wood	House floor 1
4702	Clam knife	Wood	House floor 1
734	Clam knife	Bone	House floor 1
1005	Clam knife	Wood	House floor 1
4314	Clam knife	Bone	House floor 1
2552	Clam knife	Wood	House floor 2
4615	Clam knife	Bone	House floor 2
4371	Clam knife	Wood	House floor 2
2579	Clam knife	Wood	House 3 roof sod
2756	Clam knife	Wood	House floor 3
1776	Clam knife	Wood	House floor 3
1620	Clam knife	Wood	House floor 4
2354	Clam knife	Wood	House floor 4
2757	Clam knife	Wood	House floor 4
2598	Clam knife	Wood	House 4 roof sod
3062	Clam knife	Wood	House floor 4
3107	Clam knife	Wood	House 5 roof sod
3087	Clam knife	Wood	House floor 5
3671	Clam knife	Wood	House floor 5
1123	Clam knife	Wood	House floor 5
1965	Clam knife	Bone	House floor 5
2387	Clam knife	Wood	House floor 5
2620	Clam knife	Wood	House floor 5
862	Clam knife	Bone	House floor 5
3141	Clam knife	Wood	House 6 roof sod
896	Clam knife	Wood	House 6 wall sod
931	Clam knife	Wood	House floor 7
5516	Clam knife	Wood	House floor 8
5517	Clam knife	Wood	House floor 8
5537	Clam knife	Wood	House floor 8
6394	Clam knife	Wood	House floor 8
5411	Clam knife	Wood	Upper basal midden
5809	Clam knife	Wood	Upper basal midden
5231	Clam knife	Wood	House floor 9A
6138	Clam knife	Wood	Lower basal midden
5278	Clam knife	Wood	Lower basal midden

A previously unidentified tool type is a spatulate form shaped much like a tongue depressor (Plate 50:A-K). Clark was the first to recognize these artifacts as a distinct, standardized type. He recovered 24 "bluntly pointed

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bone pieces" at Rolling Bay (1974:98). Similar bone specimens have also been recovered in association shell middens at Ocean Bay period sites dating back to 4,000 BP (P. Knecht, personal communication 1989).

According to elder Native informants on Kodiak Island these were in fact used as clam knives, a tool used to pry marine invertebrates, such as chitons and limpets, loose from rocks of the inter-tidal zone. They were also used to pry open and scrape out the meat of mussels and clams. Today's Native harvesters of marine invertebrates use the similarly shaped metal butter knife blade, or a screwdriver for these purposes. A total of 36 clam knives were found at Karluk One made of wood and whalebone.

Wooden Clam Knives

Wooden clam knives vary widely in workmanship, but are all lens shaped in cross-section and have rounded ends which thin towards the tip. They range from 10 to 22 cm long, and from 0.5 to 0.9 cm thick (Plate 50:A-K). The ends of some specimens display considerable use-wear; blunting and fraying. Some ends bear the marks of striations, possibly incurred while prying open shellfish.

Of the 23 complete wooden clam knives in the collection, 20 have a two rounded ends. One such specimen is decorated with incised lines in a serpentine pattern, perhaps guide lines for pigment which has long since vanished (Plate 50:H). The reverse side of this piece features an incised diagonal slash design across its center.

A variant of the double ended clam knife is represented by two specimens which have one rounded end, and one carved into a square, chisel-shaped end (Plate 50:E,F). One of these specimens retains traces of red paint. Three other clam knives have a single rounded end, with the other

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Plate 50

Clam knives

Object	Description	Catalog #
A	Clam knife, whalebone	193/
B	Clam knife, wood	193/
C	Clam knife, wood	193/
D	Clam knife, whalebone	193/862
E	Clam knife, wood	193/5411
F	Clam knife, wood	193/
G	Clam knife, wood	193/6737
H	Clam knife, wood, w/incised geometric design	193/4702
I	Clam knife, wood	193/
J	Clam knife, wood	193/2757
K	Clam knife, wood	193/5517

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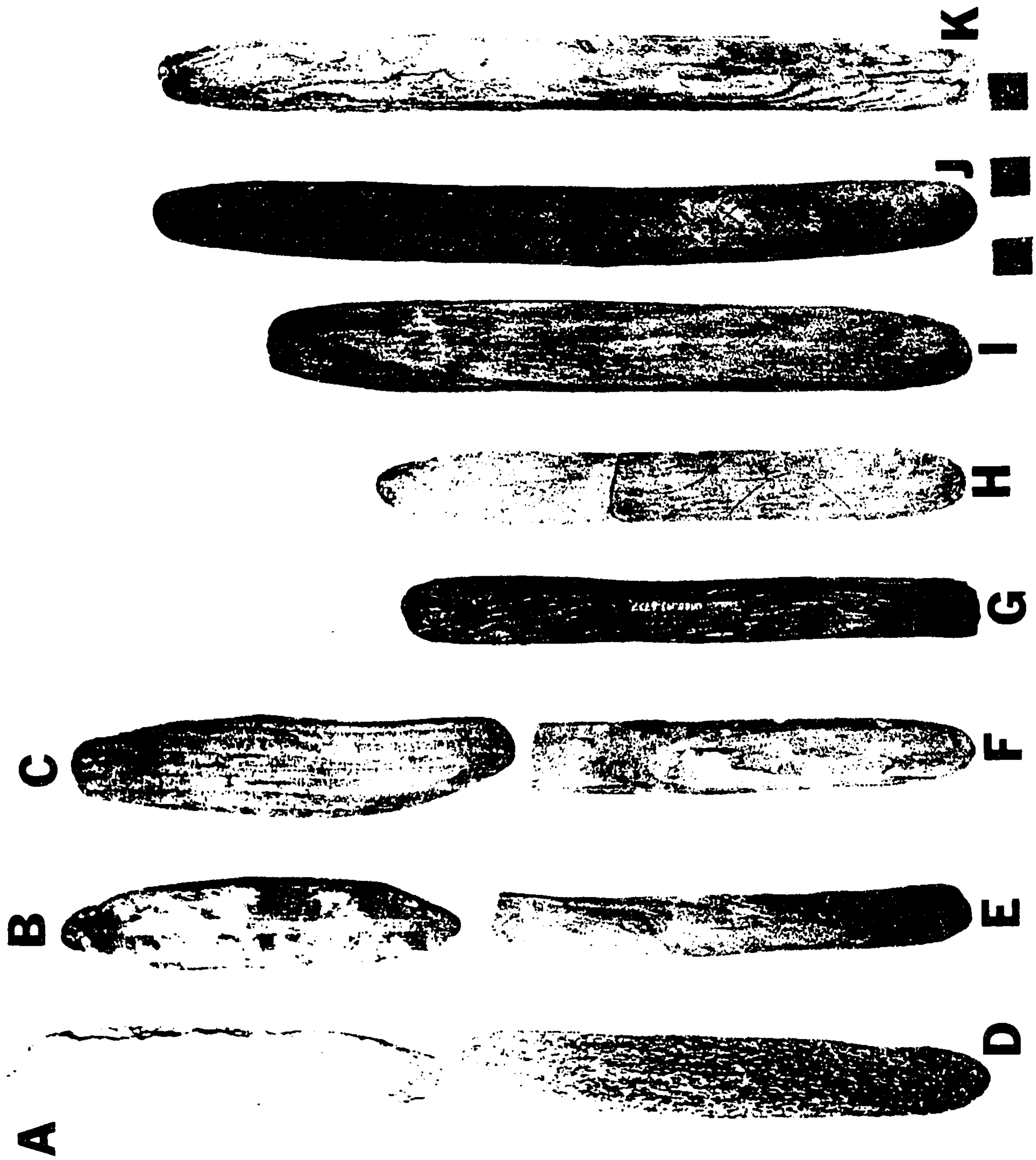

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end unmodified. Five wooden clam knives are in fragmentary condition, broken in the mid-section. All have at least one rounded end.

Five examples of clam knives are made from whalebone (Plate 50:A,D). An additional bone clam knife is represented by a mid-section fragment. They are similar in form and size to the wooden examples; each has two rounded ends, and they range from 10.7 to 15.2 cm long.

BOAT PARTS AND ACCESSORIES

Kayak paddle (Caqiyun) fragments

Table 5:37 Kayak Paddle Fragments

Catalog	Artifact Type	Material	Context
719	Kayak paddle fragment	Wood	House floor 1
765	Kayak paddle fragment	Wood	House floor 2
3373	Kayak paddle fragment	Wood	House floor 2
771	Kayak paddle fragment	Wood	House floor 2
2741	Kayak paddle fragment	Wood	House 3 roof sod
4007	Kayak paddle fragment	Wood	House floor 3
4187	Kayak paddle fragment	Wood	House floor 3
2792	Kayak paddle fragment	Wood	House floor 5
3156	Kayak paddle fragment	Wood	House floor 6
3164	Kayak paddle fragment	Wood	House floor 6
2501	Kayak paddle fragment	Wood	House floor 6
2847	Kayak paddle fragment	Wood	House 7 roof sod
2851	Kayak paddle fragment	Wood	House 7 wall sod
4988	Kayak paddle fragment	Wood	House floor 8
5014	Kayak paddle fragment	Wood	House floor 8
6450	Kayak paddle fragment	Wood	House floor 8
6125	Kayak paddle fragment	Wood	House floor 9A

Of the 14 kayak paddle fragments in the collection, 11 are blade fragments with a flat diamond shaped cross section (Plate 51:A-C, E). Of the eight blade tip fragments 4 have a rounded end and 4 taper to a point. Maximum blade widths range from 6.2 to 8 cm. Two articulating fragments appear to represent a complete blade of a kayak paddle with a rounded end 48 cm long (Plate 51:B,C). Traces of red

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pigment are visible on the surface of this specimen. An additional paddle blade fragment retains traces of black paint.

Two fragments, one retaining traces of red pigment, represent most of the mid-section of a kayak paddle (Plate 51:D,E). Another smaller fragment was broken off immediately under the handle of the paddle.

Curiously, the Kayak paddles found at Karluk One differ substantially in form from many of those in ethnographic collections from Kodiak (Fitzhugh and Crowell 1988:51, Zimmerly 1986:34). Ethnographic kayak paddles are single bladed are fairly wide, about 10 to 15 cm with a pronounced medial ridge. The Karluk One kayak paddles are also single bladed, but the blade is much narrower, and as already noted, are flattened diamond shaped in cross section, lacking a well defined medial ridge.

Nelson (1899:223), noted that kayak blade shapes changed according to locality in the Bering Sea area. While some aspects of blade shape, such as tip form, may have served to differentiate social groups, the overall shape of a kayak blade is important to its very simple, but nevertheless central role in transportation and subsistence.

A primary consideration in paddle blade design is paddling cadence (Washburne 1989:34). A larger blade, like those in Kodiak ethnographic collections, produces more power per stroke, and a slower paddling cadence. This form is more likely to produce muscle and joint strain than a smaller paddle. A medial ridge reduces flutter, or the tendency of a wider paddle to twist while being pulled through the water. In conditions where quick movements are necessary to stabilize the kayak, wider paddle blades are harder to put into play.

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Plate 51

Kayak paddle fragments

Object	Description	Catalog #
A	Kayak paddle, distal fragment, wood	193/3373
B	Kayak paddle, midsection fragment, wood	193/765
C	Kayak paddle, distal fragment, wood	193/771
D	Kayak paddle, proximal fragment, wood	193/
E	Kayak paddle, midsection fragment, wood	193/

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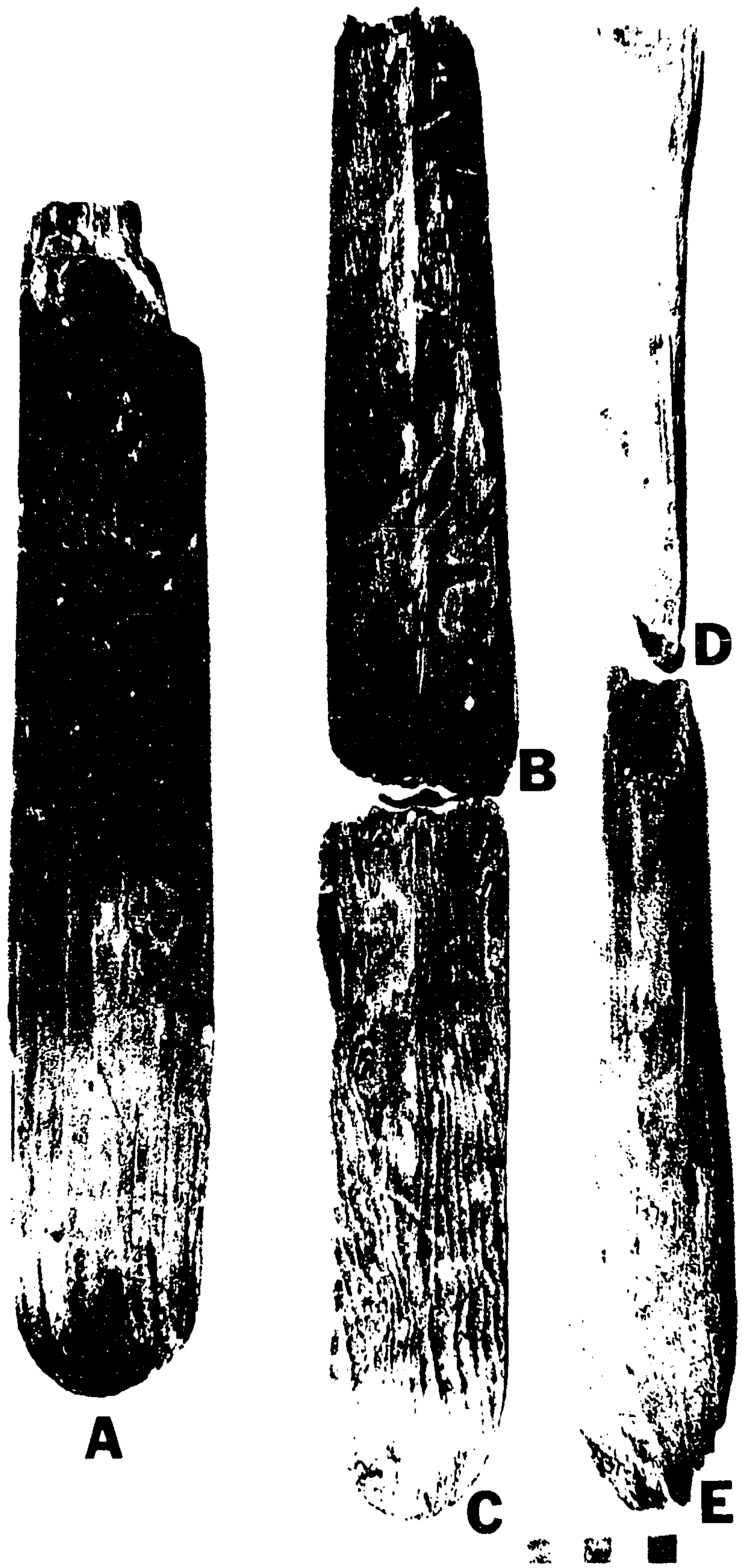

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Larger paddles are also less wind resistant, a factor that becomes significant when paddling into headwinds or gusts.

The narrow bladed paddles found at Karluk One would have been better suited for the demanding sea conditions of the Shelikof Strait, still considered by modern mariners to be one of the world's most treacherous bodies of water. This form of kayak paddle may also be an indicator that single hatched kayaks were preferred by the Koniags before Russian contact. All the kayak models found at Karluk One are representations of single hatch kayaks, where use of a narrow bladed paddle would have been most important.

With the onset of the historic fur trade economy, a premium was placed on stowage space for long distance hunting trips. The two and three hatch kayaks which predominated during the fur-trade era had wider beams, and were therefore much more stable. A wider beam requires proportionately more power, which was provided by the addition of another paddler, and very likely, a wider paddle of the type now surviving in ethnographic collections

Kayak Frame Parts

Identifications of kayak frame parts in the collection were made with the aid of plans drawn of a complete kayak collected by Holmberg in 1851 and now at the Danish National Museum in Copenhagen, as well as a three hatch kayak collected on Kodiak by Lisianski in 1814 and now at the Museum of Anthropology and Ethnography in Leningrad (Zimmerly 1986:29-32).

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Kayak Deck Beam Fragments

Table 5:38 Kayak Deck Beams

Catalog	Artifact Type	Material	Context
2862	Kayak deck beam	Wood	House floor 7
5045	Kayak deck beam	Wood	Upper basal midden
5235	Kayak deck beam	Wood	House floor 9A

Two articulating wood fragments are weathered, but are clearly recognizable as a kayak deck beam (Plate 52:A). The ends of this deck beam is missing. Two additional fragments of deck beams, (Plate 52:B,C) are 3.8 and 4.5 cm wide. The ends are distinguished by tab-like projections, intended to fit in a slot in the gunwale. Holes exist above the tabular ends, which would have secured lashing which held the deck beams to the gunwale. One of the deck beam fragments has been badly charred (Plate 52:C).

Kayak Ribs

Table 5:39 Kayak Ribs and Rib Fragments

Catalog	Artifact Type	Material	Context
1652	Kayak rib	Wood	House floor 4
942	Kayak rib	Wood	House 7 wall sod
6333	Kayak rib	Wood	House floor 8
5173	Kayak rib	Wood	House 8 roof sod
5192	Kayak rib	Wood	House floor 8
6056	Kayak rib	Wood	House floor 8
6145	Kayak rib	Wood	Lower basal midden
5284	Kayak rib	Wood	House floor 10
5296	Kayak rib	Wood	House floor 10
6180	Kayak rib	Wood	House floor 10
5303	Kayak rib	Wood	House floor 10
5304	Kayak rib	Wood	House floor 10
5334	Kayak rib	Wood	House floor 10
5440	Kayak rib	Wood	House floor 10
5620	Kayak rib	Wood	House floor 10

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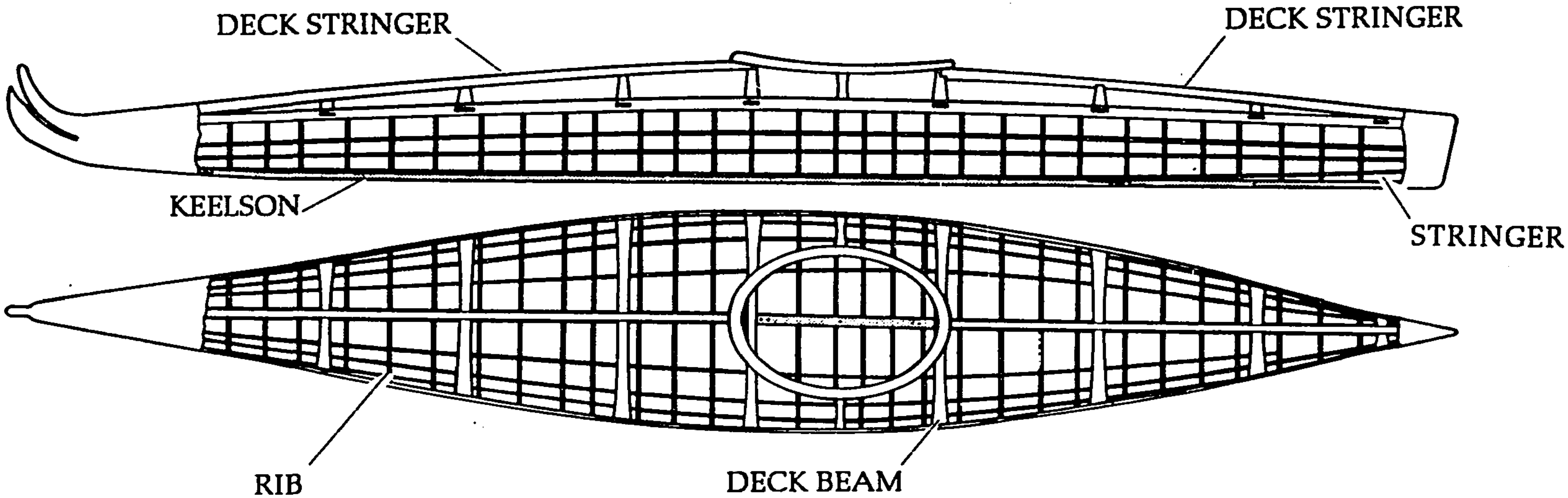

Kayak Frame Components Found at the Karluk One Site

(After lines of a 19th century Kodiak kayak taken by David Zimmerly,1986:29)

Plate 52

Kayak frame parts and deck attachments

Object	Description	Catalog #
A	Kayak deck beam, wood	193/5045
B	Kayak deck beam fragment, wood	193/5235
C	Kayak deck beam fragment, wood	193/
D	Kayak deck attachment, cottonwood bark	193/1328
E	Kayak deck attachment, cottonwood bark	193/1668
F	Kayak rib fragment, wood	193/
G	Kayak rib fragment, wood	193/
H	Kayak rib fragment, wood	193/
I	Kayak deck stringer or keelson fragment, wood	193/
J	Kayak deck stringer or keelson fragment, wood	193/6497
K	Kayak rib, wood	193/6333

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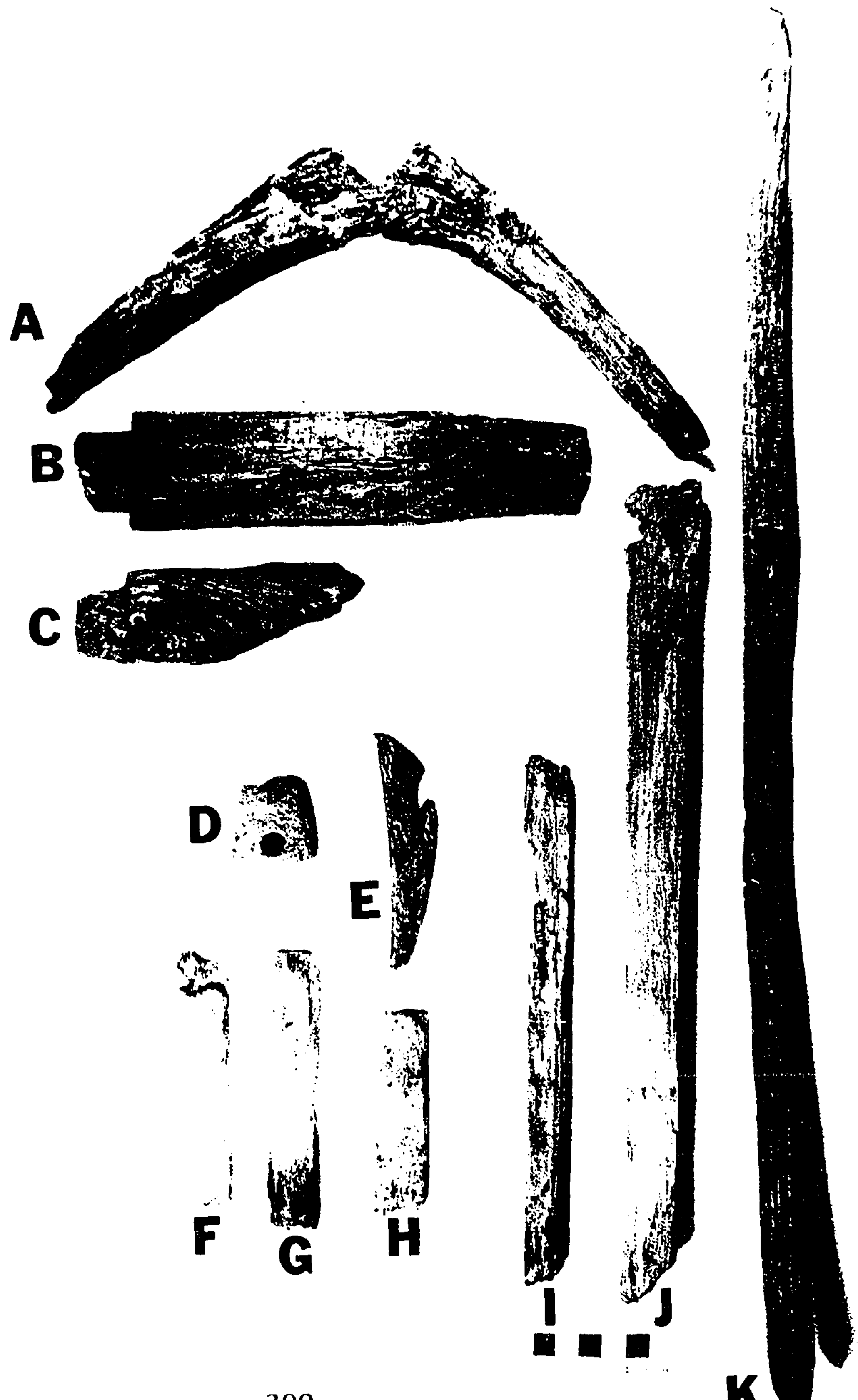

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A complete kayak rib is 1.9 cm wide, 57 cm long, and oval in cross-section (Plate 52:K). The body of the rib is slightly bent and the ends taper slightly. Another 15 fragments of kayak ribs were identified based on their close resemblance to the complete specimen described above. Five are end fragments with tapered ends (Plate 52:G), and 10 are medial body fragments (Plate 52:F,H). All are flattened oval in cross-section and measure from 1.9 to 2.4 cm wide.

Kayak Deck Stringer Fragments

Table 5:40 Kayak Keelson/Deck Stringer Fragments

Catalog	Artifact Type	Material	Context
4713	Kayak keelson/deck stringer	Wood	House floor 1
3084	Kayak keelson/deck stringer	Wood	House floor 4
3657	Kayak keelson/deck stringer	Wood	House 5 roof sod
6392	Kayak keelson/deck stringer	Wood	House floor 8
5575	Kayak keelson/deck stringer	Wood	House floor 9A
6468	Kayak keelson/deck stringer	Wood	House floor 9A
6497	Kayak keelson/deck stringer	Wood	Upper basal midden
5622	Kayak keelson/deck stringer	Wood	House floor 10

Nine kayak deck stringer fragments are represented by stout wooden shafts, semi-circular to u-shaped in profile. Kayak deck stringers lie under the apex of the angled kayak deck. Keelsons run the length of the bottom of the kayak. Deck stringers and keelson fragments are virtually indistinguishable from each other. They resemble exactly those used by Alutiiq craftsmen today in replicating kayaks, modeled on 19th century specimens. The Karluk One examples measure from 2 to 2.9 cm wide. Four of these fragments exhibit carefully carved u-shaped notches on one end where the stringer was attached to the cockpit coaming (Plate 52:I,J).

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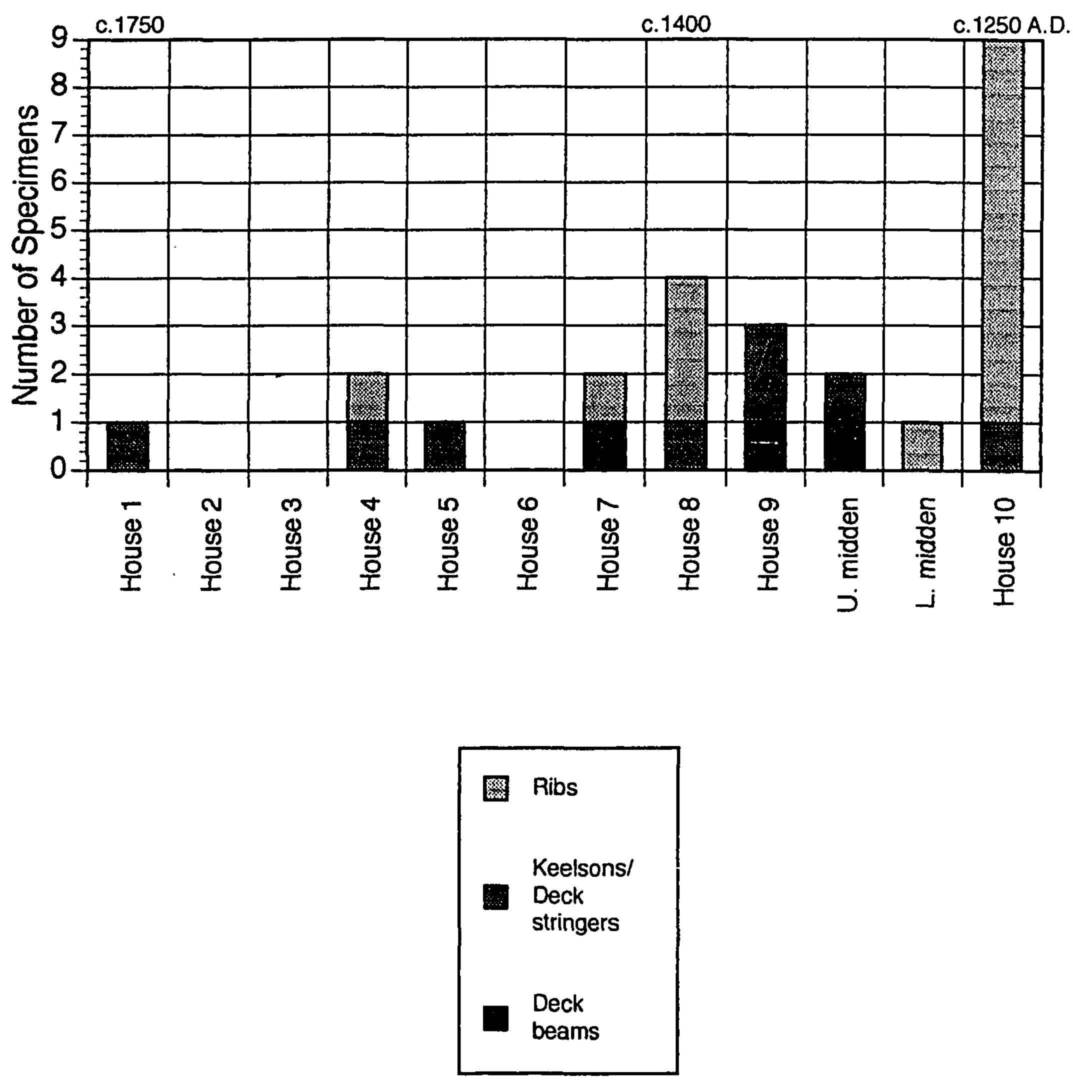
Chart 6: Kayak Frame Parts from Karluk One



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Kayak Deck Attachments

Table 5:41 Kayak Deck Attachments

Catalog	Artifact Type	Material	Context
1320	Kayak Deck Attachment	Cottonwood Bark	House floor 1
1668	Kayak Deck Attachment	Cottonwood Bark	House floor 6

Kayak deck attachments were used in conjunction with cordage and lashed across the deck to hold darts, harpoons, throwing boards, spare paddles, wooden quivers, and other gear. Two complete deck attachments, both carved from cottonwood bark, were found at Karluk One.

One piece is a simple harpoon rest (Plate 52:D), 3.6. cm long, and 1.8 cm wide, and 2.7 cm thick. It has a sub-rectangular base, and is triangular in cross-section. The base is slightly curved to fit snugly against a kayak deck and has an oval hole for attachment.

Another kayak attachment also has a curved rectangular base, measuring 9.8 cm long and 1.4 cm wide (Plate 52:E) The dorsal side has a long curved notch, suggesting that this attachment was used to secure line.

Angyaq Frame Parts

Table 5:42 Angyaq Frame Parts

Catalog	Artifact Type	Material	Context
1186	Angyaq part	Wood	House floor 6
2875	Angyaq deck beam	Wood	House floor 7
3519	Angyaq bow piece	Wood	House floor 2

The Alutiiq *angyaq*, called *baidara* by the Russians, was a wooden framed, skin covered boat equivalent in size and function to the *umiak* used

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by Eskimos elsewhere in the Arctic. Gideon recorded that one use of the *angyaq* was in warfare: "They went on raids in about 30 baidaras, each manned by 20 men, sometimes a few more or less"(1989:43). Realistic models of kayaks and *anyaqs*, including detailed wooden frames covered by skin, with dressed figurines and associated gear, were made by the Koniag and Aleuts well into the 20th century. Numbers of these models were sold to visitors, and exist in museum collections today (Krech 1989:131; Varjola 1991:243). These models were traditionally made for ceremonial purposes. Model umiaks and crews were used in a feast for the souls of whales, and in south west Alaska model kayaks were featured in the messenger feast (Krech 1989:132, Lantis 1947). *Angyaq* models in the Lowie museum still retain figurines, represented wearing spruce root hats and seal decoy helmets. A figure placed in the bow has a drawn bow, while the figure standing at the stern has a spruce root hat with a stack of what are called in the northwest coast literature "potlatch buns."

Koniag culture probably was similar to other Eskimo groups in Alaska in that ownership of a large open boat was important to status and perhaps an organizing factor in the social structure of the community (Sheehan 1985). *Anyaqs* were quickly confiscated by the Russians with the establishment of a permanent presence in 1784 (Lisianski 1814). No full sized Alutiiq *anyaqs* are known to exist in ethnographic collections, and there are no good historic sketches. Only the models survive intact; fortunately they were so accurately rendered that full sized angyaq frame parts found at Karluk One during the 1987 season were identified, as well as several model angyaq frame parts from a prehistoric context found in earlier seasons.

A weathered plank is 49 cm long, 11.4 cm wide, and 1.1 cm thick has been tentatively identified as an *angyaq* part (Plate 54:A). It has a tapered end

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that is knobbed and scarfed, and with a small hole. It is shaped like a rudder but seems rather thin for this purpose.

An *angyaq* deck beam is a carved board about 57 cm long with a triangular cross-section (Plate 54:C). Identical to the smaller scale deck beams on ethnographic models, it is 8 cm wide and has a flat central ridge which runs the length of the specimen. It appears to be incomplete, and probably re-worked, as one end tapers to a handle-like shape. A pair of holes are present near the fractured end. A larger, more complete deck beam was found during the 1987 season; a private collector also found one eroding from the site in 1993.

A roughly crescent-shaped plank 65.2 cm long, 10.4 cm wide, and 2 cm thick has been identified from the ethnographic *angyaq* models as part of the bow piece (Plate 54:B). A row of nine carved oval holes near one edge of the piece average about 1.5 cm in diameter. Additionally this piece retains traces of red surface paint.

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Plate 54

Angyaq frame parts

Object	Description	Catalog #
A	Possible Anyaq Frame Part, Wood	193/1186
B	Anyaq Bow/Gunwhale Piece, Wood	193/3519
C	Anyaq Deck Beam, Wood	193/2875

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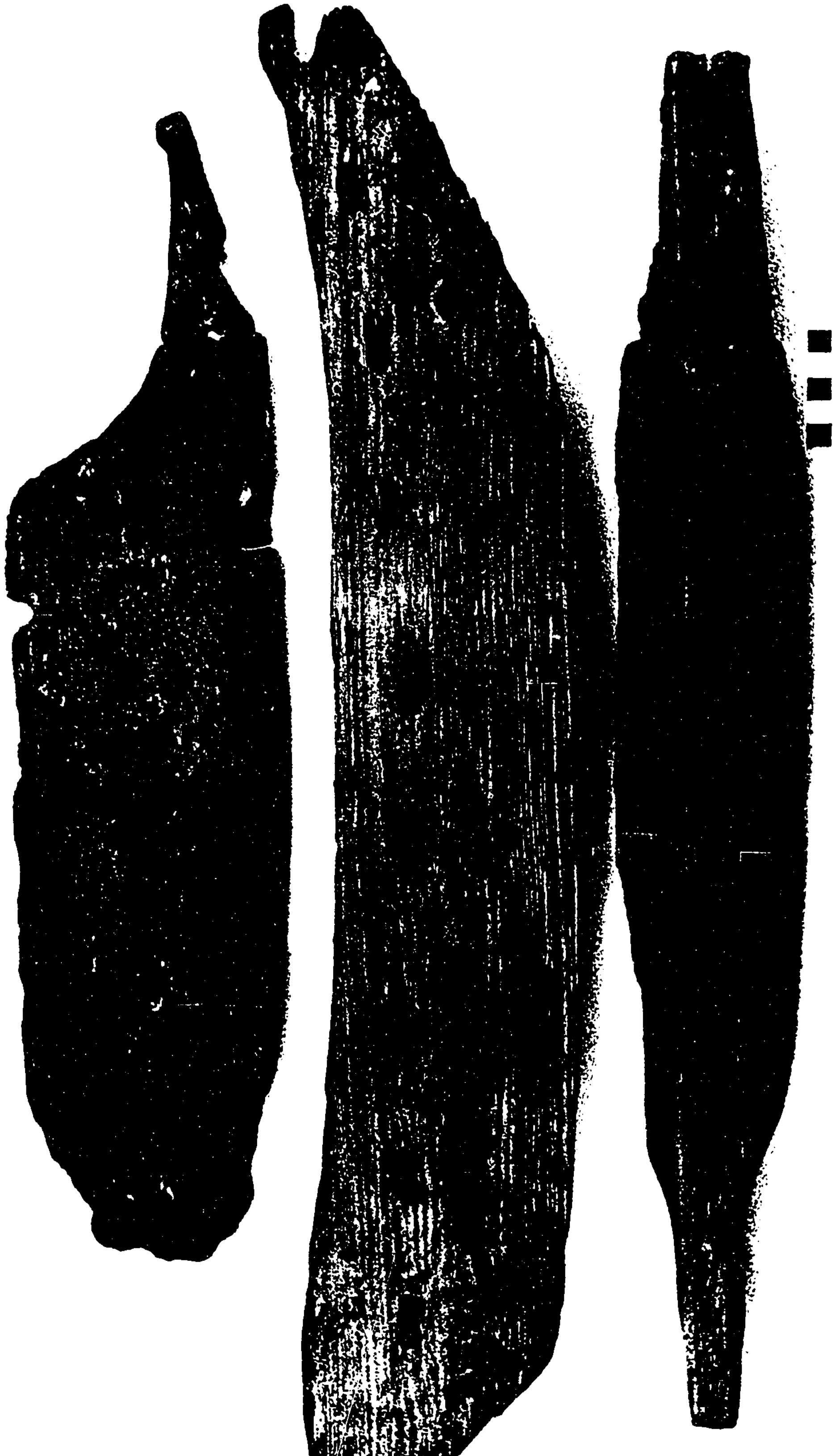

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Plate 53: Ethnographic *Angyaq* model from Kodiak Island

Lowie Museum; Alaska Commercial Company Collection

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Chapter 6: Domestic and Household Artifacts

Oil Lamps *(Kumarwik)*

Table 6:1 Oil Lamps

Catalog	Artifact Type	Material	Context
3920	Oil lamp	Diorite	House 1 roof sod
4288	Small oil lamp	Basalt	House 1 roof sod
3325	Small oil lamp	Diorite	House 1 wall sod
2971	Small oil lamp	Basalt	House floor 1
4014	Oil lamp	Diorite	House floor 1
4293	Small oil lamp	Diorite	House floor 1
4345	Small oil lamp	Diorite	House floor 1
4294	Small oil lamp	Diorite	House floor 1
4149	Small oil lamp	Diorite	House 3 roof sod
4807	Oil lamp	Diorite	House floor 6
4833	Oil lamp	Diorite	House floor 7
4927	Small oil lamp	Diorite	House floor 7
2072	Small oil lamp	Diorite	House floor 7
5545	Small oil lamp	Diorite	House floor 8
5608	Oil lamp preform	Diorite	House floor 9B

A total of 15 complete stone oil lamps and one lamp preform were found at Karluk One. The more carefully manufactured lamps from Karluk one were made of a gray-green diorite. Residents in Larsen Bay report a large diorite outcrop on Bear Island, near the mouth of Uyak Bay. This area, known locally as "Lamp Rock Beach" is about 12 miles north of Karluk Lagoon.

The majority of lamps fall into a broad class of ovate stone lamp found throughout the prehistoric sequence. Lamps recovered from Koniag phase sites by Clark (1974:114) have a similar stylistic range. Only the two largest lamps and two smaller lamp types have the diagnostic attributes of Koniag phase lamps. These specimens are ovate, with a wide flat rim, a deep oil reservoir, and a wide wick shelf.

The largest oil lamp from Karluk One is complete and was found tucked into a wood lined storage box dug into the sod wall of a rear side room.

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The top of the lamp is 25 cm wide, 32.4 cm long and 13 cm high (Plate 55). The rim is flat and 3 cm wide and surrounds an oil reservoir 18.3 cm wide and 24 cm long with a depth of 4.5 cm. The wick shelf is 8.5 cm wide and ground smooth. Charring is visible along the edge of the wick shelf.

The other large oil lamp is nearly identical in form but was found eroding near the surface of the site. It is complete except for a missing 10 cm chunk on the outside rim. The top surface of this specimen measures 26.5 cm wide, 31.5 cm long, and 12 cm high. A flat rim 4 cm wide surrounds an oil reservoir 18.3 cm wide, 24 cm long, and 2.4 cm deep. The wick shelf is 5.5 cm wide. Charring exists on the wick shelf and on the rim edge opposite it on the vertical axis, suggesting that on at least one occasion, two wicks were maintained at the same time.

Koniag oil lamps lack a prow and other forms of rim decoration observed in Kachemak oil lamps (Heizer 1956). The deep bowl typical of the better manufactured 'formal' oil lamps lacks designs in relief, such as anthropomorphic faces, sitting figurines, and twin knob elements seen in Kachemak lamps. These elements may have served to hold a portion of sea mammal fat, with oil gradually collecting into a secondary basin, or a central groove which may have collected oil from sea mammal fat. These features are nearly always absent in Koniag lamps. Pecked designs are also observed on some Kachemak lamps; the bases of Koniag lamps are undecorated and modified by rough pecking to create a rounded shape. Large Koniag style lamps identical to those recovered from prehistoric house floors at Karluk One are also found in historic contexts. One was excavated in a mid-19th century barabara at KAR-37 (Knecht and Jordan 1985). Holmberg collected such a lamp in 1851, which was subsequently illustrated by Birket-Smith (1941:149).

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Plate 55

Large oil lamp

Diorite, Catalog # 3920

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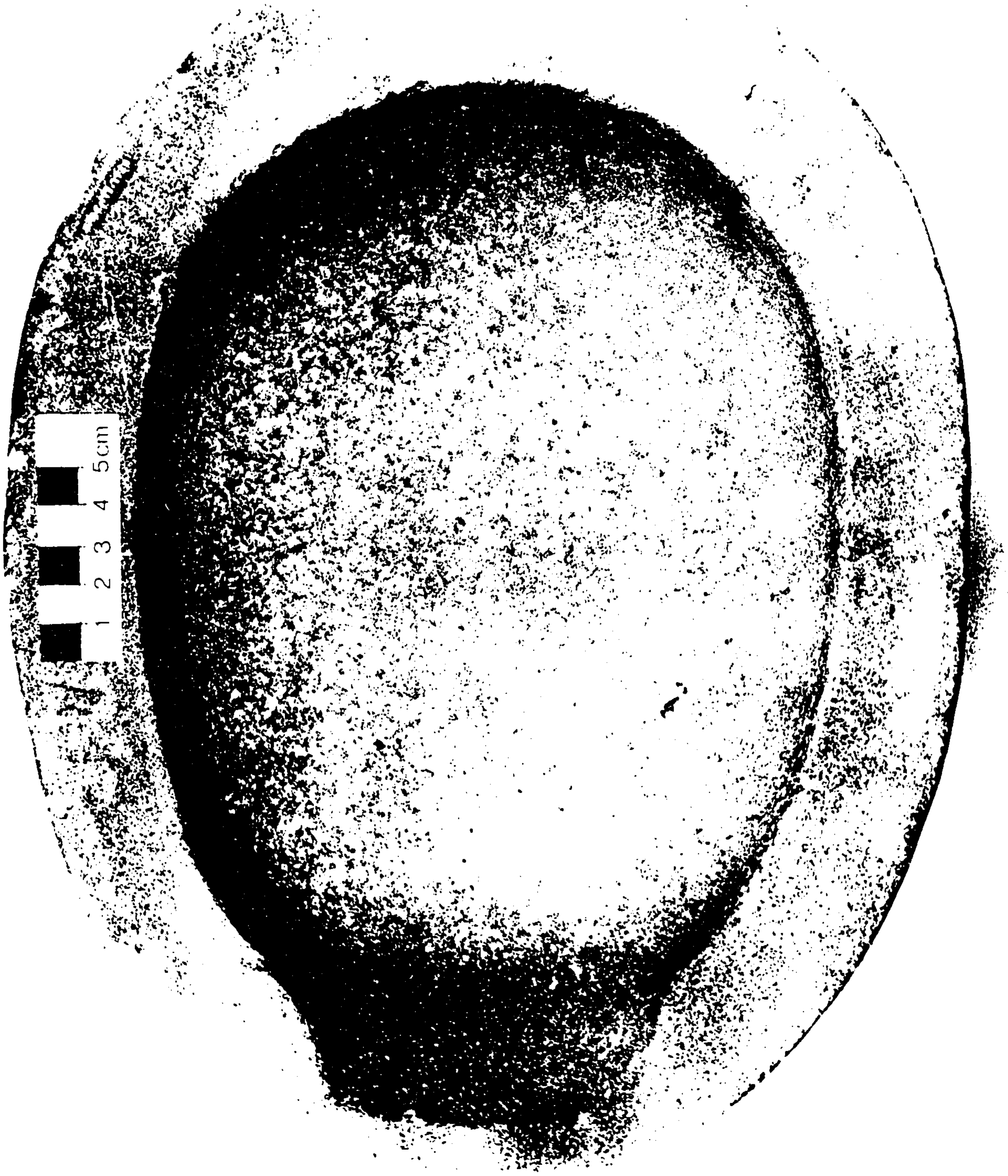

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Oil lamps of various sizes are found throughout the prehistoric sequence of the Kodiak Archipelago and increase in size through time. I have seen fragmentary Koniag style oil lamps in private collections that were once more than 70 cm in diameter. The greater maximum size of Koniag lamps is probably tied to the greater size of Koniag houses and may reflect inter-village trade relationships. Unlike Kachemak lamps, Koniag examples appear to have been designed to hold oil from sea mammal fat previously rendered in ceramic vessels. The relative distribution of prehistoric ceramics on Kodiak corresponds closely with sites adjacent to sea mammal migration routes.

Ceramic sherds in Karluk One were found in only in house 1 and the overlying disturbed levels. The majority of lamps were also found in house 1. This corresponds with the relatively greater quantity of sea mammal hunting gear in house 1, in comparison with levels post-dating A.D. 1400. The numbers of lamps in house 1 is probably another reflection of a general resurgence in sea mammal hunting, which seems to be concurrent with the end of the Little Ice Age early in the 18th century.

A sub-rectangular lamp of greenish diorite was also recovered in a disturbed context on the site (Plate 56: A). This specimen has been casually pecked into shape below the rim. The under surface as not been modified. The top of this lamp, however, has been carefully pecked and ground. The lamp is 12.3 cm wide and 21 cm long, and is 8.1 cm high. The rim is flat and measures 2.4 cm wide. The wick shelf has been removed by a large flake broken from the front of the lamp. The oil reservoir is 15 cm long, 8.2 cm wide, and 1.3 cm deep. There is some charring and a light encrustation of burned sea mammal oil below the wick shelf area. Sub-rectangular lamps may be another form diagnostic of the Koniag lamps (Clark 1974: 114),

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Plate 56

Oil lamp and oil lamp preform

Object	Description	Catalog #
A	Oil lamp, diorite	193/6866
B	Oil lamp preform, diorite	193/2015

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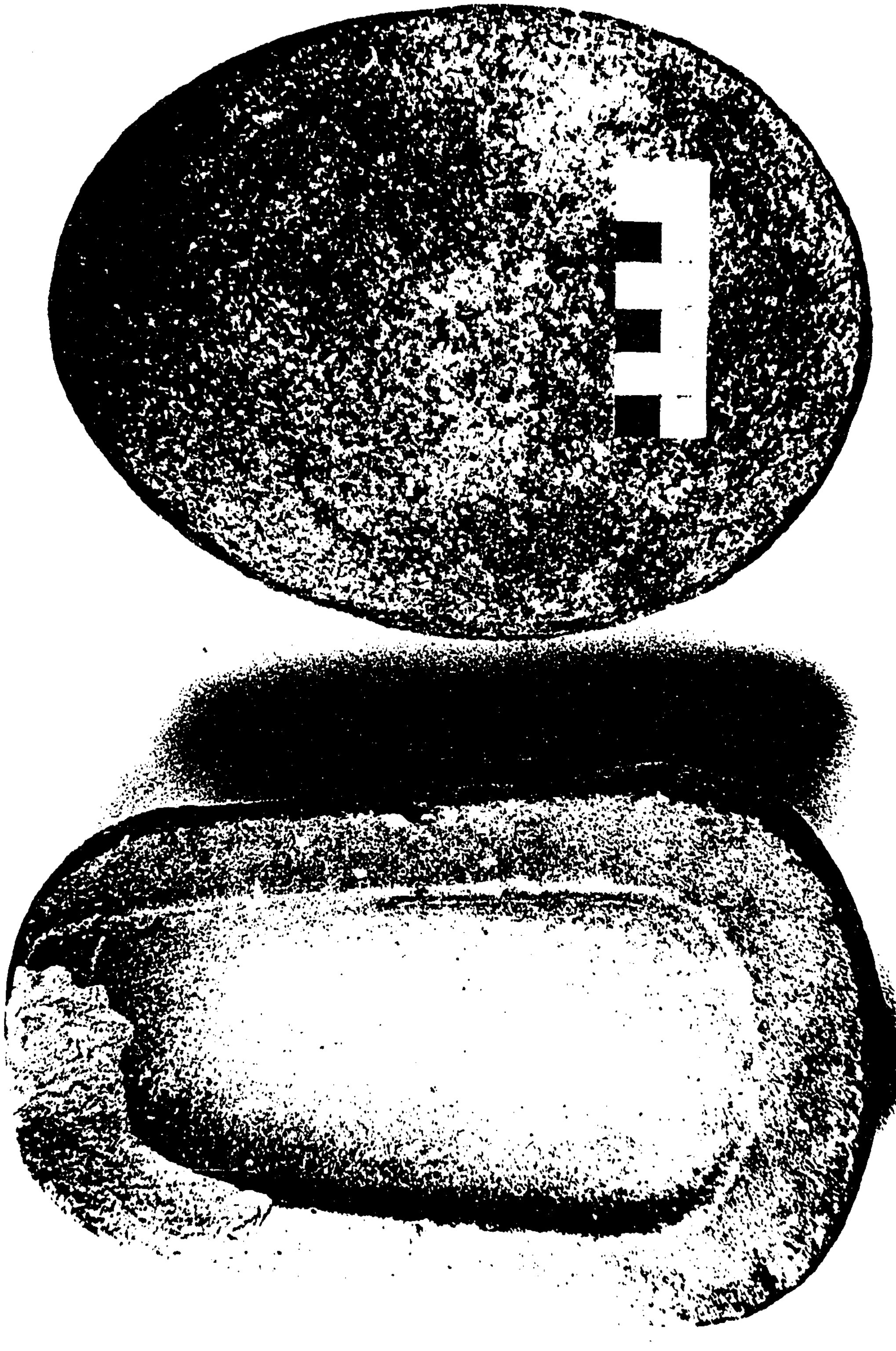

A

B

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although they are considerably less formally modified than the larger Koniag oil lamps.

Two of the 15 smaller stone lamps found on the site were made in a style reminiscent of the larger lamps described above (Plate 57: A,B). One lamp has a top surface 10 cm wide, 12.9 cm long, and is 5.3 cm high (Plate 57: A). The rim slopes slightly outward and is 1.3 cm wide. The wick shelf is 2.5 cm in maximum width, and the oil reservoir is 9 cm long, 7.2 cm wide and 0.8 cm in maximum depth.

A second small ovate lamp is smaller, with the top surface measuring 10.4 cm long and 7.9 cm wide (Plate 57: B). The rim, 1.1 cm wide, slopes downward from the oil reservoir, which is 8 cm long, 5.9 cm wide, and has a maximum depth of only 0.6 cm. The wick shelf is poorly defined, but is stained from charring.

Seven oil lamps consist of little more that natural cobbles with a pecked oval hollow which in some cases has a poorly defined, spout shaped end which served as a wick shelf (Plate 57: C-G). One such specimen has natural, slightly pecked hollows on both sides, each of which had served at some time as an oil reservoir and has associated charring marks (Plate 57: D). All of these simply made lamps lack rims or other embellishments. The lamps are made from graywacke cobbles, rather than the diorite utilized in the more extensively modified lamps. They range in size from a cobble 14 cm long, 11 cm wide, and 6 cm high to small 'hunter's lamps' 6.8 cm long, 5.1 cm wide, and 2.5 cm wide. Small, stylistically informal oil lamps are also common in Kachemak assemblages (Steffian 1994).

According to oral tradition, the smallest lamps were used as a source of warmth for those engaged in stationary, tedious, outdoor tasks, such as working skins or cleaning fish. The lamps were lit and simply placed under

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Plate 57

Small oil lamps

Object	Description	Catalog #
A	Small oil lamp, diorite	193/4833
B	Small oil lamp, diorite	193/668
C	Small oil lamp, unknown lithic	193/4927
D	Small oil lamp, unknown lithic	193/5545
E	Small oil lamp, diorite	193/
F	Small oil lamp, graywacke	193/4288
G	Small oil lamp, graywacke	193/4293

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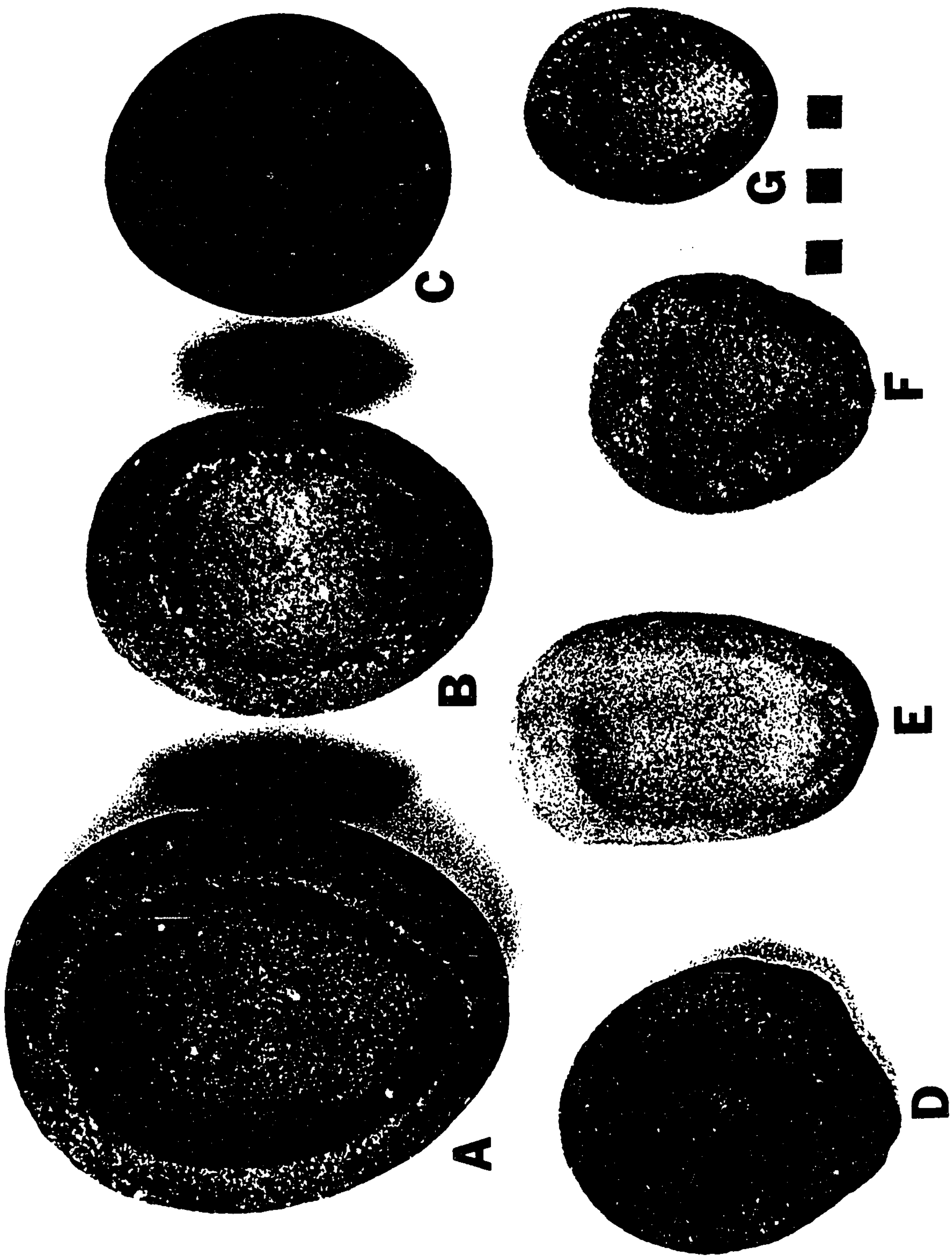

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the parka and between the feet. Heat from the burning lamp rose inside the parka and warmed the user.

Three completely unmodified fist-sized cobbles with natural hollows were also utilized as oil lamps, judging from charring in the hollows. Three similar uncharred cobbles were found on Karluk One housefloors and have also been tentatively identified as oil lamps. As Clark noted (1974:114), small, casually prepared lamps are the most common form of oil lamp type found in Koniag contexts.

A single diorite oil lamp preform has been carefully pecked into an oval shape, however, the oil reservoir was barely started (Plate 56: B). The top surface of this lamp preform is 18.3 cm long and 14.4 cm wide. It stands 8 cm high.

Rock Scoops *(Saqiyuun)*, and Water Dippers *(Culuun).*

Table 6:2 Rock Scoops and Water Dippers

Catalog	Artifact Type	Material	Context
764	Rock scoop preform	Wood	House floor 2
2569	Rock scoop	Wood	House floor 2
1045	Water dipper	Wood	House floor 2
3956	Rock scoop fragment	Wood	House floor 3
1095	Water dipper	Wood	House floor 3
2470	Water dipper	Wood	House floor 5
2837	Rock scoop fragment	Wood	House floor 6
4816	Rock scoop	Wood	House floor 6
5972	Rock scoop	Wood	House 8 roof sod
5523	Rock scoop	Wood	House floor 8

The wooden rock scoops and water dippers in the Karluk One collection were used in the Alutiiq *maq'iwimgu'aq*, or sweat bath. Sweat baths, now referred to by the Russian term *banya* , are still commonly used in Kodiak's Native villages for the combined purposes of cleaning, socializing, and healing. The banya remains as a popularly prescribed remedy for conditions such as hangovers, arthritis, discomforts associated with

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pregnancy, and "whatever ails ya. " Groups of men and women bathe separately; although married couples sometimes go in together. Banyas most often can accommodate about six bathers, although some of the larger steam baths have enough room for several times that number. Important issues can be discussed inside the banya, and invitations to 'make banya' are sometimes extended across the village as a means of calling a meeting. Visitors from outside are invited to banya as a routine part of hospitality.

In prehistoric times, the sweat bath was probably utilized for a variety of ritual and social purposes. At least some religious/ritual associations survived into the 20th century (see Bobby Stamp's recollections below). Several older Native informants recall that elder men would recount hunting stories, detailing animal habits and hunting beliefs, while sharing the banya with younger men and boys. According to an early 19th century account, the sweat bath was an essential part of the marriage ceremony; once permission to marry was obtained from the bride and groom's fathers:

> "..the young man the following night goes to the girl's house, and lies down next to her, fully clothed; in the morning, having risen, he gathers firewood, heats rocks in the front room for a sweat bath, which he then takes together with his bride (Gideon 1989 [orig. 1803-09]: 50)."

In recent years the banya has come to resemble a wood-fired sauna. However, the more traditional *maq'iwimgu'aq* was used well into living memory. The banya is now contained in a separate building, usually some distance from the house. This is done primarily to avoid fire as nearly all banyas catch fire at one time or another at a contact point between stoves and roofs and walls. Prehistoric sweat baths were located in a barabara side room. A small interior and low roof made them easier to heat. As barabaras fell into

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disuse during the early decades of the 20th century, small sod bathhouses with an outdoor fire pit were used.

Using the *maq'iwimgu'aq* involved heating stones on the hearth in the central room of the barabara, and transporting them in to the bathers inside the bathing room. Rocks were carefully selected to avoid types and shapes that would crack too quickly, or even explode when splashed with water. Fist sized graywacke cobbles work nicely. Granite cobbles also work, but they tend to crumble and break quickly. Quartzite can explode, and slate cobbles are undesirable because they shatter, leaving sharp slivers behind which are difficult to remove from the floor. Cobbles that fracture have to be removed; a freshly fractured surface gives off obnoxious vapors when the water is poured on. Sweat bath rubble, composed of cobbles broken during the sweat bath, are a common component of archaeological middens on Kodiak, and are particularly common in late Koniag phase sites. Modern banyas also utilize cobbles; however they are stacked around the outside of an iron barrel stove, and do not come in direct contact with the fire. Today's banyas therefore do not produce the large piles of rubble associated with the older *maq'iwimgu'aq.*

Building a fire that will evenly heat as many cobbles as possible is considered an art. Heavy cross pieces of wood are placed across the fire; then smaller sticks are built up to form a pyramid-shaped pile. Rocks are leaned strategically around the outside of the wooden pyramid which eventually burns and collapses; carrying the rocks into the reddened coals. According to recollections of an Alutiiq elder from Prince William Sound, building the fire for the *magewik* had some further significance:

> ...the heating of the rocks was called *kumarci.* The younger hunters would compete or race to see who could get to the bathhouse first to heat the rocks. We believed

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> that the bathhouse had a spirit called *maqirem suunua;* or person of the bathhouse. Not only one but all the bathhouses as a whole....If you heated rocks for him he made your hunt successful (Bobby Stamp: 1989).

Once the rocks were heated and the bathers ready inside the *magewik;* an individual removed the rocks from the fire with a pair of wooden tongs, called *qumiutuq*:

> They had two pieces of wood about four feet long that were hewed from a young sapling... They were small enough that you could put your hand around it and using the same principle as tweezers, the red hot rocks were picked up and passed to another person who was in the doorway of the bathhouse (Bobby Stamp: 1989)

Inside the *maq'iwimgu'aq,* , the rocks were dropped in an area boxed off near the door; the sweat bather would use a paddle shaped wooden rock scoop, or *saqiyuun* , to pick up the rocks and arrange them into a conical pile, or *ya'amat;* as sharply peaked as possible, near the middle of the floor. Bentwood tubs held water for splashing on the rocks, and for bathing. A wooden scoop, or dipper called *culuun,* such as those found at Karluk One, was used to splash the rocks with water, producing steam. A rock or two could be dropped into one of the tubs to warm the water for washing. Use of the tongs in removing the rocks from the fire helped insure that coals and ash would not also be transferred to the water buckets. Even under water, heated rocks can scorch and otherwise damage the bottom of the vessel. As one might expect, burn marks are often seen on the paddle-shaped scoops and bentwood vessel bases recovered from Karluk One.

Steam and warm water were supplemented with scrubbers, *tahick,* which are made from the roots of rye grass (Elymus mollis). They are picked up on the beach, where the action of the surf takes the fine roots and forms them into a dense ball which is then trimmed and cleaned. Sometime

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during the 19th century the *tahick* was supplemented by the Russian *wanick*, or switch. Russian and Finnish sweat bathers lash themselves with a switch which brings blood to the surface of the skin and increases the effect of the heat.

Rock Tongs *(qumiutuq:)*

Wooden tongs were used to move heated rocks from the fire for use in the sweat bath, as well as in cooking and heating. A total of 76 wooden bluntly pointed shaft fragments are oval in cross-section and have battered tips. They average about 2 cm in diameter, and when complete, measure from 50-60 cm long. The tongs consisted of a pair of these shafts bound together near one end. Complete tong shafts exist in the 1987 and 1994 assemblages from Karluk One. A complete tong shaft was found be Hrdliçka in an Aleutian burial cave and is now in the Alan May collection in the Anchorage Museum of History and Art.

Some of the shaft fragments may have had alternative uses. They resemble wooden stringers, the long components that fit between the bow piece and stern of a kayak frame. Typical single-hatch kayak frames included about 20 stringers, each running nearly the length of a kayak frame roughly 6m long. They have similar diameters and bluntly pointed ends however, there is a lack of a corresponding quantity of medial fragments in the assemblage. Wooden fish traps recovered archaeologically from southeastern Alaska are made of similarly shaped shafts, however, the use of fish traps is unrecorded among the Koniag in ethnohistorical accounts.

Wooden Rock Scoops ***(Saqiyuun)***

Four wooden rock scoops have a flat, spatulate bowl and are roughly the same size and shape of a ping-pong paddle (Plates 40, 41). According to

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Chart 7: Rock Tong Fragments at Karluk One

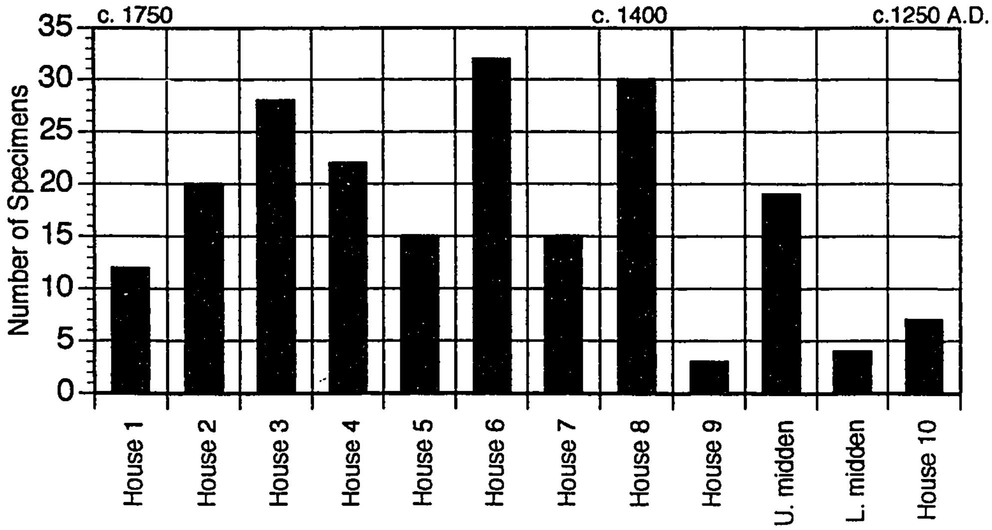

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Plate 58

Rock tong fragments

Object	Description	Catalog #
A	Rock tong fragment, wood	193/
B	Rock tong fragment, wood	193/
C	Rock tong fragment, wood	193/
D	Rock tong fragment, wood	193/
E	Rock tong fragment, wood	193/6743
F	Rock tong fragment, wood	193/

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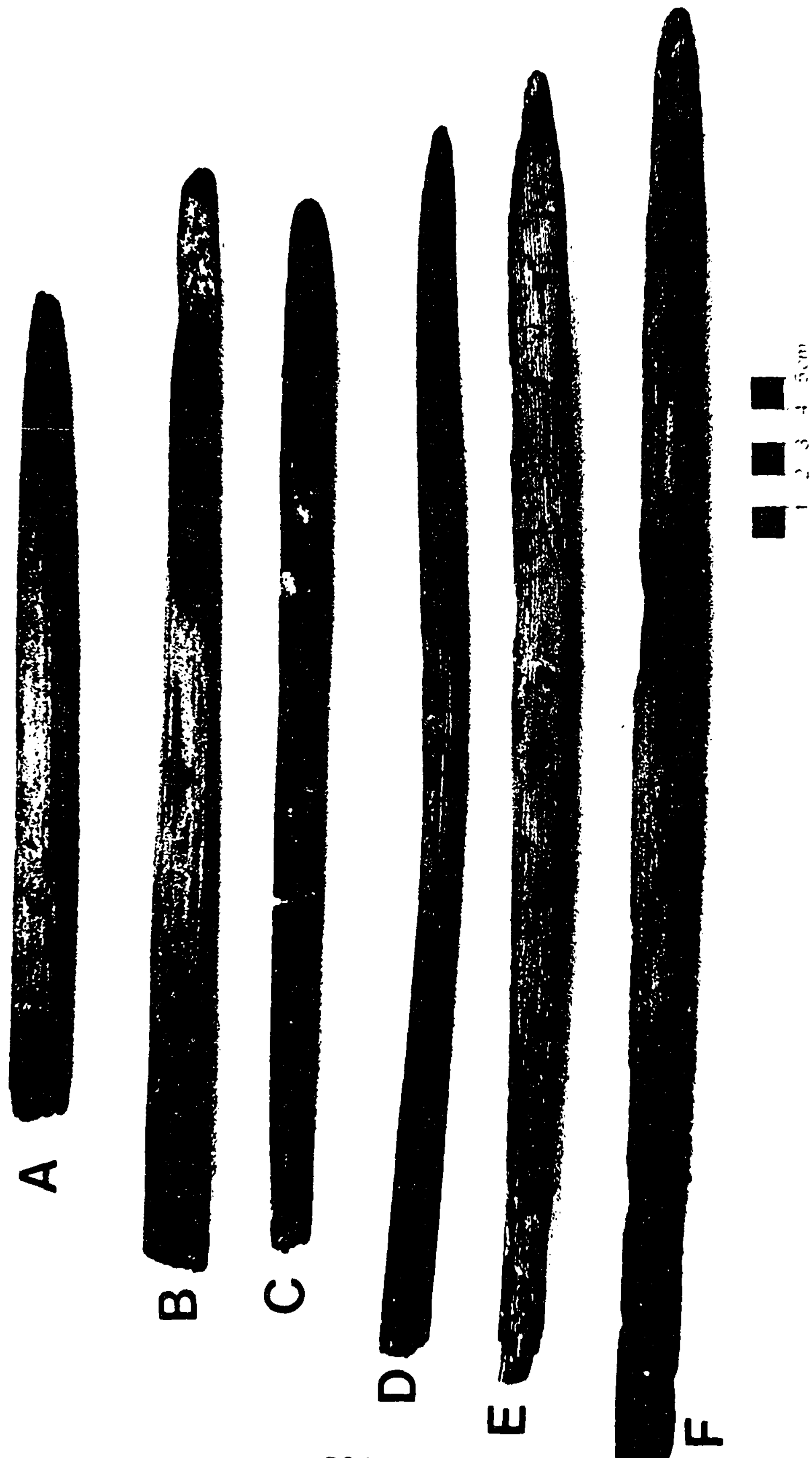

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Native elders, wooden scoops of this kind were used to remove heated sweat bath cobbles from the fire and carry them to the banya. Burn marks on the bowl surface of many of the Karluk One specimens support this identification. The reverse sides of the bowls on the three best preserved rock scoops indicate that they were also occasionally used for cutting surfaces, probably in an opportunistic fashion, like many other wooden artifacts in the assemblage.

Three very similar paddle shaped rock scoops are nearly complete, have short, sub-rectangular handles, and measure from 27 to 28.1 cm in length (Plate 58: B, Plate 59: A,B). All are missing the side edges of the bowl from battering, but when complete the scoops would have measured about 12 cm in diameter.

The largest flat bowled rock scoop measures 36.2 cm long and has a bowl diameter of 12 cm (Plate 58: A). The butt of the long, tapered handle has been carved into an abstract owl or other bird and is stylistically similar to a full-sized wooden owl mask found at the site (Plate 119:A).

A wooden rock scoop preform has been roughly shaped from a dense, hardwood (Plate 62: D). The handle and bowl have been shaped but not completed. The outer edges of the preform bear marks left by an adze bit with a width of at least 2.5 cm, and the marks of a much smaller carving tool bit are evident on the bowl surface. The preform measures 18.5 cm long and 9 cm in maximum width.

Water Dippers *(Culuun).*

Three wooden water dippers have deep bowls and lack burn marks. One finely made water dipper has a deep bowl which is semi-circular in cross-section and roughly the same size and shape as a contemporary flour scoop

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Plate 59

Rock scoops

Object	Description	Catalog #
A	Rock scoop, wood	193/4816
B	Rock scoop, wood	193/

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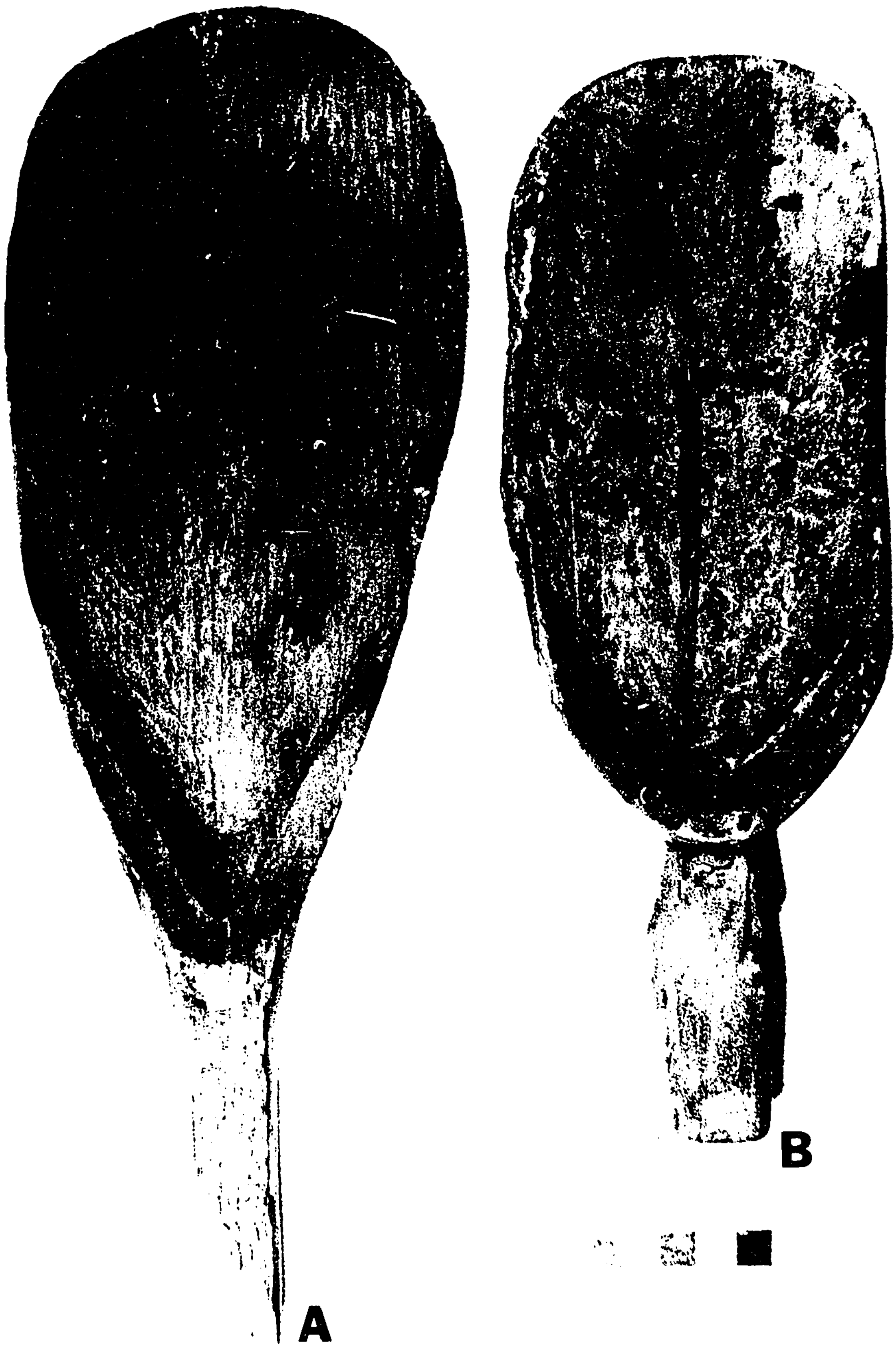

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(Plate 60: A). It measures 33 cm long and is 11.2 cm wide across the bowl. The bowl of the water dipper has a long fracture on one side which was repaired; two sets of repair holes, still retaining spruce root or wood splint lashing, were drilled on either side of the fracture line. The back of the bowl apparently saw some use as a cutting surface.

Another water dipper, incomplete and badly weathered, has a deep bowl which is sub-rectangular in shape (Plate 60: B). It is 34 cm long. Two bowl fragments and a handle represent another deep bowled water dipper. Two articulating fragments of a handle have a bit of a bowl attached and represent a water dipper of undetermined form.

Spoons and Spatulates

Table 6:3 Spoons and Spatulates

Catalog	Artifact Type	Material	Context
2764	Spoon preform	Bark	House floor 3
4012	Spoon bowl fragment	Wood	House floor 4
3076	Spoon	Wood	House 4 wall sod
2400	Spoon bowl fragment	Horn	House floor 4
2805	Spoon	Wood	House 6 roof sod
4814	Spoon	Wood	House 6 wall sod
2837	Spatulate	Wood	House floor 6
5455	Spoon bowl fragment	Wood	House floor 6
2860	Spoon	Wood	House floor 7
6039	Spatulate	Bone	House floor 8
6122	Spoon	Wood	House floor 9A

Wooden Spoons

There are three nearly complete wooden spoons in the Karluk One assemblage (Plate 61). One 15.3 cm long spoon, with a 3.4 cm wide bowl, has a long tapered handle. The shallow bowl has been cracked and mended with repair holes and lashing (Plate 61: A). A second wooden spoon of similar size; 14.3 cm long, and 3.5 cm wide, has a somewhat deeper bowl (Plate 61: B). The end of the handle has been carved into the head of a zoomorphic creature

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Plate 60

Water dippers

Object	Description	Catalog #
A	Water dipper, w/repair holes, wood	193/
B	Water dipper fragment, wood	193/

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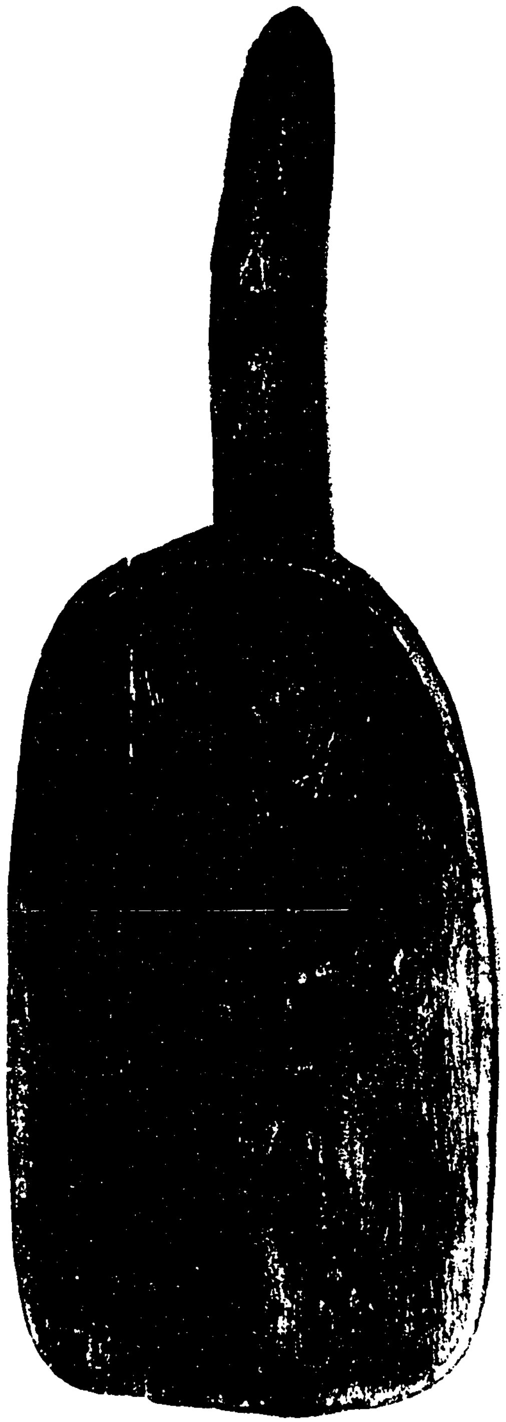

A

B

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Plate 61

Spoons and spoon fragments

Object	Description	Catalog #
A	Spoon, w/repair holes, wood	193/6122
B	Spoon, w/zoomorphic handle, wood	193/
C	Spoon fragment, w/zoomorphic handle, wood	193/2805
D	Spoon bowl fragment, wood	193/4814
E	Spoon bowl fragment, wood	193/
F	Spoon bowl fragment, wood	193/
G	Spoon bowl fragment, horn	193/2400

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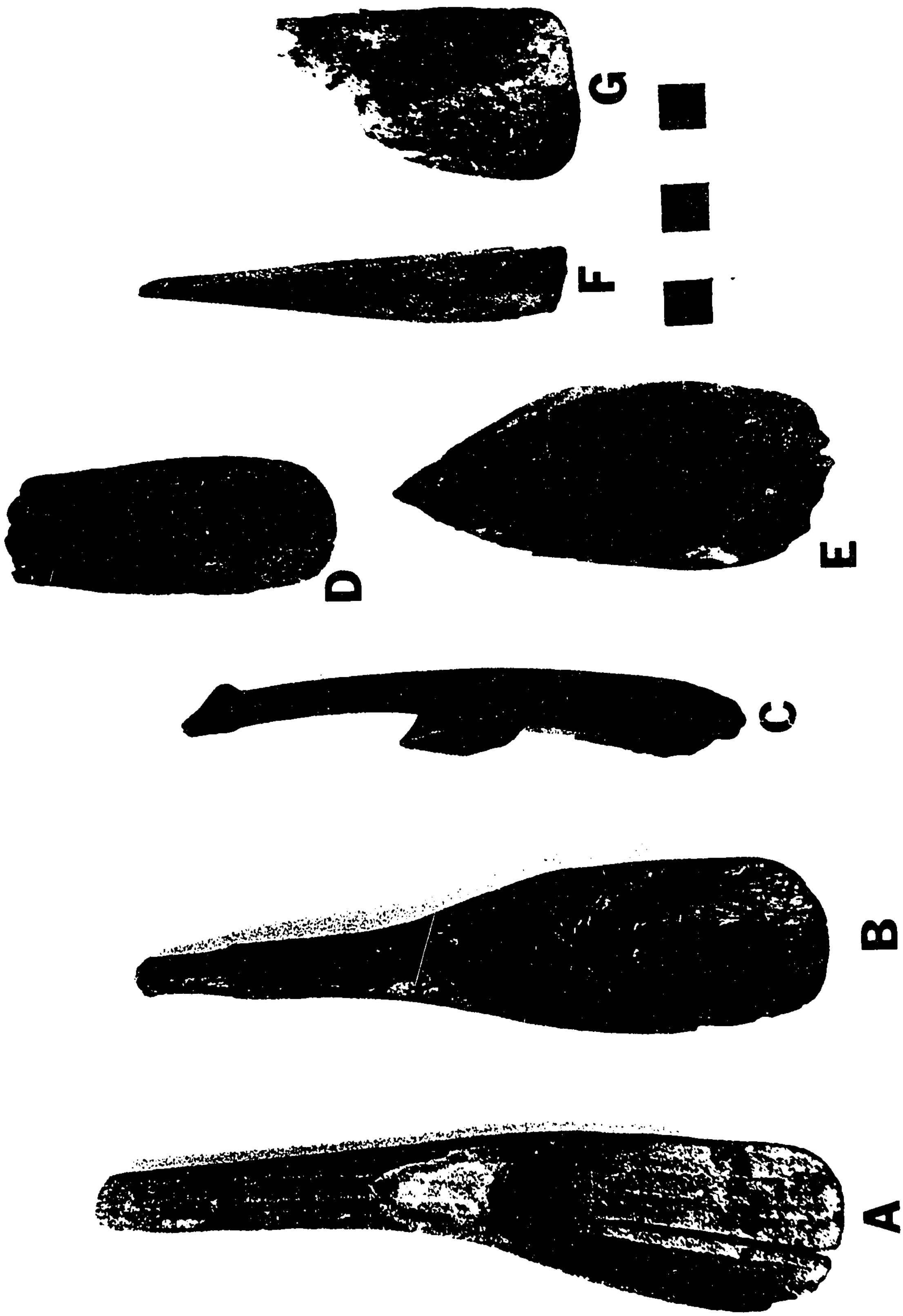

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with an open mouth and protruding tongue. Nostrils are represented by twin dents on the snout, and very lightly incised circles may have served as guides for painting the eyes. Although crudely rendered, it is reminiscent of Northwest Coast spoon motifs.

A third spoon is complete except for the end of the bowl which has been cracked off and charred (Plate 61: C). The bowl begins in a peak which extends slightly above the base of the handle. The handle is long and thin, ending in an abstract zoomorphic carving of an eared creature, somewhat similar to a caribou. Small dots, incised on the sides of the head denote the eyes. In its original complete condition, this spoon was probably about 15 cm long.

Three spoon bowl fragments represent wood spoons of a similar size to the ones just described (Plate 61: D-F). One of these bowl fragments is crudely incised with the eyes and mouth of a zoomorphic creature (Plate 61: D).

Horn Spoon Fragment

A single fragment represents the end of a small spoon manufactured from dark colored horn, probably that of a Dall sheep (Plate 63: G). Spoons of Dall sheep horn were manufactured by the Chugach and Northwest Coast Indian societies and often traded. Complete examples of horn spoons exist in several ethnographic collections. A set collected at Karluk by Fisher in the late 19th century is illustrated by Clark (1984:191).

Bark Spoon Preform

A large spoon preform of cottonwood bark measures 20.8 cm long and 6.8 cm across the bowl (Plate 62: C). The basin of the bowl has been outlined, but hollowing was barely begun before work on the piece ceased.

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Spatulates

There is one fragment of a wooden spatulate in the Karluk One assemblage in fragmentary condition. This specimen is a thin, flat, spoon-shaped piece of wood but lacks a hollowed bowl (Plate 62: A). The piece has a long tapered handle, and is 23.5 cm long and about 5 cm wide. A second, smaller spatulate is roughly carved from a thin flat piece of whale bone (Plate 62: B). This piece is 16.5 cm long and 3.6 cm wide. The distal end is only slightly concave. The handle is tapered and similar in shape to the wooden spatulate.

Bentwood Vessels

Table 6:4 Complete Bentwood Vessels

Catalog	Artifact Type	Material	Context
2660	Bentwood vessel	Wood	House 1 roof sod
2662	Bentwood vessel	Wood	House floor 1
3504	Bentwood vessel	Wood	House floor 2
2748	Bentwood vessel	Wood	House 3 roof sod
2366	Bentwood vessel	Wood	House floor 4
6346	Bentwood vessel	Wood	House floor 8
5792	Bentwood vessel	Wood	House floor 8
6460	Bentwood vessel	Wood	House floor 9A
6302	Bentwood vessel	Wood	House floor 10

Ovate Bentwood Vessels

The majority of the bentwood vessels found at Karluk One are constructed of two pieces, a thinly worked piece of flat wood bent around and pegged to an ovate base. Vessel bases have a scarf on one edge to accommodate the overlapping ends of the rim, which were in turn pegged or stitched together with baleen or spruce root.

Two complete bentwood vessels feature high, flat slides and a flat, oval bases most characteristic of the wooden vessel assemblage at Karluk One. One

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Plate 62

Spatulates and spoon preforms

Object	Description	Catalog #
A	Spatulate, wood	193/2837
B	Spatulate, whalebone	193/6039
C	Spoon preform, cottonwood bark	193/2764
D	Spoon/scoop preform, wood	193/764

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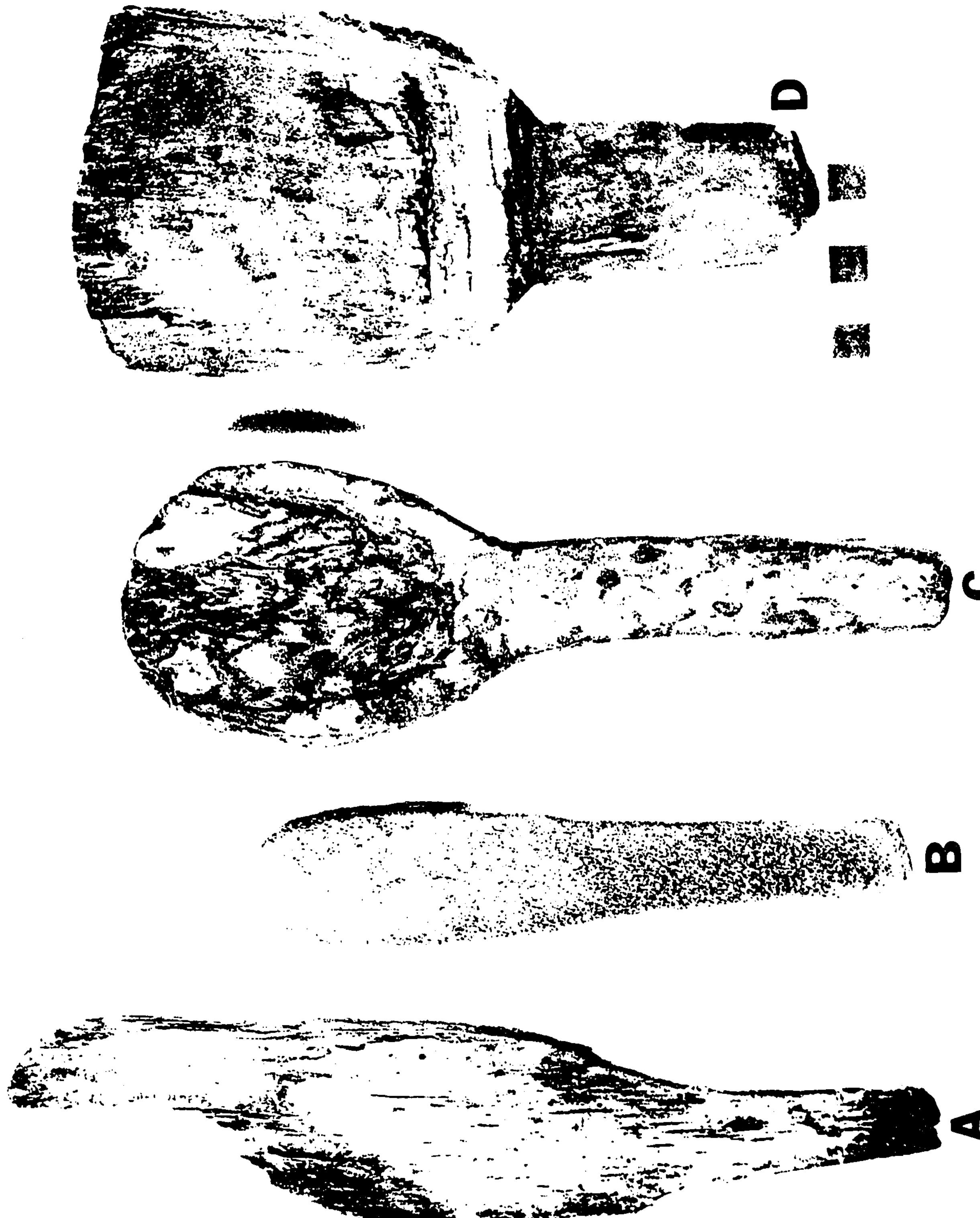

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of these specimens was found in the upper basal midden, partially crushed by an overlying deposit of sweat bath rubble (Plate 63). The base of this vessel is an oval shaped board 16.4 cm wide, 28.6 cm long, and about 1 cm thick. The rim is 8.3 cm high and 0.7 cm thick, joined together by baleen stitching and reinforced by a row of pegs.

A similarly constructed, but smaller complete vessel is 11.9 cm high and 10 cm wide (Plate 65: C). The rim is 3.1 cm high and .3 cm thick. It is possible that this piece is a lid rather than a discrete vessel.

Sub-rectangular Bentwood Vessels

Sub-rectangular vessels are represented by two complete bowls and a rim fragment (Plate 64: A-B). In these vessels, the rim component is carved of a stouter, denser piece of wood fastened by an elaborate scarf joint. Identical bentwood vessels were recovered by Hrdliçka in Aleut burial caves (Hrdliçka 1944).

One finely made and largely inatct bentwood vessel has rounded corners and thick one piece rim expertly pegged around a concave base carved from a single piece of wood (Plate 64: B). The vessel is 26.4 cm long and 22.6 cm wide, and stands 7.2 cm high at the rim. The rim is held together with an overlapping scarf joint, fastened with seven wood pegs of various sizes, possibly indicating some repair work. The rim is fixed to the base by 12 evenly spaced wooden pegs. The rim's exterior has a wide, centrally placed groove.

A second complete sub-rectangular vessel is identical in construction to the specimen described above, but smaller; 7.8 cm long and 6.8 cm wide (Plate 64: A). The base component is also basin shaped, but is badly warped. The base was fixed to the rim with six wooden pegs. A single rim fragment

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Plate 63

Wooden vessel

Wood, with wooden pegs and baleen lashing
Cat. no. 193/6460

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Chart 8: Bentwood Vessel Provenience and Frequency at Karluk One

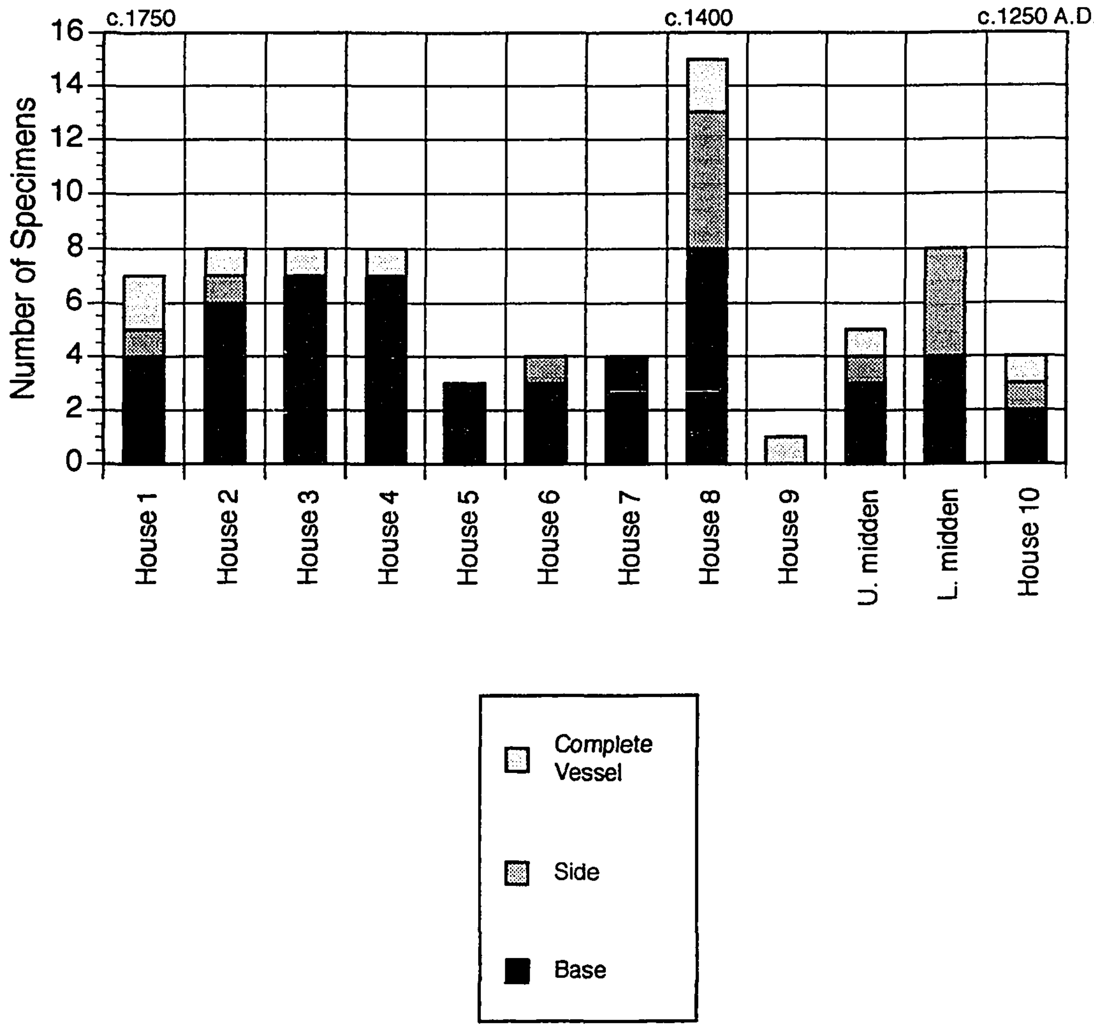

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Chart 9: Average Diameters of Bentwood Vessels at Karluk One

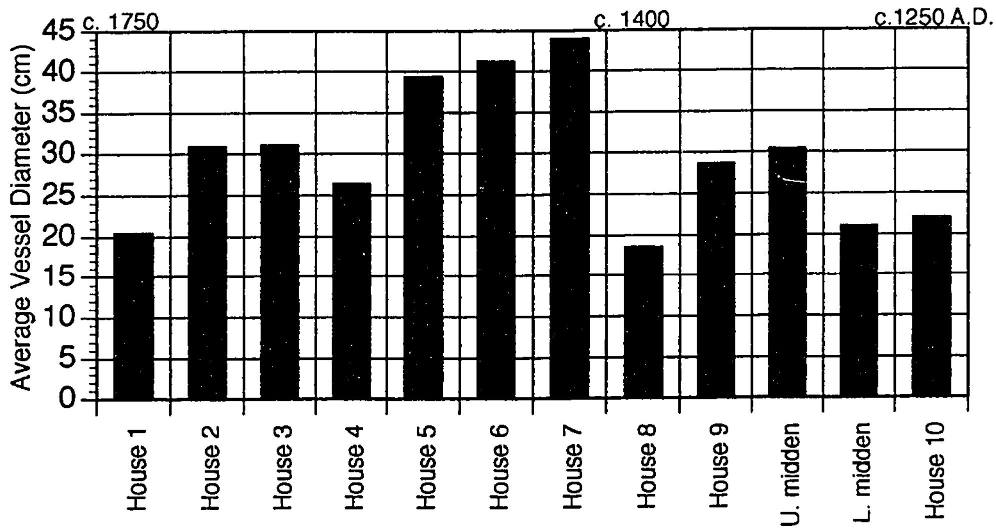

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Plate 64

Sub-rectangular bentwood vessels

Object	Description	Catalog #
A	Small sub-rectangular bentwood vessel, w/wooden pegs	193/3504
B	Large sub-rectangular bentwood vessel, w/wooden pegs	193/

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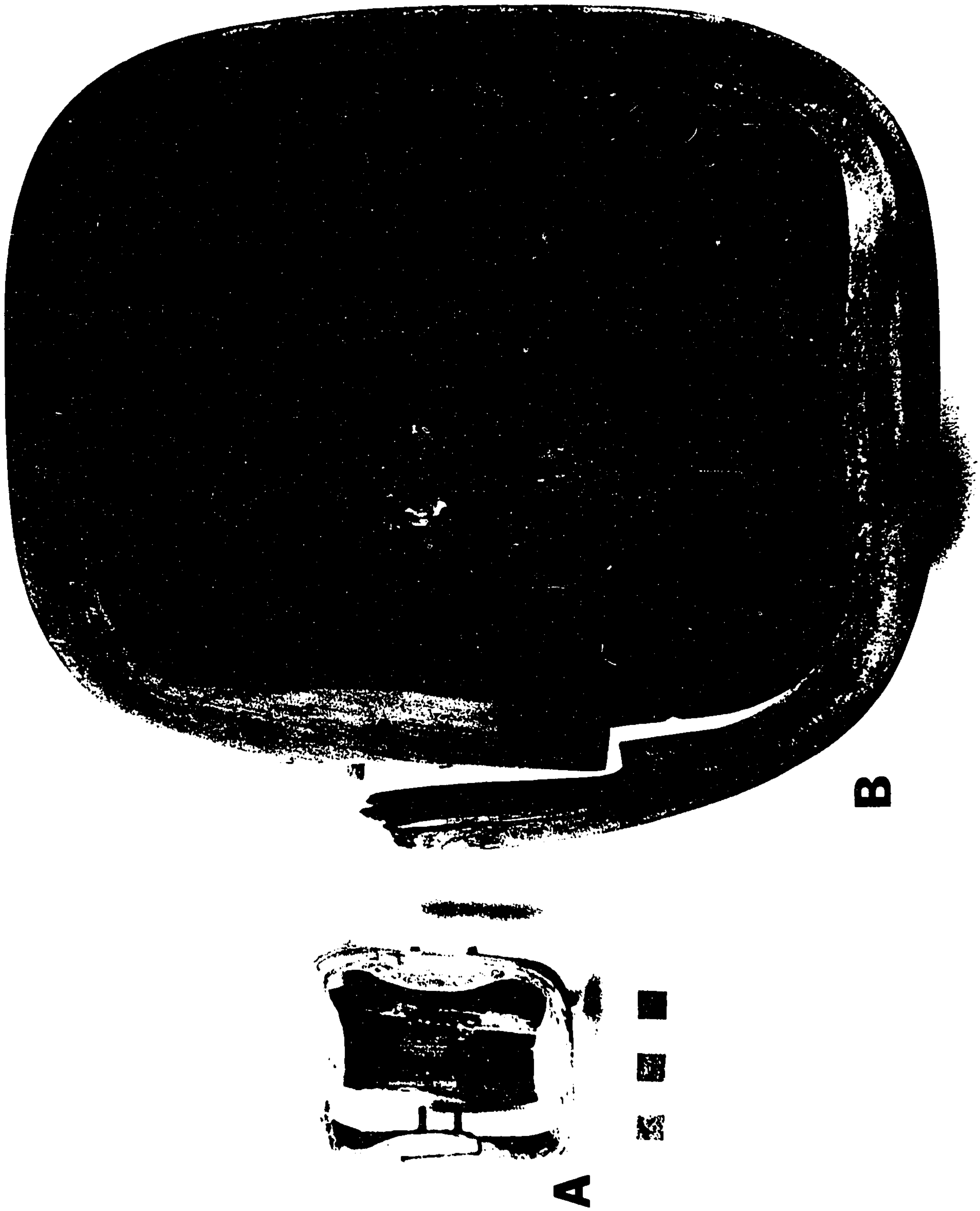

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Catalog	Artfact Type	Material	Context
3915	Vessel Base	Wood	House 1 roof sod
722	Vessel Base	Wood	House floor 1
4686	Vessel Base	Wood	House floor 1
2702	Vessel Base	Wood	House 2 wall sod
2558	Vessel Base	Wood	House floor 2
3521	Vessel Base	Wood	House floor 2
1033	Vessel Base	Wood	House floor 2
2737	Vessel Base	Wood	House 3 roof sod
4365	Vessel Base	Wood	House floor 2
2734	Vessel Base	Wood	House 3 roof sod
3383	Vessel Base	Wood	House floor 2
2735	Vessel Base	Wood	House floor 3
1406	Vessel Base	Wood	House floor 3
1056	Vessel Base	Wood	House floor 3
1915	Vessel Base	Wood	House floor 3
4166	Vessel Base	Wood	House floor 3
1642	Vessel Base	Wood	House floor 4
4412	Vessel Base	Wood	House floor 4
2769	Vessel Base	Wood	House floor 4
2781	Vessel Base	Wood	House floor 4
2768	Vessel Base	Wood	House floor 4
2779	Vessel Base	Wood	House floor 4
1962	Vessel Base	Wood	House floor 4
4437	Vessel Base	Wood	House floor 5
2623	Vessel Base	Wood	House floor 5
4641	Vessel Base	Wood	House floor 5
2824	Vessel Base	Wood	House floor 6
2827	Vessel Base	Wood	House floor 6
2828	Vessel Base	Wood	House floor 6
5469	Vessel Base	Wood	House 7 roof sod
4249	Vessel Base	Wood	House floor 7
4907	Vessel Base	Wood	House floor 7
2857	Vessel Base	Wood	House floor 7
6316	Vessel Base	Wood	House 8 roof sod
6411	Vessel Base	Wood	House floor 8
6323	Vessel Base	Wood	House floor 8
5508	Vessel Base	Wood	House floor 8
6049	Vessel Base	Wood	House floor 8
4992	Vessel Base	Wood	House floor 8
6420	Vessel Base	Wood	House floor 8
6451	Vessel Base	Wood	House floor 8
5226	Vessel Base	Wood	Upper basal midden
6124	Vessel Base	Wood	Upper basal midden
6496	Vessel Base	Wood	Upper basal midden
5275	Vessel Base	Wood	Lower basal midden
5051	Vessel Base	Wood	Lower basal midden
5277	Vessel Base	Wood	Lower basal midden
5850	Vessel Base	Wood	Lower basal midden
5286	Vessel Base	Wood	House floor 10
6152	Vessel Base	Wood	House floor 10

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represents a third vessel of this type, similar in size to the larger specimen described above.

A total of 29 vessel bottom fragments represent ovate vessels ranging from 11 to 51 cm in diameter. Twelve complete vessel bottoms were found, representing wooden vessels measuring between 11 to 37.5 cm in diameter (Plates 47, 49-51). Smaller vessel bottoms, less easily broken than their larger counter-parts, constitute most of the complete examples (Plate 65). Vessel bottoms smaller than 20 cm in maximum diameter lack burn marks, probably left by cooking stones, seen on larger specimens (Plate 68). This suggests that the larger bentwood vessels may have used for cooking, and that smaller vessels served other purposes.

Remnants of baleen, spruce root and/or pegs, are often visible around the edge of vessel bottoms, as well as holes where the rim was attached. One vessel bottom has a neatly bored 1.2 cm circular hole near its center, probably for draining stored liquid (Plate 66). At least one vessel bottom has repair holes (Plate 70).

Bentwood Vessel Rim Fragments

Table 6:6 Bentwood Vessel Rim Fragments

Catalog	Artifact Type	Material	Context
3367	Vessel side fragment	Wood	House floor 1
1017	Vessel side fragment	Wood	House floor 2
4889	Vessel side fragment	Wood	House floor 6
5478	Vessel side fragment	Wood	House 8 roof sod
6353	Vessel side fragment	Wood	House floor 8
4998	Vessel side fragment	Wood	House floor 8
5689	Vessel side fragment	Wood	House floor 8
5214	Vessel side fragment	Wood	House floor 8
6133	Vessel side fragment	Wood	Upper basal midden
5831	Vessel side fragment	Wood	Lower basal midden
5842	Vessel side fragment	Wood	Lower basal midden
5830	Vessel side fragment	Wood	Lower basal midden
5848	Vessel side fragment	Wood	Lower basal midden
5331	Vessel side fragment	Wood	House floor 10

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Plate 65

Small bentwood vessel bases

Object	Description	Catalog #
A	Bentwood vessel base, wood	193/4412
B	Bentwood vessel base, wood	193/4365
C	Bentwood vessel base, w/ rim, wood	193/5792
D	Bentwood vessel base, w/ wooden pegs, wood	193/1056
E	Bentwood vessel base, w/ wooden pegs, wood	193/6316
F	Bentwood vessel base, wood	193/3380
G	Bentwood vessel base, w/spruce root lashing, wood	193/6451

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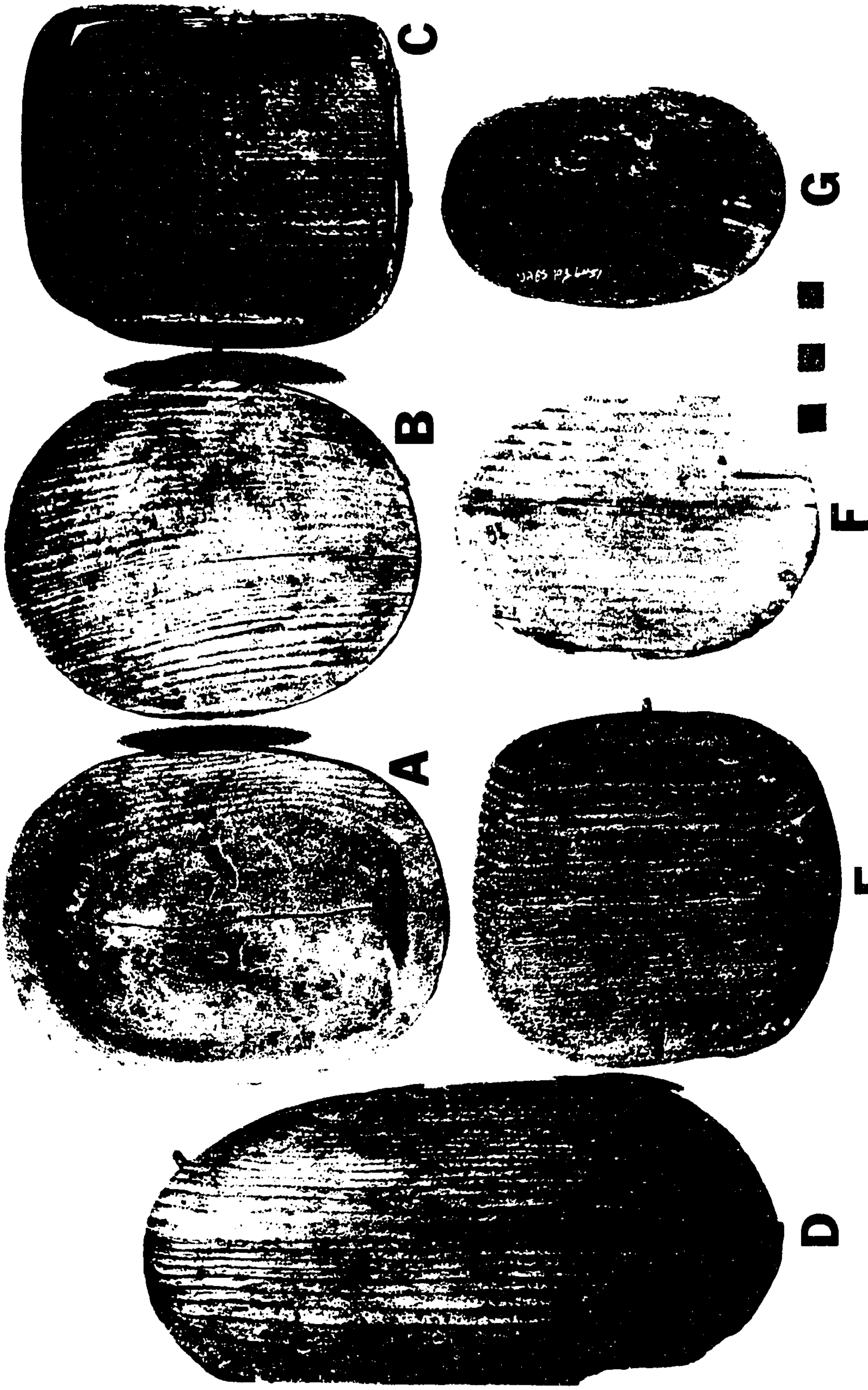

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Plate 66

Perforated vessel base

Wood, with spruce root lashings
Cat. no. 193/722

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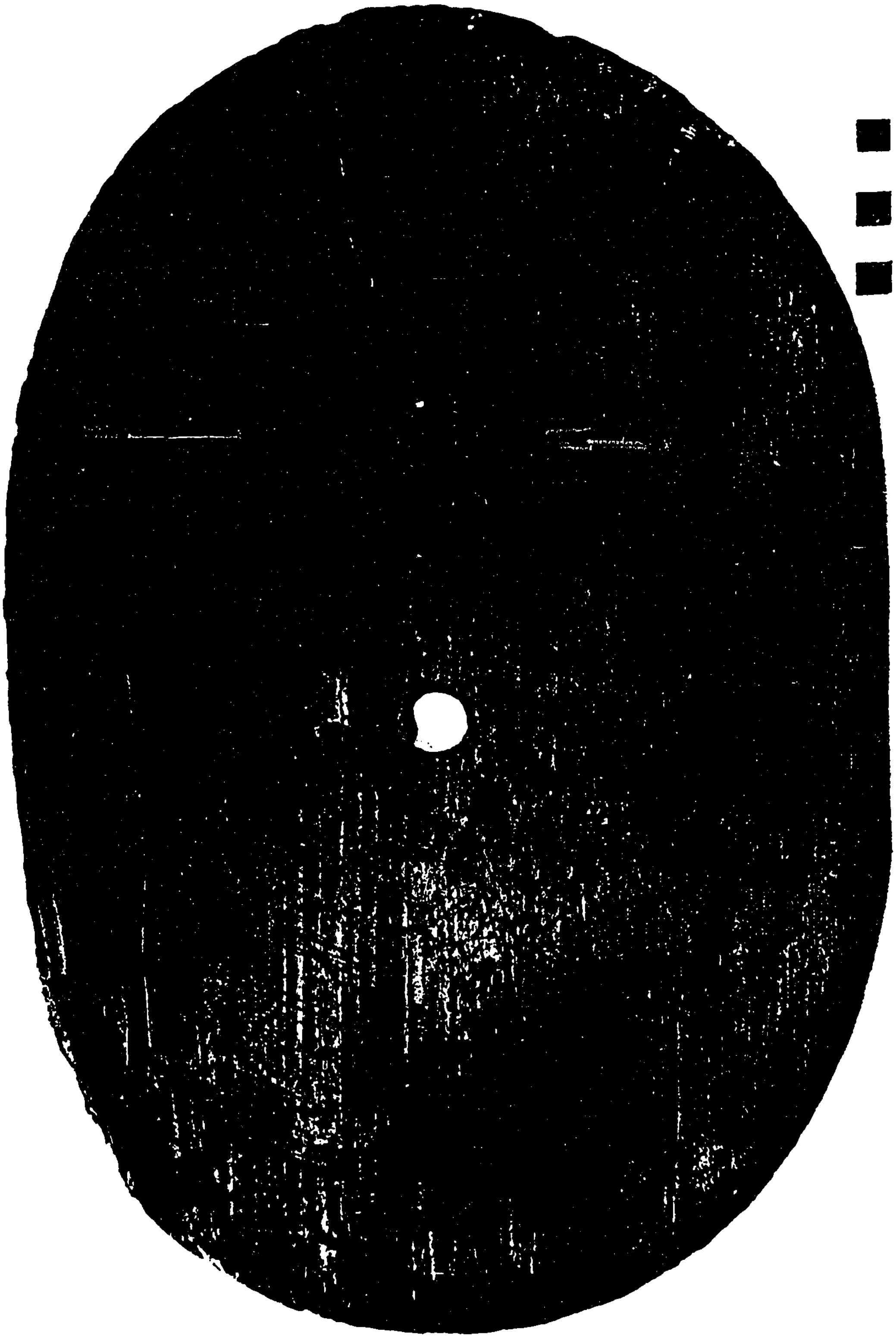

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Plate 67

Bentwood vessel base

Wood, w/ spruce root lashing

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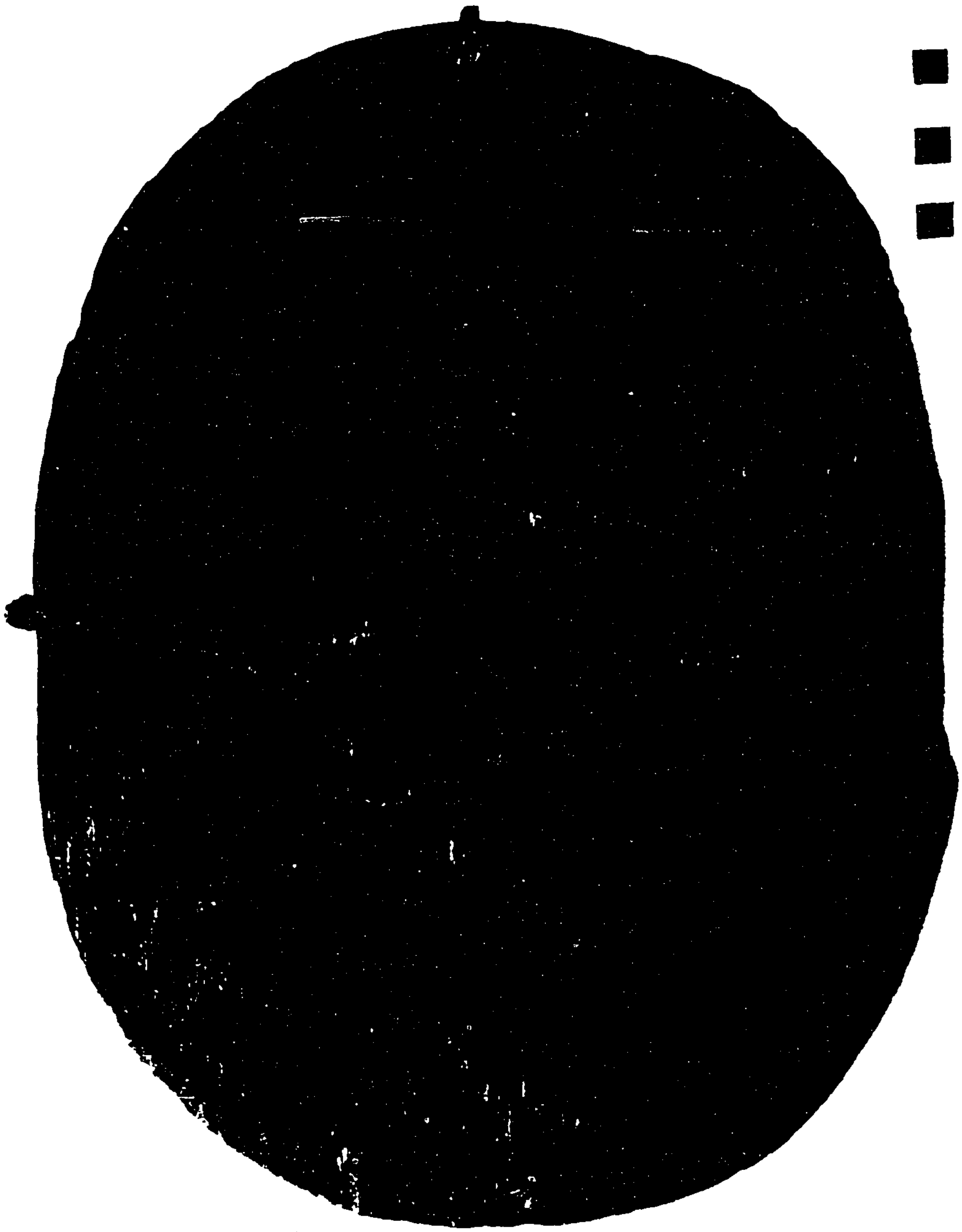

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Plate 68

Bentwood vessel base

Wood, w/burn marks left by heated rocks

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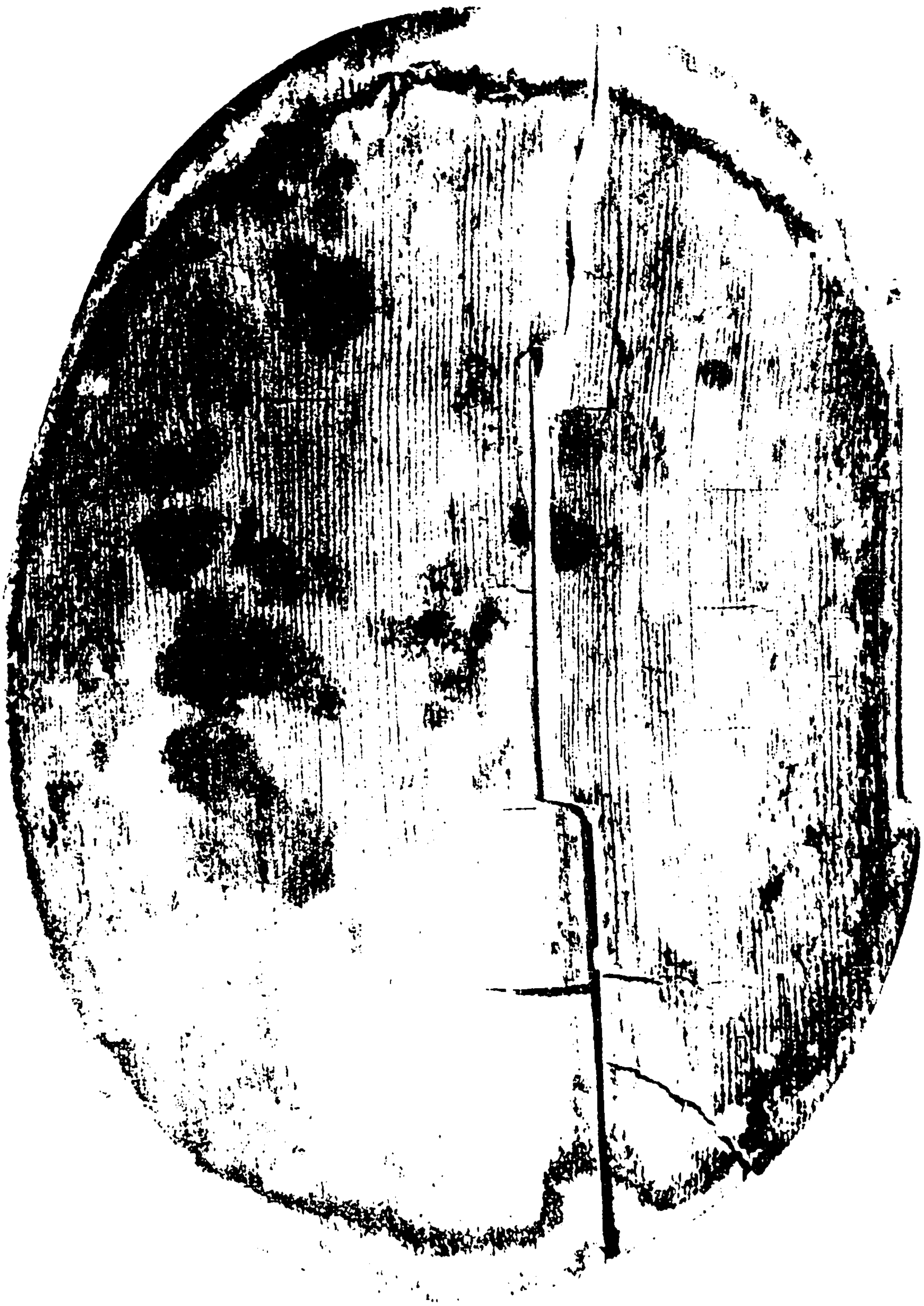

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Plate 69

Bentwood vessel side fragments

Object	Description	Catalog #
A	Bentwood vessel side fragment, wood w/spruce root lashing	193/
B	Bentwood vessel side fragment, wood w/baleen lashing and wooden pegs	193/
C	Bentwood vessel side fragment, wood w/spruce root lashing and wooden pegs	193/

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Twenty fragments represent rims of ovate bentwood vessels. Given the large number of vessel bases, this is an unexpectedly low figure. However small rim fragments are difficult for excavators to identify, particularly if the fragments lack lashing holes or scarfing.

Eleven rim fragments exhibit various methods of joinery; pegs, or countersunk lashing. Three rim joints are intact (Plate 69: A-C). One of these joints is held together by a combination of countersunk spruce root stitches and two small wooden pegs (Plate 69: A). There is an oval hole just below the rim, probably for attachment of a handle. A second specimen is also joined by pegs and countersunk stitches of spruce root (Plate 69: C). A third joined rim was made with countersunk baleen lashing and a pair of small wooden pegs (Plate 69: B).

Wooden Vessel Handles

Table 6:7 Vessel Handles

Catalog	Artifact Type	Material	Context
830	Vessel handle	Wood	House floor 4
827	Vessel handle	Wood	House floor 4
4770	Vessel handle	Wood	House floor 4
3690	Vessel handle	Wood	House floor 6
6900	Vessel handle	Wood	House 7 roof sod
6020	Vessel handle	Wood	Upper basal midden

Six bar-shaped wooden handles were used in conjunction with bentwood vessels or other containers (Plate 71: A-E). Similar handles exist on bentwood vessels collected in the Alutiiq village of Katmai by Fisher (Smithsonian cat. 90442). The Alutiiq name for these vessels is "a-gai-lak", or *agalek* , which means 'one that has a handle'. Not all Koniag bentwood vessels were handled. The specimen in the Fisher assemblage has high sides, and may have been used as a bucket. Vessel with a larger diameters and lower sides probably served as storage tubs.

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The largest vessel handle in the assemblage consists of a wooden shaft 30.5 cm long and 2.3 cm in diameter (Plate 71:E). A rectangular knob with a pair of grooves carved on the top surface, exists on both ends. This handle retains traces of black surface painting.

A simpler handle is 17.1 cm long and 1.3 cm in diameter (Plate 71: A). This specimen is a smoothly carved, round, wooden shaft with broad notches at either end. Two articulating wood fragments represent a similar handle, but are oval in cross-section (Plate 71: D). The complete handle is 27.2 cm long and 1.8 cm in diameter, and retains traces of black pigment.

A wooden vessel handle 20.3 cm long and 1.8 cm in diameter was attached in an unusual manner. Instead of notching this piece has a sub-rectangular socket carved in either end (Plate 71: C). A crescent shaped handle 20.5 cm long, has triangular ends perforated by a small hole (Plate 71: B).

Whalebone vessel

Three articulating fragments represent about half the rim and a portion of the body of a finely made, globular vessel carved from a whale vertebrae (Plate 72). The vessel is about 22.5 cm in diameter with a 2 cm wide rim. Natural foramens in the vessel sides preclude its use to store of liquids. Hollowed whale vertebrae are frequently encountered in Kachemak and Koniag sites (Clark 1974: 136, Heizer 1956: 178-179), however the exterior surface of the vertebra has little modification, except for removal of the vertebral processes. This specimen is unique in the amount of attention given to its exterior, the thinness of the vessel walls, and its shape. Unfortunately this specimen was recovered from the upper disturbed level of the site, and its context within the Koniag phase is therefore questionable.

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Plate 70

Whalebone vessel fragment

Cat. no. 193/6858

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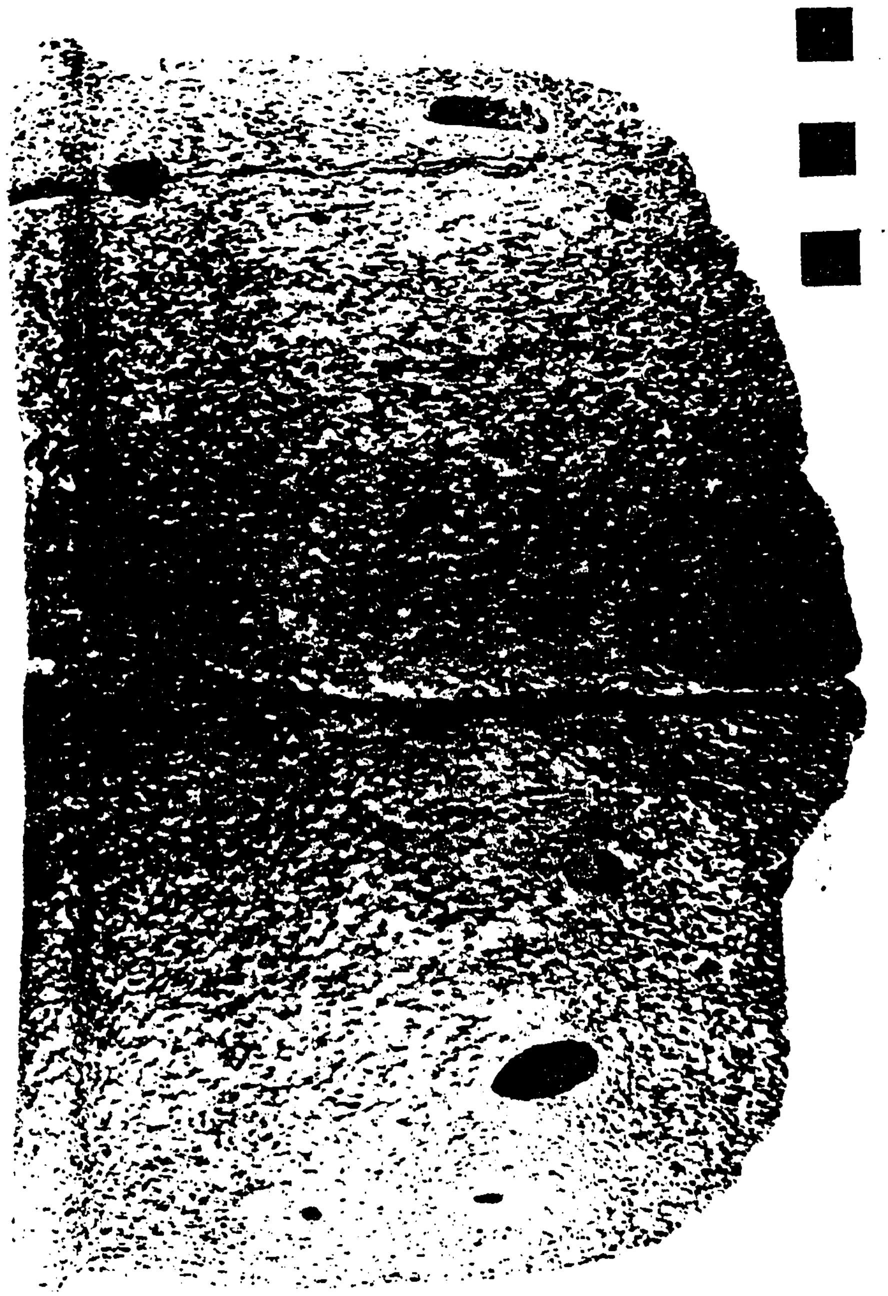

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Plate 71

Bentwood vessel handles

Object	Description	Catalog #
A	Bentwood vessel handle, wood	193/4770
B	Bentwood vessel handle, wood	193/6020
C	Bentwood vessel handle, wood	193/6900
D	Bentwood vessel handle, wood	193/827
E	Bentwood vessel handle, w/ black paint, wood	193/3690

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Ceramic Fragments

Table 6:8 Ceramic Fragments

Catalog	Artifact Type	Material	Context
6846	Pottery fragment	Clay	surface/erosion face
953	Pottery fragment	Clay	Disturbed
2084	Pottery fragment	Clay	Disturbed
2085	Pottery fragment	Clay	Disturbed
2086	Pottery fragment	Clay	Disturbed
1841	Pottery fragment	Clay	House floor 1

A assemblage of ceramic fragments was recovered from house floor one and represents the remains of at least one gravel-tempered vessel. This vessel was cylindrical, with a flat base, and roughly 22.5 cm in diameter (Plate 55). The walls of the pot average 1 cm thick, and were tempered with slate gravel. Thick, gravel-tempered pottery of this type is characteristic of late-prehistoric Eskimo sites throughout western Alaska. Flat-bottomed pots are the most common form recovered from Kodiak Island sites, although round-bottom and knobbed bases are also known from private assemblages (de Laguna 1939, Clark 1974: 116).

Much of the previous literature on Kodiak Archaeology (Clark 1974; Heizer 1948), divides the Koniag phase into ceramic and non-ceramic using 'facies.' Archaeological evidence illustrates that ceramics were used more commonly on the south and east side of Kodiak Island. For example Clark describes a sherd assemblage representing a minimum inventory of two hundred vessels on Rolling Bay and Kiavak, on the southeast side of Kodiak (1974:118).

The distribution of ceramics in Koniag sites may be most parsimoniously explained by a functional interpretation. The Karluk One pot, like most ceramics recovered from Kodiak sites, has an interior surface encrusted with thick, greasy, charred material, probably burned fat. Clark

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Plate 72

Partially reconstructed ceramic vessel

Gravel tempered clay; various cat. nos., from house floor 1

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(1974:116), also notes that the exterior of the lower half of the ceramic vessels he observed are discolored by fire.

Since ethnohistorical accounts of Koniag food preparation indicate that heated stones were dropped into wooden vessels or even baskets to boil the contents, the relatively ungainly ceramics may have another function. It seems most likely that Koniag ceramics were used to render sea mammal fat into oil, a process impractical in wooden vessels. Stone oil lamps found at Karluk One, like those from other Koniag sites, lack extensive the encrustation and charring seen on lamps from the eastern Arctic; where unrendered sea-mammal fat was burned in lamps.

The possibility that Koniag ceramics were used primarily for rendering sea-mammal fat is further supported by the distribution of sea-mammal populations, and the migratory routes of several species of seal and whales which are most abundant in locations where archaeological sites with pottery fragments are most common.

Trapezoidal Box Panels

Table 6:9 Trapezoidal Box Panels

Catalog	Artifact Type	Material	Context
4738	Trapezoidal box panel	Wood	House floor 1
3304	Trapezoidal box panel	Wood	House floor 2
3306	Trapezoidal box panel	Wood	House floor 2
3043	Trapezoidal box panel	Wood	House floor 3
835	Trapezoidal box panel	Wood	House floor 4
2804	Trapezoidal box panel	Wood	House floor 4
5206	Trapezoidal box panel	Wood	House floor 8

Seven trapezoidal planks of pine or spruce represent side panels from boxes of an unknown function (Plate 73, 74). The panels range in size from 47 to 28 cm long, 11 to 16.3 cm wide, and 1.3 to 2.5 cm in maximum thickness.

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Plate 73

Trapezoidal box panels with tabular ends

Object	Description	Catalog #
A	Trapezoidal box panel with tabular end, wood	193/
B	Trapezoidal box panel with tabular end, wood	193/

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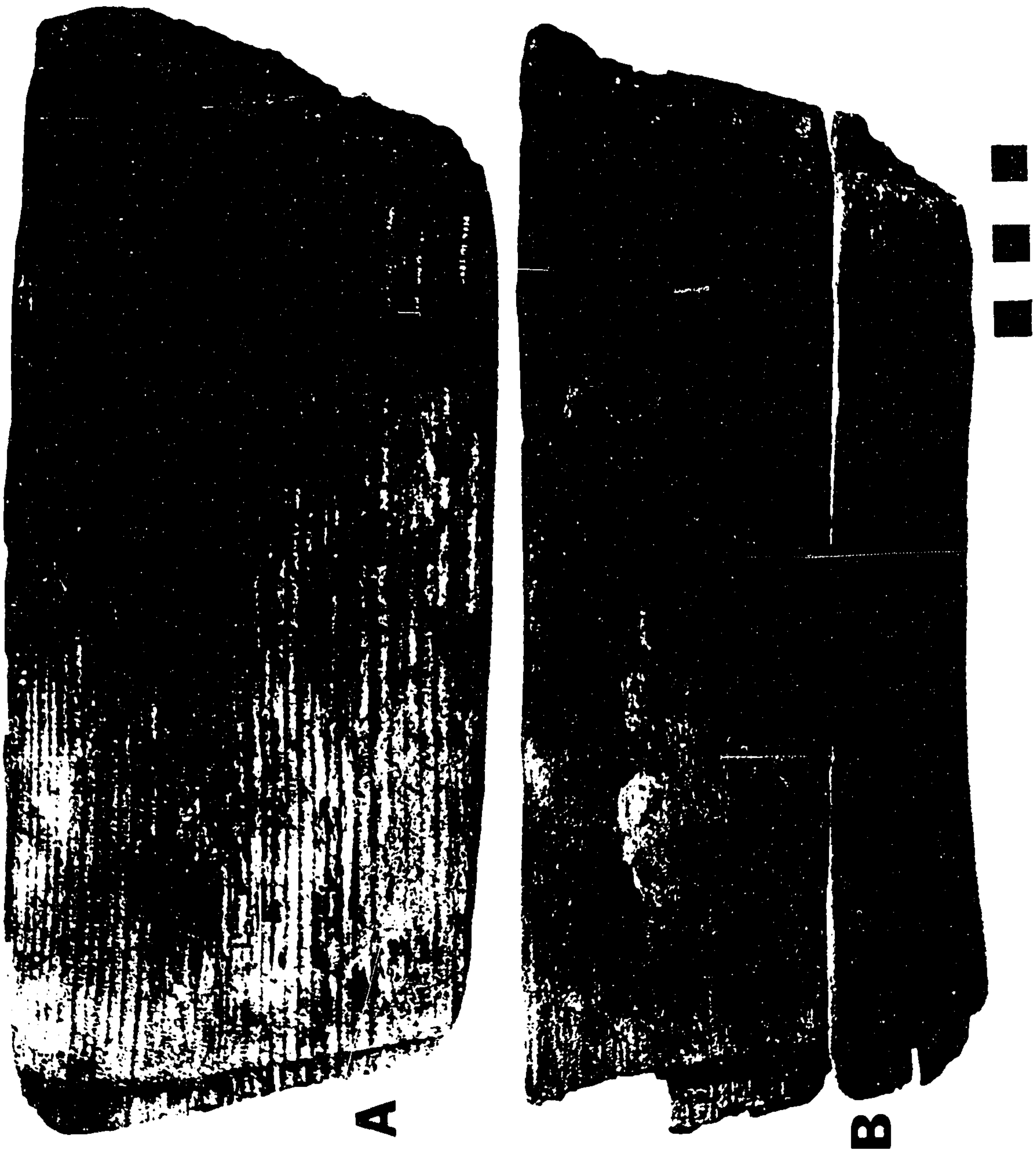

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Plate 74

Trapezoidal box panels with scarfed ends

Object	Description	Catalog #
A	Trapezoidal box panel with scarfed end, wood	193/3306
B	Trapezoidal box panel with scarfed end, wood	193/835

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The ends of the longer planks have been scarfed, with the joint at a 45 degree angle. The inside, scarfed surface has been carefully adzed and planed smooth.

The shorter planks are not scarfed, but have a tabular end, suggesting that the shorter planks fit into the angular scarfs on the longer planks, creating a rectangular, trough-shaped box. Box joints show no signs of pegging or lashing. Consequently, the boxes were probably not watertight. One box panel even has an unplugged knothole (Plate 74: B). The precise function of this type of box is unknown, however similar forms were used among Northwest Coast Indians for storage boxes.

Box Lids

Table 6:10 Box Lids

Catalog	Artifact Type	Material	Context
1876	Box lid	Wood	House floor 2
1088	Box lid	Wood	House floor 3
1934	Box lid	Wood	House floor 4
4771	Box lid	Wood	House floor 4
4025	Box lid	Wood	House floor 5
4774	Box lid	Wood	House 5 wall sod
3644	Box lid	Wood	House floor 5
2813	Box lid	Wood	House floor 6
930	Box lid	Wood	House floor 7
6427	Box lid	Fossil ivory	House floor 8
5616	Box lid	Wood	Lower basal midden

Seven small wooden box lids were found at Karluk One. One box lid, a thin sub-rectangular board, measures 21 cm long, 11.3 cm wide, and 0.9 cm thick (Plate 75: F). A crudely countersunk hole on its surface probably held some type of handle. The top surface has been utilized repeatedly as a cutting board.

A second box lid is represented by two articulating fragments of a nearly complete square board, broadly beveled around the top edge (Plate 75: G). The beveled edges retain most of a coat of original red paint. The top

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surface has been used as a cutting board. This lid is 15 cm square, and 1.3 cm thick.

A sub-rectangular box lid has a convex surface (Plate 75: E). It measures 17.9 cm long, 8 cm wide, and 3 cm in maximum width. Two sets of three adjoining holes near one edge probably held cordage that kept the lid in place in a hinge like arrangement.

A square, flat lid measure 6.7 cm on a side, and is 0.9 cm thick (Plate 75: A). It has a pair of countersunk lashing holes on one edge and black paint on its top.

A lid made of a flat square of wood is 7.2 cm on a side and has a round hole near one edge (Plate 75: C). A smaller hole on the under side of the lid was started, but did not perforate the lid completely.

Another piece, tentatively identified as a box lid, is a square piece of wood, 5.5 cm on a side, and 1.4 cm thick (Plate 75: B). It has a small cross incised on the center of the top surface. Tiny holes are present on the center of all four sides of the lid.

One lid in the assemblage is circular, measuring 9.1 cm in diameter and 1.5 cm thick (Plate 75: D). A encircling flange surrounds one edge, suggesting that it plugged into the mouth of a circular box, or alternatively, formed the base of one a cylindrical wooden quiver, known ethnographically (Birket-Smith 1941: 145, Heizer 1952: 23).

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Plate 75

Wooden box lids

Object	Description	Catalog #
A	Box lid, wood w/black paint	193/4774
B	Box lid, wood	193/
C	Box lid, wood	193/5616
D	Box lid, or possible quiver base, wood	193/2813
E	Box lid, wood	193/
F	Box lid, wood	193/930
G	Box lid, wood w/red paint	193/4771

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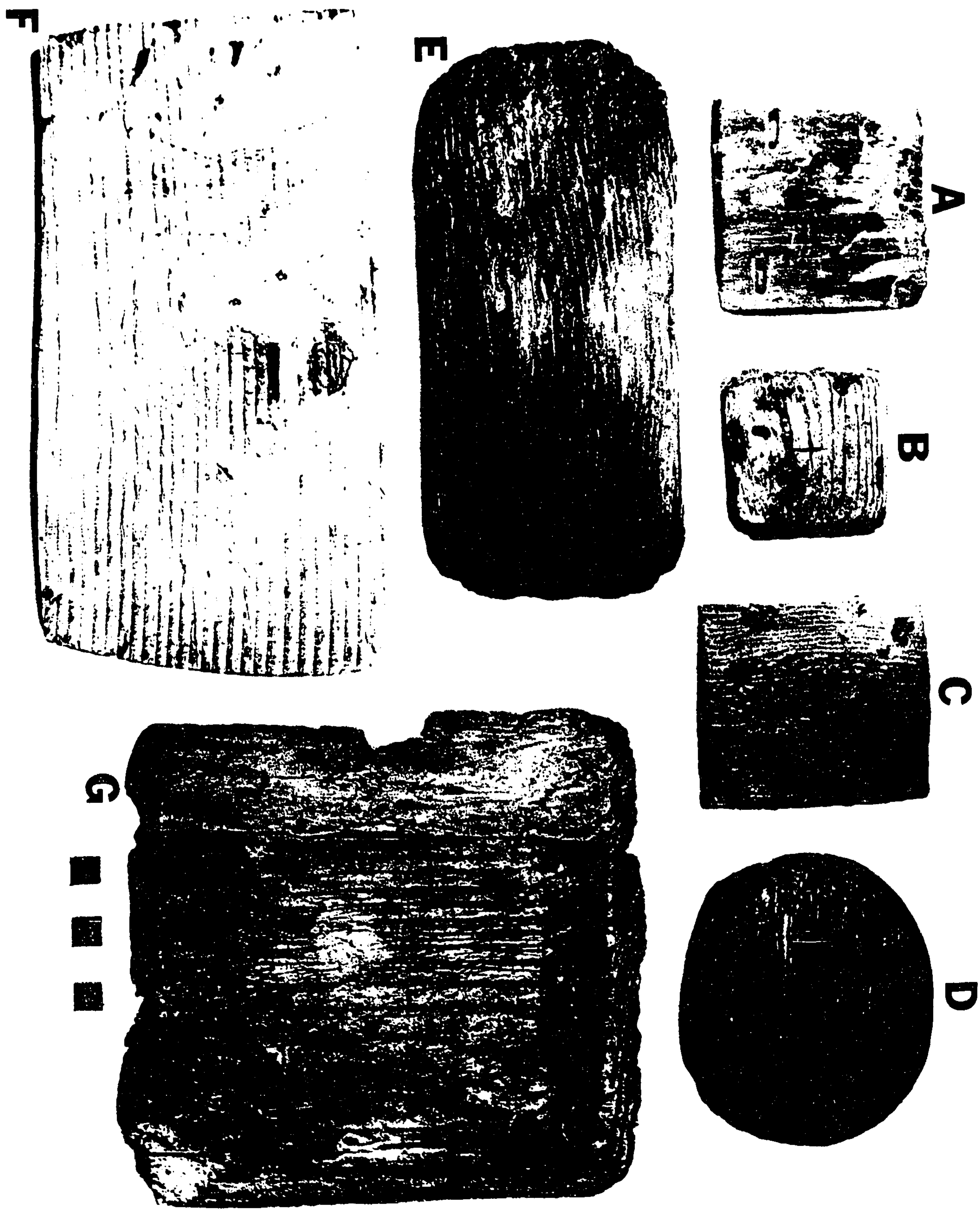

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Basketry

Table 6:11 Basketry

Catalog	Artifact Type	Material	Context
644	Basket fragment	Spruce root	surface/erosion face
645	Basket fragment	Spruce root	surface/erosion face
6721	Basket fragment	Spruce root	General excavation
4670	Baskets (2)	Grass	Burial
3067	Basket	Spruce root	House floor 4
1920	Basket	Spruce root	House floor 4
4440	Basket	Spruce root	House floor 4
1927	Basket	Spruce root	House floor 4
3143	Basket	Spruce root	House 6 roof sod
5156	Basket	Spruce root	House floor 6
6085	Basket	Spruce root	House floor 8
6483	Basket	Spruce root	Upper basal midden
5266	Basket fragment	Baleen	House floor 9B
6914	Basket; large	Spruce root	House floor 10

A very limited number of 18th and 19th century Pacific Eskimo baskets exist in museum collections (Lee 1981). Thirteen baskets of uncertain origin, but attributed to the Pacific Eskimo, exist in eight museums, seven of which are in Europe. Small scraps of carbonized spruce root twined basketry were found at the Uyak Site (Heizer 1956:29; Hrdliçka 1944:219, 306). Clark also found some small pieces of spruce root basketry at Rolling Bay (1974:115). The Karluk One specimens, four of which are complete baskets, and remarkably well preserved, are presently the largest, and oldest known assemblage of Alutiiq basketry.

Complete Spruce Root Baskets

Twined spruce root baskets of the Alutiiq are superficially very similar to those known ethnographically from the Tlingit (Paul 1944; Weber 1986). Upon closer examination, however, several key differences can be discerned. The angle of the twining on the Karluk One baskets differs from those of Tlingit baskets. Tlingit basket makers have examined the Karluk One specimens, and indicate that Alutiiq baskets were made upside down, in the

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same manner as Aleut grass baskets are. Tlingit spruce root baskets are made rightside up. This difference is also apparent in the shape of the small coil in used to start the basket, located near the center of the base.

Several scraps of spruce root in various stages of processing were found, indicating spruce root technology was known to the Koniag, and practiced on the site. Coiled basketry, used by Yupik speakers north of the Alaska Peninsula, is absent from Alutiiq ethnographic assemblages, and so far, absent from the archaeological record in the Alutiiq culture area.

Three complete twined spruce root baskets were found on Karluk One housefloors. Unlike ethnographic baskets, they lack surface painting or other decoration. The smallest spruce root basket was found on housefloor six (Plate 78). It measures 10 cm in diameter and is 5 cm in high. A single ring of three stand twining is present on the rim. This basket is of fairly fine weave, with a maximum stitch gage of 24 stitches per square cm. There is no evidence of a handle on this basket. Frederica de Laguna suggested that this piece may have been a drinking cup (personal communication 1987).

Two complete twined spruce root baskets were found on house floor four, both carefully folded flat for storage. One basket is cylindrical, measuring about 15 cm high and 14 cm in diameter (Plate 77). Three concentric rings of paired three-strand twining reinforce the base. A handle, made of a three-strand braided length of spruce root was found inside the basket. Attachment loops for the handle are present near the basket rim. One of these loops still holds the knotted end of the handle. The other handle loop had been repaired with a few threads of baleen stitching. The basket rim is defined by two rows of three-strand false embroidery. The weave is fine, with a maximum stitch gage of 35 stitches per cm^2.

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The other basket from house floor four is similar, measuring 18.3 cm high and 18 cm in diameter (Plate 76). Three concentric rings of three-strand twining are present on the base, but only the center most ring is made of a pair of strands. The other reinforcement rings are single strand. The basket's weave is fine, with a maximum stitch gage of 35 stitches per cm^2. The rim is reinforced with two rows of three-strand twining. Although there is no handle, small loops are present on either side of the rim for a handle attachment.

A large spruce root basket was found on housefloor 10. This specimen has been torn in several places, burned, and about is 80% complete. It once measured about 40 cm high and 30 cm wide. It has a coarser stitch than the smaller basket, with about 12 stitches per cm^2. It may represent a large variety of storage basket noted by Gideon (1987:38). He described 200 large storage baskets filled with *sarana*, a starchy flour made from the root of the Kamchatka Lily, stored in a Russian-America Company barabara he visited in Karluk in 1809.

Spruce Root Basket Fragments

Two fragmentary spruce root baskets were found on housefloor four. One fragment is a basket side, from base to rim, which represents about a quarter of a complete basket. This basket, when complete, was about 14.5 cm high (Plate 79: A). Three concentric rings of three-strand twining are present on the base, and the rim is reinforced by two rows of three-strand twining. The weave is fine, with a maximum stitch gage of 35 stitches per cm^2.

An additional fragmentary basket, about 65% complete, was found on housefloor eight. It measures 30 cm high, and 30 cm in diameter. It is

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manufactured from thicker strands of split spruce root and is more coarsely woven than the smaller spruce root baskets.

One larger basket fragment represents the crumpled sides of a medium sized basket with a stitch gage of 20 stitches per cm^2 (Plate 79: B). The other two fragments are those of a base and side of a coarsely woven basket of 12 stitches per cm^2.

Grass Baskets

Two complete miniature baskets were found in association with the burial in square 11 (Plate 80: A,B). These baskets are intact, but very fragile, perhaps because they were deposited near the surface of the site. The larger basket is 7 cm in diameter, and about 6 cm high (Plate 80: A). The smaller basket is 4 cm in diameter, and 5 cm high (Plate 80: B). Both are loosely woven of grass, probably wild rye (<u>Elymus mollis</u>), which is still used for basketry in the Aleutians and Kodiak. Grass weaving, in the form of carbonized matting was encountered on house floors in the Uyak site by Hrdliçka (1944:342), and according to the recollection of Heizer, was used throughout the Uyak occupation (1956:30).

The rims of these baskets are made of a three-strand braid connected to the basket by a series of smaller braided strands, which forms a series of elliptical loops around the rim. The larger basket has two encircling bands, formed by leaving bare weft. Both grass baskets contained numerous fly larva cases, suggesting that they may have contained foodstuffs when included in the burial.

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Plate 76

Spruce root basket

193/3067

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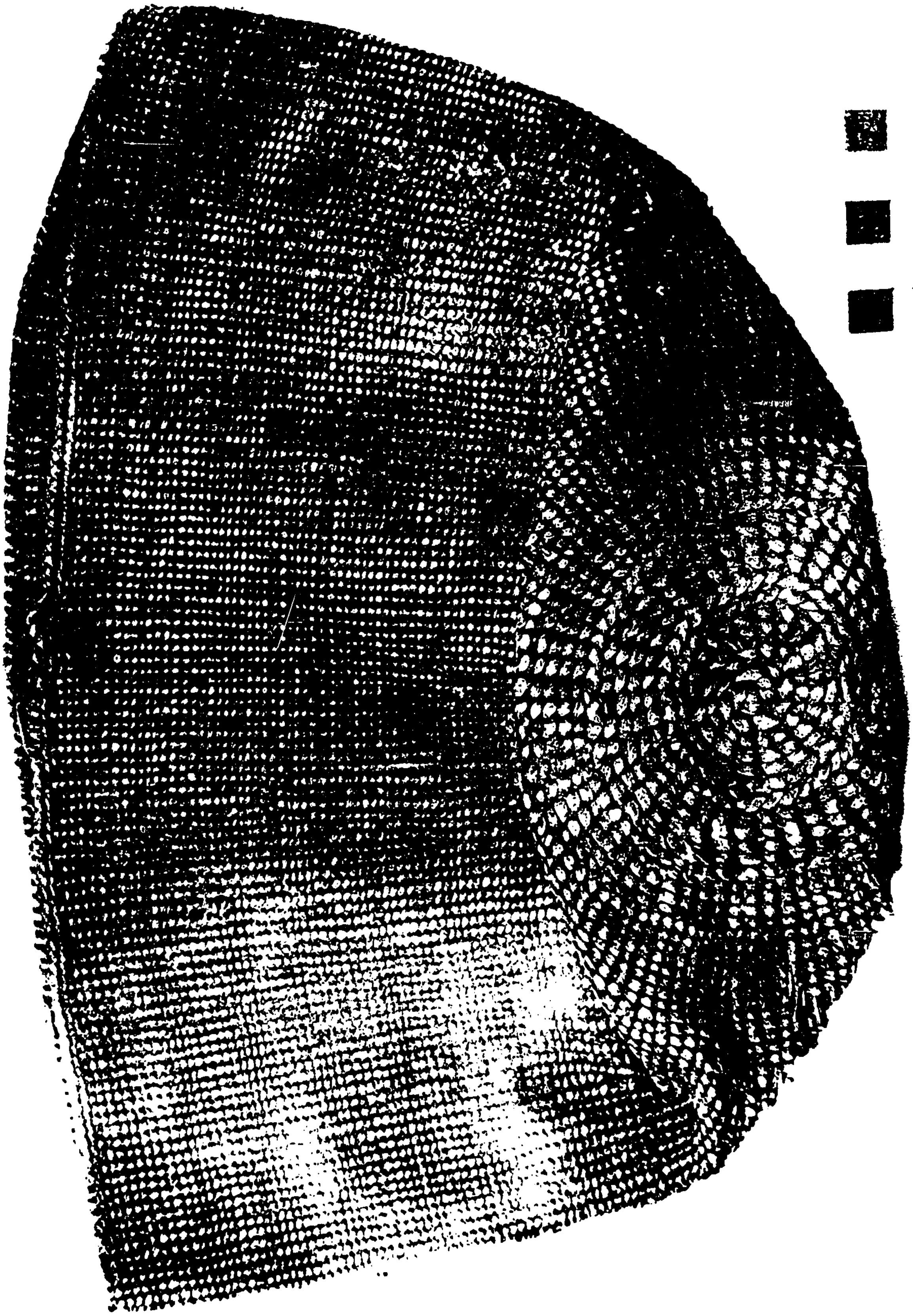

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Plate 77

Spruce root basket and handle

193/1920

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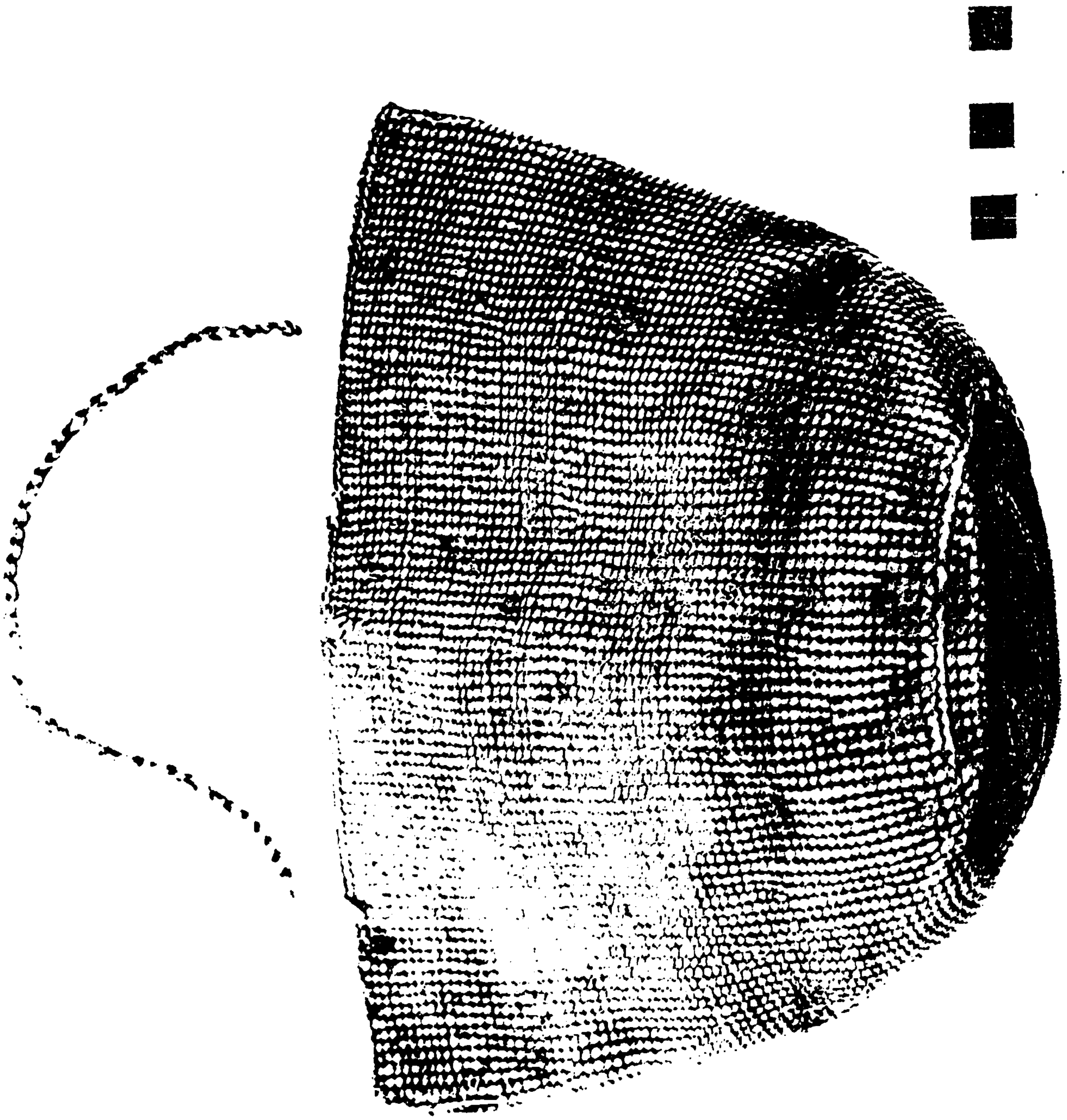

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Plate 78

Small spruce root basket

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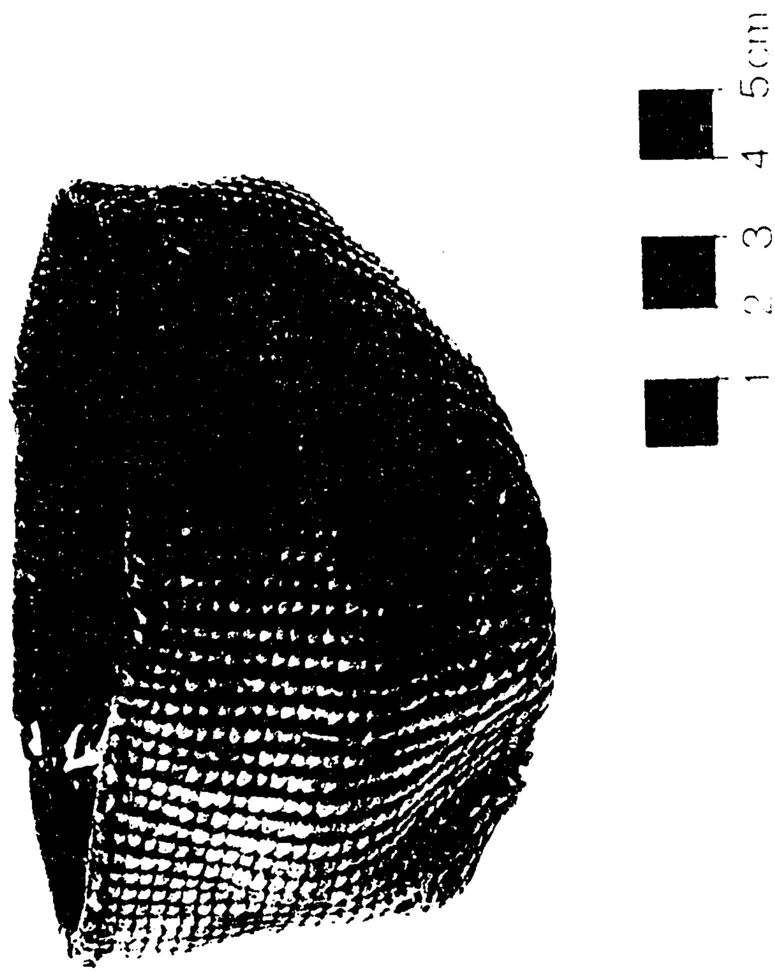

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Plate 79

Spruce root basket fragments

Object	Description	Catalog #
A	Basket fragment, spruce root	193/4440
B	Basket fragment, spruce root	193/1927

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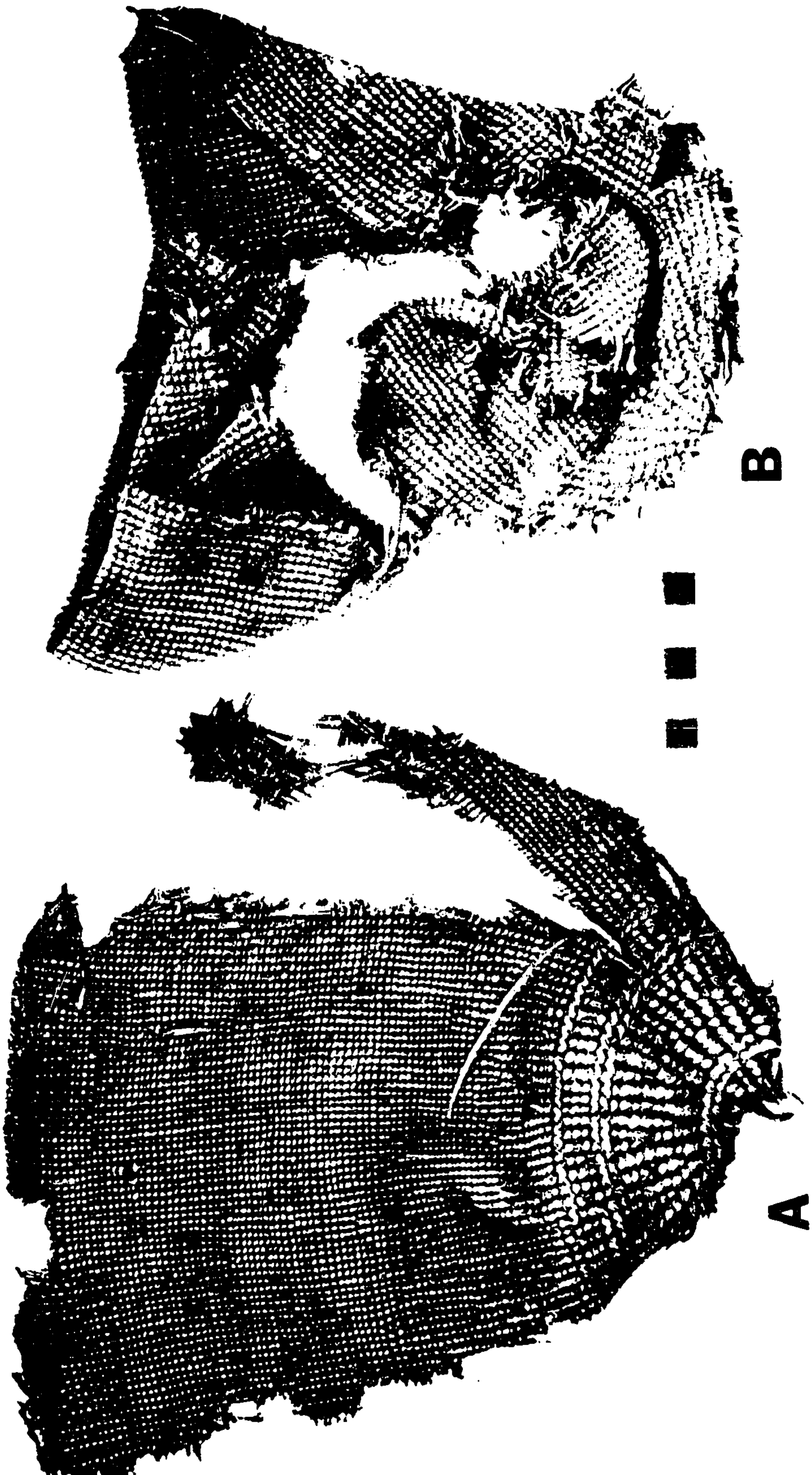

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Plate 80

Grass baskets

Object	Description	Catalog #
A	Grass basket	193/
B	Grass basket	193/

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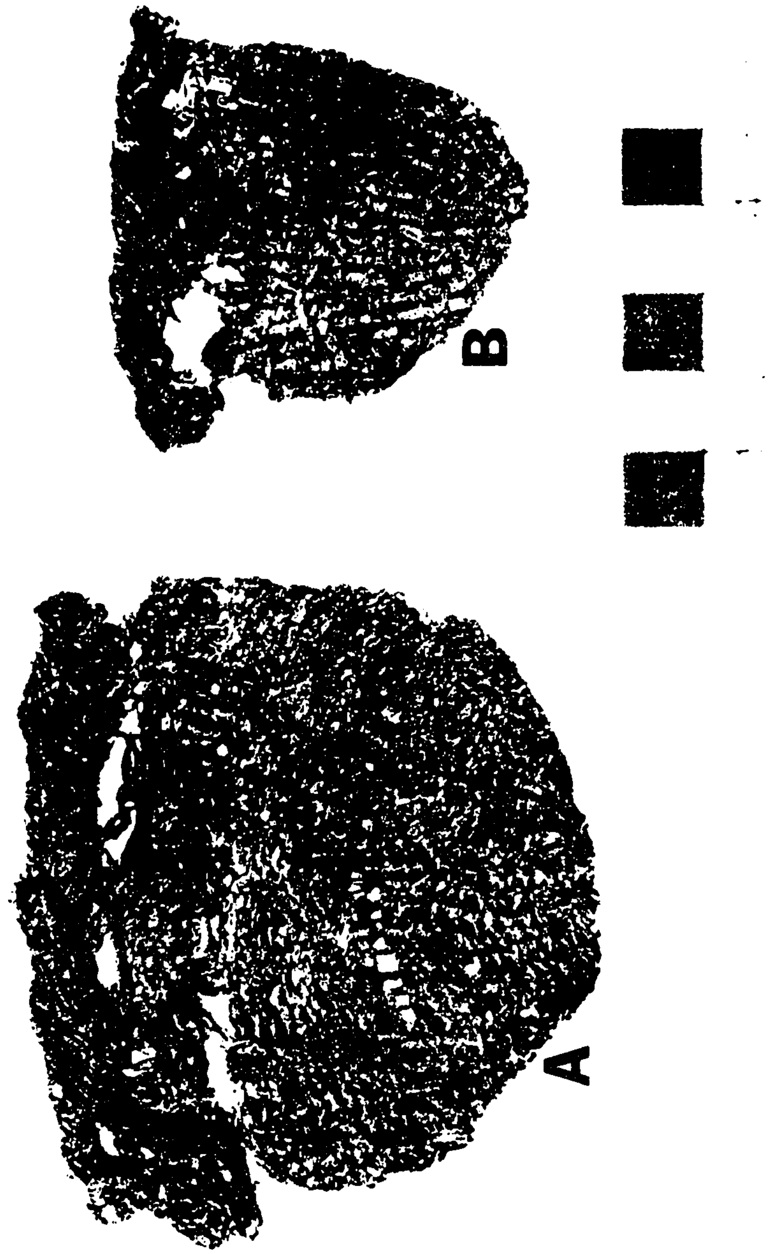

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Baleen Basket

Fragments representing the rim and side of a baleen basket were found in the lower basal midden (Plate 81). The rim is a three-strand braid connected to the basket by a series of smaller braided strands, similar to rim attachment in grass basketry. The body of the basket is loosely, but intricately woven of thin bundles of baleen strands. The vessel is too fragmentary for a size determination. A somewhat more intact piece of baleen basketry was found eroding from the midden at KAR-31, on the north side of Karluk Lagoon, associated with Kachemak levels of that site.

Fire Drills and Hearths

Table 6:12 Fire Drills

Catalog	Artifact Type	Material	Context
989	Fire drill	Wood	House floor 1
2965	Fire drill	Wood	House floor 2
2690	Fire drill	Wood	House floor 2
2570	Fire drill	Wood	House floor 2
1370	Fire drill	Wood	House floor 2
4395	Fire drill	Wood	House 3 wall sod
3610	Fire drill	Wood	House floor 3
2597	Fire drill	Wood	House floor 3
3064	Fire drill	Wood	House floor 4
4060	Fire drill	Wood	House 6 wall sod
3819	Fire drill	Wood	House floor 6
1676	Fire drill	Wood	House floor 6
1701	Fire drill	Wood	House floor 7
1705	Fire drill	Wood	House floor 7
2871	Fire drill	Wood	House floor 7
5712	Fire drill	Wood	Upper basal midden
5611	Fire drill	Wood	House floor 9B

Wooden Fire Drills

Seventeen wooden fire drills were found at Karluk One. These cigar-shaped pieces of pine or spruce range in length from 11.6 to 21.1 cm, with a maximum diameter from 1.1 to 2.3 cm (Plate 82: A-H). Fire drills were used

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Plate 81

Baleen basketry fragments

Cat. no. 193/5266

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in conjunction with a socketed mouthpiece, a piece of cord, and a socketed board or fire-hearth. Davydov witnessed the fire-starting process (1977:187):

> They make fire by using a sharpened stick which, like the wood chips used with it, is from the chaga (redwood) tree which is thrown up on the island by the sea and which grows on the mainland of America. In the middle of this stick, the end of which is smeared with fat, a string has been twisted round several times. They take the ends of the string in their hands, and turn it as quickly as they can in both directions, until smoke comes from the end of the stick which is poked into the wood chips. Then they pickup a smoldering chip and put it to some dry grass; this they wave in their hand until a flame appears.

The only known ethnographically collected examples of fire-starting equipment from the Alutiiq area are two complete sets collected by Fisher in the late 19th century (Smithsonian cat. no. 18490). The fire drills and hearths collected by Fisher are identical to the specimens found at Karluk One, although no mouth pieces, or socket insets have yet been found on Kodiak.

There are eight complete fire drills, with both ends rounded and charred from use, in the Karluk One assemblage. Two were used subsequently as fire hearths (Plate 82: C, F). At least two of the fire drills have cut marks around their mid-sections to keep the drill cord from slipping during use.

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Plate 82

Fire drills

Object	Description	Catalog #
A	Fire drill, wood	193/
B	Fire drill, wood	193/6723
C	Fire drill, reworked as fire hearth, wood	193/
D	Fire drill, wood	193/
E	Fire drill, wood	193/1701
F	Fire drill, reworked as fire hearth, wood	193/
G	Fire drill, wood	193/5611
H	Fire drill, wood	193/4060

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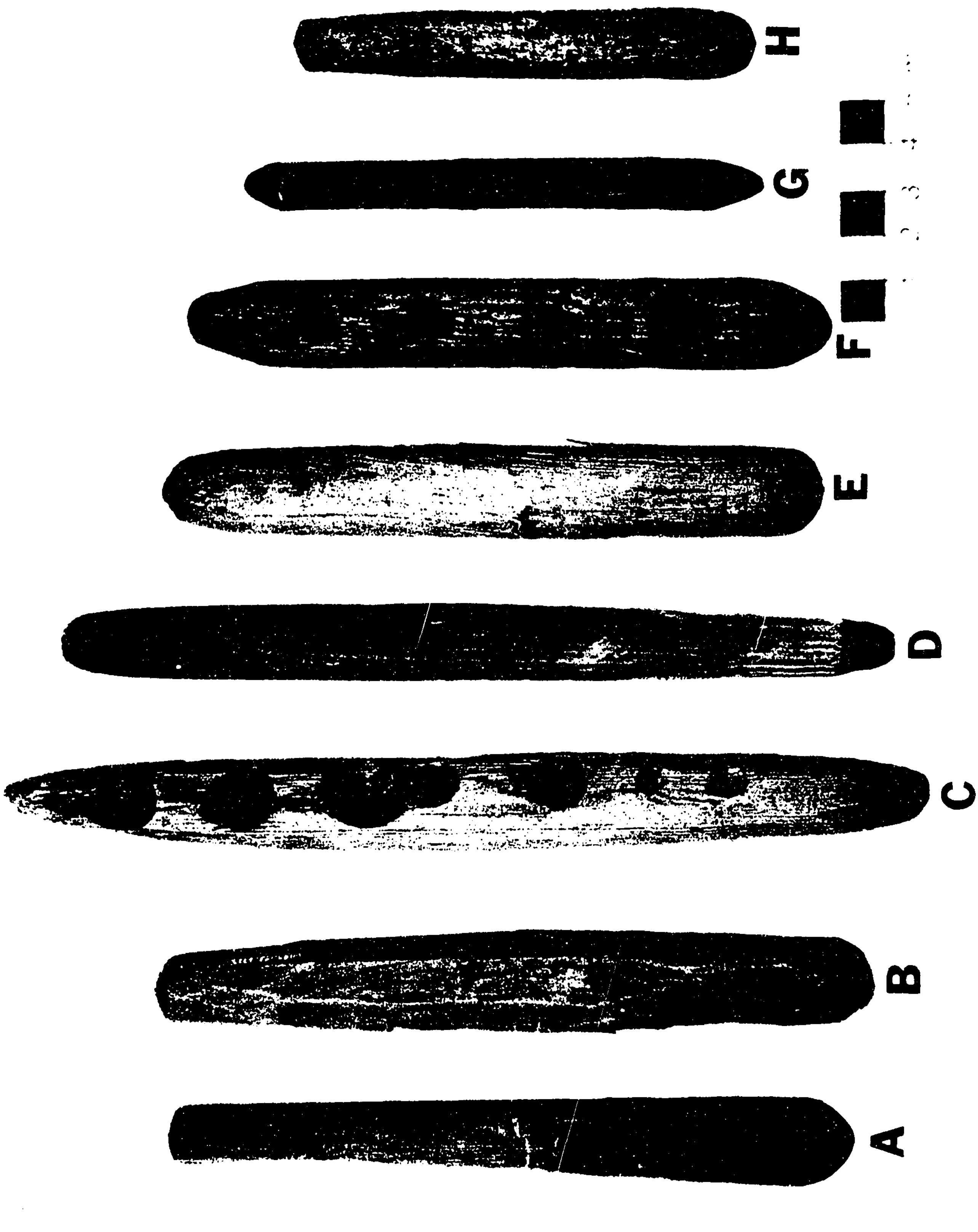

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Wooden Fire Hearths

Table 6:13 Fire Hearths

Catalog	Artifact Type	Material	Context
2679	Fire hearth	Wood	House 1 roof sod
4689	Fire hearth	Bark	House floor 1
1724	Fire hearth	Wood	House floor 3
400	Fire hearth	Wood	Profile 1; 140 cm bd
4775	Fire hearth	Wood	House 5 wall sod
886	Fire hearth	Wood	House floor 6
6893	Fire hearth	Wood	House floor 7
6324	Fire hearth	Wood	House floor 8
6012	Fire hearth	Wood	House floor 8
5225	Fire hearth	Bark	Upper basal midden
5601	Fire hearth	Bark	Upper basal midden

Four wooden fire hearths are square shaft fragments, with up to six round, charred holes left by fire drills (Plate 83: A-D). These fire hearths are all fragmentary, but measure 1.4 to 4.5 cm on a side. A single hearth was made from a heavy shaft or kayak part and is semi-circular in cross-section (Plate 83: B). It retains traces of black surface painting. Another fragmentary fire hearth is also a re-used piece of a larger object used as a cutting surface (Plate 83: D). One specimen is an otherwise unmodified piece of driftwood, bearing a single charred socket in its center.

There are three bark fire hearths in the assemblage each with a single charred hole near the center. These hearths are smaller than the wooden specimens, and may have alternatively served as drill caps. A palm-sized bark hearth is 4.7 by 3 cm, with a single drill hole in the center. There is half of a additional socket on one edge, indicating that the hearth was once longer with multiple sockets (Plate 83: C). A third fragmentary bark specimen is 15 cm long, and unmodified except for a single drill socket in the center.

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Plate 83

Fire hearths

Object	Description	Catalog #
A	Zoomorphic Fire hearth, Uksgaaq target, cottonwood bark	193/5601
B	Fire hearth, wood	193/1724
C	Fire hearth, cottonwood bark	193/4689
D	Fire hearth, wood	193/2679

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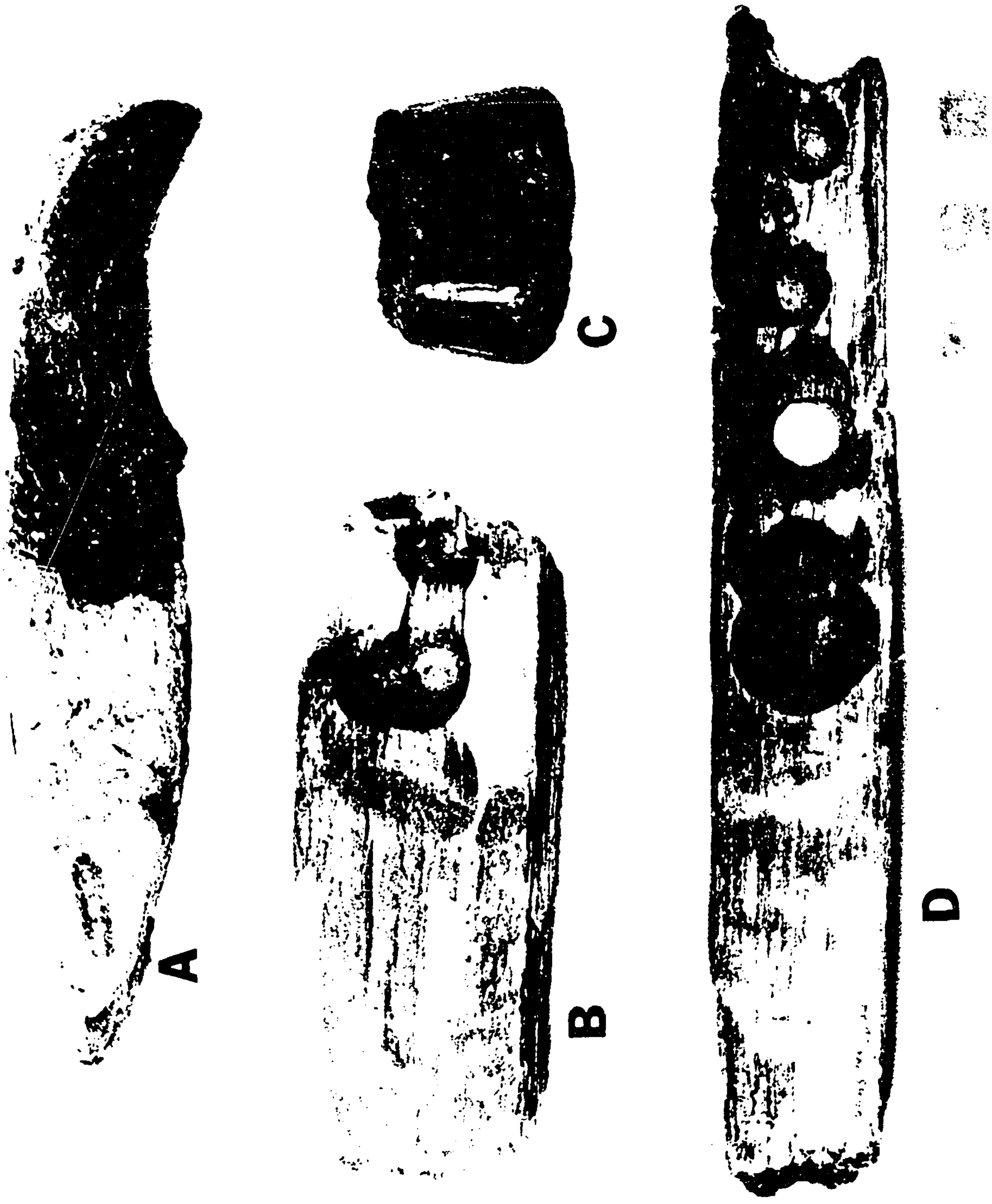

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Root Picks

Table 6:14 Root Picks

Catalog	Artifact Type	Material	Context
4370	Root pick	Whale bone	House floor 2
4078	Root pick	Whale bone	House floor 7

Root picks may have been used to harvest edible roots or clams, or for excavation and sod-cutting associated with barabaras construction. Root picks were also employed in procuring spruce root, used for basketry, hats, and cordage; although not in the treeless Karluk area. Clark recovered a root-pick made from a whale rib at Rolling Bay (1974: 69)., and de Laguna found one in the Yukon Fox Farm site (1975:101). No notching, or other treatment is recorded on the Koniag phase root picks, however notches do exist on some root picks from the preceding Kachemak (Heizer 1956:75, Steffian 1994) and Ocean Bay phases (Hausler-Knecht: 1993). The assemblage of root picks seems rather small, given all the digging that evidently went on at Karluk One. It may be that most digging tools were expediently modified sticks that are unrecognized archaeologically. A tip fragment from a whalebone root pick is 3.3 cm wide. The tip is well-carved and with some use-wear polish (Plate 84: B). A fragment from near the tip of a similar pick is 4.5 cm long (Plate 84: A).

Drag Handles

Six short lengths of wood have a crude notch carved near their centers (Plate 85:C-F). One is a shaft fragment. The others are otherwise unmodified sticks, with bark still adhering. They range from 10.3 cm to 13.5 cm long and from 1.7 to 2.6 cm in diameter. These have been provisionally identified as drag handles, and were probably manufactured expediently as needed.

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Plate 84

Root picks and drag handles

Object	Description	Catalog #
A	Root pick fragment, whalebone	193/4370
B	Root pick fragment, whalebone	193/4078
C	Drag handle, alder wood	193/5010
D	Drag handle, alder wood	193/5571
E	Drag handle, alder wood	193/4071
F	Drag handle, wood	193/6845

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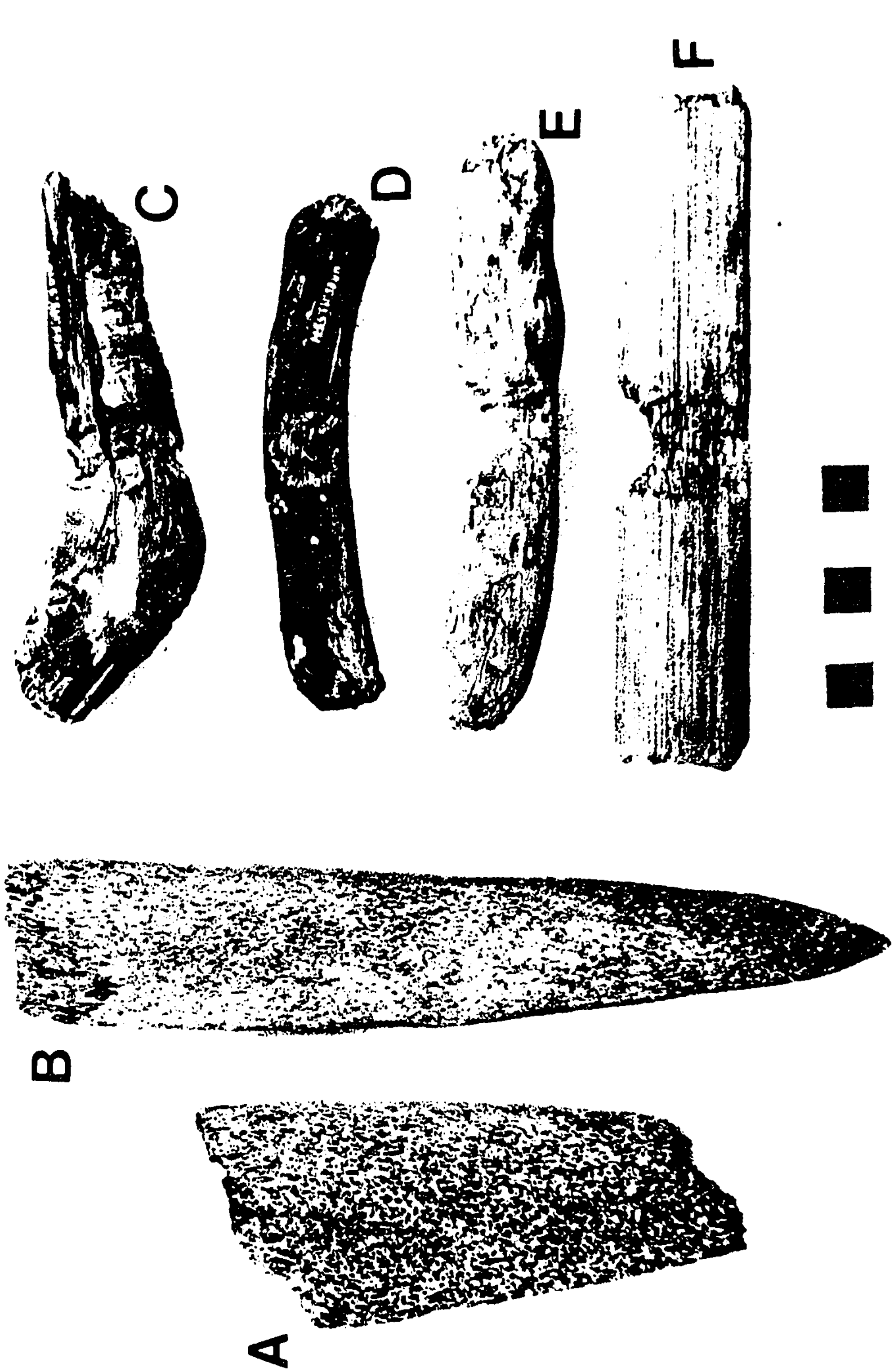

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Cordage

Table 6:15 Cordage

Catalog	Artifact Type	Material	Context
4459	Cordage	Baleen	House floor 4
3647	Cordage	Grass	House floor 5
4522	Cordage	Wood	House floor 7
5210	Cordage	Spruce root	House floor 8

Scraps of cordage are one of the most commonly recovered artifacts in wet sites such as Ozette and Hoko River on the Northwest Coast, primarily because cordage was manufactured from cedar bark. The relative rarity of cordage at Karluk One stems from the fact that Koniag cordage was primarily made from sinew, which along with skin and leather, are among the few organic materials not consistently preserved. Sinew is the most common material used for cordage, wrapping, and thread on ethnographically collected artifacts from the Alutiiq area. Indentations on hunting implement shaft fragments found at Karluk One also suggest that braided sinew was also commonly used in prehistoric times.

Larry Matfay, an elder from Akhiok, retains several large pieces of unused sinew as heirlooms from his father Sava Matfay who hunted from a kayak in the last quarter of the 19th century. These are round, amber colored lengths of connective tissue removed near the flukes of a small whale. They are about 65 cm in length, thick as a finger, and stored in a tied coil. From raw sinew such as this, thin threads were pulled off and braided together to the required length and thickness. Elders also report that the backstrap and sinews of Porpoise were very strong, and preferred for lashing kayak frames. It is unfortunate that sinew was not among the organic materials preserved at Karluk One, as ethnographic examples on bows, darts, and fishing gear are woven with stunning intricacy (Varjola 1990:320-321).

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Of the few cordage specimens of cordage from Karluk One, a fragmentary strand of braided baleen has a knot on one end. A coil of thin spruce root, (Plate 85:B) represents a preliminary stage in spruce root preparation; indicating that the Koniag were preparing spruce roots and making objects on their own, rather than obtaining them in trade from the Tlingit. A knotted segment of spruce root is .7 cm wide and may be a fragment of a basket handle (Plate 85:D). An additional piece of cordage is represented by a fragile, plaited strand of grass in fragments .6 cm wide. A 10 cm length of cylindrical cordage has been braided from baleen fibers, and resembles ethnographic harpoon lines (Plate 85:C). It is .25 cm thick.

Toggles

Table 6:16 Toggles

Catalog	Artifact Type	Material	Context
1599	Toggle	Bone	House floor 3
2407	Toggle;Figurine	Ivory	House floor 4
4027	Toggle	Bone	House floor 5
4050	Toggle	Antler	House floor 6
4065	Toggle	Bone	House floor 6
4507	Toggle	Bone	House floor 7
4910	Toggle	Tooth	House floor 7

Bone and ivory toggles were probably used for a variety of purposes by the Koniag. Toggles are used as closures on ethnographic examples of slat armor from the Aleutians, similar to that worn by Kodiak Island warriors (Black 1982:26; Fitzhugh and Crowell 1988:230). A toggle or a bead was often attached to the drawstring of gutskin or leather pouches. Guts skin kamleikas kept the hunter dry and prevented water from entering the kayak. Even a small amount of water in a kayak leads to an immediate loss of stability. When launching in surf, timing is critical, and there is very little time to seal the kamleika to the cockpit ring. To solve this problem the hunter held a

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Plate 85

Spool and miscellaneous cordage

Object	Description	Catalog #
A	Spool, cottonwood bark	193/1503
B	Cordage coil, spruceroot bark	193/3647
C	Cordage, braided baleen	193/5210
D	Cordage, split spruceroot	193/4522

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toggle in his mouth that was attached to the drawstring at the base of his kamleika. He pulled on it with his teeth while launching until the kayak was safely out of the surf zone, and the garment could be more securely tied to the cockpit ring (Bobby Stamp 1989).

Two of the toggles found at Karluk One are simple bone cylinders 3.4 cm long. One of which has been hollowed out (Plate 86:C,D). A more elaborate bone toggle (Plate 86:A) has a small knob on each end and encircling lines incised around its center. This specimen is 2.6 cm long. A crescent-shaped toggle has been elaborately carved from a canine tooth; possibly of a seal, and is 3.6 cm long. A deep encircling groove is present around the center of the piece, and shallower encircling lines cover the remaining surface. A sub-rectangular, nearly ovate toggle has been made from antler. This specimen is plano-convex in cross-section, with a hole countersunk in the center of the back side. It measures 2.6 cm in diameter.

A bone toggle in the form of a bird (Plate 86:G), has four adjoining holes in the center, and a hole on the tail end. It is 3.9 cm long and is reminiscent of a toggle from the western Aleutians illustrated by Black (1982:17). The most unique toggle is in the form of a human face (Plate 86:F). It was made from ivory and the eye holes are drilled. Two bridged holes are present on the back of this piece, which measures 1.8 cm in diameter.

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Plate 86

Toggles

Object	Description	Catalog #
A	Toggle, bone	193/
B	Toggle, antler	193/4050
C	Toggle, bone	193/
D	Toggle, bone	193/
E	Toggle, canine tooth	193/4910
F	Toggle in the form of a human face, ivory	193/2407
G	Toggle in the form of a bird-like creature, bone	193/

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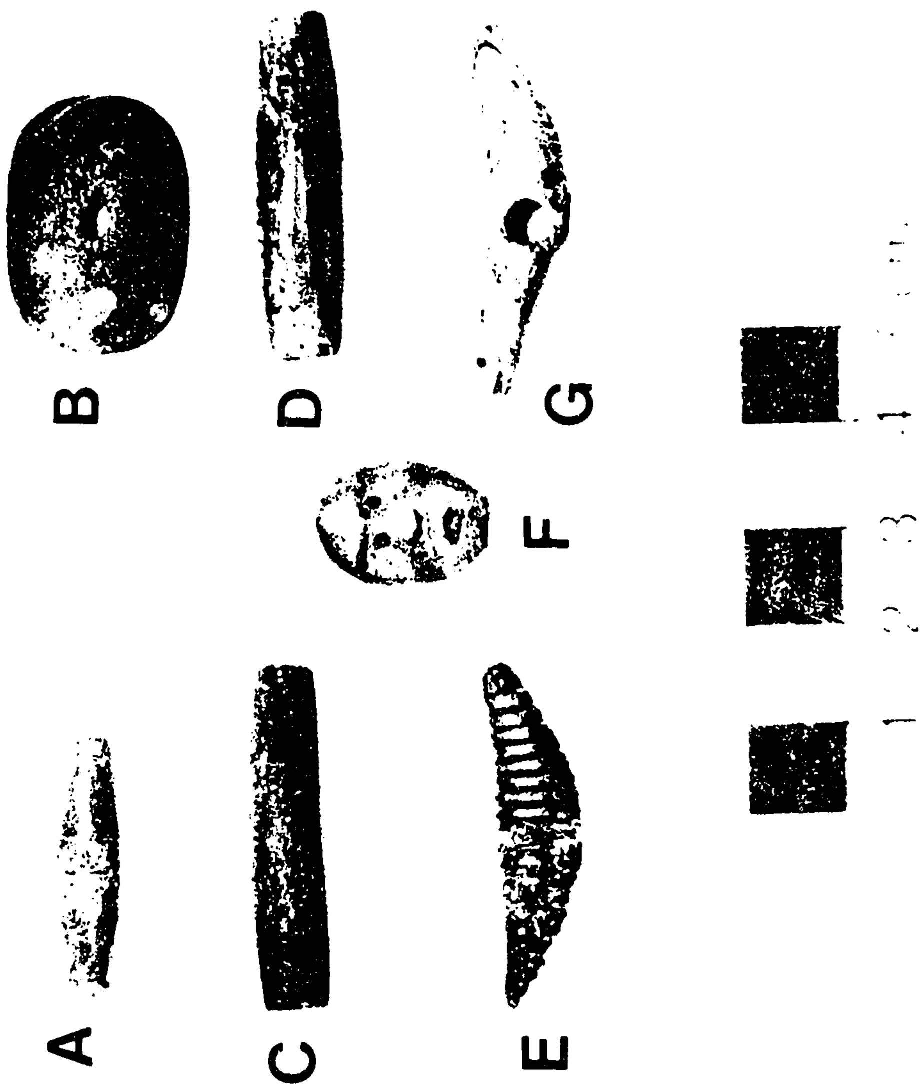

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Hammerstones

All the identifiable hammerstones from Karluk One, a total of 74, were collected. Nearly all of these hammerstones are water worn cobbles which exhibit various degrees of battering. One exception is a fragment of a green silicified slate adze blade which was reused as a hammerstone (Plate 87: A). Most of the hammerstones were probably acquired on the beach immediately in front of the site, which is composed of granite and graywacke cobbles. Of interest are two graywacke specimens with large natural holes which apparently served as grips (Plate 87: D,E). A single red siltstone hammerstone also represents an exotic lithic material (Plate 87: C).

Table 7: 1 Granite Hammerstones

Catalog	Artifact Type	Material	Context
980	Hammerstone	Granite	House 1 roof sod
1328	Hammerstone	Granite	House floor 1
1836	Hammerstone	Granite	House floor 1
3347	Hammerstone	Granite	House 1 wall sod
1844	Hammerstone	Granite	House floor 1
4329	Hammerstone	Granite	House floor 1
4139	Hammerstone	Granite	House 2 roof sod
2389	Hammerstone	Granite	House floor 2
3963	Hammerstone	Granite	House floor 3
1928	Hammerstone	Granite	House floor 3
3660	Hammerstone	Granite	House 4 roof sod
822	Hammerstone	Granite	House floor 4
1428	Hammerstone	Granite	House floor 4
3607	Hammerstone	Granite	House floor 4
848	Hammerstone	Granite	House 5 roof sod
3171	Hammerstone	Granite	House 6 wall sod
2018	Hammerstone	Granite	House floor 6
1218	Hammerstone	Granite	House 6 wall sod
1473	Hammerstone	Granite	House floor 6
1718	Hammerstone	Granite	House floor 7
2055	Hammerstone	Granite	House floor 7
5987	Hammerstone	Granite	House 8 roof sod
6535	Hammerstone	Granite	House floor 10

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Table 7:2 Graywacke Hammerstones

Catalog	Artifact Type	Material	Context
4668	Hammerstone	Graywacke	House 1 roof sod
3536	Hammerstone	Graywacke	House 1 roof sod
3472	Hammerstone	Graywacke	House floor 1
3500	Hammerstone	Graywacke	House floor 1
1062	Hammerstone	Graywacke	House floor 2
783	Hammerstone	Graywacke	House floor 2
3027	Hammerstone	Graywacke	House 3 roof sod
3477	Hammerstone	Graywacke	House 3 roof sod
3949	Hammerstone	Graywacke	House 3 roof sod
1086	Hammerstone	Graywacke	House floor 3
4164	Hammerstone	Graywacke	House 3 wall sod
3621	Hammerstone	Graywacke	House 4 roof sod
1774	Hammerstone	Graywacke	House floor 4
1129	Hammerstone	Graywacke	House floor 4
2613	Hammerstone	Graywacke	House floor 4
2619	Hammerstone	Graywacke	House floor 4
1971	Hammerstone	Graywacke	House floor 4
4222	Hammerstone	Graywacke	House floor 5
5452	Hammerstone	Graywacke	House floor 6
4905	Hammerstone	Graywacke	House 6 wall sod
3778	Hammerstone	Graywacke	House floor 7
3824	Hammerstone	Graywacke	House 7 wall sod
4922	Hammerstone	Graywacke	House floor 7
2050	Hammerstone	Graywacke	House floor 7
5771	Hammerstone	Graywacke	House 8 roof sod
5971	Hammerstone	Graywacke	House 8 roof sod
5006	Hammerstone	Graywacke	House floor 8
5700	Hammerstone	Graywacke	Upper basal midden
6156	Hammerstone	Graywacke	Upper basal midden
5338	Hammerstone	Graywacke	House floor 10
5330	Hammerstone	Graywacke	House floor 10
6539	Hammerstone	Graywacke	House floor 10

Graywacke, granite, and basalt are the favored materials for hammerstones throughout Karluk One's Koniag sequence (Chart 11). There seems to be a gradual increase in their use probably related to the greater numbers of chert debitage, notched-pebble sinkers, and oil lamps in the later house floors. There are also greater numbers of hammerstones of non-local basalt shortly after A.D. 1600, indicating more travel to or trade with the mainland.

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A total of 27 basalt hammerstones were found, all probably imported from the Alaska Peninsula, the nearest source of this material. I have seen entire beaches of the Katmai Bay area, which is the nearest shore of the Alaska Peninsula from Karluk, covered with rounded cobbles of this variety of basalt. This gray to black basalt with white phenocrysts (Plate 87: B), is often encountered in Kachemak and Koniag sites along Karluk Lagoon, and was used for hammerstones or burnishing stones. No other lithic artifacts in the collection are made from this type of basalt. It is possible that basalt was carried back as kayak ballast from the Alaska Peninsula. Kayaks were often ballasted with as much as 20 kg. of rock to increase their stability, particularly in rough seas (Zimmerly 1986).

Table 7:3 Basalt Hammerstones

Catalog	Artifact Type	Material	Context
2946	Hammerstone	Basalt	House floor 1
2947	Hammerstone	Basalt	House floor 1
2108	Hammerstone	Basalt	House floor 1
2109	Hammerstone	Basalt	House floor 1
1839	Hammerstone	Basalt	House floor 1
4124	Hammerstone	Basalt	House 2 roof sod
3966	Hammerstone	Basalt	House 2 wall sod
3582	Hammerstone	Basalt	House 2 wall sod
778	Hammerstone	Basalt	House 2 wall sod
2301	Hammerstone	Basalt	House floor 2
791	Hammerstone	Basalt	House floor 2
792	Hammerstone	Basalt	House floor 2
2572	Hammerstone	Basalt	House 3 roof sod
4163	Hammerstone	Basalt	House 3 wall sod
3964	Hammerstone	Basalt	House floor 3
3567	Hammerstone	Basalt	House floor 3
2405	Hammerstone	Basalt	House floor 3
3052	Hammerstone	Basalt	House floor 3
4427	Hammerstone	Basalt	House floor 4
4460	Hammerstone	Basalt	House floor 4
3679	Hammerstone	Basalt	House floor 5
3815	Hammerstone	Basalt	House floor 6
3193	Hammerstone	Basalt	House floor 7
5176	Hammerstone	Basalt	House floor 8
5314	Hammerstone	Basalt	House floor 10
5315	Hammerstone	Basalt	House floor 10

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Plate 87

Hammerstones

Object	Description	Catalog #
A	Hammerstone, silicified slate	193/
B	Hammerstone, basalt	193/2946
C	Hammerstone, basalt	193/
D	Hammerstone, naturally shaped graywacke	193/3949
E	Hammerstone, naturally shaped graywacke	193/5452

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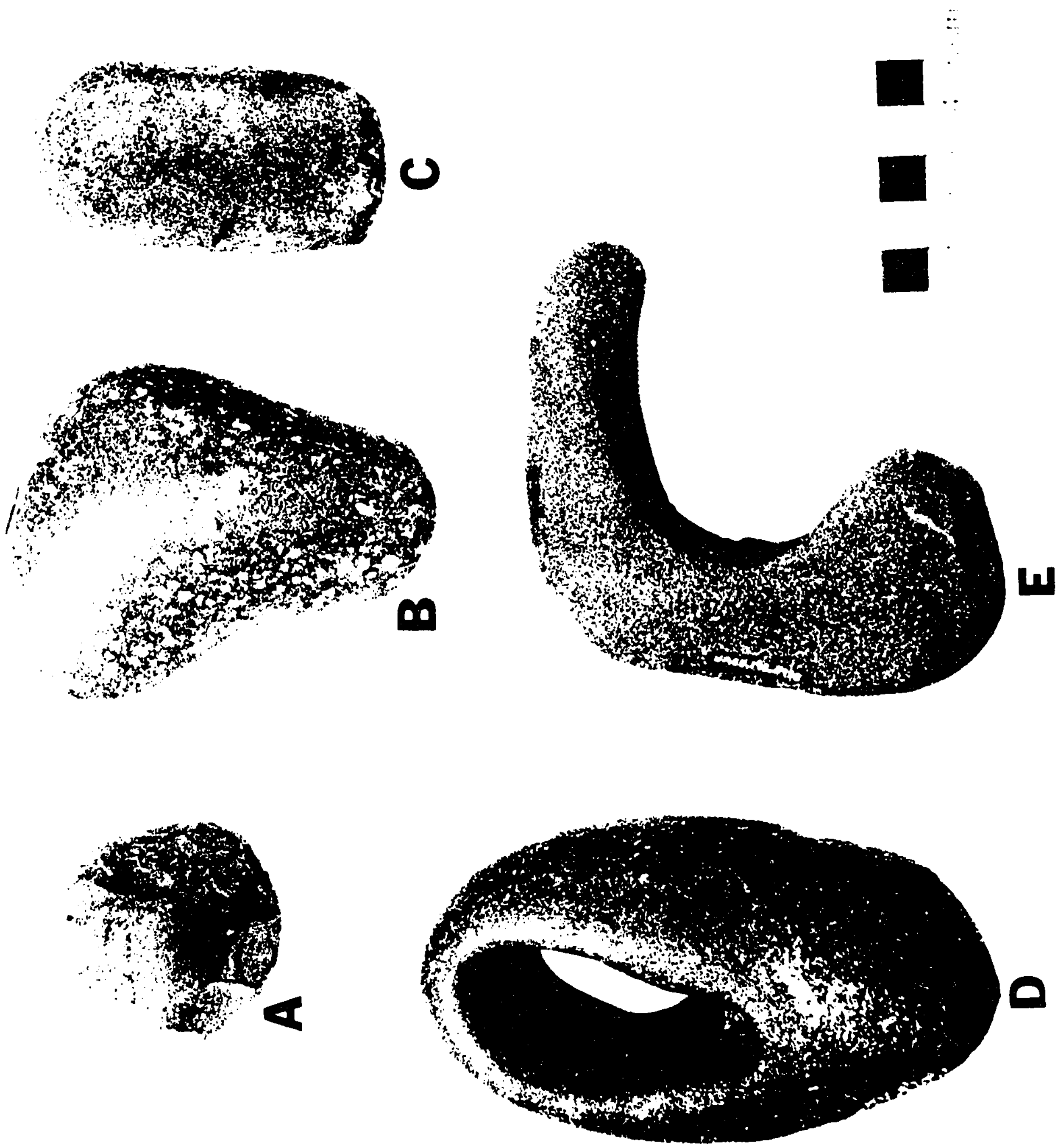

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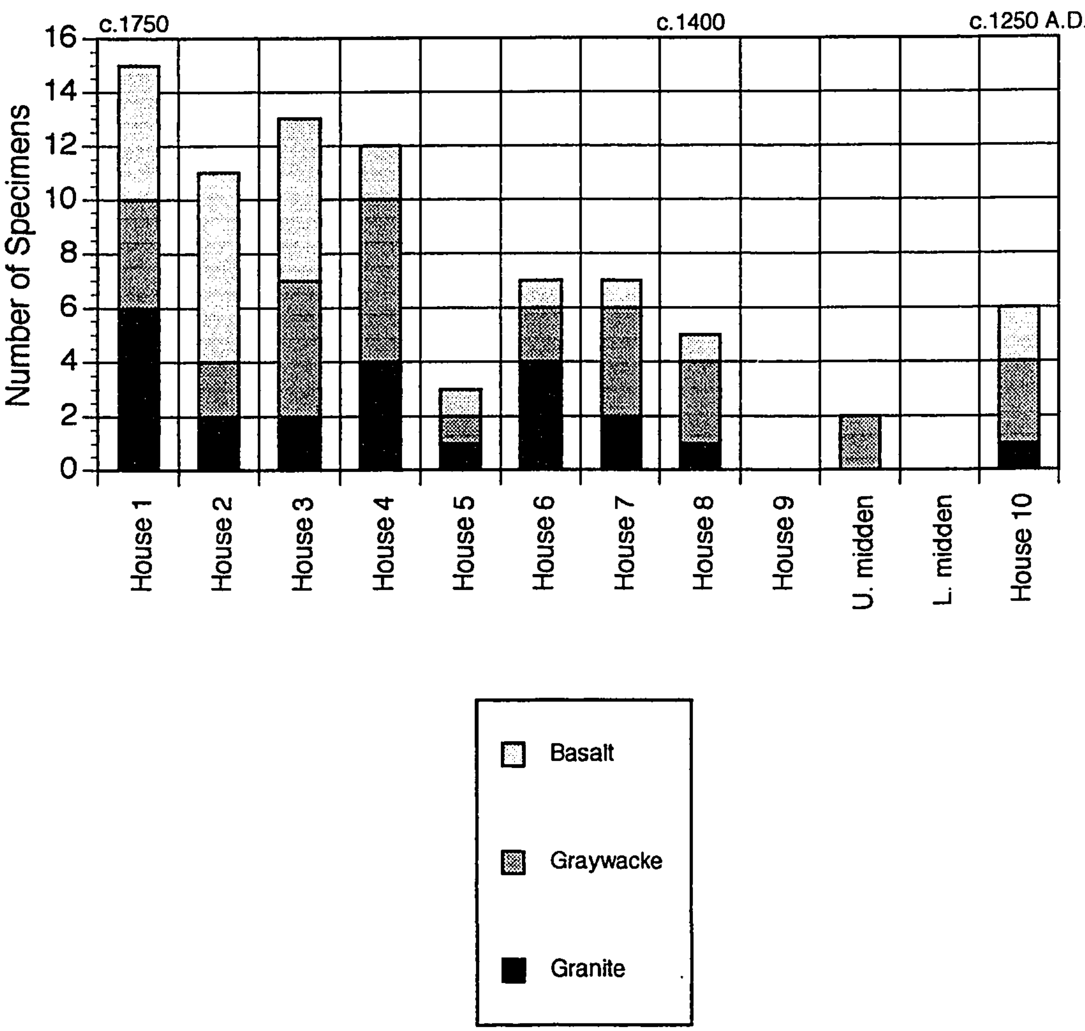
Chart 10: Hammerstones At Karluk One



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Fossil Ivory Hammer Head

A hammer head made of an oblong piece of brown fossil ivory measures 6.7 cm long and 3.3 cm thick. This specimen is ground on the top surface and has a v-shaped groove encircling the top and sides. It was found on house floor 3 and strongly resembles ethnographic specimens of hammer heads collected from the Bering Sea region. This object may be a trade item from this region.

Flakers

A cylindrical piece of whalebone with a blunted tip is 7 cm long, and was probably used as a pressure flaker for stone knapping. It was found on house floor 6. An antler tip, blunted by use, is also tentatively identified as a flaking tool. It measures 5.1 cm in length and was found on house floor 8. Many flakers were recovered from the Uyak site, which also produced a greater number of chipped stone tools (Steffian 1994).

Split Cobble Tools

Split cobble tools, or boulder flakes, are common in Kodiak sites from both the Kachemak and Koniag phases (Clark 1974: 81). Examples in the Karluk One assemblage are nearly all made by splitting a large flake from the side of a cobble. They probably served a variety of functions (de Laguna 1934: 60-61). At least some of the Karluk One specimens may have been used as saws, scrapers, or both as no other tools appropriate for these tasks were found. The numbers of split cobble tools decrease steadily in the three uppermost house floors at Karluk One (Chart 12), when a relatively heavy reliance on fishing began to abate. Steffian reports an inverse relationship

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Chart 11: Provenience and Frequency of Split Cobble Tools at Karluk One

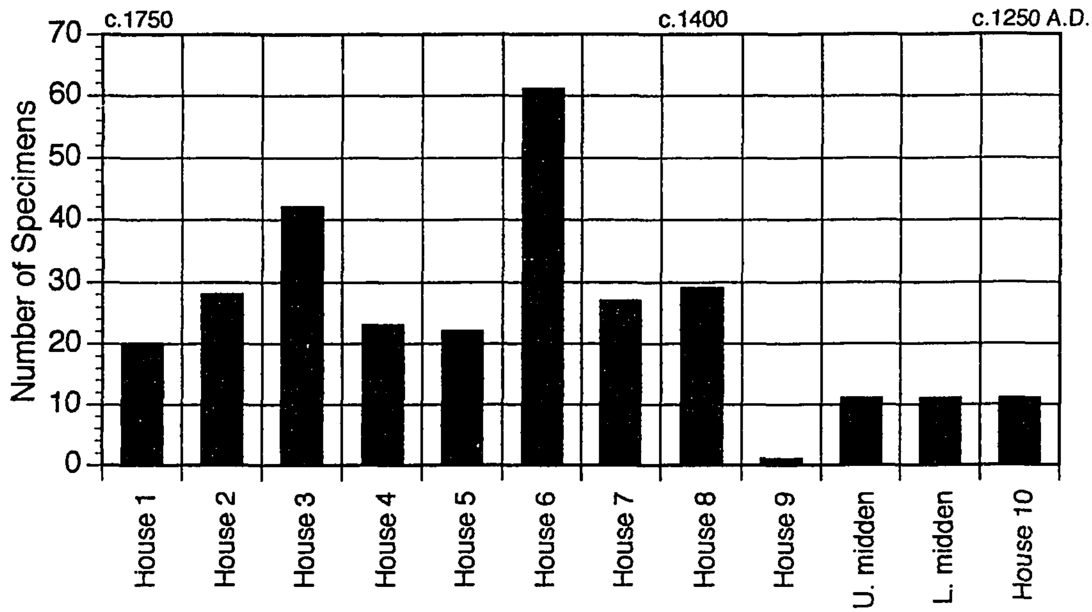

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Plate 88

Split cobble tools

Object	Description	Catalog #
A	Split cobble tool, graywacke	193/
B	Split cobble tool, graywacke	193/
C	Split cobble tool, graywacke	193/
D	Split cobble tool, graywacke	193/
E	Split cobble tool, graywacke	193/
F	Split cobble tool, graywacke	193/
G	Split cobble tool, graywacke	193/

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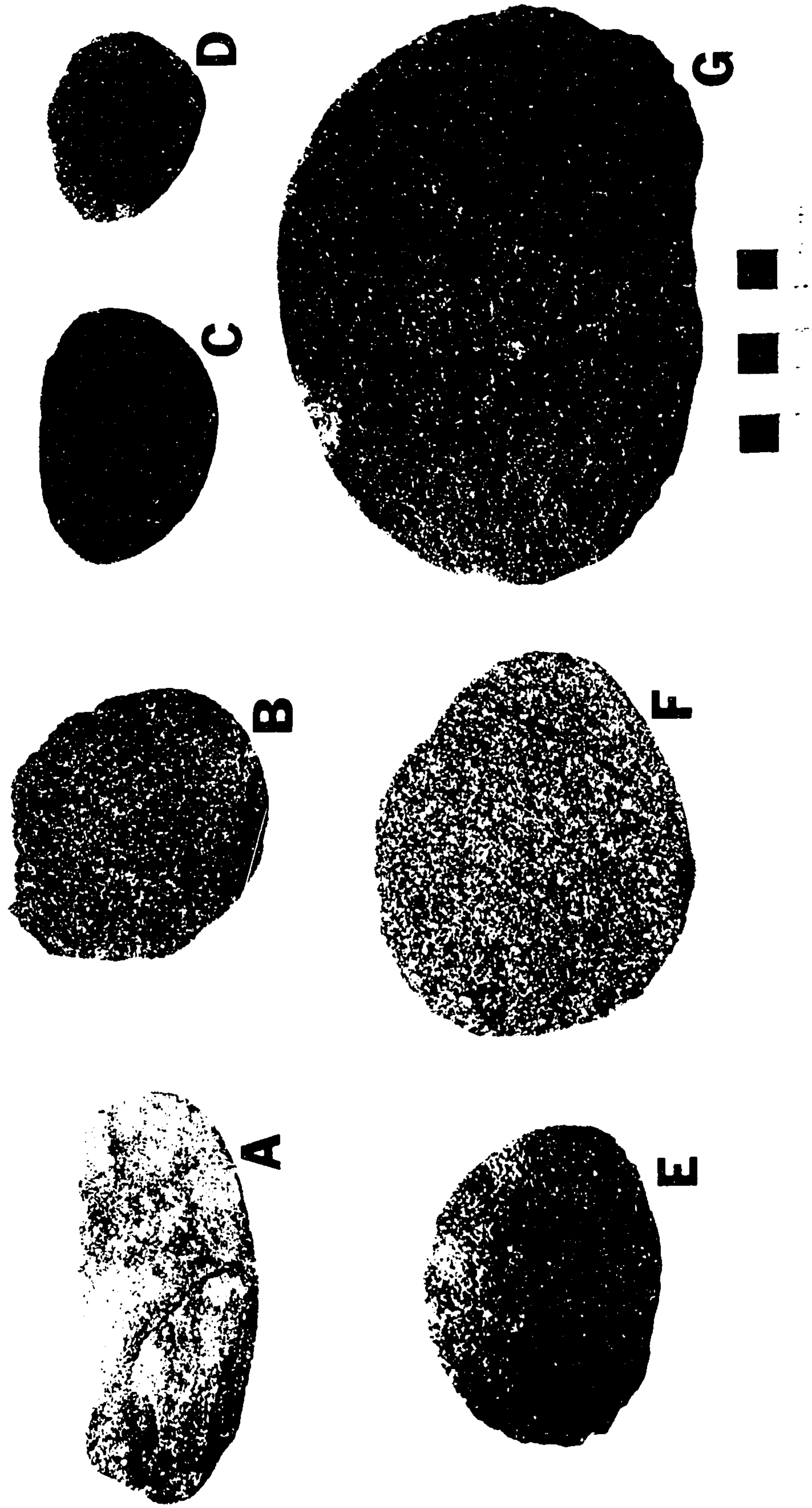

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Plate 89

Large split cobble tools

Object	Description	Catalog #
A	Large split cobble tool, graywacke	193/
B	Large split cobble tool, graywacke	193/

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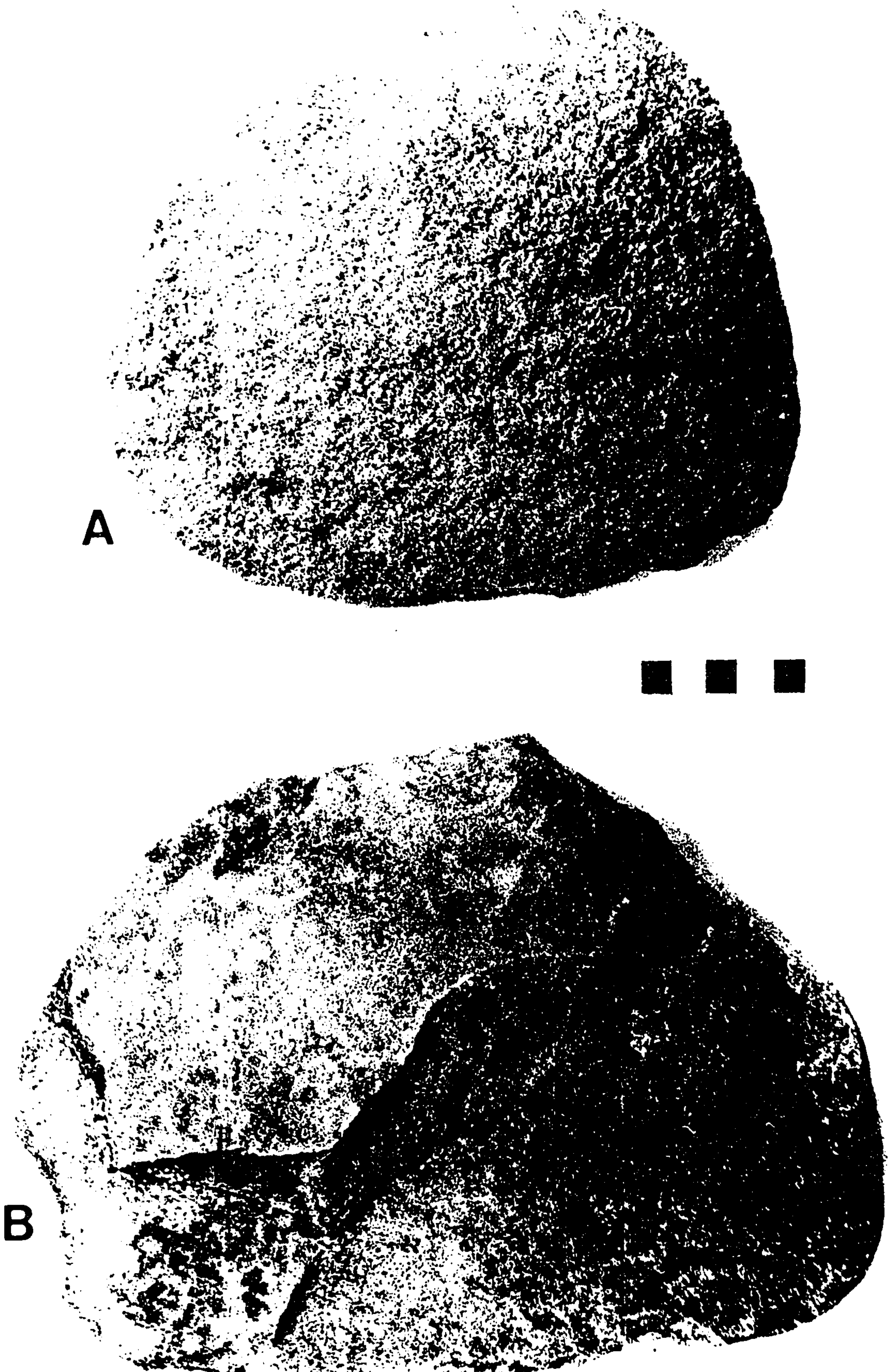

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between the presence of net sinkers and split cobble tools in Kachemak sites (1994).

Of the total of 260 split cobble tools in the assemblages 257 are made of graywacke. Although graywacke is harder, but fractures easier than the more abundant granite and the resulting flakes have a straighter cutting edge. Most split cobble tools range in size from 3.5 to 14.5 cm in diameter (Plate 88: A-G), with a single larger example measuring 20 cm in diameter. Nearly all exhibit some degree of edge wear.

A single granite split cobble appears to be a fire spalled fragment which may have been utilized as a split cobble tool on an opportunistic basis. Two other examples of split cobble tools in materials other than graywacke in the assemblage include one of silicified slate, and another from basalt with white phenocrysts.

Battered Graywacke Cobbles

Two other large flat graywacke cobbles have numerous large flake scars, and poorly defined notches on their sides. Other similar large cobbles were observed eroding from Koniag middens in Karluk Lagoon. They may have used as cores from which split cobble tools, were struck or may have served as seine or boat anchors. One large graywacke cobble has large flake scars, and is bifacially worked. It is flat, roughly oval, and 24 cm in diameter. Another graywacke cobble is ovate, with notches on both the short and long axis. It is 21.8 cm long and 11.8 cm wide.

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Table 7:4 Burnishing Stones

Catalog	Artifact Type	Material	Context
2672	Burnishing stone	Graywacke	House 1 roof sod
2204	Burnishing stone	Banded Slate	House floor 1
3332	Burnishing stone	Silicified slate	House floor 1
3343	Burnishing stone	Silicified Slate	House floor 1
4730	Burnishing stone	Unident. lithic	House 2 wall sod
1572	Burnishing stone	Slate	House 2 wall sod
3476	Burnishing stone	Unident. lithic	House floor 2
2686	Burnishing stone	Unident. lithic	House floor 2
4296	Burnishing stone	Basalt	House floor 2
1369	Burnishing stone	Graywacke	House floor 2
4726	Burnishing stone	Basalt	House floor 2
766	Burnishing stone	Silicified Slate	House floor 2
4735	Burnishing stone	Graywacke	House floor 2
3511	Burnishing stone	Silicified slate	House floor 2
1859	Burnishing stone	Graywacke	House floor 2
3525	Burnishing stone	Unident. lithic	House floor 2
1872	Burnishing stone	Graywacke	House floor 2
1749	Burnishing stone	Basalt	House floor 2
2592	Burnishing stone	Basalt	House 3 wall sod
4626	Burnishing stone	Basalt	House 3 roof sod
814	Burnishing stone	Graywacke	House floor 3
1811	Burnishing stone	Graywacke	House floor 3
1604	Burnishing stone	Silicified slate	House floor 3
1630	Burnishing stone	Graywacke	House floor 3
819	Burnishing stone	Basalt	House floor 3
1919	Burnishing stone	Basalt	House floor 3
1657	Burnishing stone	Graywacke	House floor 4
2403	Burnishing stone	Graywacke	House floor 4
4220	Burnishing stone	Unident. lithic	House floor 5
1157	Burnishing stone	Silicified slate	House floor 5
2485	Burnishing stone	Silicified Slate	House floor 5
4881	Burnishing stone	Silicified slate	House floor 5
885	Burnishing stone	Silicified slate	House 6 roof sod
4906	Burnishing stone	Basalt	House 6 wall sod
4824	Burnishing stone	Silicified slate	House floor 7
4911	Burnishing stone	Graywacke	House floor 7
4509	Burnishing stone	Silicified slate	House floor 7
4975	Burnishing stone	Graywacke	House floor 7
6314	Burnishing stone	Graywacke	House 8 roof sod
5775	Burnishing stone	Basalt	House 8 roof sod
6055	Burnishing stone	Basalt	House floor 8
6213	Burnishing stone	Graywacke	House floor 8
6072	Burnishing stone	Unident. lithic	House floor 8
5381	Burnishing stone	Graywacke	Upper basal midden
5382	Burnishing stone	Unident. lithic	Upper basal midden
5811	Burnishing stone	Graywacke	Upper basal midden
5812	Burnishing stone	Silicified Slate	Upper basal midden
5568	Burnishing stone	Graywacke	House floor 9A
6446	Burnishing stone	Basalt	House floor 9A
5248	Burnishing stone	Silicified Slate	House floor 9A
5605	Burnishing stone	Silicified slate	House floor 9B
6537	Burnishing stone	Slate	House floor 10

There are 56 burnishing stones in the assemblage. These are elongate, water worn stones (Plate 89: A-L), with various degrees of polish incurred by burnishing wood or bone items during the final stage of artifact manufacture.

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Modern wood workers use rounded steel burnishers on hardwoods. Makers of English longbows use a burnishing stone to crush the grain of yew wood and to prevent slivers and breakage. Koniag wood workers probably used burnishing stones in a similar manner, possibly in working Pacific Yew. I have found that similar stones effective in polishing freshly carved wood without scratching. Burnishing stones in the assemblage range in length from 13.8 cm to 6.3 cm. Fairly deep pecking marks appear on most of the specimens, in small areas of the stones' surface. It may be that these rough areas were purposely created so that the stone could also be used to smooth occasional rough spots as needed.

The majority of the burnishing stones are made of a distinctive banded, gray-green sedimentary rock, possibly a type of silicified slate, which is not present elsewhere in the Karluk One assemblage. Clark recovered burnishing stones of this same lithic material at Kiavak (1974:94), however they were curiously absent from the Rolling Bay assemblage. This material occurs naturally on pocket beaches near the southern terminus of Cape Alitak. Repeated pummeling by high energy seas acts as a natural rock tumbler, giving the beach cobbles an unusually high gloss. A few other lithic materials used for burnishing stones are also present, including specimens made of basalt, slate, graywacke, and seven of undetermined lithic material. Burnishing stones were recovered from all house floors at Karluk One, with the greatest number from house floors 2 and 3.

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Plate 90

Burnishing stones

Object	Description	Catalog #
A	Burnishing stone, silicified slate	193/1572
B	Burnishing stone, basalt	193/6055
C	Burnishing stone, basalt	193/1919
D	Burnishing stone, greywacke	193/5568
E	Burnishing stone, basalt	193/1859
F	Burnishing stone, silicified slate	193/6818
G	Burnishing stone, silicified slate	193/3332
H	Burnishing stone, silicified slate	193/4824
I	Burnishing stone, silicified slate	193/885
J	Burnishing stone, basalt	193/2592
K	Burnishing stone, greywacke	193/1657
L	Burnishing stone, silicified slate	193/5248

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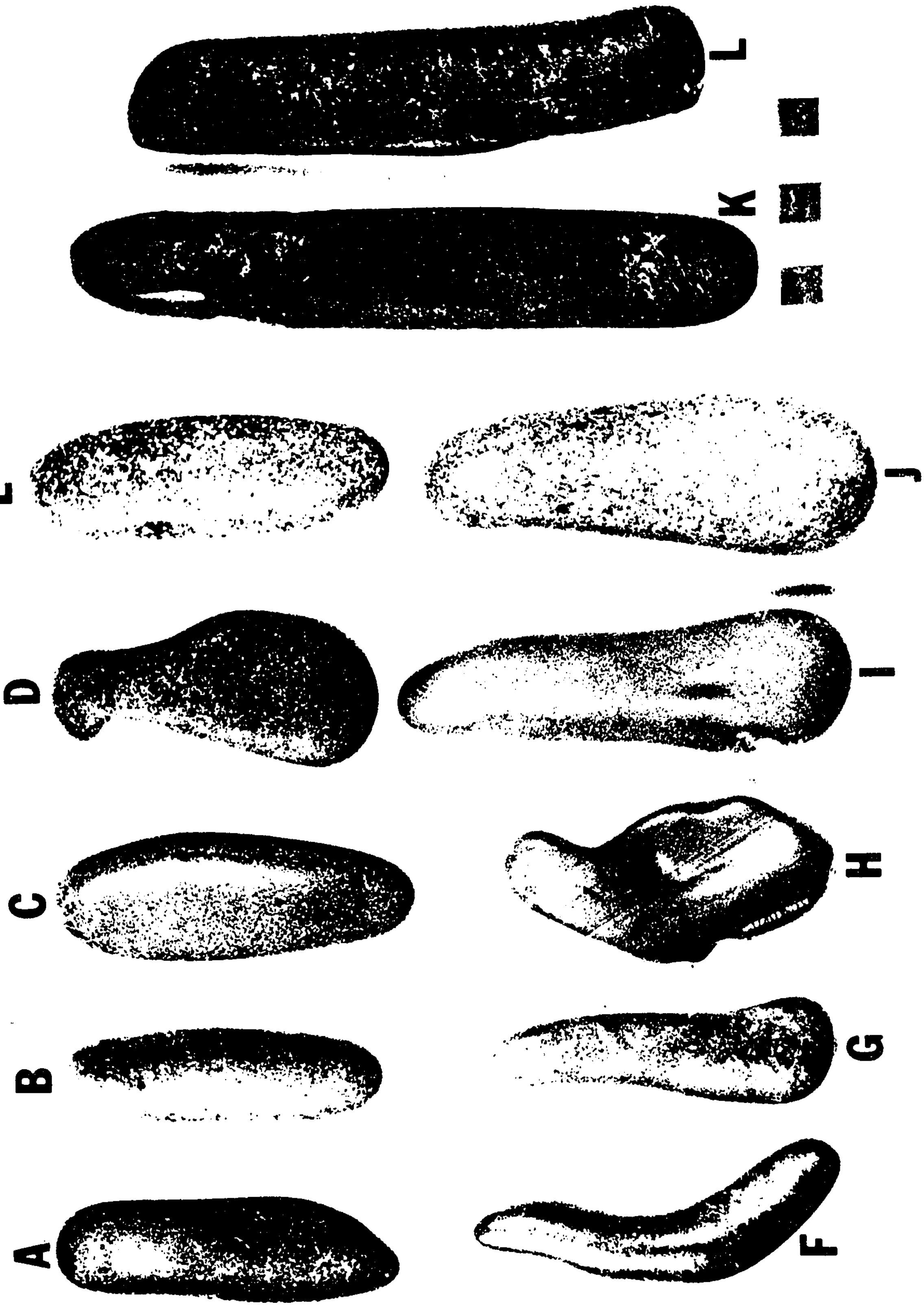

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Abraders and Whetstones

Table 7: 5 Pumice Abraders

Catalog	Artifact Type	Material	Context
1330	Abrader	Pumice	House floor 1
717	Abrader	Pumice	House floor 1
730	Abrader	Pumice	House floor 1
732	Abrader	Pumice	House floor 1
1842	Abrader	Pumice	House floor 1
1843	Abrader	Pumice	House floor 1
3932	Abrader	Pumice	House 2 roof sod
3510	Abrader	Pumice	House floor 2
4550	Abrader	Pumice	House floor 2
4346	Abrader	Pumice	House floor 2
1634	Abrader	Pumice	House floor 4
4101	Abrader	Pumice	House floor 4
3127	Abrader	Pumice	House 5 wall sod
1163	Abrader	Pumice	House floor 5
1449	Abrader	Pumice	House floor 5
4954	Abrader	Pumice	House floor 7
5081	Abrader	Pumice	House floor 8
5236	Abrader	Pumice	Upper basal midden

Pumice and Scoria Abraders

Nineteen irregularly shaped lumps of pumice/scoria were found at Karluk One, 16 have been ground on at least one surface. They range from 2.3 to 8.3 cm in diameter (Plate 90: A,B). Fifteen are light enough to float, and could have been collected as flotsam from the beach. However four are heavier, and are almost certainly imports from the volcanically active Alaska Peninsula. Three of the pumice pieces are white, while the remainder range from light to brick red and black in color. Pumice and scoria are most appropriate for heavier duty grinding and scouring purposes, as they are too coarse for finer finishing work. Pieces of pumice still wash up on Karluk beaches and are used by today's village residents to polish stoves and rusted metal.

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Plate 91

Abraders and whetstones

Object	Description	Catalog #
A	Abrader, pumice	193/
B	Abrader, pumice	193/
C	Whetstone, green siltstone	193/
D	Whetstone, green siltstone	193/5101
E	Whetstone, sandstone	193/5100
F	Whetstone, sandstone	193/
G	Whetstone, green siltstone	193/
H	Whetstone, green siltstone	193/6027

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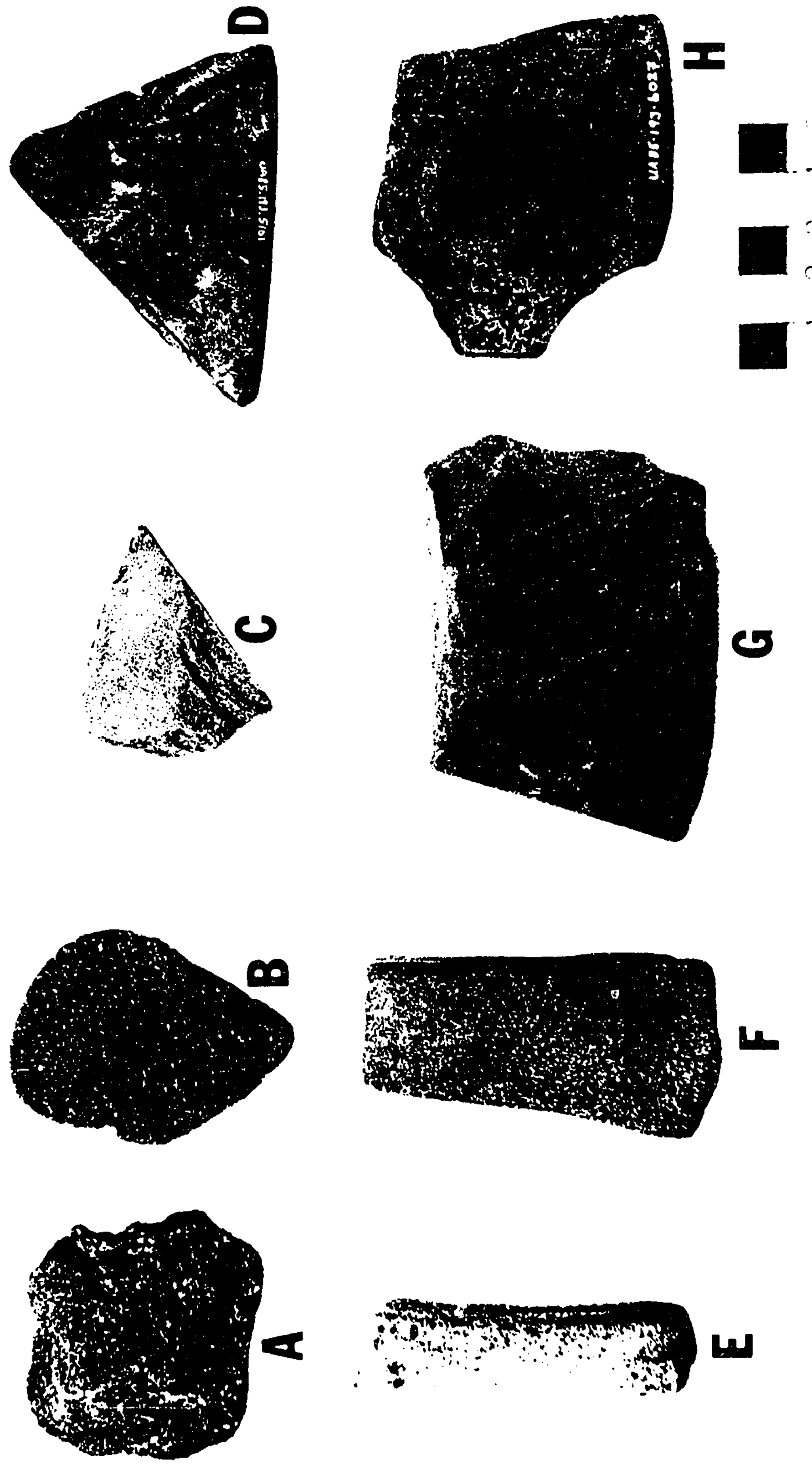

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Hones

Table 7: 9 Hones

Catalog	Artifact Type	Material	Context
685	Hone	Unident. lithic	House floor 1
693	Hone	Sandstone	House floor 1
2122	Hone	Siltstone	House floor 1
3461	Hone	Siltstone	Burial
2696	Hone	Silicified Slate	House floor 2
1986	Hone	Sandstone.	House floor 5
2294	Hone	Slate	House floor 2
1854	Hone	Basalt	House floor 2
391	Hone	Slate	Profile 1; 98 cm bd
3571	Hone	Sandstone.	House floor 3
2602	Hone	Unident. lithic	House 4 wall sod
2647	Hone	Siltstone	House floor 4
3390	Hone	Unident. lithic	House floor 4
3642	Hone	Unident. lithic	House floor 4
4011	Hone	Slate	House 5 roof sod
4219	Hone	Siltstone	House floor 5
2911	Hone	Siltstone	House floor 5
1169	Hone	Silicified Slate	House floor 5
1981	Hone	Silicified Slate	House floor 5
1456	Hone	Siltstone	House floor 5
1499	Hone	Siltstone	House floor 6
2829	Hone	Siltstone	House floor 6
2920	Hone	Siltstone	House floor 6
916	Hone	Sandstone.	House floor 7
3906	Hone	Siltstone	House floor 7
2040	Hone	Siltstone	House floor 7
6417	Hone	Sandstone.	House floor 8
5100	Hone	Sandstone.	Upper basal midden
5101	Hone	Silt stone	Upper basal midden
6027	Hone	Silt stone	Upper basal midden

Hones of various siltstones and sandstones are found in assemblages throughout the prehistoric sequence in the Kodiak Archipelago. They were used in the manufacturing and maintenance of edged and pointed implements. In the Karluk One assemblage, there are 13 pieces of tabular and irregularly shaped pieces of siltstone used as hones. The tabular pieces range in thickness from 0.3 to 2 cm (Plate 90: D,G,H). The irregularly shaped pieces range from 4.3 to 7 cm long and are 1.5 to 4.5 cm thick. All of these specimens

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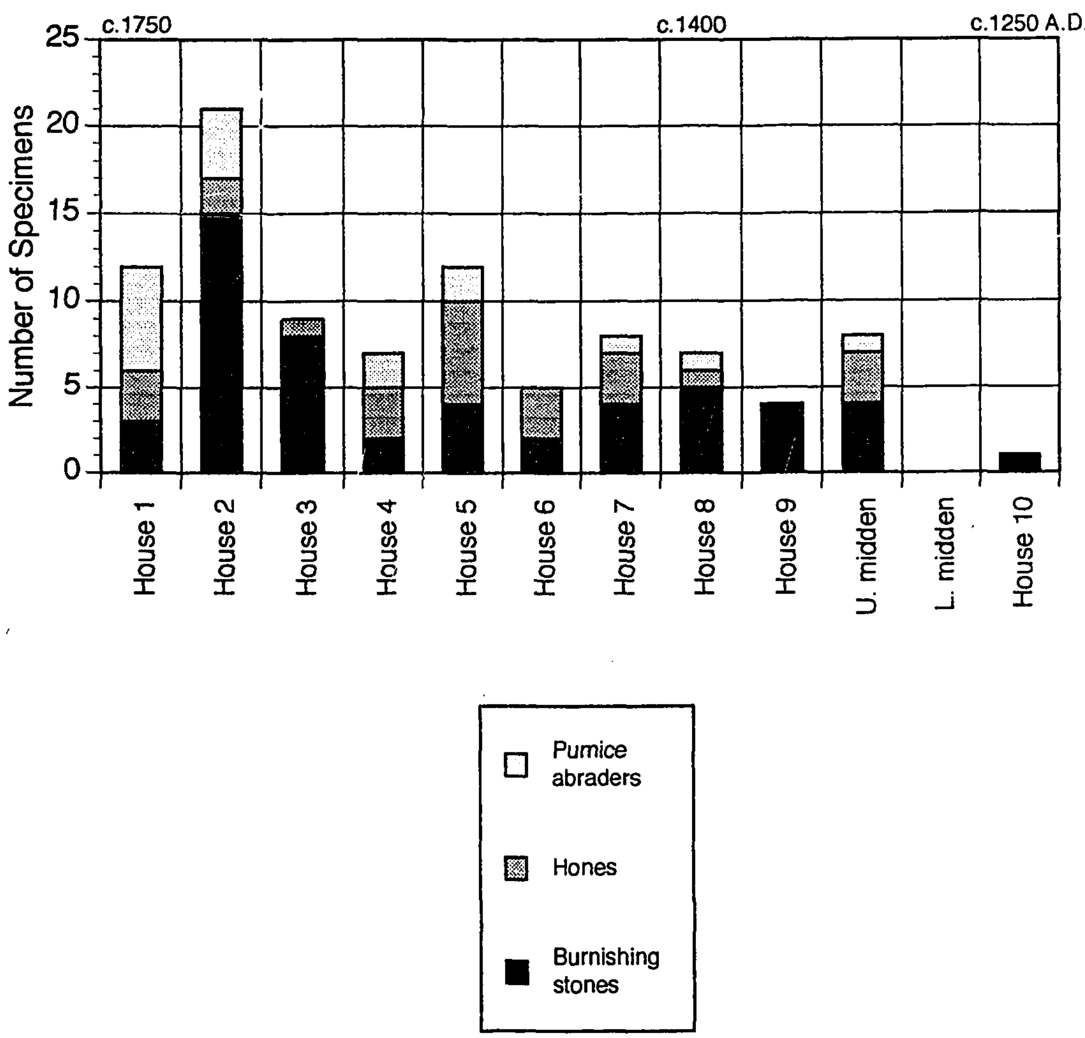
Chart 12: Abraders, Hones, and Burnishing Stones at Karluk One



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are ground on one or more surfaces. The ground areas are uneven, and lack striations, which suggests these pieces were used to create and maintain sharp edges and/or points.

Coarser in texture than the siltstone specimens are six hones of fine grained sandstone (Plate 90: C,E,F). Four of the sandstone specimens are quadrangular, and ground on all surfaces. They range from 3.2 to 5.9 cm long and from 1.2 to 2.9 cm thick. Two others hones are irregularly shaped chunks. One of these, a rounded specimen about 5.5 cm in diameter, has a pair of short v-shaped grooves, possibly intended for small bone points or needles.

Wedges

The Karluk One assemblage contains 88 wooden wedges in a variety of sizes, ranging in length from 6 to 38 cm (Plate 96: A-G). Most are complete, there are only five fragmentary specimens, and consist of a sharpened length of wood with heavy battering on the proximal end. Three wedges are reused fragments of other wooden artifacts. One appears to be a the mid-section of a former bow. Wedges were used to split driftwood logs, in particular the red and white cedar logs carried from southerly regions to the Gulf of Alaska by the Japanese current.

Partially drilled holes, or 'drill sockets' (Clark 1974), occur on both wood and bone wedges collected on Kodiak and the Aleutians. Heizer recorded bone wedges with as many five or six such indentations on their sides from the Uyak site (1956:74). They may have functioned as drill caps, however some of the very largest wooden wedges, thick as a fence post, have sockets on their faces; an unlikely choice for a drill cap. Elders recall that fat was used to prevent wedges from becoming stuck. It is possible that the

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Plate 92

Wedges

Object	Description	Catalog #
A	Wedge w/drill socket, wood	193/
B	Wedge w/drill socket, wood	193/2958
C	Wedge, wood	193/
D	Wedge, wood	193/
E	Wedge, wood	193/
F	Wedge, wood	193/
G	Wedge, wood	193/

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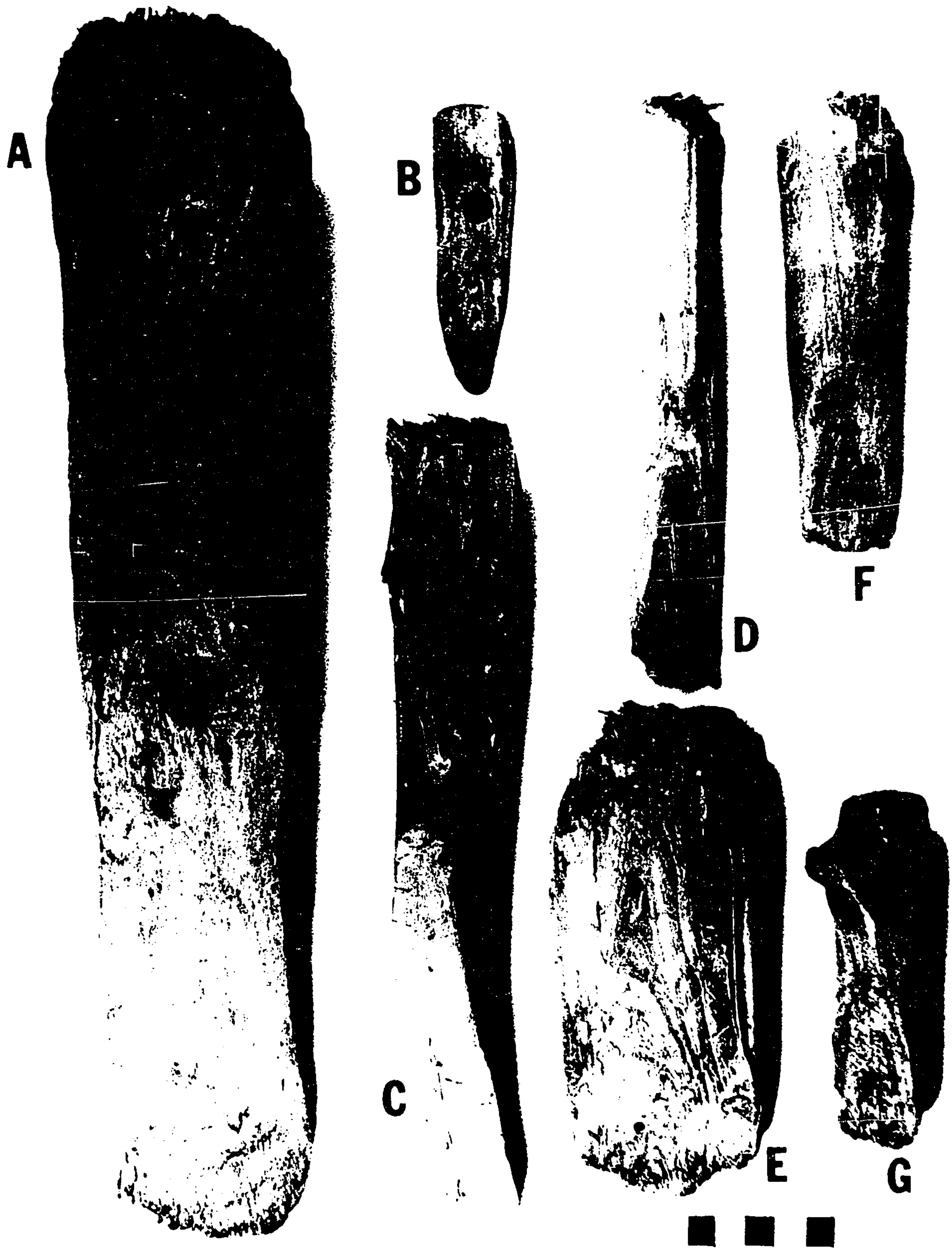

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Catalog	Artifact	Material	Context
3322	Wedge	Wood	House 1 roof sod
705	Wedge	Wood	House floor 1
724	Wedge	Wood	House floor 1
1850	Wedge	Wood	House floor 1
1858	Wedge	Wood	House floor 1
2674	Wedge	Wood	House floor 1
3321	Wedge	Wood	House floor 1
4292	Wedge	Wood	House floor 1
2958	Wedge	Wood	House 2 roof sod
761	Wedge	Wood	House floor 2
1039	Wedge	Wood	House floor 2
1578	Wedge	Wood	House floor 2
1582	Wedge	Wood	House floor 2
1584	Wedge	Wood	House floor 2
1585	Wedge	Wood	House floor 2
1589	Wedge	Wood	House floor 2
2289	Wedge	Wood	House floor 2
2305	Wedge	Wood	House floor 2
3928	Wedge	Wood	House floor 2
1089	Wedge	Wood	House floor 3
1423	Wedge	Wood	House floor 3
2331	Wedge	Wood	House floor 3
2355	Wedge	Wood	House floor 3
3568	Wedge	Wood	House floor 3
3967	Wedge	Wood	House floor 3
4002	Wedge	Wood	House floor 3
1432	Wedge	Wood	House 4 roof sod
1444	Wedge	Wood	House floor 4
1952	Wedge	Wood	House floor 4
1958	Wedge	Wood	House floor 4
1964	Wedge	Wood	House floor 4
2614	Wedge	Wood	House floor 4
2773	Wedge	Wood	House floor 4
4414	Wedge	Wood	House floor 4
4424	Wedge	Wood	House floor 4
4455	Wedge	Wood	House floor 4
4456	Wedge	Wood	House floor 4
1143	Wedge	Wood	House 5 roof sod
2016	Wedge	Wood	House floor 5
4473	Wedge	Wood	House floor 5
4475	Wedge	Wood	House floor 5
4879	Wedge	Wood	House floor 5
3133	Wedge	Wood	House 6 roof sod
4901	Wedge	Wood	House 6 wall sod
934	Wedge	Wood	House 6 wall sod

Catalog	Artifact	Material	Context
879	Wedge	Wood	House floor 6
1678	Wedge	Wood	House floor 6
2823	Wedge	Wood	House floor 6
3737	Wedge	Wood	House floor 6
3818	Wedge	Wood	House floor 6
5453	Wedge	Wood	House floor 6
5454	Wedge	Wood	House floor 6
1504	Wedge	Wood	House 7 wall sod
917	Wedge	Wood	House floor 7
1520	Wedge	Wood	House floor 7
1698	Wedge	Wood	House floor 7
2071	Wedge	Wood	House floor 7
4831	Wedge	Wood	House floor 7
5483	Wedge	Wood	House 8 roof sod
5993	Wedge	Wood	House 8 roof sod
4984	Wedge	Wood	House floor 8
4993	Wedge	Wood	House floor 8
5008	Wedge	Wood	House floor 8
5198	Wedge	Wood	House floor 8
5488	Wedge	Wood	House floor 8
5510	Wedge	Wood	House floor 8
5513	Wedge	Wood	House floor 8
5520	Wedge	Wood	House floor 8
5527	Wedge	Wood	House floor 8
5530	Wedge	Wood	House floor 8
5691	Wedge	Wood	House floor 8
6060	Wedge	Wood	House floor 8
6326	Wedge	Wood	House floor 8
6349	Wedge	Wood	House floor 8
6413	Wedge	Wood	House floor 8
6430	Wedge	Wood	House floor 8
6431	Wedge	Wood	House floor 8
6439	Wedge	Wood	House floor 8
6613	Wedge	Wood	House floor 8
5244	Wedge	Wood	House floor 9A
5578	Wedge	Wood	House floor 9A
6155	Wedge	Wood	Upper basal midden
6161	Wedge	Wood	Upper basal midden
5617	Wedge	Wood	Lower basal midden
5728	Wedge	Wood	Lower basal midden
5835	Wedge	Wood	Lower basal midden
6673	Wedge	Wood	Lower basal midden

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sockets may have held the fat. Six Karluk One wedges have sockets, all of which are located near the top of the beveled, working edge (Plate 96: A,B).

In the Kodiak Archipelago, prehistoric wooden wedges have only been recovered at Karluk One, and at Malina Creek, both wet sites with wood preservation. The Ozette site, a late prehistoric wet site on coastal Washington state, yielded more than 1,100 wedges, the vast majority of which were made from wood (Gleeson 1980:66). Unlike the Ozette wedges, the Koniag wedges lack a grommet of spruce bark around the poll, or proximal end, of the wedge.

In Osgood's study of Ingalik material culture, he noted that spruce was the preferred wood for wedges (1970: 101). He noted that the Ingalik kept wedges indoors to protect them from the softening effects of the rain. This may account for fairly high numbers of wedges being found in houses at Karluk One.

Table 7:8 Whalebone Wedges

Catalog	Artifact Type	Material	Context
1855	Wedge	Whale bone	House floor 1
1598	Wedge	Whale bone	House floor 3
2339	Wedge	Whale bone	House floor 3
2351	Wedge	Whale bone	House floor 3
4404	Wedge	Whale bone	House floor 3
3307	Wedge	Whale bone	House 4 wall sod
4493	Wedge	Whale bone	House floor 6
5254	Wedge	Whale bone	House floor 9B
5265	Wedge	Whale bone	House floor 9B
5604	Wedge	Whale bone	Upper basal midden
6184	Wedge	Whale bone	House floor 10
6193	Wedge	Whale bone	House floor 10

Osgood also recorded the use of bone and antler wedges. Although these can fracture during use, they can be sharpened to a finer edge and were preferred for work requiring more precise control (1970:103). Whalebone wedges are present through out the prehistoric sequence on Kodiak Island.

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They tend to be shorter, flatter, and have a greater edge angle than the wooden wedges. In his study of Ozette woodworking technology, Gleeson also found a similar pattern. Bone wedges were thinner, flatter, and sharper than the wooden wedges.

Eleven complete whalebone wedges were manufactured by sharpening a section of whale rib (Plate 97: B-H). The Karluk One specimens range from 6.4 to 16.8 cm long, and 4.8 to .58 cm wide. One wedge was made from the base of a shed antler (Plate 97: A). It is 5.8 cm long, 2.8 cm in diameter, and similar to one from the Kiavak Site (Clark 1974:97).

None of the whalebone wedges in the Karluk One assemblage have a drill socket indentation, although numerous socketed specimens were found at the Uyak site (Heizer 1956; Steffian 1994). Whalebone wedges from the Kachemak phase have been found in Uyak Bay sites (Crozier 1989:92; Heizer 1956:74), and on the Kenai Peninsula (de Laguna 1934:100). Heizer noted that wedges from the lower, mostly Kachemak level, of the Uyak site seem to have been more carefully made than those from the upper, mostly Koniag phase levels (1956:74). A similar pattern is reported by Clark based on his research at Three Saints Bay, Kiavak, and Rolling Bay (1974:95). Heizer found that fewer whalebone wedges occurred in the upper levels of the Uyak site. A similar pattern is present at Karluk one. There are slightly more whalebone wedges in the lower levels of the site, although there tend to be fewer whalebone artifacts and faunal remains of any kind in the later levels.

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Plate 93

Antler and whalebone wedges

Object	Description	Catalog #
A	Wedge, antler	193/4875
B	Wedge fragment, whalebone	193/4404
C	Wedge, whalebone	193/6184
D	Wedge, whalebone	193/2351
E	Wedge, whalebone	193/6704
F	Wedge, whalebone	193/2337
G	Wedge, whalebone	193/5265
H	Wedge, whalebone	193/1855

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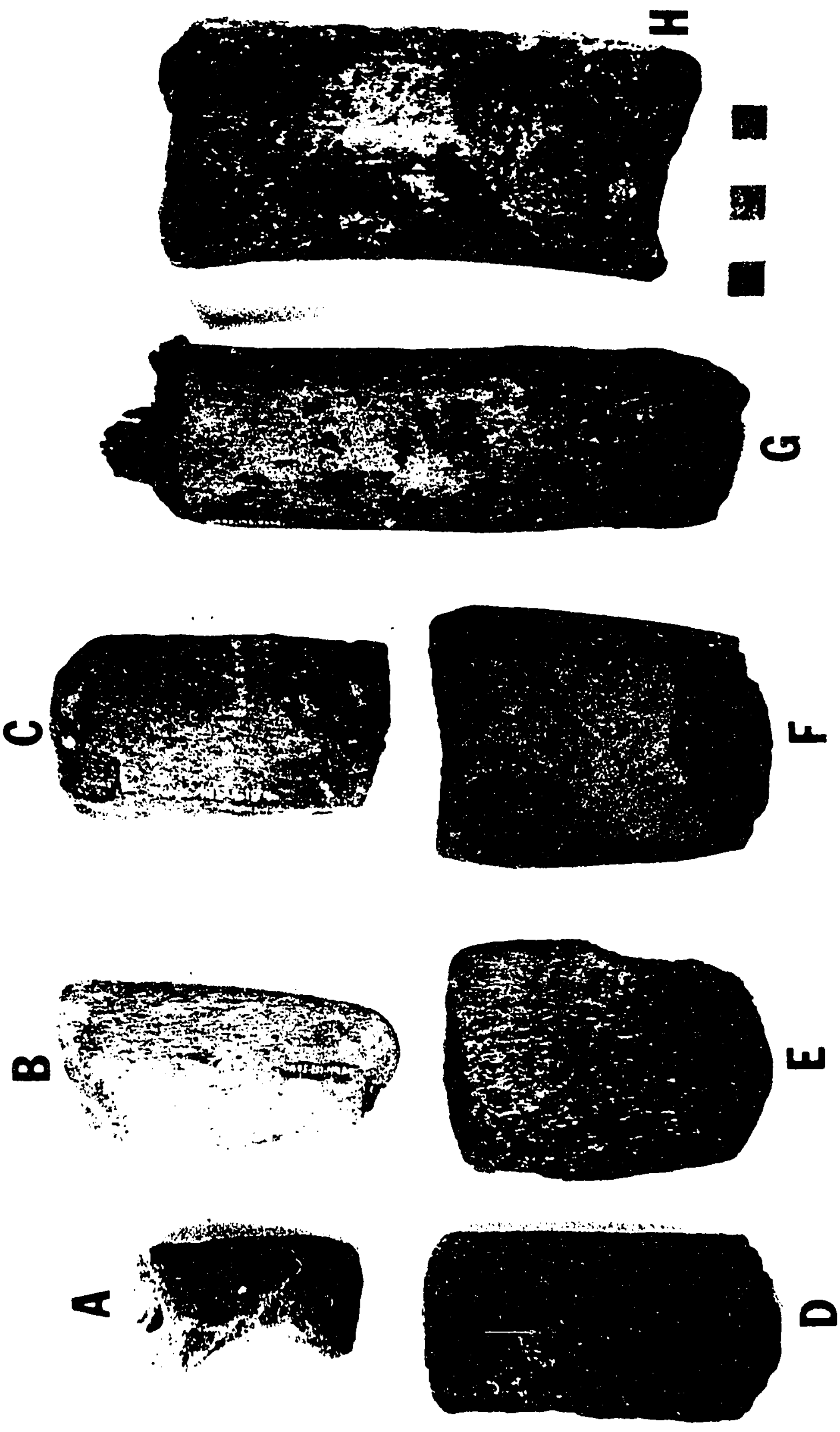

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Grooved Splitting Adzes

Table 7:9 Grooved Splitting Adzes

Catalog	Artifact Type	Material	Context
681	Grooved splitting adze	Silicified Slate	House 1 roof sod
3918	Grooved splitting adze	Silicified Slate	House 1 roof sod
3374	Grooved splitting adze	Silicified Slate	House floor 2
821	Grooved splitting adze	Silicified Slate	House floor 4
3092	Grooved splitting adze	Basalt	House floor 5

Koniag splitting adzes were hafted like an adze blade, but they were used to split wood. They are easily distinguished from planing adzes by their greater mass and obtuse edge angle. Clark found ten grooved splitting adzes in a Koniag site he excavated on Monashka Bay, near the city of Kodiak (Clark 1974:92). They are also known from Kachemak Bay in Cook Inlet (de Laguna 1934:56), and Prince William Sound (de Laguna 1956:110-121). Frederica de Laguna suggested that this adze form spread to the Chugach and Koniag from the Northwest Coast, never reaching the Aleutian Chain; an idea supported by Clark (1974:92). The Karluk One data is consistent with these findings. Grooved axes appear relatively late in Karluk assemblages and are a diagnostic of the late Koniag phase.

An ethnographic example of a grooved splitting adze from Kodiak Island, hafted on a decorated handle, exists in the collection of the Staalichen Museum fur Volkerkunde in Munich, Germany (Zerries and Rousselot 1978:77). Other specimens may exist in Russian collections (Jordan, personal communication 1990). Lydia Black (personal communication, 1990) has suggested that grooved adzes may also have been utilized as war clubs. Indeed numbers of splitting adzes were found during the excavation of a Koniag barabara at KOD-450, a fortified sea stack. However the use-wear on the Karluk One specimens seems to indicate a more mundane, utilitarian

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function. It seems likely that grooved splitting adzes may have been used opportunistically in warfare.

Six nearly complete grooved splitting adzes were found in at Karluk One. These artifacts are manufactured from a variety of lithic material. Three are made of graywacke, two of gray silicified slate, and one of green silicified slate. All have one to three pecked grooves on their dorsal surface and a flattened ventral surface. Only the cutting edge are ground and polished.

The largest grooved adze is missing its bit and measures 31 cm long and 5 cm wide (Plate 91: A). It is pecked and ground from graywacke and has two grooves. All but the ventral surface of this artifact, which appears to be unmodified, natural cortex, has been pecked. A second graywacke adze is very similar, although somewhat smaller. It measures 23.9 cm long and 4 cm wide (Plate 91: B), and has a single, poorly defined groove. A third graywacke adze has three grooves (Plate 91: C). It is 21.1 cm long and 5.4 cm wide.

The grooved adzes of silicified slate are shorter with more pronounced grooves than those of graywacke. A green silicified slate adze 18.1 cm long and 4.4 cm wide, has one broad groove (Plate 91: D). An adze of dark olive silicified slate 18.5 cm long and 4.4 cm wide has two wide grooves (Plate 91: E). Another adze, badly battered and missing a portion of its proximal end, is made from of black silicified slate (Plate 91: E). This specimen measures 15 cm long, and 4.2 cm wide.

A single preform of a grooved splitting adze is made of basalt with white phenocrysts. Some preliminary shaping has been done by pecking. This piece is 24.8 cm long and 4.6 cm wide.

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Splitting Adzes

Table 7: 10 Plain Backed Splitting Adzes

Catalog	Artifact Type	Material	Context
3331	Splitting adze	Silicified Slate	House 2 roof sod
3372	Splitting adze	Silicified Slate	House floor 2
1726	Splitting adze	Silicified Slate	House floor 2
1864	Splitting adze fragment	Silicified Slate	House floor 2
3058	Splitting adze fragment	Silicified Slate	House floor 3
1660	Splitting adze	Silicified Slate	House 5 roof sod
3116	Splitting adze fragment	Silicified Slate	House floor 5
2815	Splitting adze	Silicified Slate	House 6 roof sod
1162	Splitting adze preform	Silicified Slate	House floor 6
3182	Splitting adze	Silicified Slate	House 6 wall sod
3722	Splitting adze	Silicified Slate	House floor 6
3166	Splitting adze	Silicified Slate	House floor 6
3793	Splitting adze	Silicified Slate	House floor 6
2846	Splitting adze	Silicified Slate	House 7 roof sod
4504	Splitting adze	Silicified Slate	House floor 7
1513	Splitting adze	Silicified Slate	House floor 7
5091	Splitting adze	Silicified Slate	Upper basal midden

Thirteen plain backed splitting adzes lack grooves and surface pecking, but otherwise resemble the grooved axes in shape and edge angle, which exceeds 30 degrees (Plate 92: A-E). They are made from gray to green silicified slate, and five are of a similar size, ranging from 16.3 to 17.7 cm long and 3.9 to 4.3 cm wide. The single exception is a short, wedge-shaped, splitting adze which may be a reused fragment (Plate 91: F). It is made of green silicified slate and is 9.3 cm long and 4.2 cm wide. The cutting edge is very highly polished. Five pecked and ground pieces of gray silicified slate represent fragments of spitting adzes. These artifacts are too fragmentary for a more specific classification.

At Karluk One, use of splitting adzes increases after A.D. 1400, and grooved splitting adzes were found only in post A.D. 1600 levels. Grooved splitting adzes also appear quite late in the tool kits of other Alaskan peoples. Among the Tlingit and Athapaskans, grooved adzes appear about A.D. 1500

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Plate 94

Grooved splitting adze heads

Object	Description	Catalog #
A	Grooved splitting adze head, silicified slate	193/
B	Grooved splitting adze head, silicified slate	193/
C	Grooved splitting adze head, silicified slate	193/
D	Grooved splitting adze head, silicified slate	193/
E	Grooved splitting adze head, silicified slate	193/
F	Grooved splitting adze head, silicified slate	193/

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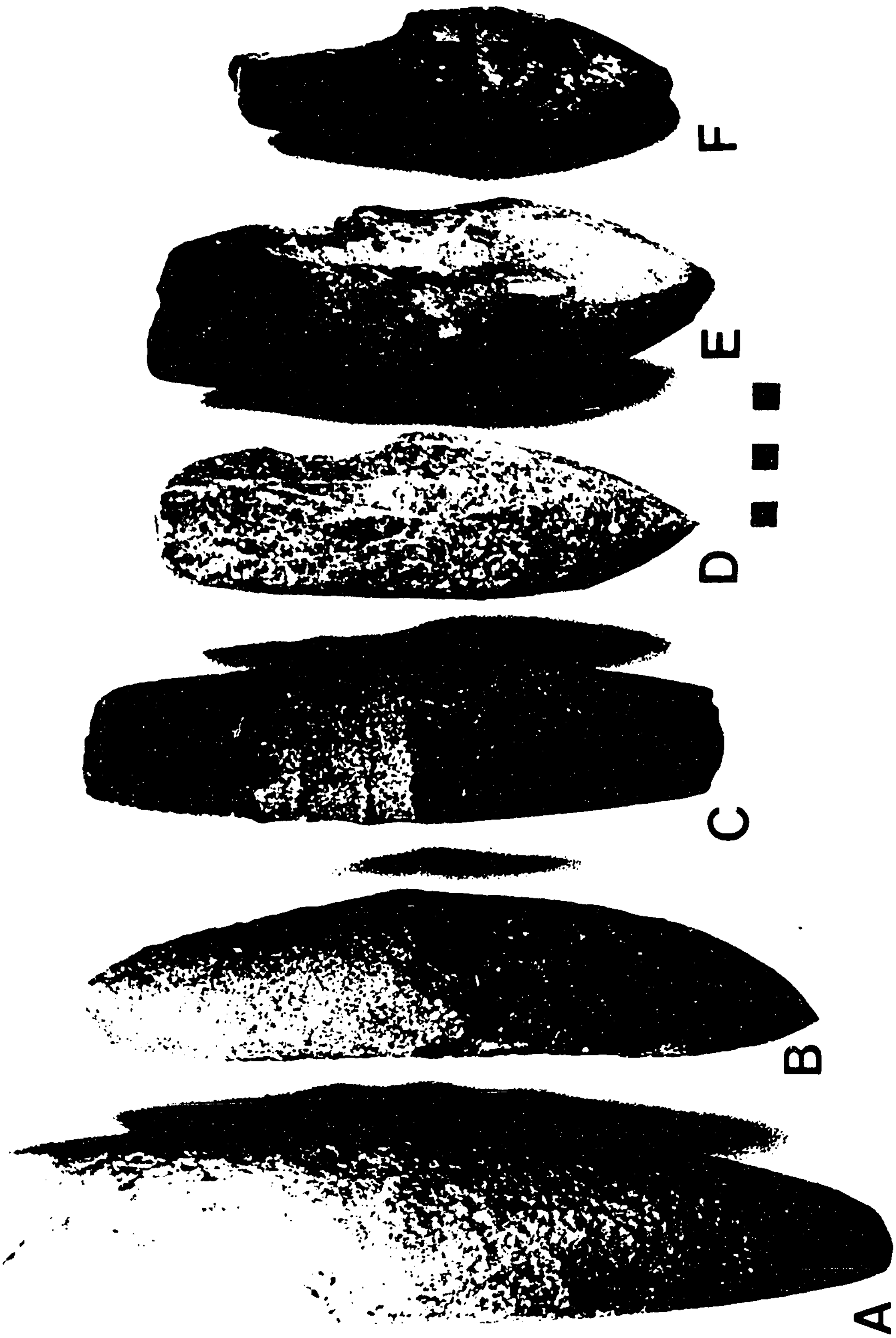

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(Clark 1974:92). Wedges were probably used for splitting planks from driftwood logs. Splitting adzes, may have been used to supplement wedges in this process. However, they more likely used like modern splitting mauls to split logs into firewood. The geographical distribution and increase in splitting adzes in late prehistoric Alaska may be related to an increased need for firewood during Little Ice Age in A.D. 1400.

Planing Adze Blades

Fifty six complete adze blades were found at Karluk One. All are made from silicified slate that grades from green to dark gray-green to black in color. This material is most often described in the literature as 'greenstone'. All of the adze blades were chipped into shape and then ground with particular attention to the cutting edges and adjacent surfaces. They are present in a continuum of sizes, from 3.5 to 17.3 cm long, which here have been arbitrarily divided into three groups based on length; large adze blades longer than 10 cm, medium sized blades 6 to 10 cm long, and small adze blades less than 6 cm in length.

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Table 7: 11 Large Planing Adze Blades (>10 cm. long)

Catalog	Artifact Type	Material	Context
3921	Adze blade; large	Silicified Slate	House 1 roof sod
3022	Adze blade; large	Silicified Slate	House 3 roof sod
3654	Adze blade; large	Silicified Slate	House 4 roof sod
1298	Adze blade; large	Silicified Slate	House floor 1
4313	Adze blade; large	Silicified Slate	House floor 1
1029	Adze blade; large	Silicified Slate	House floor 2
1042	Adze blade; large	Silicified Slate	House floor 2
4364	Adze blade; large	Silicified Slate	House floor 2
1913	Adze blade; large	Silicified Slate	House floor 3
820	Adze blade; large	Silicified Slate	House floor 4
1922	Adze blade; large	Silicified Slate	House floor 4
2812	Adze blade; large	Silicified Slate	House floor 5
1185	Adze blade; large	Silicified Slate	House floor 6
3144	Adze blade; large	Silicified Slate	House floor 6
6119	Adze blade; large	Silicified Slate	House floor 9A
5092	Adze blade; large	Silicified Slate	Upper basal midden
5701	Adze blade; large	Silicified Slate	Upper basal midden
6502	Adze blade; large	Silicified Slate	Upper basal midden
6517	Adze blade; large	Silicified Slate	Upper basal midden

A total of 22 specimens exceeding 10 cm in length are classified as large adze blades (Plate 93: H,I). The cutting edges on these tools range from 5.3 to 3.5 cm wide and the blades are 1.5 to 2.9 cm thick. Many specimens, particularly those of greatest length, exhibit battering and step fractures on the proximal end. This suggests that they were at least occasionally used in conjunction with a hammerstone. Some may have been even utilized as wedges.

Twenty-four medium sized adze blades measure between 6 and 10 cm long (Plate 93: E,F,G). Cutting edge widths range from 2.1 to 4.1 cm and measure from .5 to 2.6 cm in maximum thickness. Nine of these specimens have battered or step-fractured proximal ends.

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Plate 95

Plain backed splitting adze heads

Object	Description	Catalog #
A	Plain backed splitting adze head, silicified slate	193/
B	Plain backed splitting adze head, silicified slate	193/
C	Plain backed splitting adze head, silicified slate	193/
D	Plain backed splitting adze head, silicified slate	193/
E	Plain backed splitting adze head, silicified slate	193/
F	Plain backed splitting adze head, silicified slate	193/

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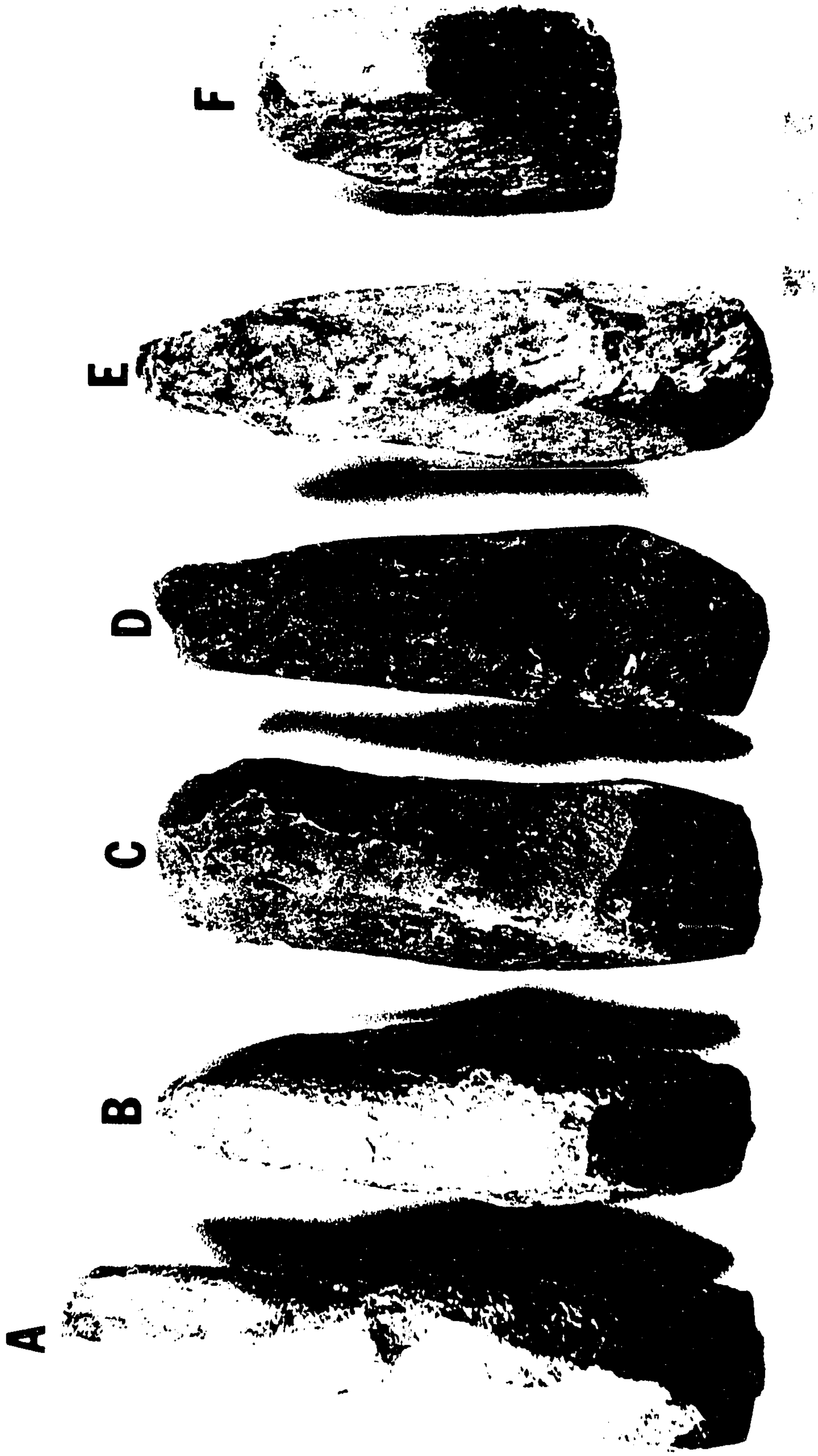

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Table 7: 12 Medium Planing Adze Blades (6-10 cm. long)

Catalog	Artifact Type	Material	Context
4123	Adze blade; medium	Silicified Slate	House 1 roof sod
4729	Adze blade; medium	Silicified Slate	House 1 wall sod
4330	Adze blade; medium	Silicified Slate	House floor 1
1018	Adze blade; medium	Silicified Slate	House floor 2
1379	Adze blade; medium	Silicified Slate	House floor 2
2290	Adze blade; medium	Silicified Slate	House floor 2
1624	Adze blade; medium	Silicified Slate	House floor 3
2341	Adze blade; medium	Silicified Slate	House floor 3
4161	Adze blade; medium	Silicified Slate	House floor 3
3078	Adze blade; medium	Silicified Slate	House 4 wall sod
4212	Adze blade; medium	Silicified Slate	House 4 wall sod
1435	Adze blade; medium	Silicified Slate	House floor 4
2811	Adze blade; medium	Silicified Slate	House floor 5
4435	Adze blade; medium	Silicified Slate	House floor 5
4880	Adze blade; medium	Silicified Slate	House floor 5
1671	Adze blade; medium	Silicified Slate	House 6 wall sod
3177	Adze blade; medium	Silicified Slate	House 6 wall sod
3154	Adze blade; medium	Silicified Slate	House floor 6
3761	Adze blade; medium	Silicified Slate	House floor 6
2048	Adze blade; medium	Silicified Slate	House floor 7
5576	Adze blade; medium	Silicified Slate	House floor 9A
5093	Adze blade; medium	Silicified Slate	Upper basal midden

Table 7: 13 Small Planing Adze Blades (< 6 cm. long)

Catalog	Artifact Type	Material	Context
673	Adze blade; small	Silicified Slate	House 1 roof sod
1853	Adze blade; small	Silicified Slate	House floor 1
2967	Adze blade; small	Silicified Slate	House floor 2
3216	Adze blade; small	Silicified Slate	House floor 3
2439	Adze blade; small	Silicified Slate	House floor 4
3759	Adze blade; small	Silicified Slate	House floor 6
6117	Adze blade; small	Silicified Slate	House floor 9A
5816	Adze blade; small	Silicified Slate	Upper basal midden

Ten small adze blades range from 6 cm to 3.5 cm long (Plate 93: A-D), with edge widths of 1.8 to 4 cm, and overall thicknesses from 0.7 to 1 cm. There are three blades 3.5 cm long, which could alternatively be classified as carving tool bits, although they are otherwise identical to larger adze blades.

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Plate 96

Planing adze blades

Object	Description	Catalog #
A	Small planing adze blade, silicified slate	193/
B	Small planing adze blade, silicified slate	193/
C	Small planing adze blade, silicified slate	193/
D	Small planing adze blade, silicified slate	193/
E	Medium sized planing adze blade, silicified slate	193/
F	Medium sized planing adze blade, silicified slate	193/
G	Medium sized planing adze blade, silicified slate	193/
H	Large planing adze blade, silicified slate	193/
I	Large planing adze blade, silicified slate	193/

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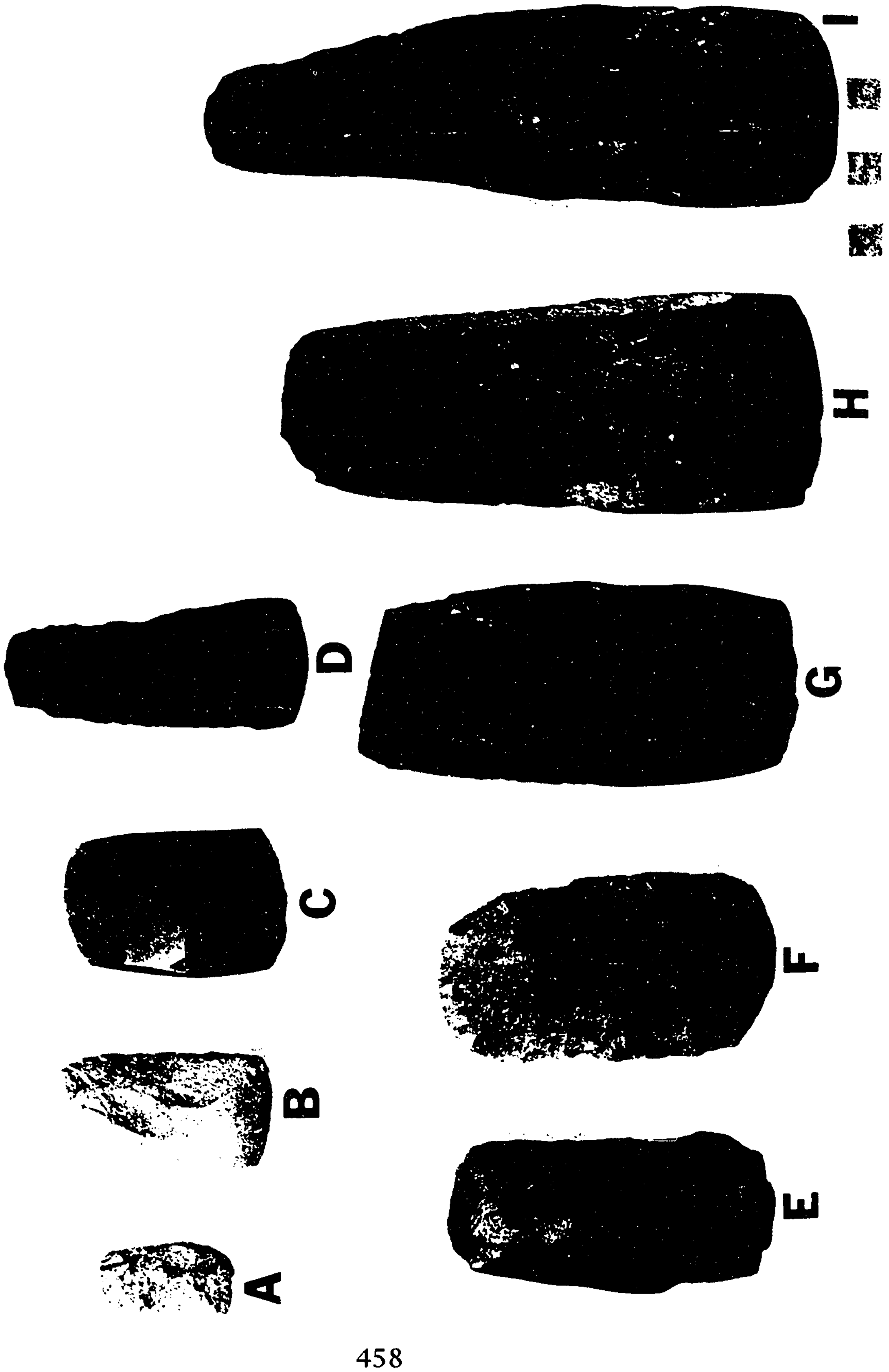

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Chart 13: Changes in Wood Splitting Tools at Karluk One

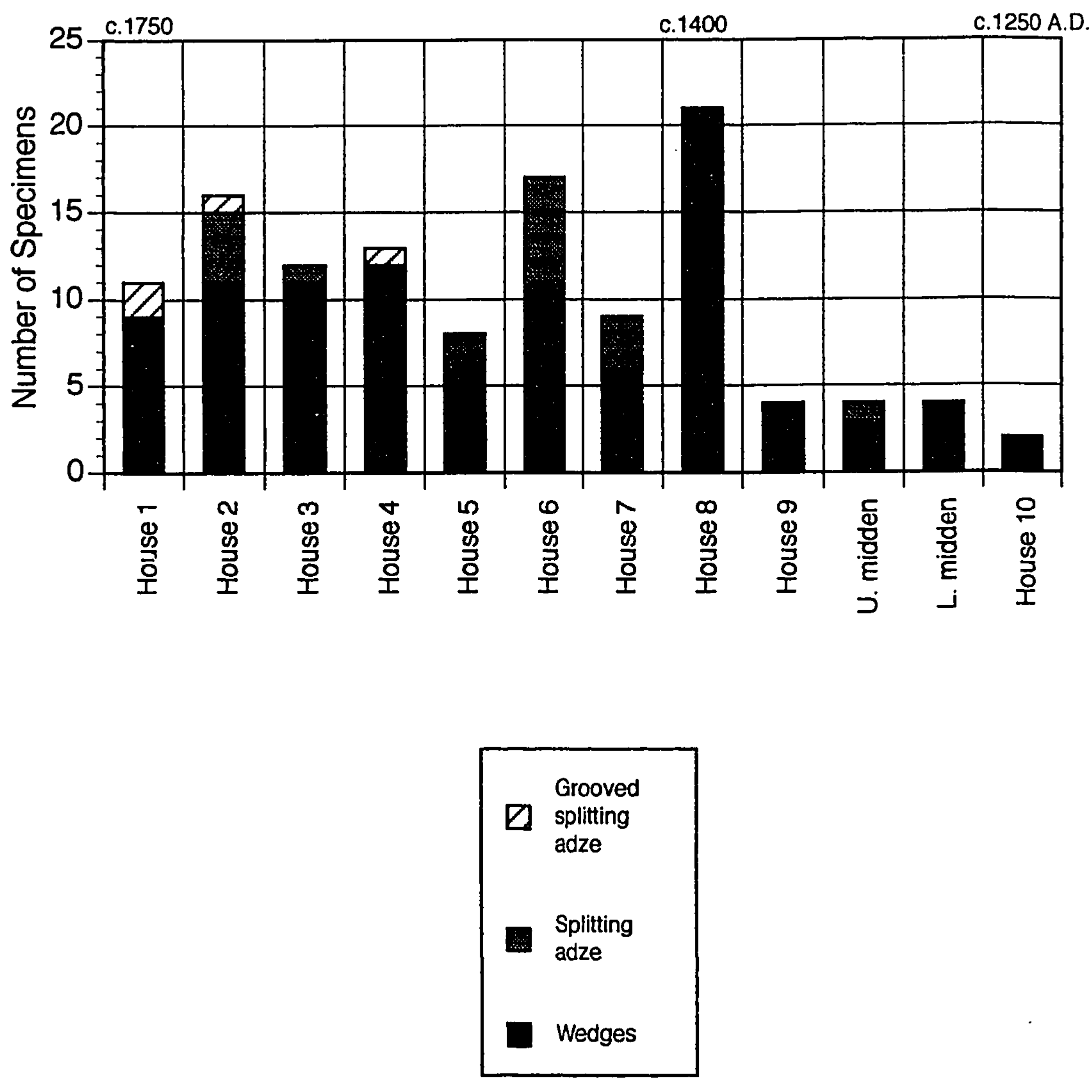

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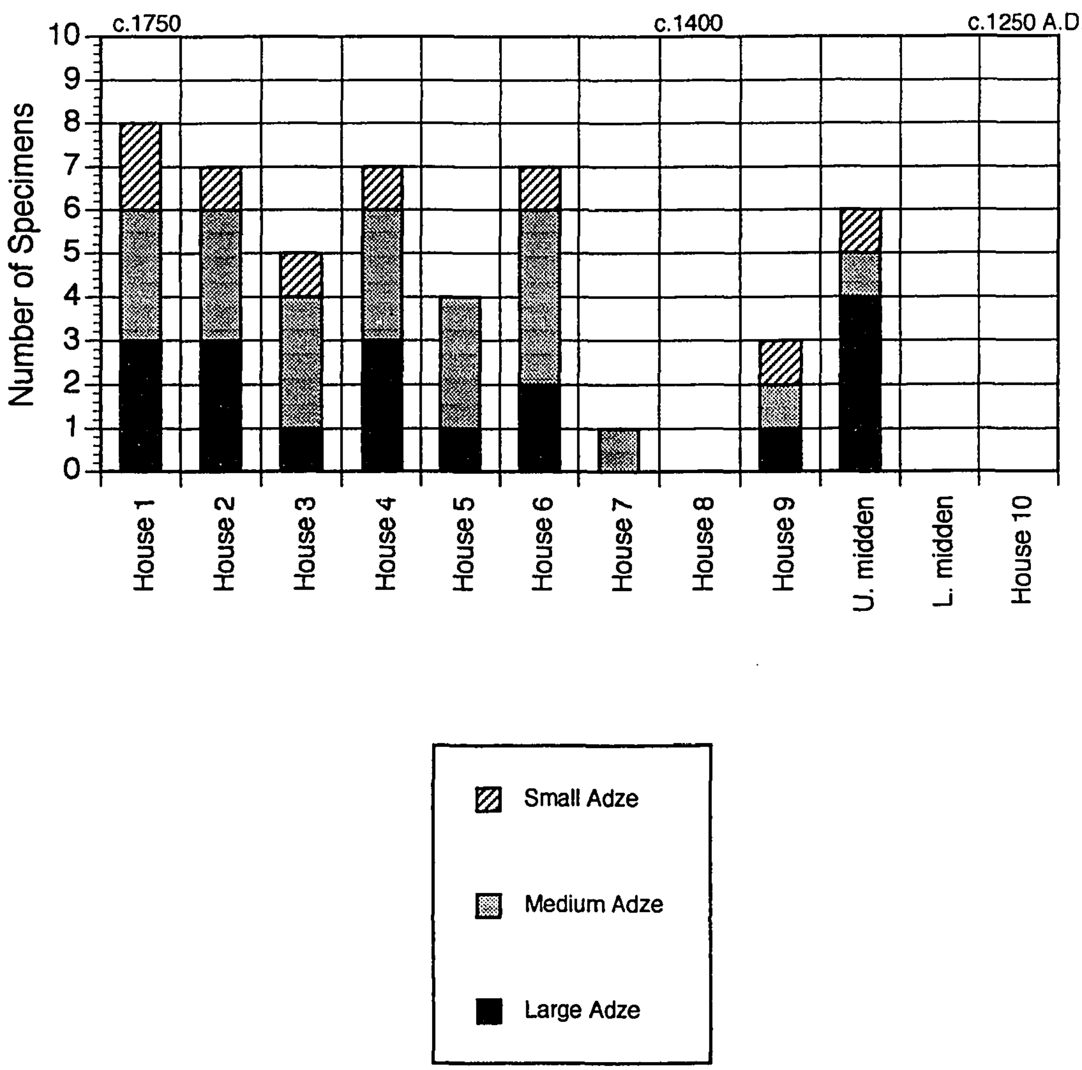
Chart 14: Sizes, Provenience, and Numbers of Planing Adze Blades at Karluk One



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Eight adze blade preforms have been chipped to shape, but lack a ground cutting edge. They range from 10.4 to 22.6 cm long and from 1.2 to 3.2 cm thick. Seven other fragments also appear to be adze blade preforms broken during the initial stages of manufacture.

Forty-five adze blade fragments are in the assemblage, although some may represent edge fragments of splitting adzes. Sixteen of these represent broken cutting edges of adze blades, ranging wide from 3.1 to 6 cm. A common artifact in all Karluk One levels were silicified slate flakes that have been ground or polished on at least one surface. These were probably generated during the use and/or retouch of adze blades. Seventy such specimens were recovered from Karluk One house floors, indicating that wood working tool maintenance or woodworking was an activity that was at least occasionally done inside Koniag barabaras. This is also evident from the large numbers of wood chips and splinters present in housefloor levels.

Wooden Adze Handles

Table 7: 14 Wooden Adze Handles

Catalog	Artifact Type	Material	Context
2937	Adze handle fragment	Wood	House floor 1
4158	Adze handle fragment	Wood	House floor 3
927	Adze handle fragment	Wood	House floor 7
5791	Adze handle fragment	Wood	House floor 8
6343	Adze handle fragment	Wood	House floor 8
5974	Adze handle fragment	Wood	House 8 roof sod
5046	Adze handle fragment	Wood	Lower basal midden

Eight fragmentary wooden adze handles, which may have been used with both splitting or planing adze blades, were found at Karluk One (Plate 93: A-F). No bone socketed adze holders, as seen in Kachemak phase assemblages at the Uyak site (Heizer 1956:188, Steffian 1994), were found. The adze handles are made from a soft wood, probably cottonwood or alder, and are not well preserved. They appear to have been manufactured from a piece of a

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Plate 97

Adze handle fragments

Object	Description	Catalog #
A	Adze handle fragment, cotton wood	193/6847
B	Adze handle fragment, cotton wood	193/5791
C	Adze handle fragment, cotton wood	193/427
D	Adze handle fragment, cotton wood	193/5974
E	Adze handle fragment, cotton wood	193/2937
F	Adze handle fragment, wood	193/4158

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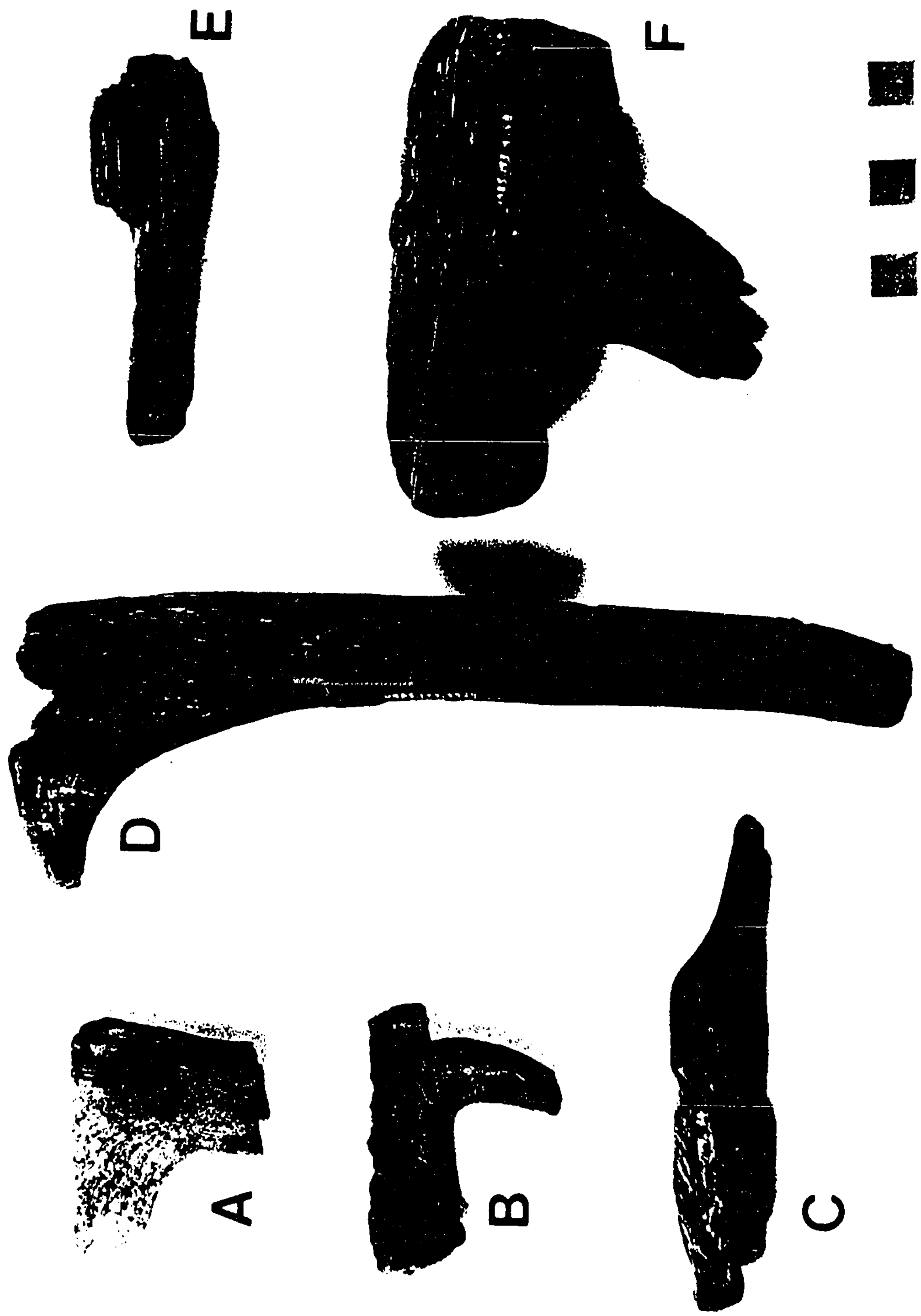

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small tree trunk, with the natural branch modified into the handle, which seems to be standard practice among wood workers in many Alaskan cultures in historic times (Emmons and De Laguna 1991:172, Osgood 1970:99)

One nearly complete adze handle, missing only the distal end, is 18.2 cm long and 2.9 cm in diameter (Plate 93: D). Seven other specimens are distal, from the hafting end, fragments. They are cylindrical in shape, 2.3 to 4.2 cm in diameter, and have ridges encircling the very distal end for attachment of the adze blade.

Carving Tool Bits

Table 7: 15 Carving Tool Bits

Catalog	Artifact Type	Artifact Type	Context
982	Carving tool bit	Slate	House floor 1
2148	Carving tool bit	Rodent Incisor	House floor 1
4121	Carving tool bit	Silicified Slate	House floor 1
1869	Carving tool bit	Slate	House floor 1
4374	Carving tool bit	Silicified Slate	House floor 2
438	Carving tool bit	Rodent Incisor	Profile 1; 153 cm bd
4472	Carving tool bit	Silicified Slate	House floor 5
3738	Carving tool bit	Unident. lithic	House floor 6
4040	Carving tool bit	Silicified Slate	House floor 6
3151	Carving tool bit	Rodent Incisor	House floor 6
3165	Carving tool bit	Silicified Slate	House floor 6
4284	Carving tool bit	Silicified Slate	House floor 6
3832	Carving tool bit	Rodent Incisor	House 6 wall sod
5458	Carving tool bit	Rodent Incisor	House floor 6
2070	Carving tool bit	Slate	House floor 7
5197	Carving tool bit	Silicified Slate	House floor 8
5018	Carving tool bit	Slate	House floor 8
6066	Carving tool bit	Rodent Incisor	House floor 8
5705	Carving tool bit	Granite	Upper basal midden

Ten stone carving tool bits are bifacially chipped with a cutting edge ground at the distal end, much like larger adze blades (Plate 95: E-N). Nine are made of gray to green silicified slate, and a single specimen is made of graywacke. They range from 3.8 to 7.2 cm long and from .8 to 1.8 cm wide.

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One of the green silicified slate specimens (Plate 95: E), differs from the others as it is ground on all four surfaces. This tool is reminiscent of Dorset burin-like tools from the eastern Arctic (Maxwell 1985), or Norton burin-like tools from the Bering Strait area (Giddings 1964:152, Plate 41B). Burin-like tools were used for incising long grooves into bone, ivory, or antler so the material could be broken into rectangular pieces.

Four fragmentary rodent incisors, tentatively identified as marmot or porcupine, are imports, probably from the Alaska Peninsula. They were intended for use as carving tool bits (Plate 95: A-D). Facets exist on the distal ends of the incisors, use-wear incurred during their use as carving tools. Rodent incisor carving tools were apparently used throughout the prehistoric sequence in the Kodiak Archipelago, as worn incisors occur in the lower, or Kachemak, levels of the Uyak site (Heizer 1956:82), and at Rice Ridge, an Ocean Bay site (Hausler-Knecht 1993). During the 1987 excavations of Karluk One, two wooden carving tool handles with hafted rodent incisors were recovered. The teeth were side-hafted, like a draw-knife, rather than end hafted like 19th century ethnographic carving tools from the Kodiak area (Fisher collection; Aron Crowell, personal communication 1990; National Museum at Copenhagen; Birket-Smith 1941, Fig. 32). Rodent incisor tools were also used by the Tlingit (Emmons and de Laguna 1991:173 and by Bering Strait Eskimos (Nelson 1899:89-90).

Hafted incisors were used for other purposes besides carving; Nelson (1899:89) noted that, "The smooth back of the tooth is used also as a polishing instrument for finishing woodwork and the carved outer edge serves for sharpening knives by rubbing it sharply along the blades." Similarly, Fisher's notes refer to one incisor tool, collected in Katmai village, as a "knife sharpener" (Smithsonian Archives Record:unit 305). Another hafted incisor,

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Plate 98

Carving tool bits

Object	Description	Catalog #
A	Carving tool bit, rodent incisor	193/3151
B	Carving tool bit, rodent incisor	193/5458
C	Carving tool bit, rodent incisor	193/6066
D	Carving tool bit, rodent incisor	193/3832
E	Carving tool bit/ burin like tool, silicified slate	193/
F	Carving tool bit, slate	193/
G	Carving tool bit, slate	193/
H	Carving tool bit, slate	193/
I	Carving tool bit, silicified slate	193/
J	Carving tool bit, silicified slate	193/
K	Carving tool bit, silicified slate	193/
L	Carving tool bit, silicified slate	193/
M	Carving tool bit, silicified slate	193/
N	Carving tool bit, graywacke	193/

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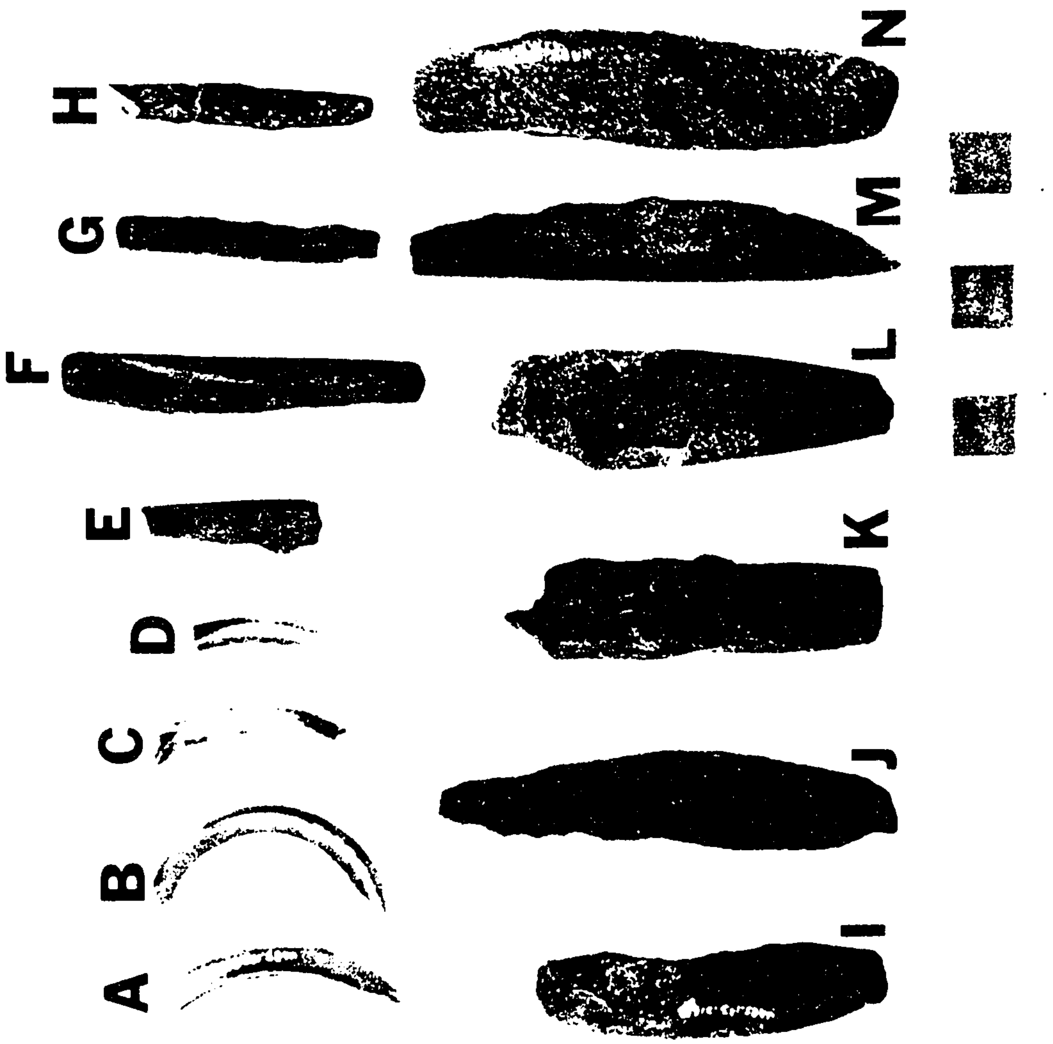

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apparently that of a beaver, collected by Fisher from a village on the Shelikof Straits, was used as a "polisher" (Smithsonian Archives Record:unit 312).

Gut Scrapers

Table 7:16 Gut Scrapers

Catalog	Artifact Type	Material	Context
2541	Gut scraper	Bone	House 1 roof sod
1011	Gut scraper	Antler	House floor 2
2551	Gut scraper	Antler	House floor 2
1027	Gut scraper	Antler	House floor 2
3020	Gut scraper	Antler	House 3 roof sod
1966	Gut scraper	Antler	House floor 5
3697	Gut scraper	Antler	House floor 6
2059	Gut scraper	Antler	House floor 7

Gut skin was an indispensable material in Eskimo and Aleut culture. It was used to make the light, durable, and watertight kamleika that was critical for kayaking. It was also used to manufacture a variety of bags, clothing, and even bed coverings. Gut skin rain garments, sewn in European style patterns, were prized and collected in large numbers by visiting mariners during the 19th century (Varjola 1990:147).

Eight small, spoon-shaped tools found at Karluk One were manufactured from antler, and in one case, bone. According to Native elders, these were used to scrape fresh sea mammal or bear gut in preparation for drying (Plate 98: A-D). Today, in the Alutiiq villages on the Alaska Peninsula, metal spoons filed smooth to prevent tearing of the gut, are used for this purpose. Gut is soaked for several days in a large bucket. A board is placed across the bucket, so that the portions of the gut not being worked remain moist. The gut is turned inside out and soft tissue adhering to it is scraped off with the spoon. The bowl of the spoon collects the tissue, which is periodically discarded. Varjola indicates that in some cases a mussel shell was used for gut scraping (1990:147). Once the gut is cleaned, it is tied and inflated

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Plate 99

Gut scrapers

Object	Description	Catalog #
A	Gut scraper, antler	193/2551
B	Gut scraper, antler	193/1966
C	Gut scraper, antler	193/1027
D	Gut scraper, antler	193/3697

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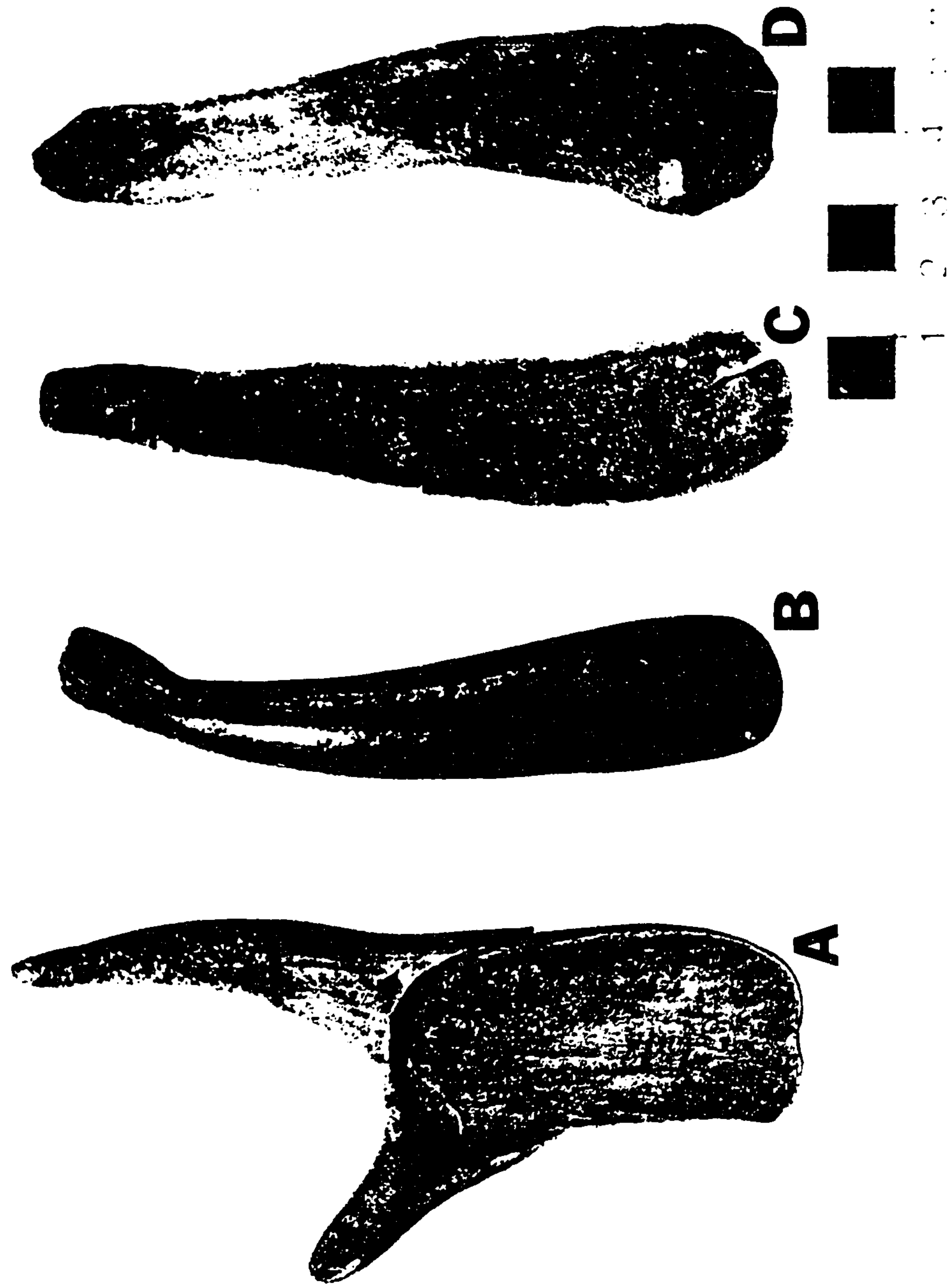

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like a balloon, and hung to dry. When dry, the gut is split to form a single, wide strip which is coiled into a ball until used.

In historic times on Kodiak bear gut was preferred as it is wider and easier to work with. I once helped butcher a sea lion under the supervision of a Native elder. The sea lion gut was long, relatively narrow, and tightly bound together with connective tissue. The advantages of bear gut were obvious. However elder informants have also said that bear gut obtained near the end of the summer salmon fishing season were sometimes weakened, or even perforated, by salmon bones consumed by the bear.

Clark found two complete and three fragmentary gut scrapers at Rolling Bay, although he identified them as spoons (1974:112, Plate 36 L). Similarly shaped gut scrapers have been recovered in late prehistoric middens on the Aleutians (Jochelson 1925: 89, Figure 60).

One of the gut scrapers from Karluk One is particularly well made. The handle is carved into the shape of a front leg and paw probably that of a bear (Plate 98:B). It measures 10.8 cm long and 2.2 cm wide. The bowl runs almost the entire length of the piece. The paw is perforated by a hole, similar to the perforation in the hands of *tunghak* spirit carvings of the Bering Sea area (Fitzhugh and Kaplan 1982:203). Five digits are clearly defined, each with a tiny, partially drilled hole at the proximal end. The perforated hand motif, and the uncharacteristic drilling suggests that this piece may have been manufactured elsewhere.

Another gut scraper, of similar size is 11.3 cm long, and 2.3 cm wide with a bowl which runs nearly the entire length of the piece (Plate 98:C). The handle is decorated only with some incised geometric designs. A third scraper has two natural antler tines left for handles, and features a broad sub-rectangular bowl (Plate 98: A). This piece is 11.7 cm long, with a 3.7 cm wide

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bowl. The remaining gut scraper is unfinished. It is the same size and shape as the complete specimens, but the bowl is not completely carved. It is 11 cm long and 2.6 cm wide (Plate 98: D).

Net Making Tools

Table 7:17 Net Making Tools

Catalog	Artifact Type	Material	Context
759	Net gauge	Wood	House floor 2
2986	Net shuttle	Wood	House floor 2
3394	Net gauge	Wood	House 3 roof sod
1643	Net gauge	Bone	House floor 4
2364	Net gauge	Wood	House floor 4
6514	Net gauge	Wood	House floor 9B

Four complete wooden net gauges were found at Karluk One. All resemble specimens collected by Nelson among the Bering Sea Eskimos in the Yukon-Kuskokwim area (1899:190-191), and those used by the Ingalik (Osgood 1970:211). The size of the gauge bar indicates the mesh of the net, which was species specific among the Ingalik. Salmon were taken with a mesh of 7 to 10 cm (Osgood 1970:211). Four net guages made from whalebone were found at the Uyak site (Heizer 1956:72), three from the upper levels of the site.

Net gauges were used in conjunction with a net shuttle in net making; the shuttle held the line, which was wrapped around the net gauge bar before a knot was tied to form a section of mesh. One net gauge is 15.2 cm long and has a 6.9 cm wide gauge bar (Plate 99: A). The handle is oval in cross-section and has a small notch in its side. A second specimen made from dense wood, is 8.5 cm long and features a double gauge bar for two different sizes; 6.1 and 6.8 cm (Plate 99: B). Long cut marks, parallel to the long axis of the gauge are present on the gauge bars. A small notched protrusion below the gauge bars may have held cordage wrapping on the gauge handle, or it may have been for a third, larger, mesh size of 9 cm.

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Plate 100

Net making tools

Object	Description	Catalog #
A	Net mesh guage, wood	193/3394
B	Net mesh guage, wood	193/2364
C	Net mesh guage, wood	193/6514
D	Net mesh guage, wood	193/759
E	Net shuttle fragment, wood	193/2986

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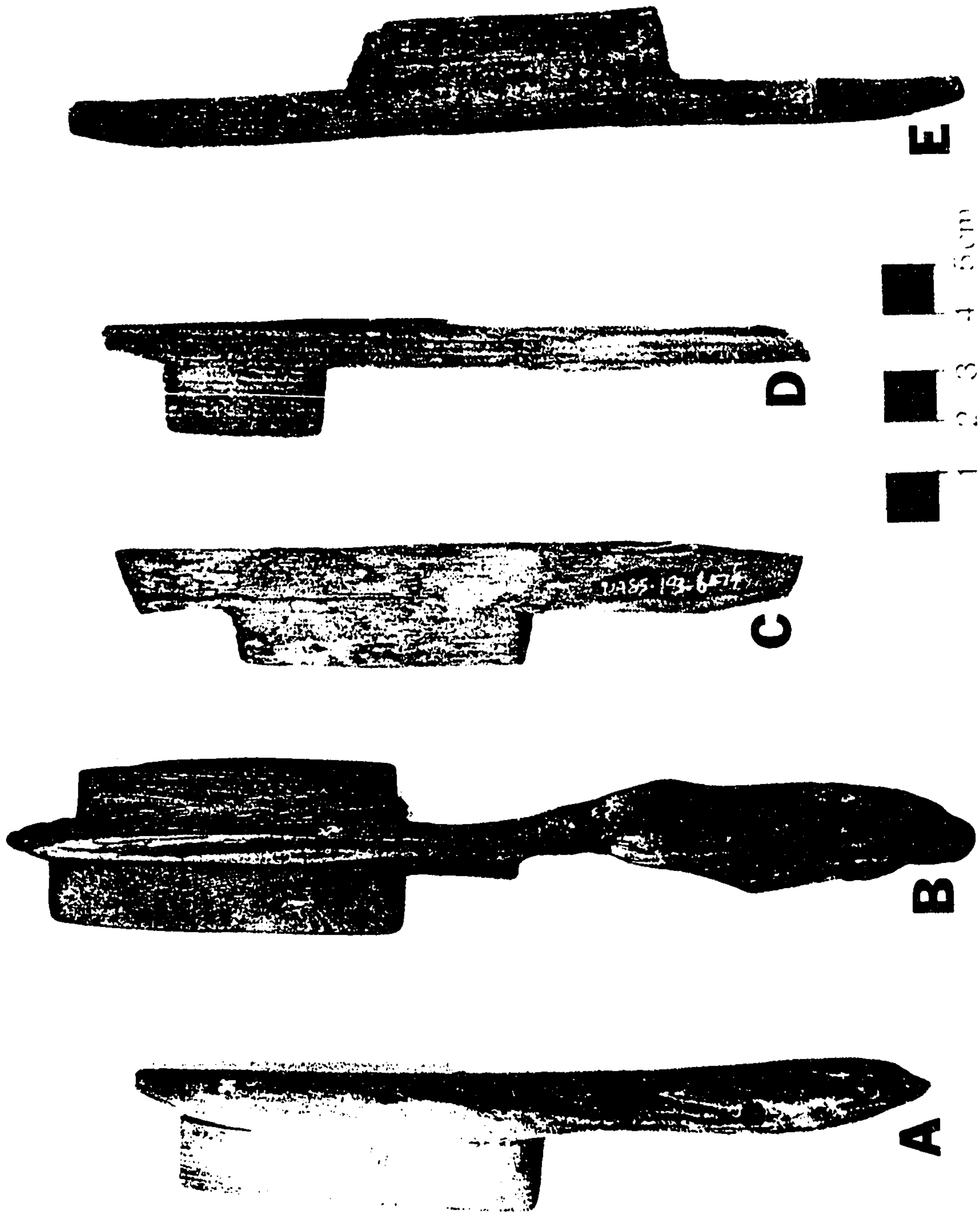

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The third net gauge is crudely carved of pine or spruce, and has a 5.7 cm wide gauge bar (Plate 99: C). This piece is 13 cm long. A fourth specimen is also carved of a soft wood (Plate 99: D). It measures 13.4 cm long and has a gauge bar 3 cm wide. A net shuttle is represented by one wooden fragment (Plate 99: E). Measuring 17 cm long, it is carved of a soft wood and is crudely made.

Slate Rods and Splinters

Table 7:18 Slate Rods and Splinters

Catalog	Artifact Type	Material	Context
977	Slate rod	Slate	House 1 roof sod
3913	Slate rod	Slate	House 1 roof sod
2701	Slate rod	Slate	House 1 wall sod
4119	Slate rod	Slate	House 1 wall sod
2203	Slate rod	Slate	House floor 1
707	Slate rod	Slate	House floor 1
1374	Slate rod	Slate	House floor 1
4705	Slate rod	Slate	House floor 1
4290	Slate rod	Silicified Slate	House floor 1
3997	Slate rod	Slate	House floor 3
832	Slate rod	Slate	House floor 3
4557	Slate rod	Slate	House floor 3
1100	Slate rod	Slate	House floor 3
1637	Slate rod	Slate	House floor 4
2772	Slate rod	Slate	House floor 4
2776	Slate rod	Slate	House floor 4
823	Slate rod	Slate	House floor 4
2412	Slate rod	Slate	House floor 4
3121	Slate rod	Slate	House 5 wall sod
4463	Slate rod	Slate	House floor 5
5349	Slate rod	Slate	House floor 6
852	Slate rod	Slate	House floor 6
2808	Slate rod	Slate	House floor 6
2926	Slate rod	Slate	House floor 6
3740	Slate rod	Slate	House floor 6
3709	Slate rod	Slate	House floor 6
1149	Slate rod	Slate	House 7 roof sod
4498	Slate rod	Slate	House 7 roof sod
5470	Slate rod	Slate	House 7 roof sod
4517	Slate rod	Slate	House floor 7
4521	Slate rod	Slate	House floor 7

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Slate rods and splinters may have functioned as awls, burnishers, or hones for sharpening edged slate tools. Nelson collected similarly shaped stone sharpeners from the Bering Sea Region (1899:90). It seems likely that most slate rods were used to maintaining the edges on ground slate tools. Slate can be ground to a long, straight edge, but the stone is soft and needs frequent re-sharpening. Use of a slate sharpener, perhaps with a bit of oil or fat, may have prevented edge damage by sharpeners made of harder lithic materials. Even a small nick in the edge of a point or an ulu blade meant that the entire edge had to be reground.

Slate rods are present in the tool kit throughout the prehistoric sequence on the Kodiak Archipelago. Heizer illustrated slate rods from the upper and lower levels of the Uyak site (1956:49, Plate 47). Slate rods have been recovered in Ocean Bay phase contexts at KAR-31, Rice Ridge, and by Clark at AFG-106, on Afognak Island (1979:354). Koniag phase examples were found at Kiavak and Rolling Bay by Clark (1974:98). At Karluk One, slate rods were found in all house floors that post-dating c. A.D. 1400, except for house floor two (Table 7:24).

The slate rods from Karluk One, and from the Uyak site have all been slightly modified by grinding, and have bluntly pointed tips. They range from 7.7 to 14.9 cm long. One specimen has an encircling groove around its mid-section (Plate 101: F), probably for a string handle as seen in examples from Nelson's collection. Two end fragments of small slate splinters are polished and bluntly tipped (Plate 101: C, D). These measure only 0.4 cm in diameter and may be awl tips. Two slate splinters are considerably larger than the others in the assemblage. One slate rod is 27.9 cm long and is bluntly pointed on both ends (Plate 101: A). Another is a bar-shaped piece of slate 17

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Plate 101

Slate rods and splinters

Object	Description	Catalog #
A	Large ground slate rod	193/4119
B	Ground slate rod	193/6819
C	Ground slate splinter	193/4463
D	Ground slate splinter	193/1869
E	Ground slate rod	193/977
F	Ground slate rod, with medial groove	193/1100
G	Ground slate rod	193/3121
H	Ground slate rod	193/4517
I	Ground slate rod	193/5349

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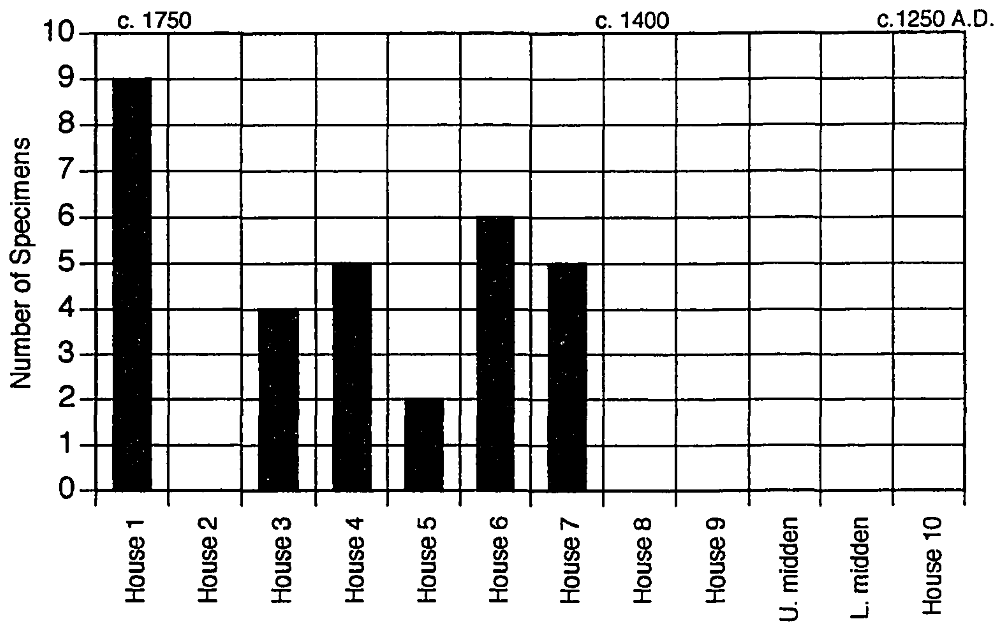
Table 15: Provenience and Frequency of Slate Rods at Karluk One



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cm long (Plate 101: B). Both pieces have numerous striations on their surfaces, probably representing use wear.

Awls (Siilaq)

Table 7:19 Awls

Catalog	Artifact Type	Material	Context
2944	Awl	Wood	House floor 1
1316	Awl	Wood	House floor 1
2121	Awl tip	Bone	House floor 1
1323	Awl tip	Bone	House floor 1
2134	Awl	Bone	House floor 1
1846	Awl tip	Bone	House floor 1
2135	Awl	Bone	House floor 1
2150	Awl	Wood	House floor 1
1012	Awl tip	Bone	House floor 2
2727	Awl	Bone	House 3 roof sod
2576	Awl	Wood	House 3 roof sod
3624	Awl	Wood	House 4 roof sod
2349	Awl	Wood	House floor 4
4003	Awl	Bone	House floor 4
3631	Awl tip	Bone	House floor 4
1111	Awl	Bone	House floor 4
4431	Awl tip	Bird bone	House floor 4
860	Awl tip	Bird bone	House floor 5
3665	Awl	Bone	House floor 5
3721	Awl	Bone	House floor 6
1190	Awl tip	Bone	House floor 6
4077	Awl	Bone	House floor 7
4070	Awl	Wood	House floor 7
1708	Awl tip	Bone	House floor 7
4836	Awl	Bone	House floor 7
4841	Awl	Bone	House floor 7
4974	Awl tip	Bone	House floor 7
6320	Awl tip	Bird bone	House floor 8
6617	Awl	Wood	House floor 8
4982	Awl	Wood	House floor 8
5175	Awl	Wood	House 8 wall sod
4994	Awl	Bone	House floor 8
6424	Awl	Wood	House floor 8
6144	Awl tip	Bird bone	Lower basal midden
5055	Awl	Wood	House floor 10

Bone Awls and Bone Awl Tips

Bone awls are common in assemblages from all prehistoric phases on Kodiak (Clark 1974:98, Heizer 1956:72). Two-piece bird-bone awls, made by

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slipping a thin, pointed bird bone into a larger unmodified bird bone occur in Ocean Bay contexts at Rice Ridge (Hausler-Knecht 1993), and at Malina Creek (R. Knecht field notes: 1993). Seven complete bone awls in the Karluk One assemblage consist of a bone fragment sharpened on one end. Two specimens retain a natural articular end. One is a bird humerus, the other a land mammal ulna (Plate 102: E,I). Five complete awls are made from sea mammal bone (Plate 102: B, C, J-L). Two of them are pointed on both ends, but are otherwise identical to the single pointed awls. An additional 13 bone fragments appear to represent fractured awl tips.

Wooden Awls

The Karluk One assemblage has eight complete wooden awls, ranging from 6.9 to 14.8 cm long (Plate 102: A, D, F-H). Two wooden awls have a single point. One of these is simply a sharpened wooden splinter (Plate 102: D). The second has a cylindrical handle, 0.6 cm in diameter, and a short point on the distal end (Plate 102:A). A more common type of wooden awl is represented by six specimens sharply pointed on both ends, which may be related to a more specialized function (Plate 102: F-H). One specimen, 7.7 cm long, is sharply pointed on one end. The other end is slightly notched, like the end of a small crochet hook (Plate 102: G). Similar pieces made of bone and ivory are known in private collections from Koniag sites. This piece may be a combined awl and embroidery tool.

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Plate 102

Awls

Object	Description	Catalog #
A	Awl, wood	193/6424
B	Awl, whalebone	193/6751
C	Awl, bone	193/2727
D	Awl, wood	193/5055
E	Awl, bird bone, proximal humerus	193/1111
F	Bi-pointed awl, wood	193/4070
G	Bi-pointed awl, wood	193/6717
H	Bi-pointed awl, wood	193/2944
I	Awl, bear bone, proximal radius	193/4077
J	Awl, whalebone	193/4836
K	Awl, whalebone	193/4994
L	Awl, bone	193/4841

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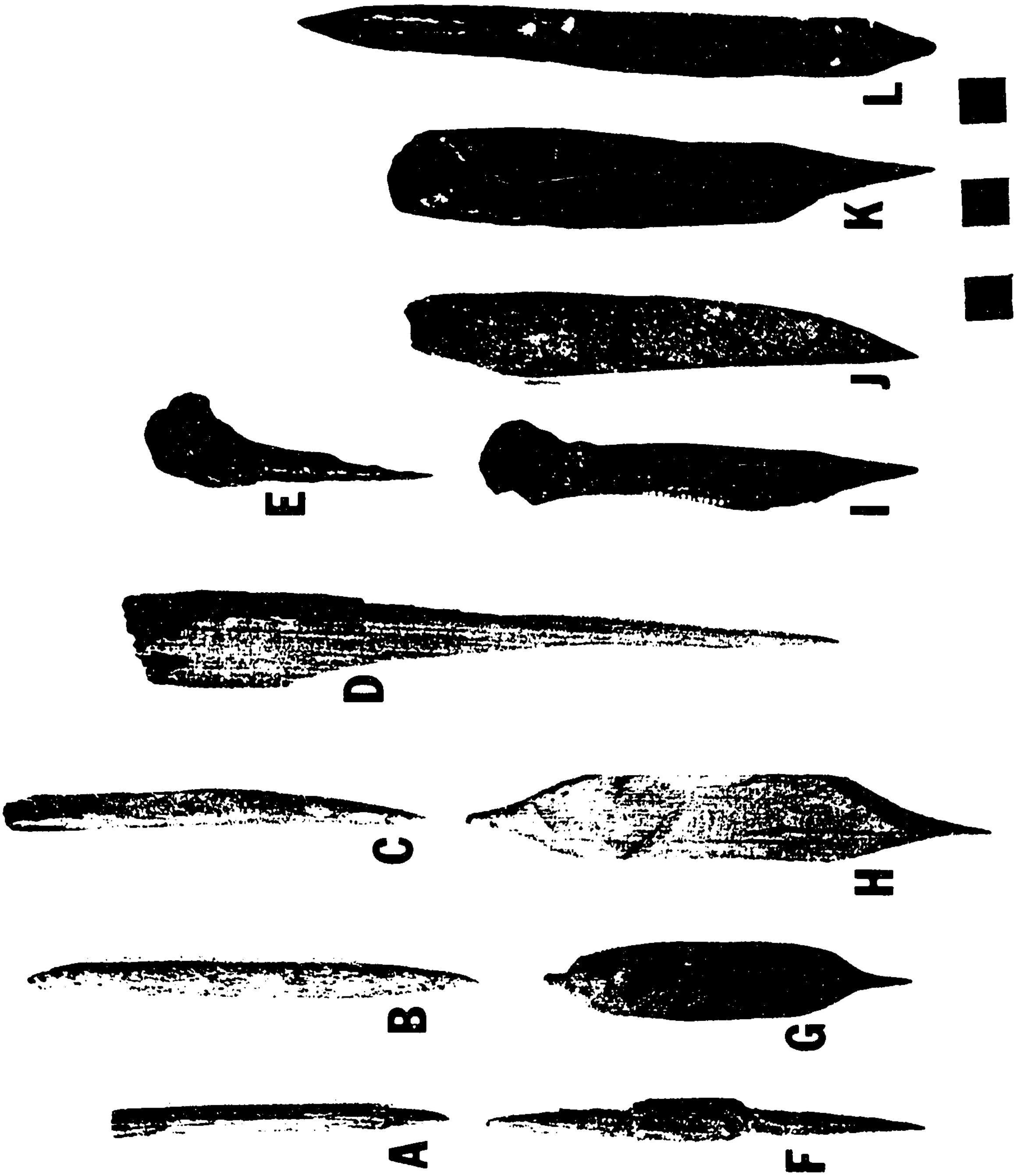

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Skin Working Boards

Table 7: 20 Skin Working Boards

Catalog	Artifact Type	Material	Context
1348	Skin working board; 2 pc.	Wood	House floor 1
4148	Skin working board	Wood	House 2 wall sod
4361	Skin working board; 2 pc.	Wood	House floor 2
3603	Skin working board	Wood	House floor 3
1629	Skin working board	Wood	House floor 3
1784	Skin working board fragment	Wood	House floor 3
818	Skin working board	Wood	House floor 4
4421	Skin working board	Wood	House floor 4
4020	Skin working board fragment	Wood	House 5 roof sod
2615	Skin working board; 2 pc.	Wood	House floor 5
4642	Skin working board	Wood	House floor 5
861	Skin working board	Wood	House floor 5
2806	Skin working board	Wood	House floor 6
3734	Skin working board; 2 pc.	Wood	House floor 6
3732	Skin working board	Wood	House floor 6
3726	Skin working board fragment	Wood	House floor 6
2061	Skin working board fragment	Wood	House floor 7
6457	Skin working board	Wood	House floor 8
6170	Skin working board	Wood	Upper basal midden

A total of fifteen complete, one-piece skin working boards are thinly worked planks that taper to bluntly pointed ends (Plate 103: A-F). All surfaces have been carefully carved and smoothed and both sides are heavily scored with hundreds of long, fine, cut marks. Today, to cut pieces of skin for clothing or kayak covers, Alaskan Eskimos use two boards, one for a cutting surface, the other as a straight edge. Lydia Black (1983:156) has illustrated an similar cutting board from the Aleutians, (Smithsonian collections #17250). Osgood, in a study of Ingalik material culture, noted the use of similar "work boards" (1970:165). Work boards were placed under the skin while it was being cut or scraped. George Emmons penned a sketch of a Tlingit woman using a work board while scraping a deer skin (Emmons and de Laguna (1991:213).

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Plate 103

Composite skin working boards

Object	Description	Catalog #
A	Composite half of skin working board, wood	193/
B	Composite half of skin working board, wood	193/1348
C	Composite half of skin working board, wood	193/4361

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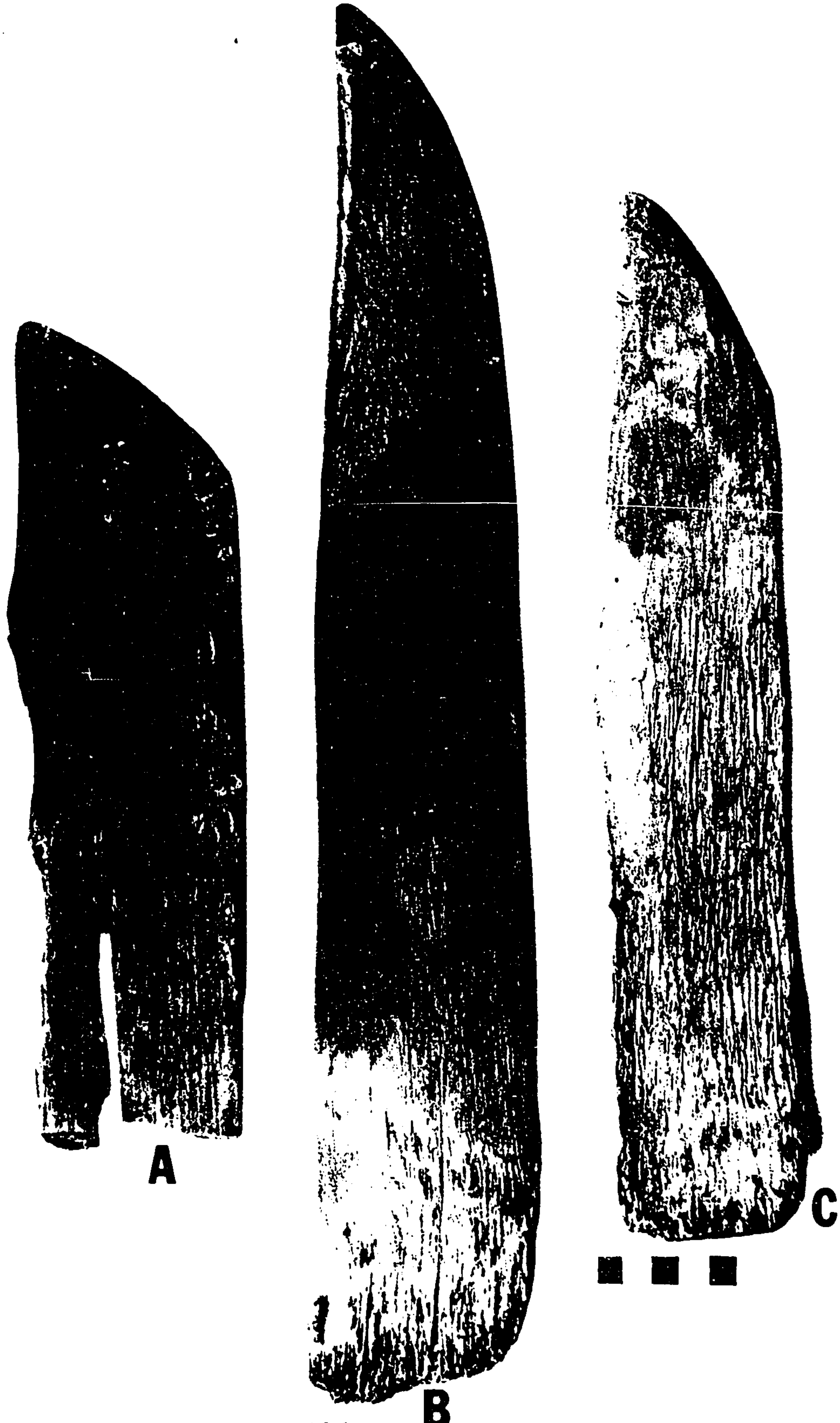

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Four skin working boards from Karluk One are of similar size; ranging from 24 to 34 cm long, 3.8 to 8 cm wide, and from 0.4 to 1.1 cm thick. Heavily used boards have been thinned somewhat by use-wear. Four additional skin stretching boards were in fragmentary condition.

Two smaller complete boards are both 11.5 cm long, 4.5 and 3.8 cm wide, and only 0.4 cm thick (Plate 103: A,B). Although small, they appear to be functional. The smaller board retains red surface paint, and both boards have many cut marks on their broad surfaces. Osgood noted that the Ingalik mad small boards were made for use by girls. This may have been true of the Koniag as well.

Three nearly complete boards have wedge shaped tips (Plate 104: A,C), and are similar to composite halves of skin stretching boards. They resemble the remaining skin working boards in the Karluk One assemblage as they are heavily scored by cut marks on both sides. These specimens are large, ranging from 36.1 to 49.1 cm long and 11 to 12.1 cm wide. If they are composite halves of skin stretchers, they would have been at least 22 cm wide when joined, about the size of a sea otter or small seal skin.

One skin working board has a wedge shaped tip with a straight angle. This board may have also served as a pattern for a parka sleeve (Plate 105). Portions of the tip edge of this specimen retain traces of red pigment. Four fragments of skin working boards were too small to permit any further identification.

Slate Ulu (Ulukaq) and/or Scraper (Qapirsuun) Blades

Native informants can readily distinguish the difference between an *ulukaq,* or ulu, and a *qapirsuun,* or scraper when shown photographs of ethnographic pieces (Hausler-Knecht, personal communication, 1988). An

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Plate 104

Skin working boards

Object	Description	Catalog #
A	Skin working board, wood w/red paint	193/1629
B	Skin working board, wood	193/6457
C	Skin working board, wood	193/4148
D	Skin working board, wood	193/818
E	Skin working board, wood	193/3732

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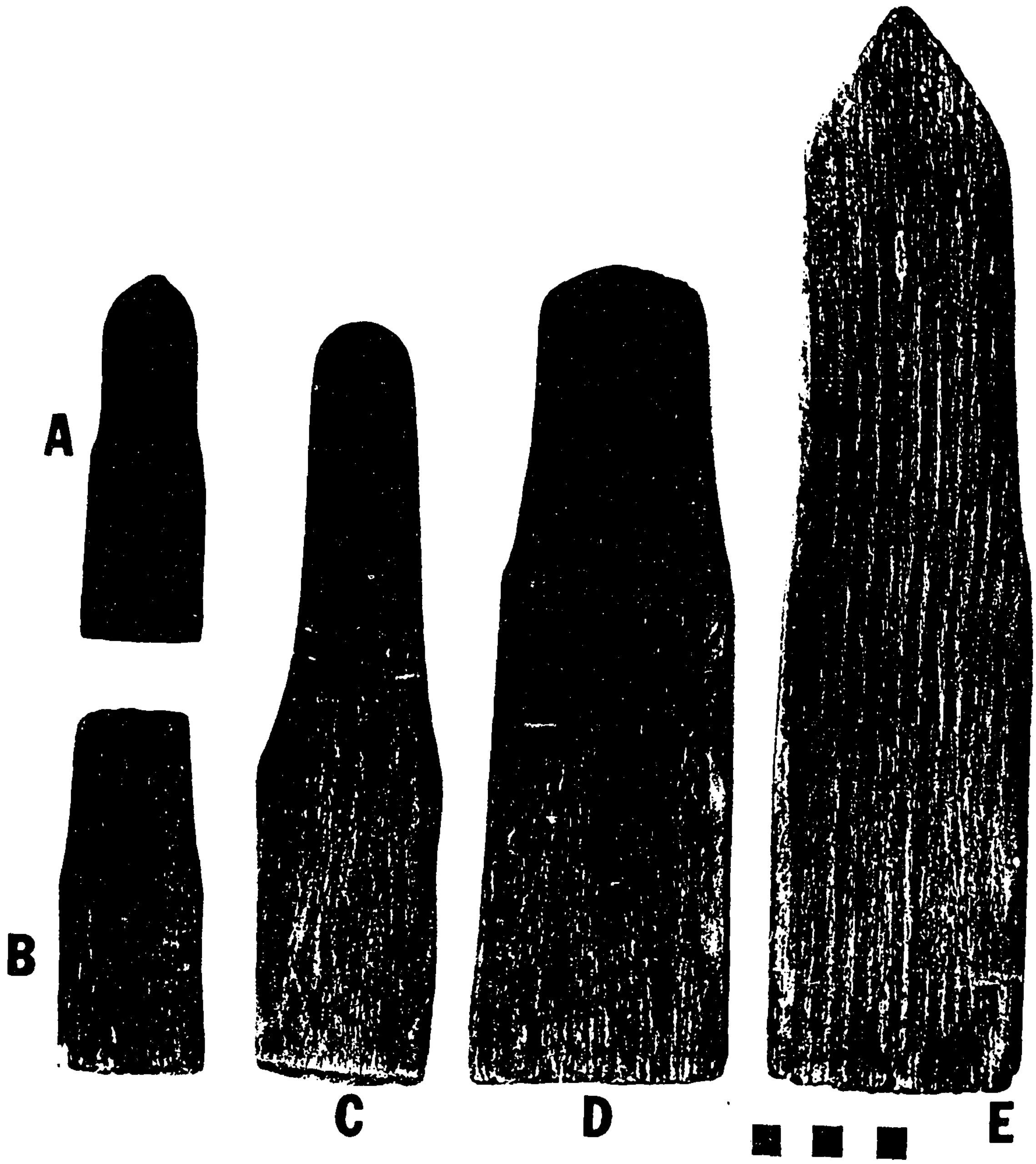

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Plate 105

Skin working board

Wood, Cat. no. 193/3734

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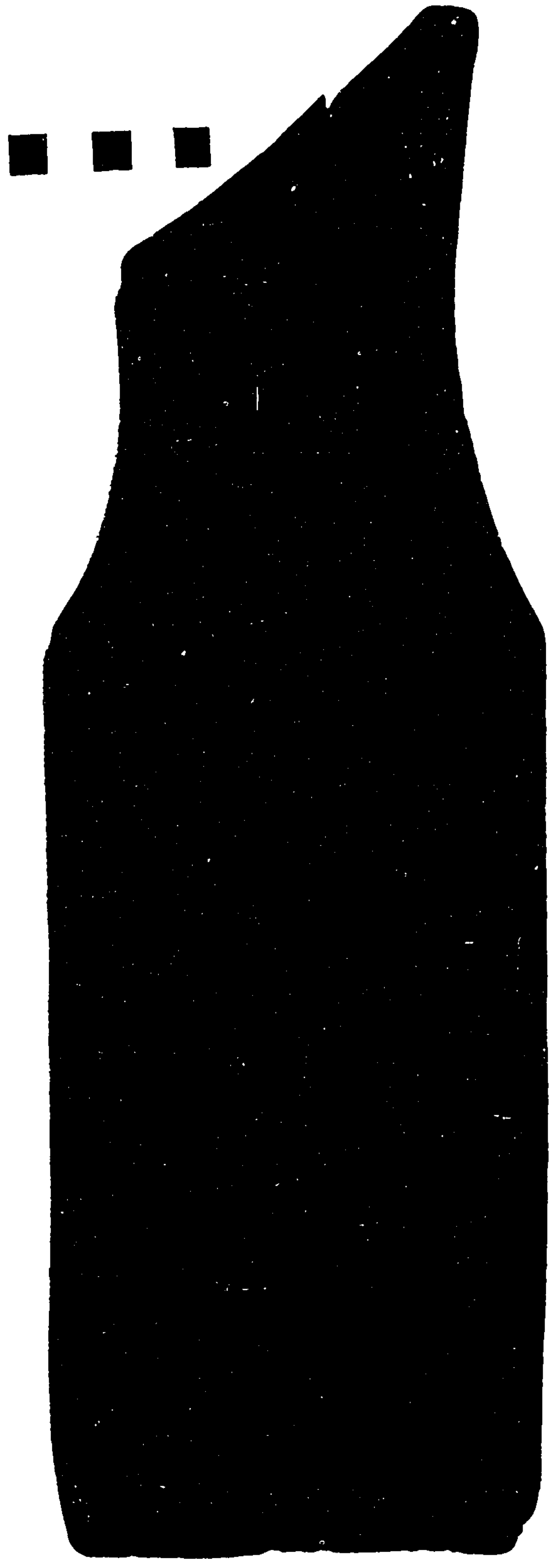

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ulukaq was used to cut fish, and has a pronounced semi-lunar blade. The *qapirsuun* has a straighter edge, and was used for dressing skins. Metal *ulukaq*, manufactured from reworked saw blades, are still used in some households. I have also seen tin can lids, one edge covered by tape, used on a contingency basis. Clark found in his research, that the relative curvature of the slate 'ulu' blades can be plotted on a cline from curved to straight, with most specimens falling somewhere in between (1974:104). For that reason, the Karluk One blades will be considered as 'ulu blades', recognizing that they may have functioned as either an *ulukaq* or a *qapirsuun*.

Straight-backed Ulu Blades

The ulu blade assemblage from Karluk One is dominated by specimens of ground black slate, with a plain, unmodified straight back (Plate 106, 107). A total of 33 complete ulu blades with straight backs were found, ranging from 5.9 to 17.2 cm long and 4.5 to 10.4 cm wide (Table 7:27). Blade edges tend to be straight or slightly curved rather that semi-lunar. Two straight-backed ulu blades are larger than the rest, including one of extraordinary size, 22.2 cm long and 14.4 cm wide (Plate 107: B). There are nine additional straight-backed ulu blade fragments. Straight-backed ulu blades were found in all levels at Karluk One.

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Perforated Ulu Blades

Table 7: 22 Perforated Ulu Blades

Catalog	Artifact Type	Material	Context
691	Ulu blade;w/drilled hole	Slate	House floor 1
700	Ulu blade;w/drilled hole	Slate	House floor 1
998	Ulu blade;w/sawn hole	Silicified Slate	House floor 1
1361	Ulu blade;w/sawn hole	Slate	House 2 wall sod
2714	Ulu blade;w/drilled hole	Slate	House floor 2
4618	Ulu blade;w/drilled hole	Slate	House floor 2
1411	Ulu blade;w/drilled hole	Slate	House 3 roof sod
2353	Ulu blade;w/pecked hole	Slate	House floor 3
4159	Ulu blade;w/sawn hole	Slate	House floor 3
2330	Ulu blade;w/drilled hole	Slate	House floor 3
4017	Ulu blade;w/drilled hole	Slate	House 4 roof sod
1967	Ulu blade;w/pecked hole	Slate	House floor 4
2621	Ulu blade;w/sawn hole	Slate	House floor 4
1968	Ulu blade;w/drilled hole	Slate	House floor 4
928	Ulu blade;w/drilled hole	Slate	House 6 wall sod
4924	Ulu blade;w/drilled hole	Slate	House floor 7
5166	Ulu blade;w/drilled hole	Slate	House floor 7
5553	Ulu blade;w/drilled hole	Slate	House floor 8

Ulu blades at Karluk One were sometimes hafted by making a hole through the blade so a handle could be lashed to it. Holes were installed by drilling, pecking, or sawing, a pattern also observed by Clark in Koniag ulu blades from the Rolling Bay and Kiavak sites. Perforations occur on Uyak site ulu blades, however, their contextual significance is hard to evaluate, given the poor stratigraphic control during excavation (Heizer 1956). Eleven complete and four fragmentary ulu blades have bi-conical, probably drilled holes (Plate 109: A-F). They range from 6.6 to 18.9 cm long and from 4.5 to 10.9 cm wide. Four ulu blades have holes placed far off-center. Two complete ulu blades have a pecked, off-center perforations. One is 16.5 cm long and 6.6 cm wide (Plate 108: A, C). The other specimen is 10.1 cm long and 5.3 cm wide. Two complete ulu blades have been perforated by sawing a short slit.

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One is 6.5 cm long and 4.5 cm wide. The other specimen is of gray-green slate, and measures 11.4 cm long and 4.1 cm wide (Plate 108: E). Two additional specimens have sawn perforations which were completed with the aid of some pecking (Plate 108: B,D). One of these is 15.2 cm long and 7.6 cm wide, the other is 9 cm long and 7.2 cm wide.

Analysis of the Karluk One ulu blade assemblage has yielded what may prove to be a regionally useful chronological seriation of hafting styles (Table 16). Stemmed ulus seem to have developed out of deep stemmed, or notched variety recovered from Kachemak phase sites (De Laguna 1975: Plate 33). At Karluk One, perforated ulu blades enter the archaeological record after about A.D. 1500 when they begin to replace stemming as the preferred hafting aid on ulu blades. Perforated ulu blades were found in all the post-A.D. 1500 housefloors except house floor 5, where the sample of ulu blades is quite small. This is consistent with Clark's conclusion that perforated ulu blades become more common through time, with sawn perforations appearing relatively late (1974:105).

Stemmed Ulu Blades

Table 7: 23 Stemmed Ulu Blades

Catalog	Artifact Type	Material	Context
6884	Ulu blade;stemmed w/handle	Slate	House floor 7
5506	Ulu blade;stemmed	Slate	House floor 8
6412	Ulu blade;stemmed	Slate	House floor 8
6493	Ulu blade;stemmed	Slate	Upper basal midden
6522	Ulu blade;stemmed/notch	Slate	Lower basal midden

Four complete ulu blades have stemmed backs (Plate 110: A-D). One specimen, measuring 18.2 cm long and 4.7 cm wide, has an off-center, 5.5 cm wide stem (Plate 110: B). A second specimen is 18.1 cm long, 6.4 cm wide, and has a centered 13.1 wide stem (Plate 110: D). The third stemmed blade is 11.4

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Plate 106

Ulu blades with straight backs

Object	Description	Catalog #
A	Ulu blade with straight back, slate	193/1335
B	Ulu blade with straight back, slate	193/4253
C	Ulu blade with straight back, slate	193/2809
D	Ulu blade with straight back, slate	193/1956
E	Ulu blade with straight back, slate	193/4201
F	Ulu blade with straight back, slate	193/5290
G	Ulu blade with straight back, slate	193/2421

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Plate 107

Large ulu blades

Object	Description	Catalog #
A	Large ulu blade, slate	193/3358
B	Large ulu blade, slate	193/3758

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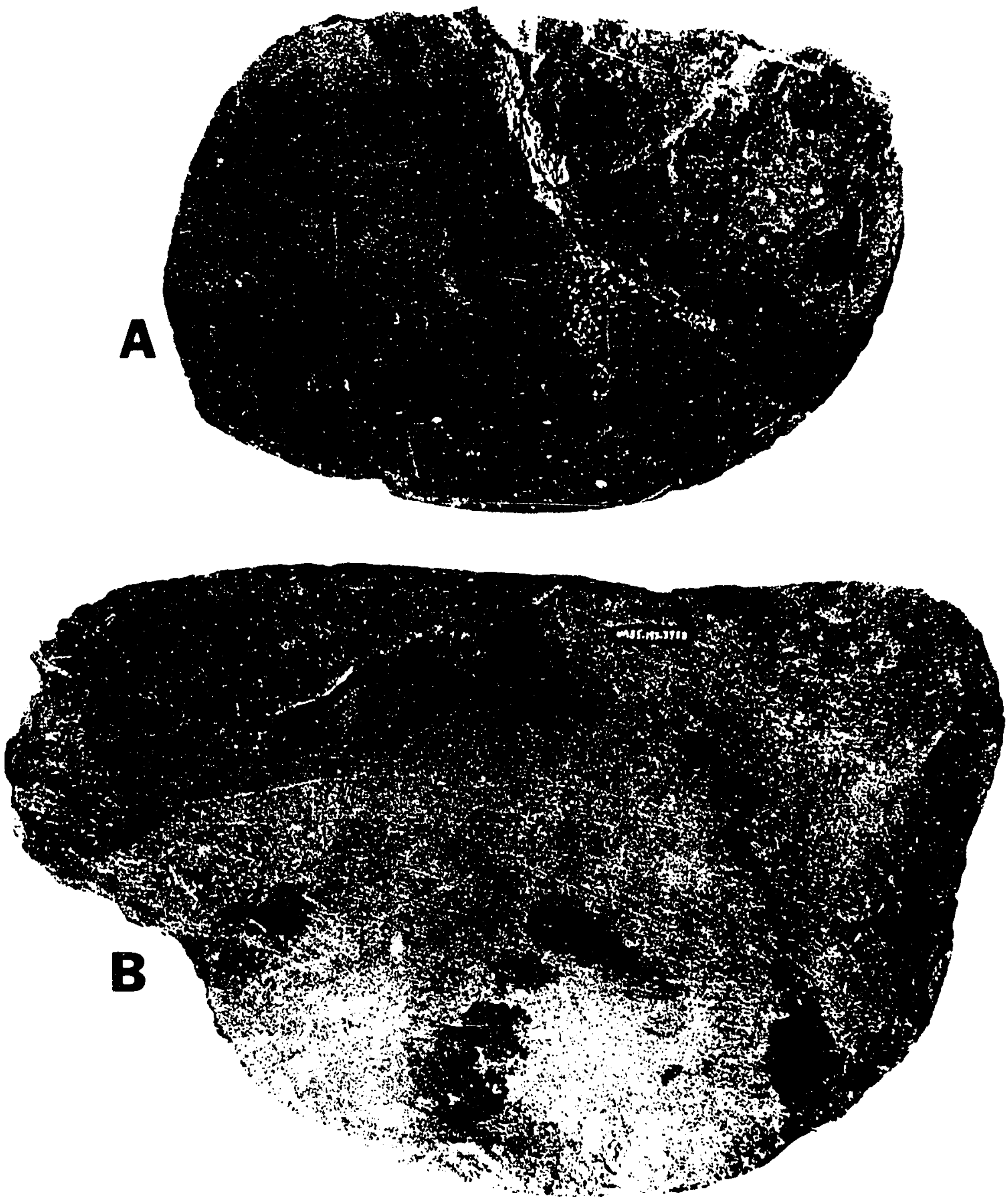

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Plate 108

Ulu blades with chipped and sawn perforations

Object	Description	Catalog #
A	Ulu blade with chipped perforation, slate	193/235
B	Ulu blade with sawn and chipped perforation, slate	193/4159
C	Ulu blade with chipped perforation, slate	193/1967
D	Ulu blade with sawn and chipped perforation, slate	193/1361
E	Ulu blade with sawn perforation, slate	193/2621

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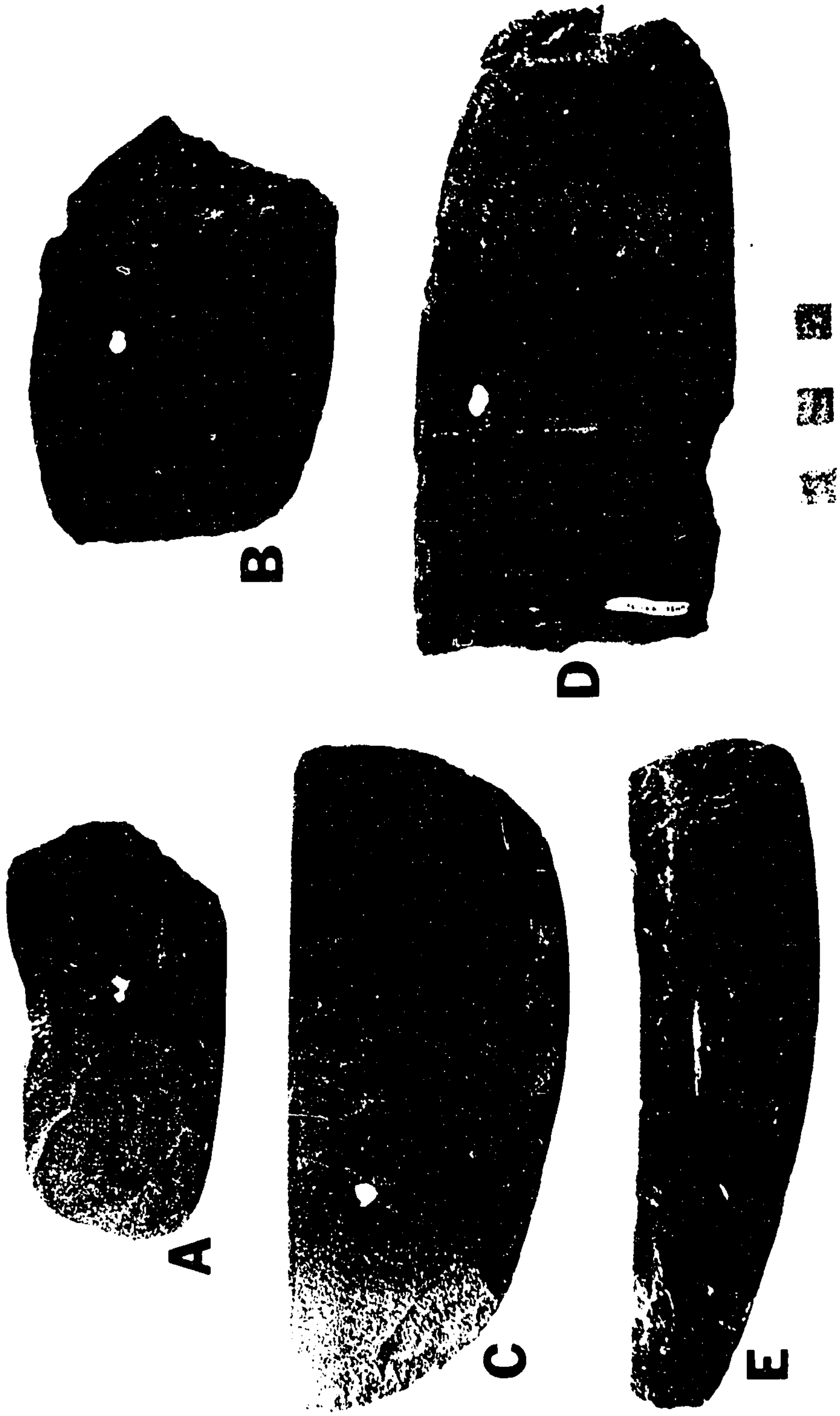

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Chart 16: Changes in the Hafting of Ulu Blades after 1400 A.D. at Karluk One

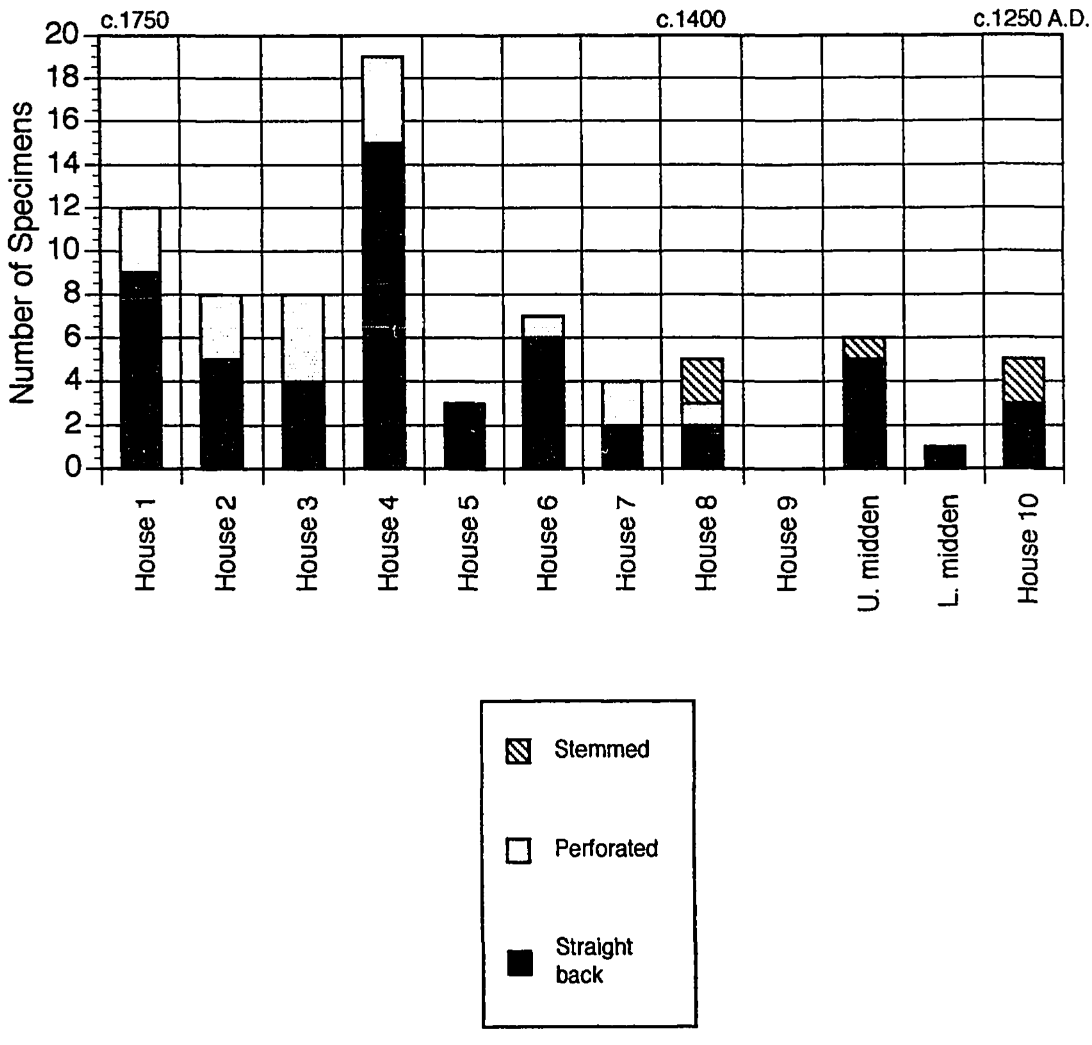

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Plate 109

Ulu blades with drilled perforations

Object	Description	Catalog #
A	Ulu blade with drilled perforation, slate	193/700
B	Ulu blade with drilled perforation, slate	193/4017
C	Ulu blade with drilled perforation, slate	193/2330
D	Ulu blade with drilled perforation, slate	193/1968
E	Ulu blade with drilled perforation, slate	193/4618
F	Ulu blade with drilled perforation, slate	193/2714

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Plate 110

Stemmed ulu blades

Object	Description	Catalog #
A	Stemmed ulu blade, slate	193/6412
B	Stemmed ulu blade, slate	193/5506
C	Stemmed ulu blade, slate	193/6522
D	Stemmed, notched ulu blade, slate	193/6493

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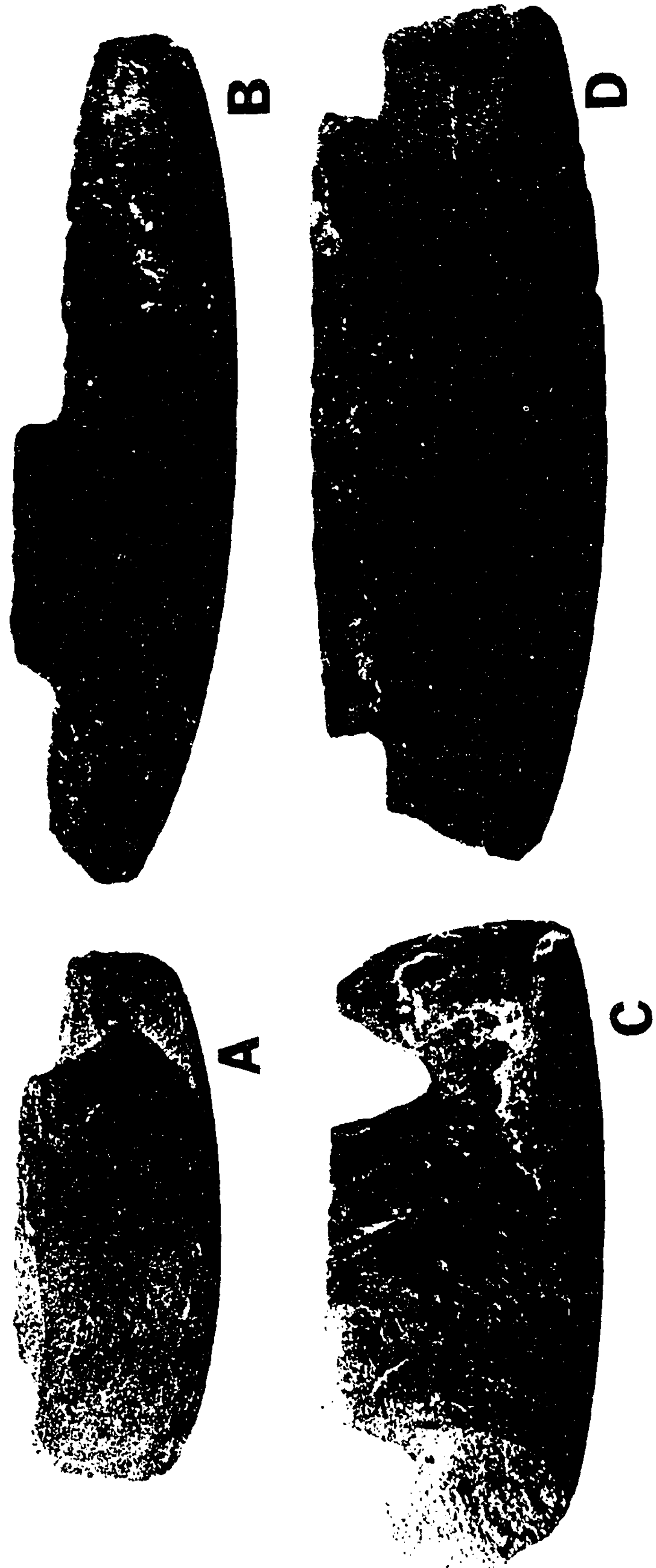

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cm long, 4.5 cm wide, and has very short stem, 6.5 cm wide (Plate 110:A). The fourth stemmed ulu blade, recovered from house floor seven, has a complete one-piece, wooden handle. The slot in the handle is countersunk to hold the stem of the blade. A fifth complete ulu blade has deep corner notches, as seen on specimens from Kachemak bay sites (de Laguna 1934: Plate 33). It is 14.3 cm long and 6 cm wide (Plate 111: C).

Ulu Handles

Table 7:24 One-Piece Ulu Handles

Catalog	Artifact Type	Material	Context
4681	Ulu handle; 1 pc.	Wood	House floor 1
1352	Ulu handle; 1 pc. zoomorphic	Wood	House floor 1
4142	Ulu handle; 1 pc.	Wood	House floor 2
1936	Ulu handle; 1 pc.	Wood	House floor 4
4069	Ulu handle; 1 pc.	Wood	House floor 7
4512	Ulu handle; 1 pc.	Wood	House floor 7
6884	Ulu handle; 1 pc.; w/blade	Cottonwood Bark	House floor 7
6354	Ulu handle; 1 pc.	Wood	House floor 8

One Piece, Slotted Ulu Handles;

There are nine complete ulu handles with slotted bases in the Karluk One assemblage (Plate 111: A-G). They are designed to hold straight backed ulu blades, although one contains the stemmed ulu blade as described above. Seven specimens are carved from wood and an eighth was manufactured from cottonwood bark. One wooden handle (Plate 111: A), has been carved to represent a creature with large, mouse-like ears, resembling an ermine. The opposite end of the handle retains traces of red pigment. This handle contained the stemmed blade (Plate 111: C), is carved from dense wood and in excellent condition. The handle measures 12.5 cm long and 5 cm wide. A cottonwood bark handle retains a straight backed ground slate blade, 2/3

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Plate 111

One piece, slotted ulu handles

Object	Description	Catalog #
A	Single piece, slotted, zoomorphic ulu handle, wood	193/1352
B	Single piece, slotted ulu handle, wood w/stemmed slate blade	193/4339
C	Single piece, slotted ulu handle, wood	193/6884
D	Single piece, slotted ulu handle, wood	193/4512
E	Single piece, slotted ulu handle, wood w/slate blade	193/6354
F	Single piece, slotted ulu handle, wood	193/4069
G	Single piece, slotted ulu handle, wood	193/4681
H	Single piece, slotted ulu handle, wood	193/1936

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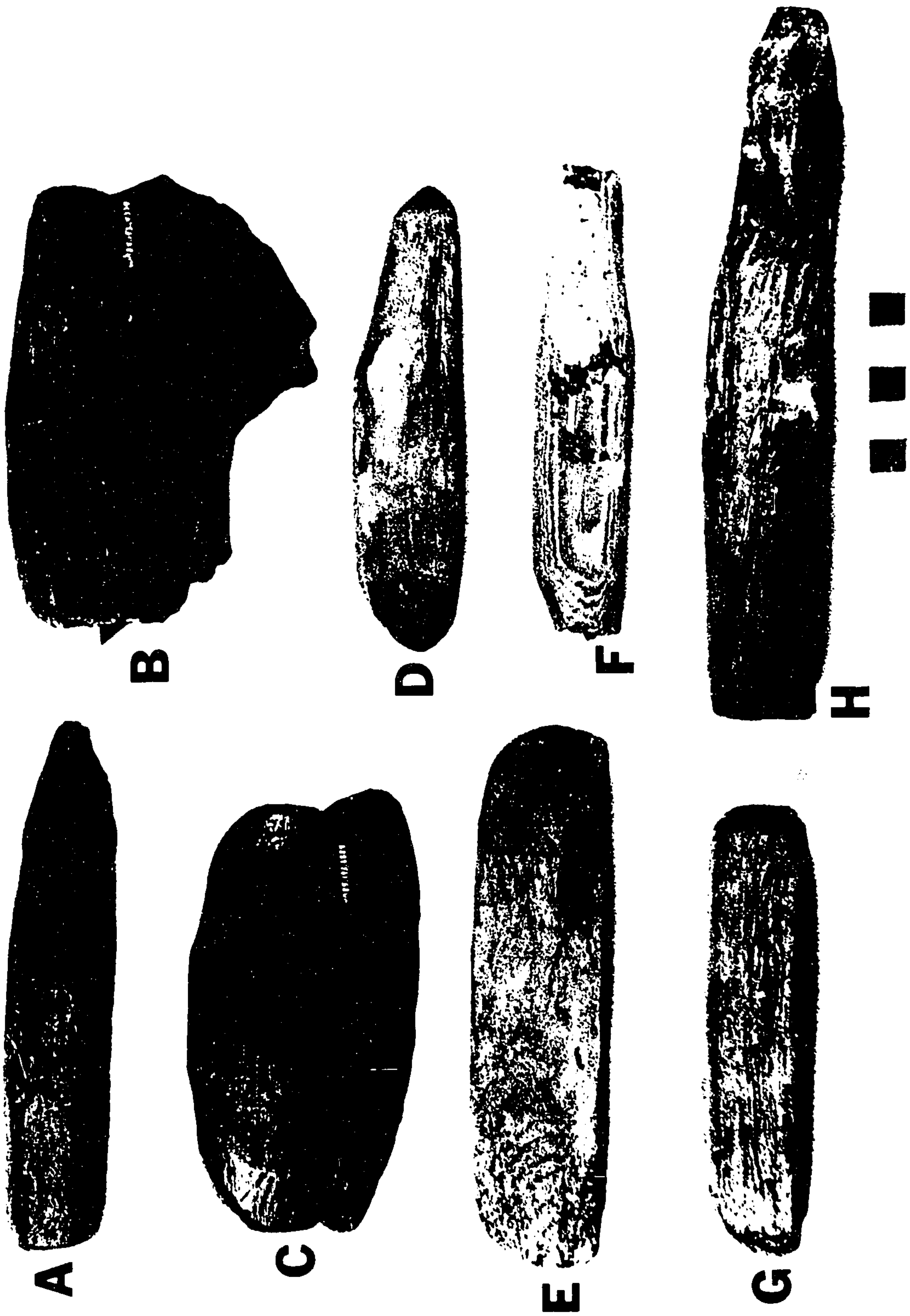

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complete (Plate 111: B), and resting in a slot which runs the length of the piece. Semi-circular in cross-section, this handle is tapered slightly.

One Piece Notched Ulu Handles

Table 7:25 Notched Ulu Handles

Catalog	Artifact Type	Material	Context
3021	Ulu handle;notched	Cottonwood Bark	House 2 roof sod
4344	Ulu handle;notched;w/blade	Cottonwood Bark	House floor 1
2762	Ulu handle;notched, zoomorphic	Wood	House floor 3
1725	Ulu handle;notched;w/blade	Wood	House floor 4
4192	Ulu handle;notched	Wood	House 4 roof sod
4467	Ulu handle;notched	Wood	House floor 5
1177	Ulu handle;notched	Wood	House floor 6

Clark recovered a notched ulu handle from Rolling Bay (1974:105), and Birket-Smith illustrated two notched handles with perforated ulu blades; (now in the National Museum in Copenhagen) (1941:153). In the Karluk One assemblage, seven one-piece ulu handles have a centrally placed notch, sometimes supplemented with a hole. (Plate 112: A-G). Like perforated ulu blades, this variety of ulu occurs in the later house floors on the site. A one-piece ulu handle (Plate 112:A) is carved into the shape of a seal, with head and flippers rendered in realistic detail. This specimen has a hafting notch on the underside of the handle, near the center of the blade slot.

One cylindrical wooden ulu handle has a tapered, slightly wedge shaped end, with a hafting groove in the center and near both ends (Plate 112:F). This handle retains a complete, straight backed ulu blade. However this blade lacks a hafting hole, and therefore may not be the original blade. Another ulu handle, made from cottonwood bark measures 18.1 cm long, 2.8 cm wide, and 3.2 cm high (Plate 112:G). This specimen has an ovate cross-section, and one tapered end. A centrally placed hafting groove encircles the

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Plate 112

One piece, notched ulu handles

Object	Description	Catalog #
A	Single piece, notched ulu handle, seal effigy, wood w/red paint	193/2762
B	Single piece, notched ulu handle, wood	193/4467
C	Single piece, notched ulu handle with perforation, wood	193/1177
D	Single piece, notched ulu handle, wood w/perforated slate blade	193/4344
E	Single piece, notched ulu handle with perforation, wood	193/4192
F	Single piece, notched ulu handle, wood w/slate blade	193/1725
G	Single piece, notched ulu handle, wood	193/3021

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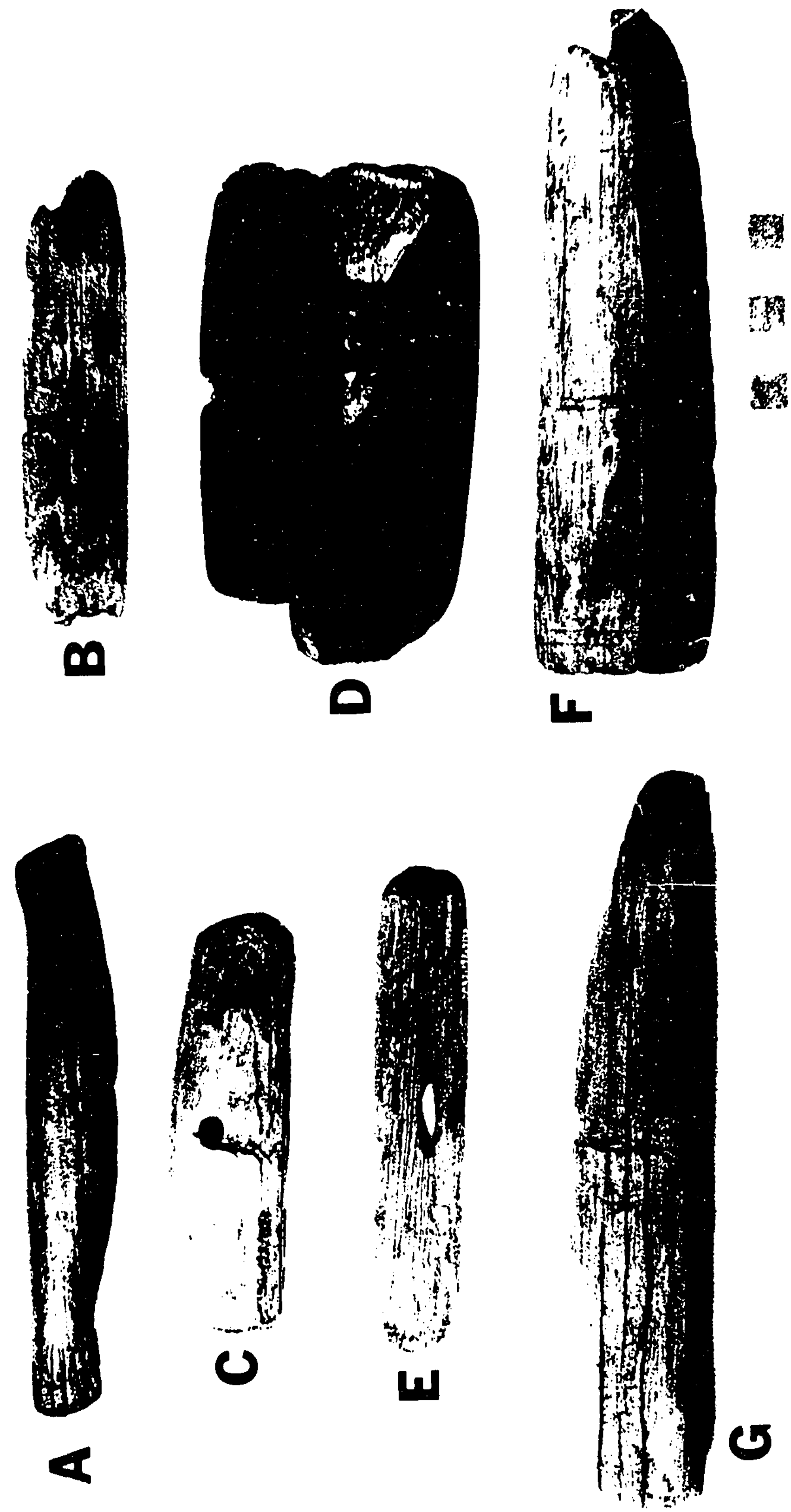

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piece. The blade slot runs the length of the handle. This slot is partially plugged by a pair of thin wooden slivers, added to keep the blade secure.

Composite Ulu Handles

Table 7:26 Composite Ulu Handles

Catalog	Artifact Type	Material	Context
3369	Ulu handle;composite	Wood	House floor 1
3545	Ulu handle;composite	Wood	House floor 3
3601	Ulu handle;composite	Wood	House floor 3
834	Ulu handle;composite	Wood	House floor 4
2017	Ulu handle;composite	Wood	House floor 7
1199	Ulu handle;composite	Wood	House floor 7
5187	Ulu handle;composite	Wood	House 8 roof sod
6033	Ulu handle;composite	Wood	House floor 8
6426	Ulu handle;composite	Wood	House floor 8
6478	Ulu handle;composite	Wood	Upper basal midden
6525	Ulu handle;composite	Wood	Lower basal midden

Twelve ulu handles are composite forms, consisting of two equal sized halves which were joined along the long axis and lashed together. Three composite ulu handles in the assemblage are complete with both sides present. The remaining eight handles are unmatched halves.

Two of the matching, composite, wooden halves form a cylindrical ulu handle with wide hafting notches on either end (Plate 113:G). This specimen measures 16.8 cm in length and 2.1 cm in diameter. Shreds of baleen still adhere to the hafting grooves. A wooden composite half of a simple cylindrical ulu handle (Plate 113:H), has retained much of its original red surface painting. The blade slot extends the length of the handle and the interior of the handle bears five well-defined gouges left by the bit of a carving tool, with a bit width of 0.6 cm wide.

Half of a composite wooden ulu handle from house floor 7 has a tapered end carved into what appears to be a stylized zoomorphic shape (Plate 113:K). Countersinking on the inside of the handle indicates that it was

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Plate 113

Composite ulu handles

Object	Description	Catalog #
A	Composite, notched ulu handle, wood	193/5187
B	Composite, notched ulu handle, wood	193/3369
C	Composite, notched ulu handle, wood	193/6426
D	Composite, notched ulu handle, wood w/baleen lashing	193/3601
E	Composite, notched ulu handle, wood	193/6525
F	Composite ulu handle, wood	193/6840
G	Composite ulu handle, wood	193/6478
H	Composite ulu handle, cottonwood bark	193/834
I	Composite ulu handle, wood w/red paint	193/6033
J	Composite ulu handle, wood	193/6836
K	Composite ulu handle with zoomorphic shape, wood	193/1199

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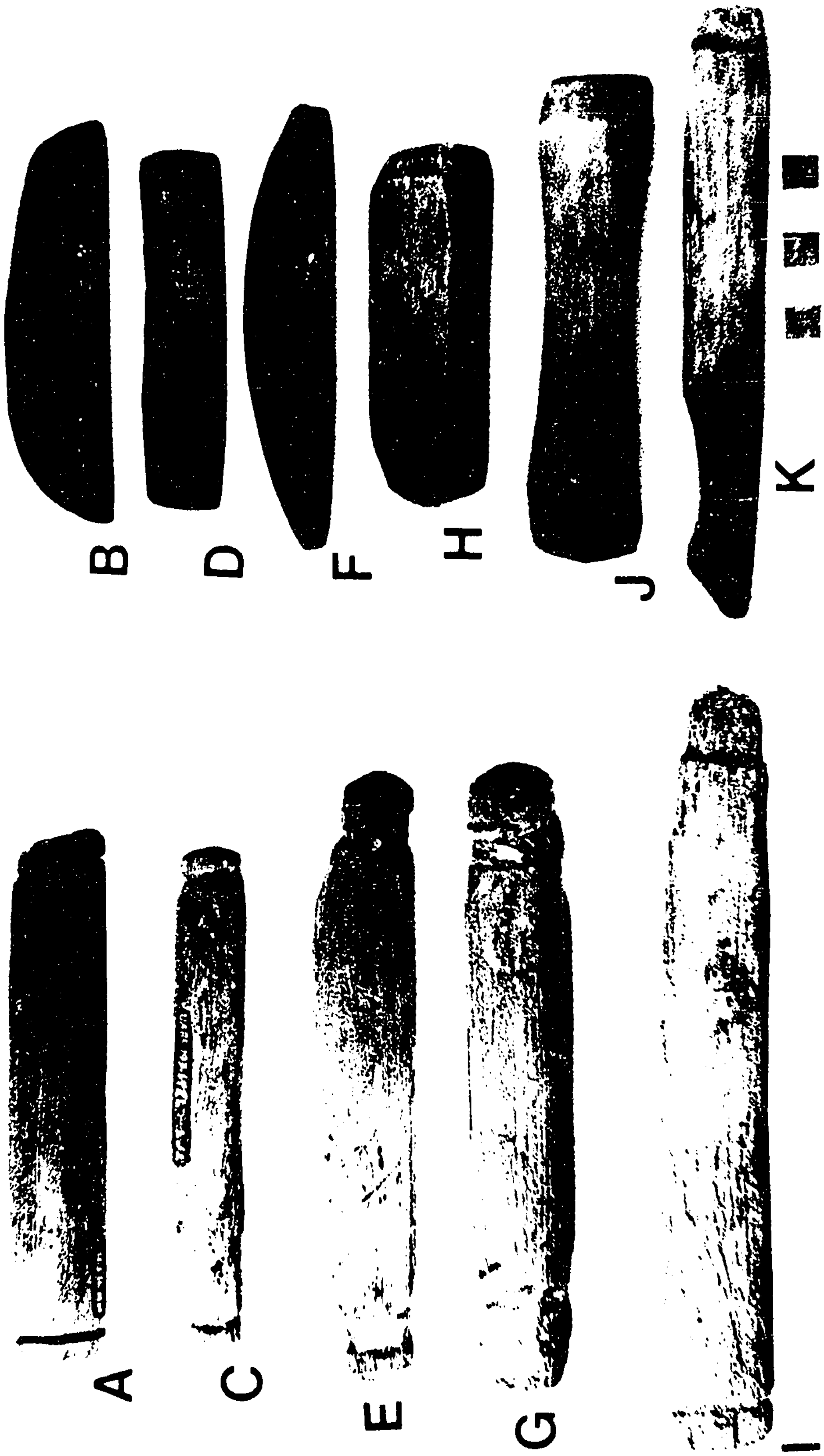

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intended for a stemmed ulu blade. A perforation on the blunt end of the handle suggests that it was pegged together. Traces of red paint are visible on some areas of the piece.

Ground Slate Knife Blades

Table 7:27 Stemmed, Double Edged Knife Blades

Catalog	Artifact Type	Material	Context
2938	Double edged knife	Slate	House floor 1
2939	Double edged knife	Slate	House floor 1
697	Double edged knife	Slate	House floor 1
1353	Double edged knife	Slate	House floor 1
1980	Double edged knife	Slate	House floor 5
1166	Double edged knife	Slate	House floor 5
3696	Double edged knife	Slate	House floor 5
1450	Double edged knife	Slate	House floor 5
2818	Double edged knife	Slate	House floor 6
2919	Double edged knife	Slate	House floor 6
4252	Double edged knife	Slate	House floor 7
2504	Double edged knife	Slate	House floor 7
4255	Double edged knife	Slate	House floor 7
6199	Double edged knife	Slate	House floor 10

Stemmed, Doubled Edged Knife Blades

Seven ground slate knife blades have rectangular stems which have been chipped and roughly ground (Plate 114: A-F). The long triangular blades are sharpened on both edges and terminate in a blunt tip. Clark recovered several comparable knife blades comparable to this type, mostly from the Rolling Bay site (1974:106). These knives seem to be more common late in Koniag phase deposits, although a considerable number of less well ground double edged knives apparently came from the lower levels of the Uyak site (Heizer 1956:48) Four complete knife blades range from 16.6 to 22.5 cm long and from 4.3 to 5.3 cm wide. One blade has a hole near one edge, suggesting that it was reworked from a perforated ulu blade (Plate 114: E). Several of the double-edged knives found by Clark also had single perforations (1974:250).

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Plate 114

Doubled edged knife blades

Object	Description	Catalog #
A	Double edged knife, slate	193/2938
B	Double edged knife, slate	193/3696
C	Double edged knife fragment, slate	193/2818
D	Double edged knife, slate	193/1450
E	Double edged knife, slate	193/1166
F	Double edged knife, slate	193/897

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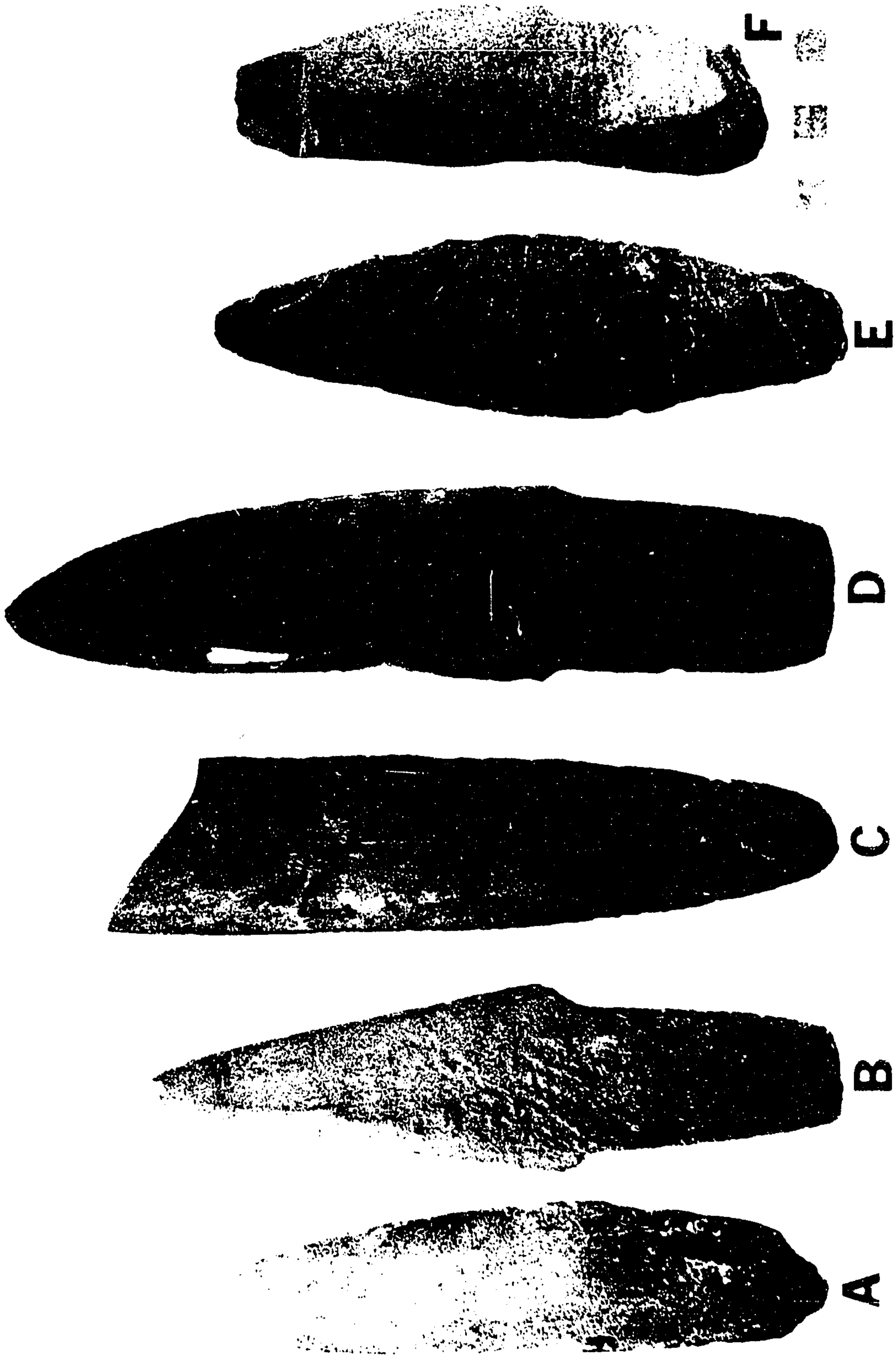

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Table 7:28 Miscellaneous Slate Knife Blades

Catalog	Artifact Type	Material	Context
4711	Large knife	Silicified Slate	House floor 1
3115	Knife	Slate	House floor 4
2900	Knife	Slate	House floor 4
4773	Knife	Silicified Slate	House floor 4
4872	Large knife	Silicified Slate	House floor 5
874	Knife	Slate	House 6 wall sod
4502	Knife	Silicified Slate	House 7 roof sod
3779	Large knife	Silicified Slate	House floor 7
5158	Knife	Slate	House floor 7
5825	Knife	Silicified Slate	House floor 9A
6038	Knife	Slate	Upper basal midden
5044	Large knife	Silicified Slate	Upper basal midden
6172	Knife	Silicified Slate	Upper basal midden
5049	Flensing knife	Slate	Lower basal midden

Silicified Slate Knife Blades

A complete stemmed knife blade of gray-green slate is smaller size shaped differently that the black slate specimens described above (Plate 115: D). This knife has a straight back, a single cutting edge, and is 14 cm long and 3 cm wide. The stem is ground on all surfaces , but not sharpened. A stem, tip, and mid-section fragment also represent knives of similar material. Two additional knife blades are flat pieces of silicified slate with a ground cutting edge on one side. They are otherwise unmodified. One is roughly triangular; (Plate 115: E), the other is semi-circular (Plate 115: G).

Small Slate Knife Blades

Four small knife blades are irregular, flat, pieces of black slate with a single ground, sharpened edge (Plate 115: A, B, F, H). These were probably hafted into wooden handles. These specimens range from 4 to 4.8 cm long and 2.2 to 3.2 cm wide. Many others may be present in the assemblage, but small fragments of ground slate knives are impossible to distinguish from fragments of ulus and other edged slate tools.

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Plate 115

Ground slate knives

Object	Description	Catalog #
A	Small knife blade, slate	193/2900
B	Small knife blade with four drilled holes, slate	193/5158
C	Small knife blade, slate	193/874
D	Knife blade, grey silicified slate	193/5044
E	Knife, grey silicified slate	193/4502
F	Small knife blade, slate	193/3115
G	Small semi-lunar knife blade, green silicified slate	193/4773
H	Small knife blade, slate	193/6038

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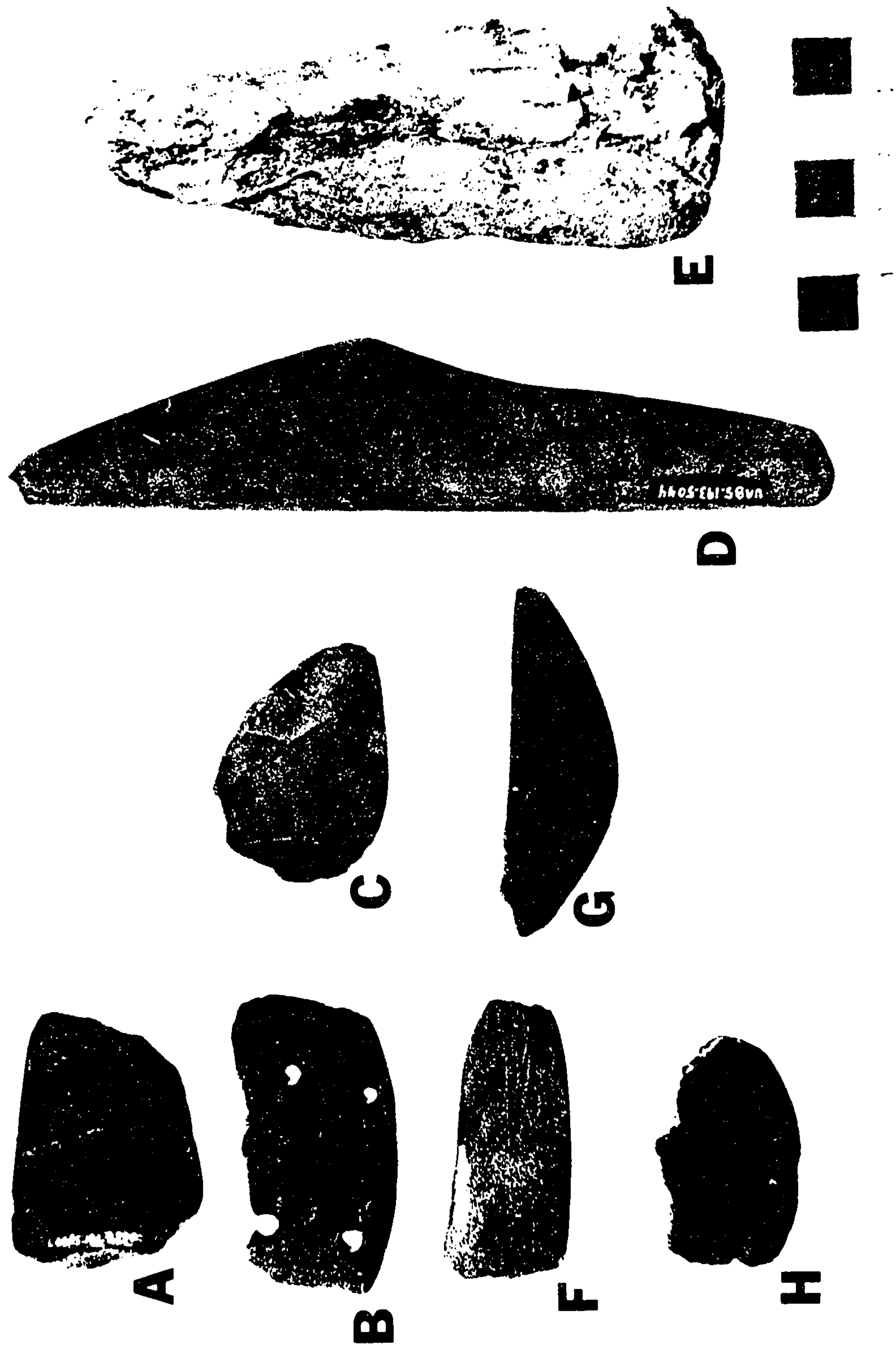

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Flensing Knifes

One fragmentary knife blade in the Karluk One assemblage has four drilled hafting holes (Plate 115: B), and resembles two specimens from Koniag contexts at Monashka Bay (Clark 1974b:42,139). Heizer illustrates more complete perforated knife blades (1956:162), which have similar multiple holes drilled on one side for hafting to a handle or shaft.

A complete unperforated flensing knife blade of ground slate resembles stemmed flensing knives from the Uyak site (1956:162). It has a semi-circular blade and a broad stem with a square base. It is 8.9 cm long and 6.5 cm wide, and was found in the lower basal midden.

Small Green Slate Knife Blades

Two small knife blades were made of green slate. One is a flat, ovoid piece with a single sharpened edge, which resembles the black slate specimens described above (Plate 115: C). It is 4.1 cm long and 2.7 cm wide. The second specimen is a finely ground and polished crescent shape (Plate 95: G). It measures 6 cm long and 1.8 cm wide.

Mussel Shell Knife

A triangular piece of thick mussel shell has a steeply ground edge on one side. It measures 9.2 cm long and is made from a locally found California mussel (*Mytilus californianus*). It was recovered from house floor 6.

U-shaped Scrapers

Table 7:29 U-Shaped Scrapers

Catalog	Artifact Type	Material	Context
1061	U-shaped scraper	Graywacke	House floor 2
3222	U-shaped scraper	Graywacke	House floor 3
4514	U-shaped scraper	Graywacke	House floor 7

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Three split cobbles of graywacke have a broad U-shaped notch chipped into one edge (Plate 116: A-C). Clark (1974:85) noted that U-shaped scrapers are never common in prehistoric tool kits on Kodiak Island. Only four were recovered from lower levels of the Uyak site (Heizer 1956:43), four found in surface assemblages at Crag Point, and only 1 out of 4500 artifacts found in the 1986-87 excavations at the Uyak site (Steffian 1994). The Kiavak site yielded 21 U-shaped scrapers (Clark 1974:85). The presence of these tools in the Karluk One assemblage, however, indicates that they are present in late Koniag contexts. The scrapers are from 5 to 9.8 cm in diameter, with notches that range from 1.1 to 3.9 cm wide. These tools were probably used for working objects like wooden shafts or kayak stringers

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Plate 116

U-shaped scrapers

Object	Description	Catalog #
A	U-shaped scraper, graywacke	193/3222
B	U-shaped scraper, graywacke	193/4514
C	U-shaped scraper, graywacke	193/1061

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Retouched Flakes

Table 7:30 Retouched Flakes

Catalog	Artifact Type	Material	Context
1327	Retouched flake	Graywacke	House floor 1
4535	Retouched flake	Silicified Slate	House floor 1
4355	Retouched flake	Slate	House 2 roof sod
4549	Retouched flake	Silicified slate	House floor 2
3239	Retouched flake	Silicified Slate	House 3 roof sod
1092	Retouched flake	Silicified slate	House floor 3
1417	Retouched flake	Slate	House floor 3
1945	Retouched flake	Chert	House floor 3
2358	Retouched flake	Silicified slate	House floor 3
3220	Retouched flake	Graywacke	House floor 3
3221	Retouched flake	Unident. lithic	House floor 3
4196	Retouched flake	Graywacke	House 4 roof sod
3878	Retouched flake	Silicified Slate	House floor 5
3879	Retouched flake	Silicified Slate	House floor 5
3880	Retouched flake	Silicified Slate	House floor 5
3881	Retouched flake	Silicified Slate	House floor 5
3275	Retouched flake	Silicified Slate	House 6 wall sod
3276	Retouched flake	Silicified Slate	House 6 wall sod
1688	Retouched flake	Silicified Slate	House floor 6
4114	Retouched flake	Silicified Slate	House floor 6
1706	Retouched flake	Chert	House floor 7
5083	Retouched flake	Unident. lithic	House floor 8
5085	Retouched flake	Silicified Slate	House floor 8
6437	Retouched flake	Silicified Slate	House floor 8
5105	Retouched flake	Silicified Slate	Upper basal midden
5106	Retouched flake	Silicified Slate	Upper basal midden
5396	Retouched flake	Silicified Slate	Upper basal midden
5810	Retouched flake	Green chert	Upper basal midden
6536	Retouched flake	Silicified Slate	House floor 10

A total of 29 stone flakes have been retouched for use as cutting tools and were recovered from all levels at Karluk One (Plate 117: A-L). Most of the retouched stone flakes are of silicified slate. These are probable by-products of the manufacture and use of planing and splitting adzes and retouched and utilized on an opportunistic basis. A retouched flake of green chert strongly resembles lithic specimens recovered from Aleutian sites. The retouched flakes range from 3.6 to 9.5 cm long.

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Chart 17: Increase in Chert Flakes and Debitage after A.D. 1400 at Karluk One

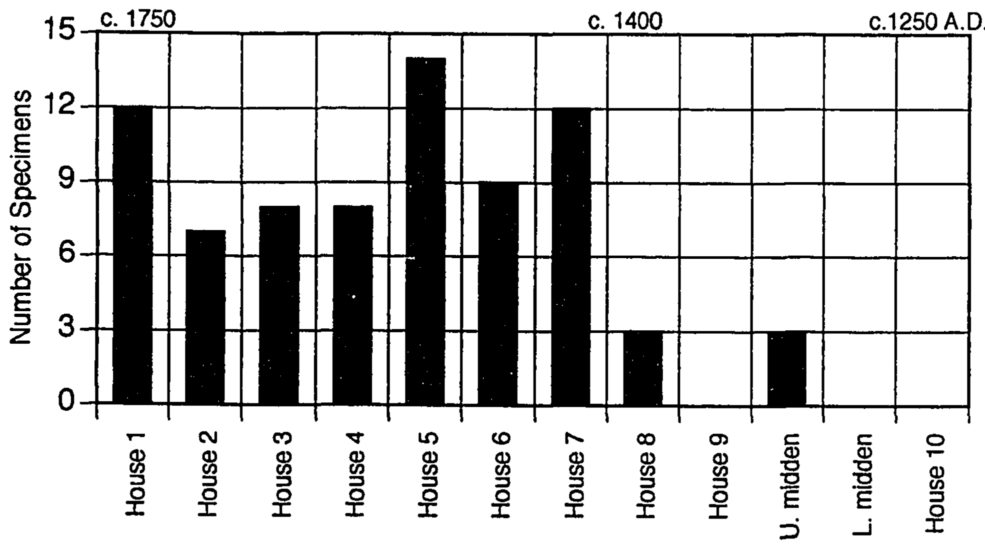

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Plate 117

Retouched flakes

Object	Description	Catalog #
A	Retouched flake, silicified slate	193/
B	Retouched flake, silicified slate	193/
C	Retouched flake, silicified slate	193/
D	Retouched flake, silicified slate	193/5105
E	Retouched flake, silicified slate	193/
F	Retouched flake, silicified slate	193/
G	Retouched flake, silicified slate	193/3239
H	Retouched flake, silicified slate	193/
I	Retouched flake, silicified slate	193/
J	Retouched flake, silicified slate	193/4549
K	Retouched flake, graywacke	193/3220
L	Retouched flake, blue-green chert	193/5810

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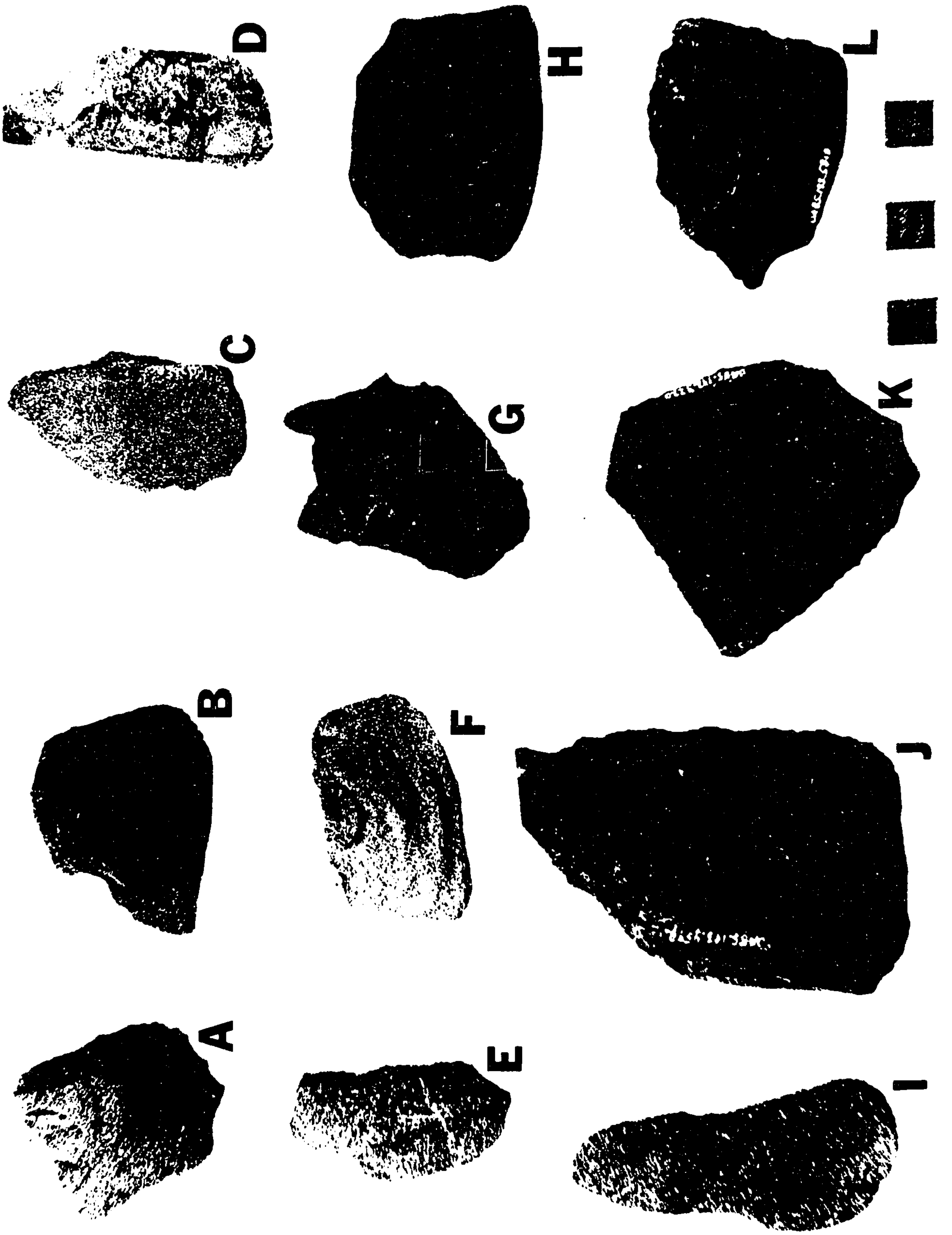

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Bifaces

Table 7:31 Bifaces

Catalog	Artifact Type	Material	Context
3318	Biface	Silicified Slate	House floor 1
4620	Biface	Silicified Slate	House floor 2
4793	Biface	Silicified Slate	House floor 4
1957	Biface	Chert	House floor 4
1147	Biface	Silicified Slate	House 5 roof sod
4483	Biface	Banded Slate	House floor 5
1527	Biface	Silicified slate	House floor 7

Six bifacially worked tools, probably scrapers, were found at Karluk One (Plate 118: A-F). Five are elongated ovals, one is pear-shaped. They range in from 4.6 to 9.7 cm long. One oval scraper is manufactured out of red chert. The pear-shaped specimen may have functioned as an end scraper (Plate 118: F). The casual flaking on these specimens suggests expedient manufacture.

Bifacially Chipped Cobbles

Table 7:32 Bifacially Chipped Cobbles

Catalog	Artifact Type	Material	Context
4718	Cobble biface	Basalt	House floor 1
4311	Cobble biface	Graywacke	House floor 1
4593	Cobble biface	Graywacke	House floor 5
5011	Cobble biface	Graywacke	House floor 8
6214	Cobble biface	Graywacke	House floor 8
5012	Cobble biface	Graywacke	House floor 8
6260	Cobble biface	Graywacke	Upper basal midden

Seven graywacke cobbles have had flakes removed from both sides, perhaps to form a crude tool (Plate 119: A-G). They may have functioned like split cobble tools, although it is conceivable that flakes were removed while the cobbles were used as hammerstones. They range in diameter from 7.2 to 12 cm.

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Plate 118

Bifaces

Object	Description	Catalog #
A	Biface, red chert	193/1957
B	Biface, silicified slate	193/3318
C	Biface, silicified slate	193/4620
D	Biface, silicified slate	193/1147
E	Biface, limestone?	193/4483
F	Biface, silicified slate	193/

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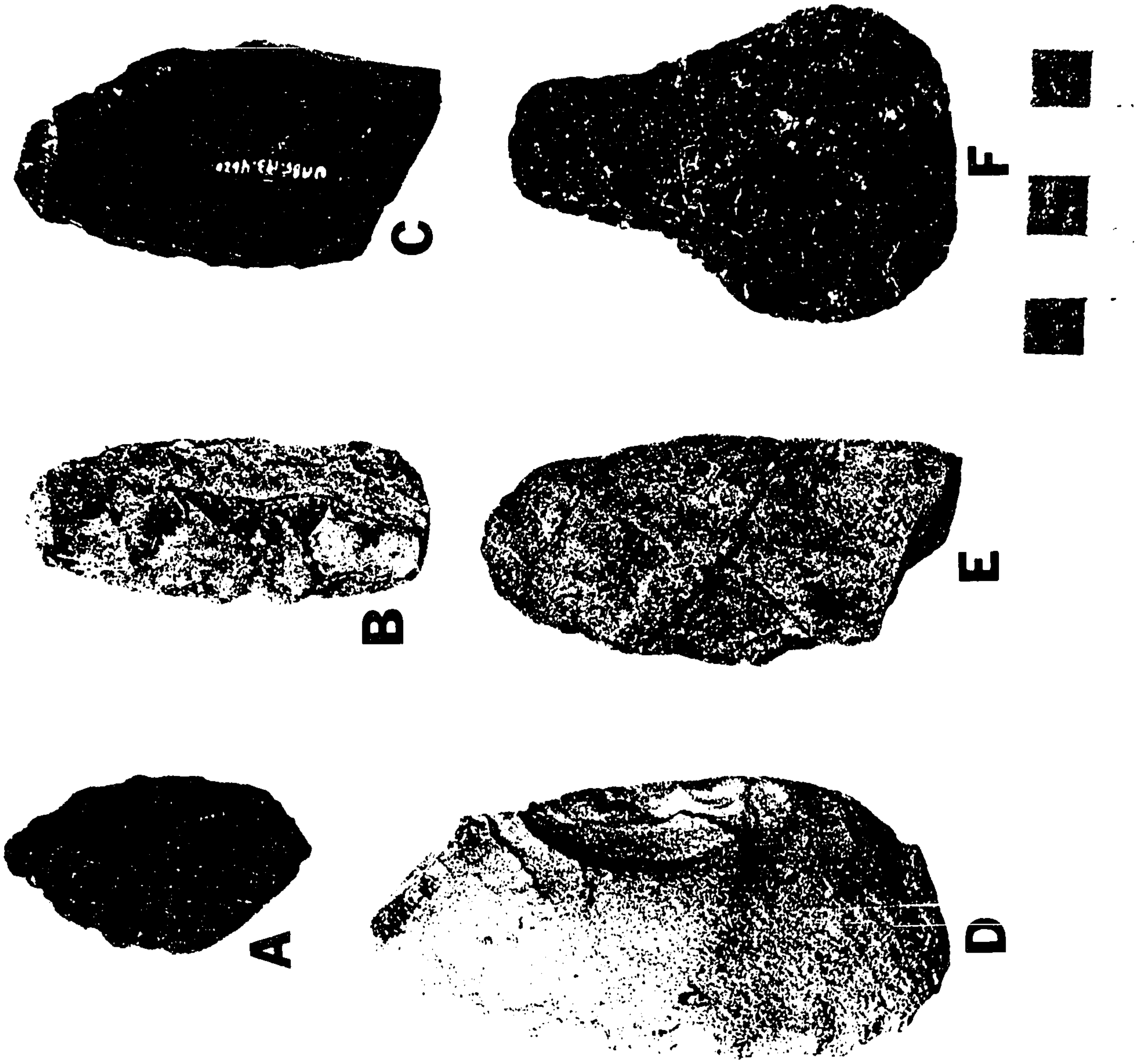

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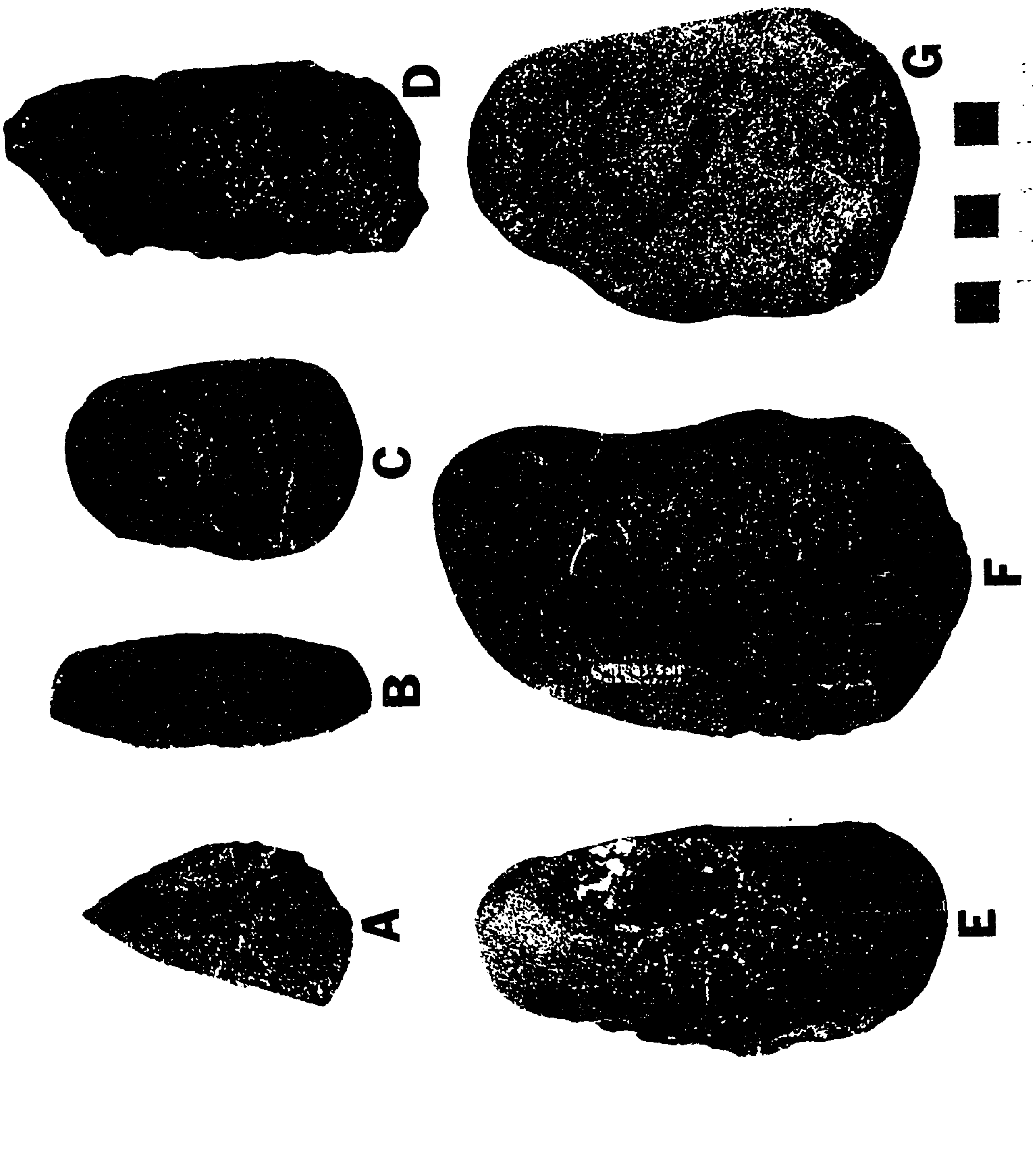

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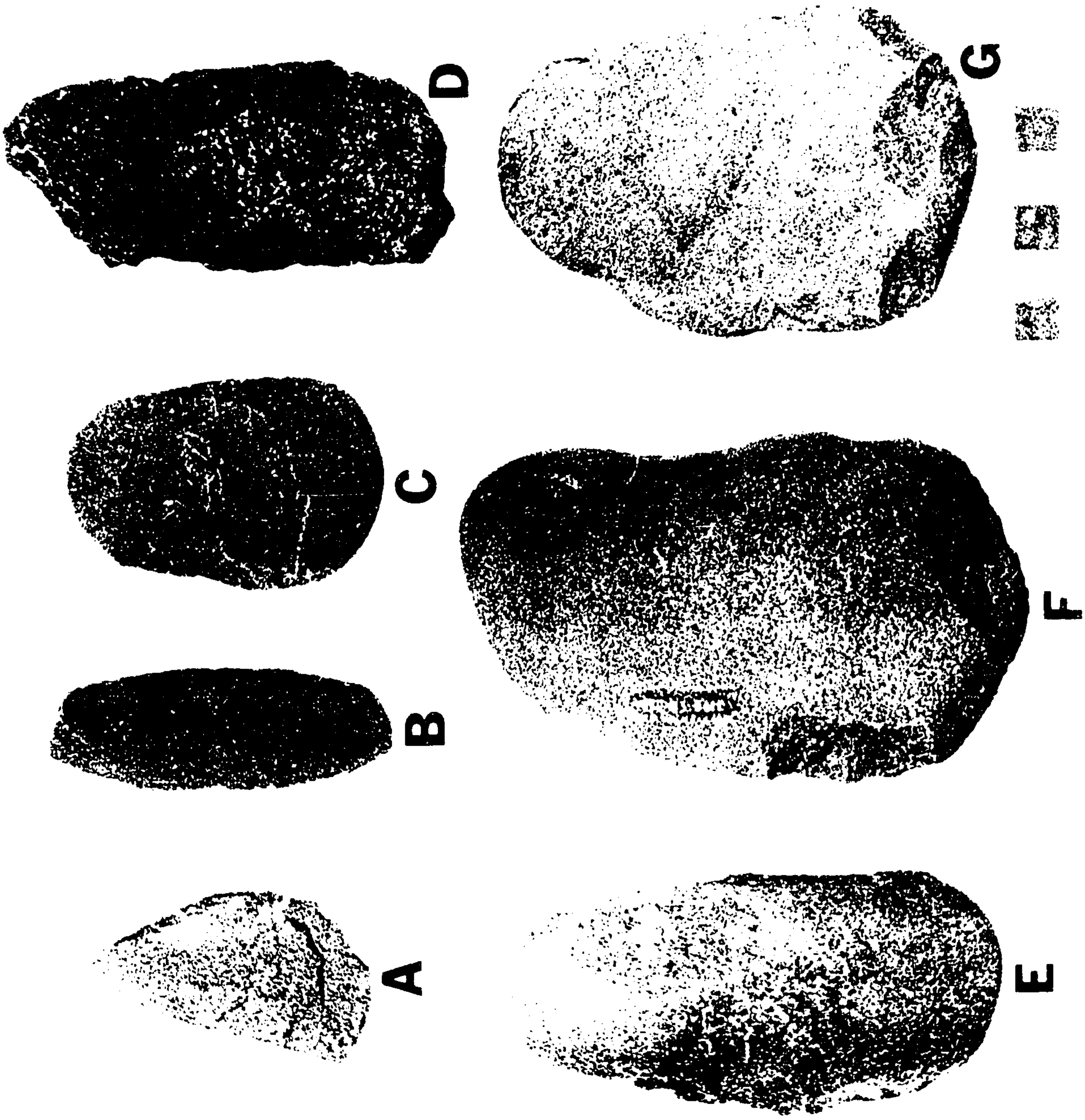

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Tool Handles with Narrow Open Sockets

Table 7:33 Tool Handles with Narrow Sockets

Catalog	Artifact Type	Material	Context
994	Tool handle, w/narrow socket	Wood	House 1 roof sod
3361	Tool handle, w/narrow socket	Wood	House 2 wall sod
2548	Tool handle, w/narrow socket	Wood	House floor 2
1752	Tool handle, w/narrow socket	Wood	House floor 2
3470	Tool handle, w/narrow socket	Wood	House 2 wall sod
1778	Tool handle, w/narrow socket	Wood	House floor 3
2416	Tool handle, w/narrow socket	Wood	House floor 4
3132	Tool handle, w/narrow socket	Wood	House floor 6
5468	Tool handle, w/narrow socket	Wood	House 7 roof sod
4250	Tool handle, w/narrow socket	Wood	House floor 7
4837	Tool handle, w/narrow socket	Bone	House floor 7
5778	Tool handle, w/narrow socket	Wood	House 8 roof sod
6387	Tool handle, w/narrow socket	Wood	House floor 8
6404	Tool handle, w/narrow socket	Wood	House floor 8
5205	Tool handle, w/narrow socket	Wood	House floor 8
5026	Tool handle, w/narrow socket	Wood	House floor 8
5565	Tool handle, w/narrow socket	Wood	House floor 9A
5282	Tool handle, w/narrow socket	Wood	Lower basal midden
5058	Tool handle, w/narrow socket	Wood	House floor 10

Eighteen wooden handles have a narrow, open socket on their distal ends which could have accommodated a rodent incisor or small stone carving bit (Plate 120: A-P). The sockets are U-shaped in cross-section and range from 1.4 to 2.5 cm in long and 0.3 to 0.9 cm wide. The bodies of the handles range from 1.0 to 2.8 cm in diameter. Handles of this type made from antler were recovered from upper levels of the Uyak site (Heizer 1956:82-83).

Three handles (Plate 120: A-D), and a handle fragment (Plate 120: P) represent a long, socketed form of tool handle; ranging from 20.9 to 26.1 cm long. They have slightly narrower sockets that the shorter handles. The distal ends of the long handles show no sign of being used in conjunction with a drill cap. One long handle has a distal end carved into the shape of a long-beaked bird head, and retains traces of black paint (Plate 120: B).

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Most of the narrow socketed tool handles are hand sized, ranging from 9.5 to 10.3 cm long. One handle, 11.7 cm long, is an abstract zoomorphic shape, with an alligator shaped body and four breast-like projections on the underside (Plate 120: E). Ted Banks recovered a similar zoomorphic stone effigy in excavations at the Amaknak site in the Aleutian Islands (Black 1982: 9, Figure 6). The Karluk One specimen was found in association house floor 2. The socketed end of this piece is more crudely carved than the rest, suggesting that it may have been reworked into a handle from a more complete zoomorphic carving.

Five of the narrow open socketed handles feature additional holes, grooves and drill sockets. Handles of this type found during the 1987 season have marmot incisors hafted into these auxiliary holes. Rodent incisors could be installed into different areas of the handle as needed, or they may have served as some kind of multiple purpose tool (Plate 120: G,I,J,K,M). Three additional tool handles are represented by fragments.

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Plate 120

Tool handles with narrow open sockets

Object	Description	Catalog #
A	Long form tool handle with narrow open socket, wood	193/
B	Long form tool handle with narrow open socket, wood w/black paint	193/1778
C	Long form tool handle with narrow open socket, wood	193/3132
D	Long form tool handle with narrow open socket, wood	193/5565
E	Tool handle with narrow open socket, wood	193/5205
F	Tool handle with narrow open socket, wood	193/5058
G	Tool handle with narrow open socket, wood	193/3470
H	Tool handle with narrow open socket, wood	193/
I	Fragment, tool handle with narrow open socket, wood	193/3361
J	Tool handle with narrow open socket, wood	193/5468
K	Tool handle with narrow open socket, wood w/zoomorphic design	193/1752
L	Tool handle with narrow open socket, wood	193/
M	Fragment, tool handle with narrow open socket, wood	193/5778
N	Tool handle with narrow open socket, wood	193/6387
O	Tool handle with narrow open socket, wood	193/994
P	Fragment, tool handle with narrow open socket, wood	193/

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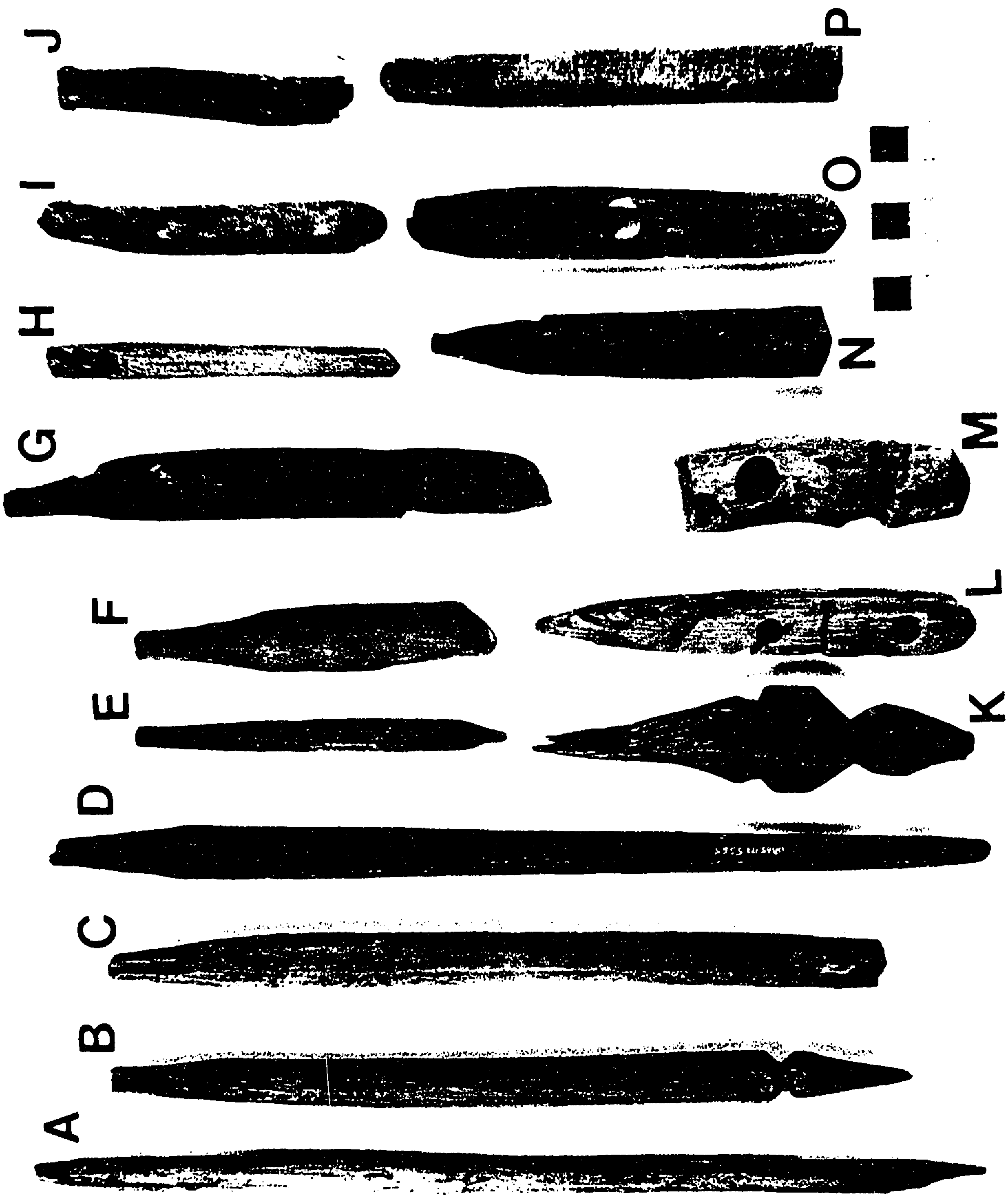

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Tool Handles with Wide Sockets

Table 7:34 Tool Handles with Wide Sockets

Catalog	Artifact Type	Material	Context
2675	Tool handle, w/wide socket	Wood	House floor 1
3575	Tool handle, w/wide socket 2pc	Wood	House floor 3
3623	Tool handle, w/wide socket 2pc	Wood	House 4 roof sod
4383	Tool handle, w/wide socket 2pc	Wood	House floor 4
2791	Tool handle, w/wide socket 2pc	Wood	House floor 5
1152	Tool handle, w/wide socket 1pc.	Wood	House floor 5
3398	Tool handle, w/wide socket 2pc	Wood	House floor 6
3149	Tool handle, w/wide socket 2pc	Wood	House floor 6
2822	Tool handle, w/wide socket 1pc.	Wood	House floor 6
3822	Tool handle, w/wide socket	Wood	House floor 6
4965	Tool handle, w/wide socket 2pc	Bone	House floor 6
4844	Tool handle, w/wide socket 2pc	Wood	House floor 7
1717	Tool handle, w/wide socket 2pc	Wood	House floor 7
5693	Tool handle, w/wide socket	Wood	House floor 8
5421	Tool handle, w/wide socket 2pc	Wood	Upper basal midden
6639	Tool handle, w/wide socket 2pc	Wood	Upper basal midden
6672	Tool handle, w/wide socket 2pc	Wood	Lower basal midden
5754	Tool handle, w/wide socket 2pc	Wood	House floor 10
5959	Tool handle, w/wide socket	Wood	House floor 10
5310	Tool handle, w/wide socket 2pc	Wood	House floor 10

Twenty handles with wide, shallow, open sockets probably contained stone blades (Plate 121). Eleven of these are two-piece composite forms (Plate 121: I,J,M,O,P). The composite halves are evenly split cylindrical shafts, with shallow basin-shaped sockets ranging from 1 to 1.7 cm wide and 1.2 to 2.5 cm long. Overall dimensions of the six complete composite halves range from 3.2 to 12.1 cm long and 1.5 to 2.2 cm wide.

Two of the composite tool handle halves terminate in sharp points, suggesting that they were also used as awls (Plate 121: F,N). Two articulating composite halves form a wooden handle 6.9 cm long and 1.6 cm wide (Plate 121: I,J). There is a carved hole in its proximal end, into which a wrapped binding was tucked. The socket is small, measuring only 0.9 cm deep.

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Plate 121

Tool handles with wide sockets

Object	Description	Catalog #
A	Fragment, tool handle with wide socket, bone	193/4837
B	Fragment, tool handle with wide socket, wood	193/
C	Tool handle with wide socket, wood	193/4844
D	Fragment, tool handle with wide socket, wood	193/
E	Composite tool handle with wide socket, wood	193/3623
F	Composite tool handle with wide socket, wood	193/3149
G	Composite tool handle with wide socket, wood	193/4383
H	Fragment, tool handle with wide socket, bone	193/
I	Fragment, tool handle with wide socket, bone	193/6829
J	Tool handle with wide socket, wood	193/5421
K	Fragment, tool handle with wide socket, wood	193/6672
L	Fragment, tool handle with wide socket, wood	193/
M	Tool handle with wide socket, wood	193/1717
N	Tool handle with wide socket, wood	193/5310
O	Composite tool handle with wide socket, wood	193/2791

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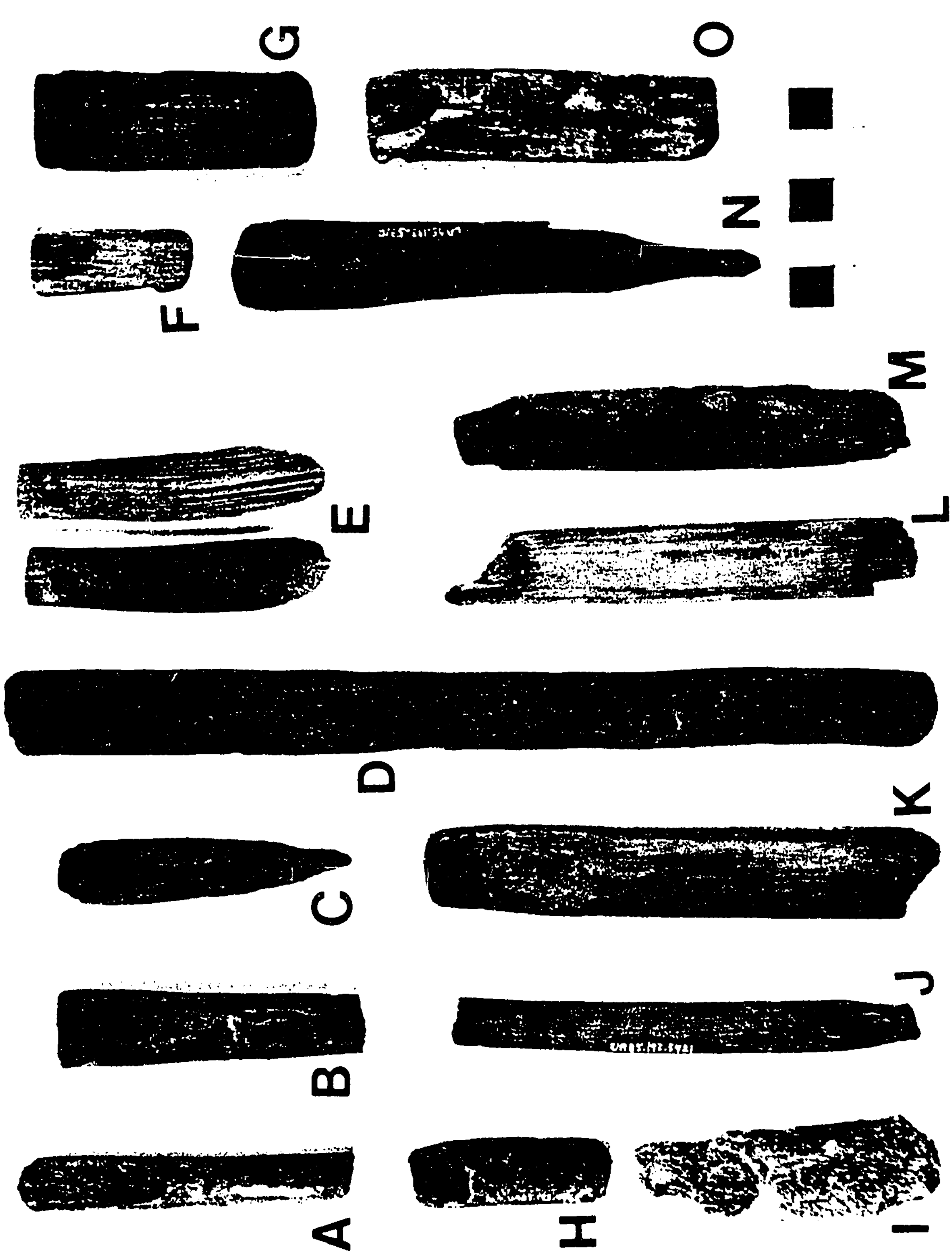

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Plate 122

Miscellaneous short tool handles

Object	Description	Catalog #
A	Tool handle with slotted end, wood	193/3822
B	Tool handle with slotted end, wood	193/
C	Tool handle with slotted end, wood	193/2822
D	Tool handle with slotted end, wood	193/1152
E	Tool handle with closed socket, wood	193/5959
F	Tool handle with closed socket, wood	193/2675
G	Tool handle, wood	193/6176
H	Tool handle, wood	193/
I	Tool handle, wood	193/6348

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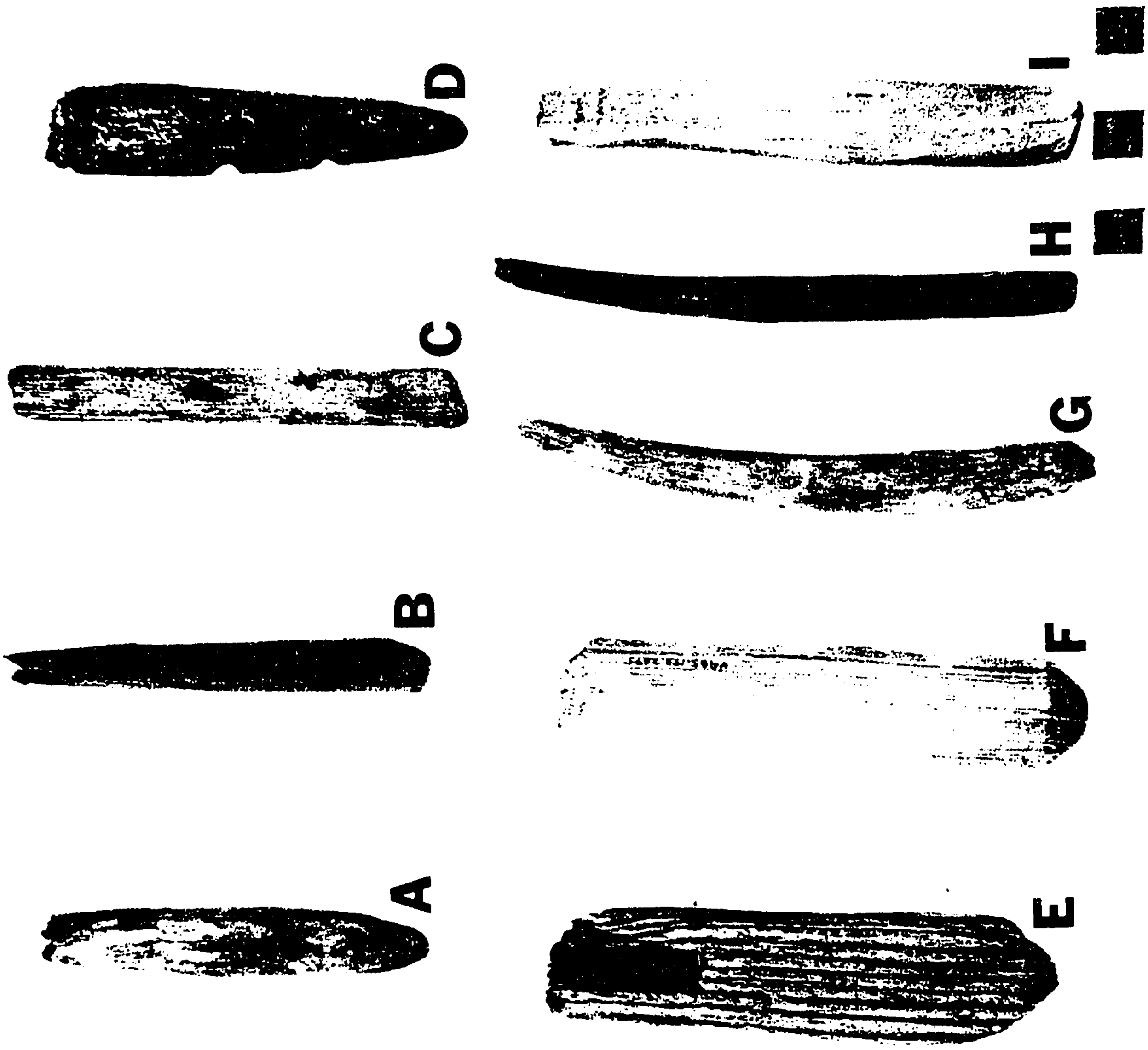

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Two wood and three bone handles with broad open sockets appear to be of one-piece construction (Plate 121: A-C,H). Only one of the wooden handles of this kind is complete, measuring 20.7 cm long, and 1.9 cm in diameter (Plate 121:H). It retains traces of red paint. Three modified mammal ribs have open sockets similar to the wood handles described above, but are all distal fragments (Plate 121:A-C).

Stem Hafted Handles

Table 7:35 Stem Hafted Tool Handles

Catalog	Artifact Type	Material	Context
2143	Stem hafted handle	Bone	House floor 1
760	Stem hafted handle	Wood	House floor 2
1371	Stem hafted handle	Wood	House floor 2
825	Stem hafted handle	Wood	House floor 4
4484	Stem hafted handle	Wood	House floor 5
3769	Stem hafted handle	Wood	House floor 6
3814	Stem hafted handle	Wood	House floor 7

Seven handles lack sockets, but have tiny stems projecting from the distal end (Plate 123: A-G). The hafting stems range from 0.4 to 1.7 cm in length and average about 0.3 cm in diameter. The stems are semi-circular in cross-section. Five of the handles consist of simple tapered shafts (Plate 123: B,C,F,G). Three are in complete condition, and range in length from 7.1 to 16.2 cm, and 5 to 1.3 cm in diameter.

One 16 cm long, stem-hafted wooden handle has been elaborately carved with a knob-like bulge near the distal end and a grooved geometric design near the middle of the handle (Plate 123:E). A very small handle, made of dense bone (Plate 123:A), has a carefully incised spiral line that runs the length of the handle. It is only 6.2 cm long and 0.4 cm in diameter.

The function of stem hafted handles is uncertain, however the stems were not designed to withstand much pressure. Heizer (1956:82) described

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bone and ivory "engraving tools" from the upper levels of the Uyak site that are identical to these from Karluk One. The stem of one of the Uyak site handles had a rust stain on it. When hafted with a sharp iron point, these tools may have been used for engraving, or alternatively, as a tattoo needle or piercing tool for inserting labrets. The fact that stem hafted tool handles have been so far recovered only from house floors post dating 1400 A.D. may reflect the influx of iron from Asia arriving with driftwood on Kodiak area beaches. Jordan (personal communication 1990), suggested that the small stems anchored paint brush bristles. The Smithsonian collections include Northwest Coast paint brush handles that are strongly reminiscent to the specimens recovered at Karluk One.

Miscellaneous Tool Handles

Six simply carved wooden handles have a slot or socket at the distal end (Plate 124: A-F). They range from 8.5 to 10.7 cm long and 1.1 to 2.8 cm in diameter. One handle has a carefully carved small indentation on the surface, which probably kept the a cordage knot associated with wrapping around the handle from bulging. (Plate 124: B). Three of these handles have blunt proximal ends and taper to a wedge-shaped distal end, presumably hafted to a blade of some type (Plate 124: G-I). They are oval in cross-section, and range from 10.8 to 11.5 cm long. They are reminiscent of handles used in conjunction with 19th century metal crooked knives, common in ethnographic assemblages.

A large wood handle, possibly designed to hold a scraper, is 21.5 cm long, and 4.2 cm wide (Plate 124: D). A flat flange on the distal end has two vertical hafting holes connected by a countersunk groove. The handle is

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Plate 124

Miscellaneous tool handles

Object	Description	Catalog #
A	Tool handle, wood	193/
B	Composite half of tool handle, wood	193/1025
C	Unfinished composite tool handle, wood	193/3637
D	Large tool handle, wood w/red paint	193/1588
E	Tool handle, wood	193/3714
F	Tool handle, wood	193/
G	Tool handle, wood	193/4703
H	Tool handle fragment, wood	193/4828
I	Tool handle, wood	193/4899

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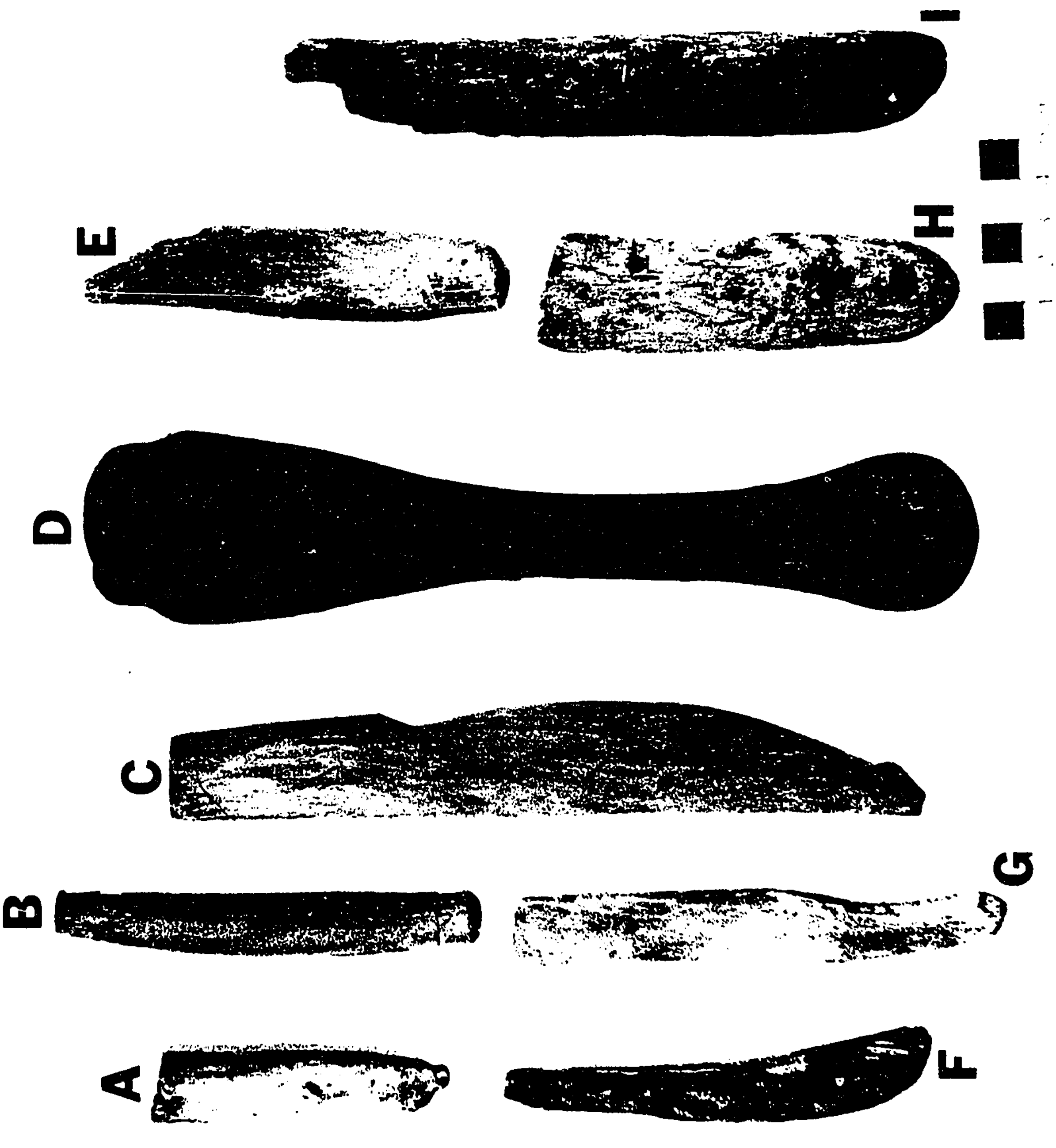

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Plate 123

Stem hafted tool handles

Object	Description	Catalog #
A	Stem hafted tool handle w/incised spiral line, bone	193/2143
B	Stem hafted tool handle, wood	193/
C	Stem hafted tool handle, wood	193/3769
D	Stem hafted tool handle, wood	193/
E	Stem hafted tool handle, wood	193/750
F	Stem hafted tool handle, wood	193/
G	Fragment stem hafted tool handle, wood	193/

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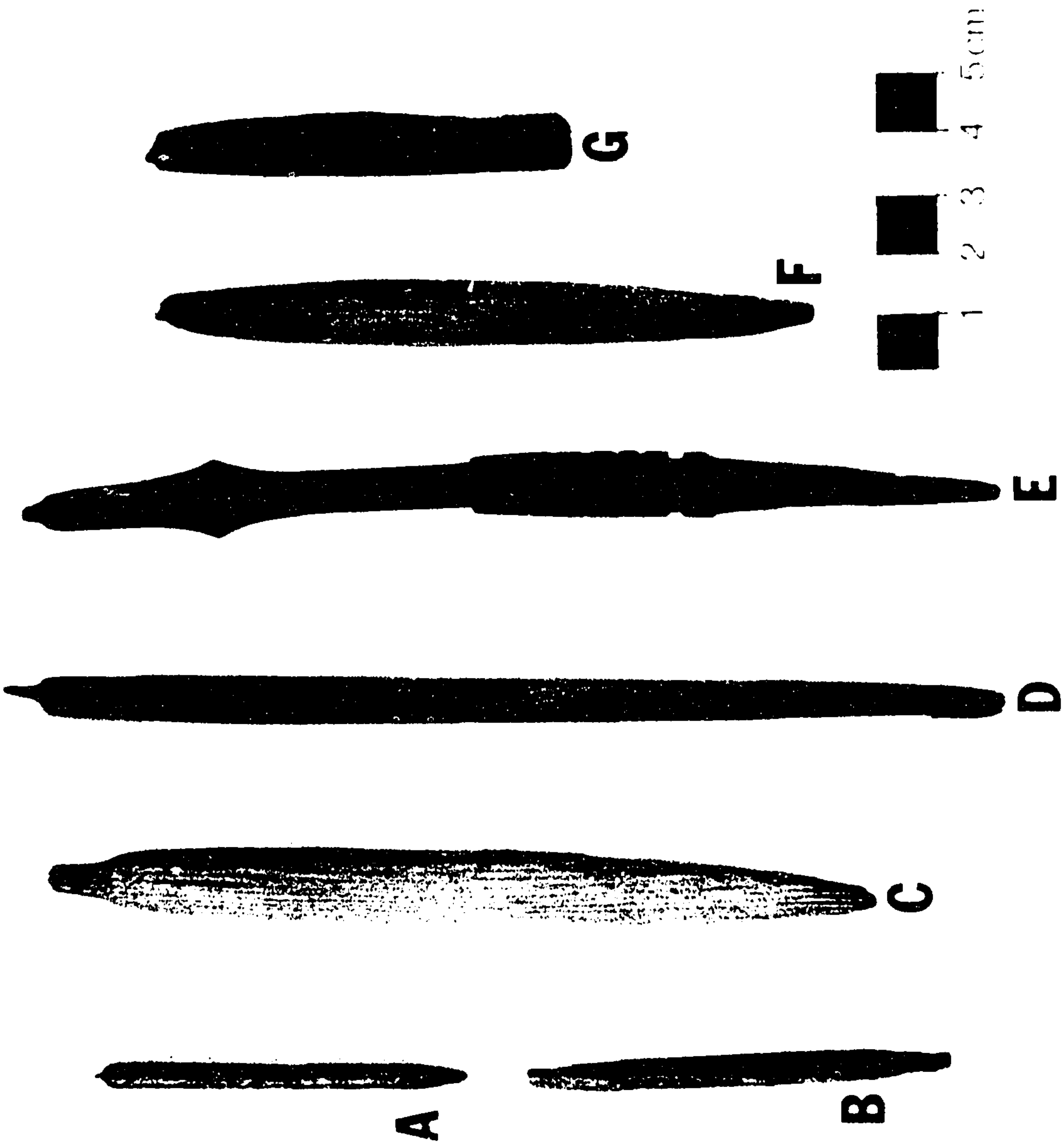

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square in cross-section, and was very well carved from a hard wood. The surface of the piece retains traces of red paint.

Three wooden preforms of tool handles are nearly finished (Plate 124: A,C,G). Two have vertical cuts into one surface, indicating they were in the process of being split into composite halves. They are rectangular in cross-section, measuring 18.4 and 12.2 cm long. The larger unfinished tool handle has an incised row of zigzags along the top surface. These may be guide-lines for a painted design (Plate 124: C). A small handle preform, 7.2 cm long is ovate in cross-section, and lacks any notching or socketing (Plate 124: A).

Six wooden handles are represented by proximal fragments of various sizes and range from 1.7 to 3 cm in diameter (Plate 124: B,E-I). Two of these fragments have holes carved near the proximal end (Plate 124: H,I). One unique specimen, possibly a composite fragment, has a groove running through the center as if a cord ran through it. It may have been used as a bucket handle (Plate 124: B). Notches on either end held lashing held the halves together. This specimen is 10.5 cm long and 1.6 cm in diameter.

Raw Material Use During the Koniag Phase

Table 7:36 Numbers of Artifacts Made From Organic Materials at Karluk One

Artifacts (n)	Material
2450	Wood
356	Bone
113	Cottonwood Bark
32	Antler
20	Birch Bark
18	Ivory
13	Spruce Root
10	Baleen
10	Tooth
4	Shell
3	Grass

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Fresh water saturation at Karluk One created an anaerobic environment condusive to the preservation of many, but not all, organic materials. Notably rare in the assemblage are soft animal tissues, skin, gut, and sinew that were so skillfully worked in creating the kayaks, clothing, weapons, and other objects now only preserved in major ethnographic collections (Fitzhugh and Crowell 1988, Varjola, 1990). Other fragile organic materials were preserved. Scraps of bird feather and sea otter fur were fairly common. Clumps of human hair were also frequently encountered tucked away in sod walls or under stones. According to Native elders, it was important to keep one's hair from falling into the hands of a *shamanaq*, who could use it on a doll or employ it in a harmful ritual. Rye grass, not visibly woven, but carefully spread, was commmonly encountered on house floors, particulary around the margins of side rooms. It was green when encountered in the excavation, but would turn brown, then black with exposure to the air. Rye grass rolls were mapped and photographed, but were too fragile to collect except as part of soil samples.

Most of the house floors at Karluk One were soaked with sea mammal oil. Its pungent odor was one of the first signs that an excavator had reached a house floor. Oily sheens collected on the small pools of water beneath plank covered drainage ditches. During excavations in a similarly well preserved Koniag midden at Malina Creek, we ecountered tarry blobs of congealed sea mammal oil that were possible to collect; however this did not occur at Karluk One. However, small lumps of sea mammal oil sometimes precipitated on the underside of cobbles or boards piled in a way that left air spaces were intact. Oil was also sometimes associated with the best cases of wood preservation.

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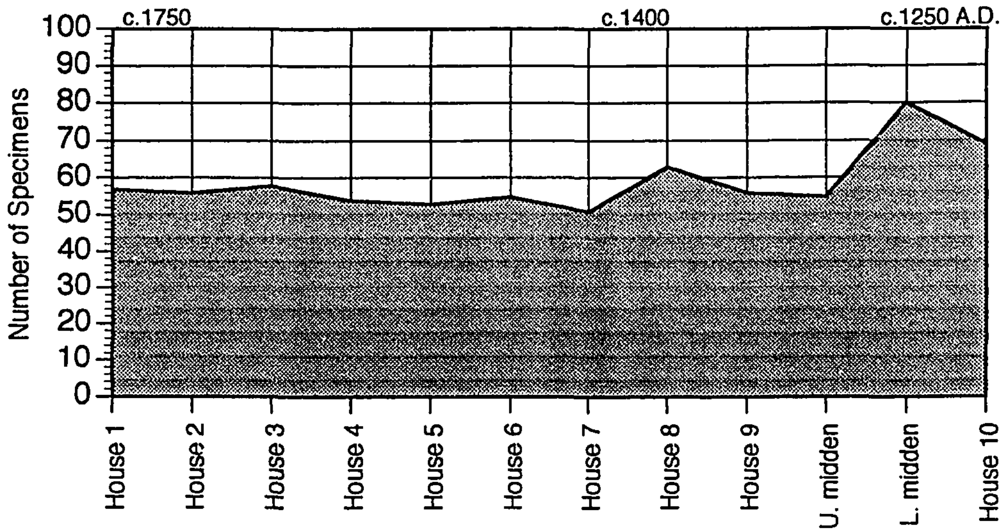
Chart 18: Percentages of Wood and Cottonwood Bark Artifacts by Level at Karluk One



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Types and Numbers of Wooden Artifacts from Karluk One

Artifact Type	Number
Misc. shaft fragments	332
Blunt pointed shaft frags	208
Tally sticks	181
Whittled sticks	169
Worked fragments	129
Labrets	99
Wedges	87
Stakes	75
Gaming discs	71
Tool handles	64
Uqshaq darts	61
Mask bangles	60
Bentwood vessel bases	51
Dart shaft fragments	48
Pegs	42
Arrow shaft fragments	39
Clam knives	32
Ulu handles	23
Miniature bows	21
Fishing rig parts	20
Skin working boards	19
Anthropomorphic figurines	17
Paddle fragments	17
Fire drills	17
Kayak rib fragments	15
Bentwood vessel side frags	14
Fish hook barbs	14
Snare pins	14
Awls	13
Trimmed boards	13
Dart butts	12
Mask hoop fragments	11
Bow fragments	10
Bentwood vessels	10
Box lids	10
Keelson/deck stringers	8
Fire hearths	8
Maskettes	8
Slat armor	8

Artifact Type	Number
Spoons	7
Trapezoidal box panels	7
Adze handle fragments	7
Drag handles	7
Stunning clubs	7
Plugs	6
Vessel handles	6
Stem hafted tool handles	6
Dippers	5
Rock scoops	5
Tops	4
Throwing boards	4
Net guages	4
Nose pins	4
Lance foreshafts	4
Fish hook shanks	4
Model anyaq parts	4
Misc. anyaq parts	4
Kayak deck beams	3
Harpoon shaft fragments	3
Masks	3
Harpoon foreshafts	3
Miniature kayaks	3
Balls	3
Box bottoms	3
Socket piece fragments	2
Zoomorphic figurines	2
Miniature drum handles	2
Miniature boat paddles	2
Miniature arrow shafts	2
Net shuttle fragment	1
Point sheath	1
Shield brace	1
Wound plug	1
Wrist band	1
Float plug	1
Miniature harpoon point	1
Miniature boatman	1
Miniature throwing board	1

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Wood

Wood is the most common raw material represented in the assemblage from Karluk One. Wooden artifacs even outnumber those of slate. Although we didn't compile statistics on items not collected, wood remains were even more abundant that fire-cracked rock. House floors were characterized by densely packed layers of wood slivers and chips. Floor boards of split cedar, ususually less than a meter long, were also common. House posts and floorboards protruding from excavation walls sometimes had to be removed with a saw or axe. When an axe was used on the larger house posts, chopping produced bright white wood chips that even smelled like fresh wood. Because of the site's remote location and our limited ability to ship and conserve organics, only samples of planks and house posts were collected. The vast bulk of the Karluk One wood assemblage consists of artifacts and worked fragments.

The types of wood used in artifact manufacture have not been analyzed systematically, however a few preliminary generalizations about various types of wood available in the driftwood piles on Kodiak area beaches can be made. Pacific Yew is a very hard, fine grained wood still prized by village craftsmen. In 1983 the late Alec Panamaroff Sr. showed me how to identify Pacific Yew logs by the uniquely shaped dent that exists next to the knot on an otherwise unremarkable drift log. He used it to carve the shafts of *uqshaq* darts. In the absence of Pacific yew, dart makers in the village of Akhiok have been know to utilize similar hard woods, in one case walnut salvaged from a discarded gunstock. Yew was also used to make bows well into the 20th century; Mr. Panamaroff noted that it was important to smooth the wood precisely, using an edge chipped from the base of a glass bottle; as any deep scratches or imperfections could cause a sudden, even dangerous,

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fracture. Prehistoric Karluk residents used yew for bows, throwing boards, tally sticks, wound plugs, sub-rectangular bentwood vessel rims, labrets, fish hook barbs, stem-hafted tool handles, snare pins, and pegs in bentwood vessels.

Spruce and cedar are the most common woods in the assemblage, and were used to make most of the artifact types listed in Table 8. Cedar, because of its superior splitting qualities, was used for almost all planks and long shafts. Spruce was favored for utilitarian objects. Most of the wedges in the assemblage are of spruce, a pattern also observed in the Ozette site assemblage (Gleeson 1980:67, Friedman, 1975:121). Spruce was also used to make the majority of the wooden labrets. According to Osgood, the Athapaskans used spruce in manufacturing labrets because softer woods swelled in contact with saliva, causing discomfort to the wearer (1970:285-7).

Softer woods, like cottonwood, were used to make adze handles, taking advantage of the wood's characteristics of flexiblity and shock absorption. Drag handles, probably made ona contingency basis, were made from dwarf birch and alder stems, some of which retain their orginal bark. Wooden artifacts

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Cottonwood Bark

Table 7:38 Artifacts Made from Cottonwood Bark

Artifact Type	(n)
Gaming disc	37
Labret	16
Maskette	14
Top	14
Miniature kayak	10
Ball	4
Net float	4
Fire hearth	3
Bird figurine	2
Miniature boatman	2
Kayak deck attachment	2
Handle	1
Spool	1
Ulu handle	1
Toy net float	1
Toy scoop	1

The bark from the balsam cottonwood (Populus balsamifera) was utilized in the manufacture of at least 148 artifacts in the Karluk One assemblage; and is present in all but the lowest levels, comprising from 2 to 6% or the entire assemblage in each level, discounting lithic scrap. No pieces of cottonwood bark were recovered below the upper basal midden, which represents the first century or more of occupation at the site. Stands of cottonwood occur in protected river valleys throughout the island. The nearest stands of cottonwood to the Karluk One are probably those in the Larsen Bay area and upper Karluk River drainage, some 20 miles distant. It is also commonly found in driftwood accumulations on beaches. Cottonwood bark grows to as much as 5-10 cm thick, and is easily carved. Today's Alutiiq Natives collect cottonwood bark on beaches for use in smoking fish (Russell 1991: 20). It produces a smoky fire of low temperature. With a density somewhere between pine and cork; cottonwood bark is extremely buoyant.

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Artifact types made from cottonwood bark take full advantage of the characteristics of the raw material. Being easy to carve, it was used to make items where durability was secondary consideration, such as toys and game pieces. Cottonwood bark objects with possible ceremonial uses, such as the maskettes, miniature kayaks, miniature boatmen, and bird figurines, may have been intended for one-time use. Native informants in Kodiak Island and Alaska Peninsula villages have told me that masks made in the winter 'masking' dances were destroyed immediately after use. In using a miniature kayak in bringing in good weather, it was probably necessary to manufacture the tiny kayaks and associated boatmen on short notice. Cottonwood bark is also the lightest available material for labrets.

Birch Bark

Table 7:39 Birch Bark Scraps

Catalog	Artifact Type	Material	Context
2540	Rolled scrap	Birch bark	House 1 roof sod
2954	Piece	Birch bark	House floor 1
1564	Rolled scrap	Birch bark	House floor 1
1084	Piece	Birch bark	House floor 3
4430	Rolled scrap	Birch bark	House floor 4
4202	Rolled scrap	Birch bark	House floor 4
4809	Piece	Birch bark	House floor 6
5687	Rolled scrap	Birch bark	House floor 8
6003	Rolled scrap	Birch bark	House floor 8
5569	Rolled scrap	Birch bark	House floor 8
5124	Rolled scrap	Birch bark	Upper basal midden
5404	Rolled scrap	Birch bark	Upper basal midden
5736	Rolled scrap	Birch bark	Lower basal midden
5737	Rolled scrap	Birch bark	Lower basal midden
5849	Rolled scrap	Birch bark	Lower basal midden
5919	Rolled scrap	Birch bark	Lower basal midden
5920	Rolled scrap	Birch bark	Lower basal midden
5921	Rolled scrap	Birch bark	Lower basal midden
5634	Rolled scrap	Birch bark	House floor 10
5749	Rolled scrap	Birch bark	House floor 10

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Small rolled scraps of birch bark occur frequently in house floors and midden at Karluk One. None of the collected specimens had been modified, except for a single flat scrap, which had stitching holes along one edge. Birch bark was found to be somewhat more common in earlier levels, those dating before about A.D. 1500 than in later house floors.

Kenai Birch (*Betula kenaica*) is a small to medium sized tree which grows in valleys and hillsides in the Kodiak Archipelago sufficiently sheltered from the wind. It has a bark which peels readily. Paper birch (*Betula papyrifera*) does not grow in the Archipelago, but arrives as driftwood (Russell 1991). According to Priscilla Russell, who interviewed informants in the villages of Akhiok and Old Harbor, birch bark strips are soaked and applied to infected wounds to aid in drainage and healing (1991:19).

Koniag bladder darts in the Smithsonian collection have small strips of birch bark under sinew lashing. They appear to cover scarfed joinery along the shaft. Birch bark wrapping also appears under sinew lashing which joins the bone socket piece to the shaft in harpoon arrows in the Etolin assemblage (Varjola 1990:299).

A Yupik fish seine in the Finnish National Museum's Bartram collection has tightly rolled pieces of birch bark used as floats, as well as birch bark wrapped sinkers (Varjola 1990:487). Varjola speculated that Bartram may have added the birch bark floats and sinkers at a later date. However, one birch bark-wrapped sinker was found on house floor three at Karluk One. At least some of the bark rolls found at Karluk One may have been used as floats.

Spruce Root

Kodiak Alutiiq basket makers have recently begun to harvest spruce root once again, following reintroduction of spruce root basket weaving by a

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Tlingit basket maker in a series of workshops sponsored by the Kodiak Area Native Association. Data from Karluk One indicates that spruce root baskets and cordage have been manufactured in the Archipelago since at least A.D. 1300. Both finished products and raw materials, such as the coiled roots, are in evidence. Spruce roots are dug from the forest floor, using a root pick. The roots are then roasted over a fire to remove the outer covering and they are then split to form tough flattened strands used for twined baskets and in cordage. Although only two specimens of spruce root cordage were recovered idividually, many more were found in association with vessel bottoms, where spruce root was used to agument wooden pegs in attaching the base to the bentwood rim. It was also used to hold the ends of bentwood rims together. Ulus were sometimes hafted to a wooden handle with spruce root. In the 1987 excavations, several complete ulus were found with spruce root lashings.

Table 7:40 Spruce Root Artifacts

Catalog	Artifact Type	Material	Context
1920	Basket	Spruce root	House floor 4
1927	Basket	Spruce root	House floor 4
3067	Basket	Spruce root	House floor 4
4440	Basket	Spruce root	House floor 4
3647	Cordage/coil	Spruce root	House floor 5
3143	Basket	Spruce root	House 6 roof sod
5156	Basket	Spruce root	House floor 6
5210	Cordage	Spruce root	House floor 8
6085	Basket	Spruce root	House floor 8
6483	Basket	Spruce root	Upper basal midden

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Bone

Table 7:41 Artifacts Made from Bone

Artifact Type	(n)
Worked fragments	89
Barbed harpoon points	34
Awls	23
Arrow points	13
Whale vertebral discs	13
Wedge	12
Leister/bird arrow prongs	12
Fish hook shanks	11
Fish hook barbs	7
Bird bone tubes	7
Clam knives	6
Toggles	6
Tool handles	4
Flakers	4
Spacer-bar sinkers	3
Fish lures	2
Fish harpoon foreshafts	2
Labrets	2
Plummet sinkers	2
Root picks	2
Socket pieces	2
Toggling harpoon points	2
False bear claw	1
Anthropomorphic figurine	1
Gut scraper	1
Miniature socket piece	1
Net guage	1
Stem hafted tool handle	1
Peg	1
Spatulate	1

Bone artifacts comprise a suprisingly small portion of the Karluk One assemblage. They make up 4 to 12% of the total assemblage of various levels, discounting lithic scrap. It is probable that some of the artifacts considered classified as bone are in fact manufactured antler; this may be particularly true for the two largest groups of bone artifacts, the fish harpoon valves and harpoon points. Sea-mammal bone is the most commonly used bone material, followed by bird and land mammal bone. Whale bone is difficult to

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distinguish in the smaller artifacts; that which could be identified in the bone assemblage was more common in the levels pre-dating 1400 A. D. Of the bone artifacts from each level, 33% were identifiable whalebone from house floors 9 and 10, while only from 13 to 23% in the upper housefloors. This conclusion, however, is based on a fairly small sample of bone artifacts. Better evidence for subsistence changes at Karluk One can be found in the faunal remains, and in the changes in technology.

Shell

Shell was apparently very rarely worked by prehistoric peoples in south west Alaska. The only worked piece that I have ever encountered in the past 11 seasons of fieldwork on Kodiak is the mussel shell knife found at Karluk One, which may well have been of non-local origin.

Antler

Table 7:42 Artifacts Made from Antler

Artifact Type	(n)
Fish harpoon valves	74
Worked fragments	17
Gut scrapers	7
Labrets	3
Wedge	1
False bear claw	1
Flaker	1

Antler at Karluk One is caribou antler, from the Alaska Peninsula, where even today, caribou can be seen foraging near the shoreline. Moose, now common on the Alaska Peninsula, were rare before 1900 A.D. (Dumond 1993, USDI 1980). Caribou racks are large, and could have been picked on beach ridges up by visiting kayakers, or perhaps obtained in trade. Gideon noted the role caribou products played in Native trade:

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> The northern and western inhabitants of Kad'iak engaged in barter trade mostly with the Amercans of Aliaksa [Alaska Peninsula], while the southern and eastern residents traded with those of Kenai and Chugach. The former obtained from the Alaskans, in exchange for dentalium shell beads and amber, caribou antlers used for spear tips, caribou parkas, and also long caribou hair taken from the animals chest, the latter being used by the Kadiak women to embroider various designs....They occasionally hunt caribou themselves... (1989:57).

Antler artifacts are present in all levels at Karluk One, but tend to be small in size. The material contained in the equivalent mass of a single a bull caribou rack would be sufficient to produce the entire antler assemblage from the site.

Baleen

Baleen was encountered most often in the pre-A.D. 1400 levels at Karluk One, where large sheets were found lining storage boxes. Smaller fragments were recovered from the later housefloors. Baleen lashing can also be seen on several of bentwood vessel bottoms and sides, and on composite ulu handles. Baleen basketry was found associated with house floor 9B at Karluk One, and a sample was found ereoding from Kachemak levels at Kar-31, on the opposite shore of Karluk Lagoon.

Table 7:43 Baleen Artifacts and Scraps

Catalog	Artifact Type	Material	Context
4721	Sample	Baleen	House 1 wall sod
4459	Cordage	Baleen	House floor 4
5467	Sample	Baleen	House floor 6
5999	Piece	Baleen	House floor 8
5259	Sample	Baleen	House floor 9B
5266	Basket fragment	Baleen	House floor 9B
5858	Sample	Baleen	House floor 10
5865	Piece	Baleen	House floor 10

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Ivory and Fossil Ivory

The classifications 'ivory' and 'fossil ivory' were arrived at somewhat subjectively in that those pieces that had been stained dark brown were classified as fossil ivory. Judging from the ivory recovered from sites on St. Lawrence Island, and other ivory rich areas, is uncertain whether such staining can be incurred by burial in a midden composed of richly black oily, organic soils. Only one piece, a box lid, is of sufficient size, to be certain that it was in fact made from a mammoth tusk; any of the other ivory pieces in the assemblage could have been made from walrus or whale teeth. The unstained ivory labrets from house floors one and two were carved from walrus molars. In any case, the extreme rarity of walrus in the waters south of the Alaska peninsula, would suggest that ivory and fossil ivory may be included among items obtained through long distance trade. Much of the ivory at Karluk One appears to have arrived on site in finished form; no unfinished pieces were found on the site. A hammerhead, and a fish lure may have orginated in the Bering Sea area. Several ivory artifacts are also atypical of Koniag material in that tiny drilled holes are employed in decorative rows, as in the game piece from house floor six, or as eyes, in the anthropomorphic face on the ivory toggle from house floor 7.

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Table 7:44 Ivory and Fossil Ivory Artifacts from Karluk One

Catalog	Artifact Type	Material	Context
3375	Labret	Ivory	House floor 1
4316	Labret	Ivory	House floor 1
1561	Labret	Fossil Ivory	House floor 1
2179	Worked fragment	Fossil Ivory	House floor 1
4372	Labret	Ivory	House floor 2
6881	Labret	Ivory	House floor 2
2344	Labret	Fossil Ivory	House floor 3
3055	Hammer head	Fossil Ivory	House floor 3
3982	Finger rest	Fossil Ivory	House floor 3
1631	Object	Fossil Ivory	House floor 4
3163	GamePiece	Fossil Ivory	House floor 6
3413	GamePiece	Ivory	House floor 6
1227	Fish Lure	Fossil Ivory	House 7 roof sod
4910	Toggle, maskette	Fossil Ivory	House floor 7
6427	Box lid	Fossil Ivory	House floor 8
6151	Worked tusk tip	Ivory	House floor 10

Lithics

Although the lithic artifacts listed in table are probably in correct order as far as the relative abundance of different lithic raw materials in the Karluk One assemblage, it should be noted that some lithics tended to be collected by excavators whenever they were encountered, and others were only sampled. Relatively 'exotic' lithcs; such as chalcedony, jet, chert, quartz crystals, and limestone were always collected, even when only represented by fragments. To some extent, I think that silicified slate also tended to find its way into lithic bags; because the bright green color of most of the silicified slate was easy to spot, and was considered of cultural origin. Slate scrap was occasionally collected, but I think that because of its color and abundance in the midden, was discarded more frequently. This was even more true for the other common lithics; graywacke and granite tended to be collected only when found as a whole artifact, such as a notched cobble, or a hammerstone. Flakes and chipping waste of graywacke and granite are hard to distinguish from spalled fire-cracked rock, and are seldom found in archaeological

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assemblages, even though this material is very abundant in Koniag middens. The less frequently encountered lithics are therefore somewhat over represented in terms of their total contribution to the overall Koniag lithic assemblage.

I am uncertain exactly where the residents of Karluk One obtained their slate; the steep cliffs in the Karluk area are highly metamorphosed and poorly consodiated felsic and mafic rock; the nearest geological deposits of marine sedimentary rock is in Uyak Bay, about 20 Km northeast of Karluk Lagoon (Capps 1937, Moore 1967). Slate is abundant in the marine sedimentary rock that makes up the bulk of the large islands of the archipelago. Silicates in the slate can make it brittle, hard to grind, and incapable of holding a straight edge. Slate with excessive amounts of silicate can be quickly be recognized by its sheen and pebbly surface. Bedding planes present in various slate deposits can also make it difficult to manufacture into tools; slate that tends to fracture into layers less than .5 cm thick is usually unsatisfactory. The best slate is dull colored, like a slate tablet, and can be found in evenly bedded layers at least .5 thick. In the slate outcrops near Larsen Bay, good working slate can be found in triangular preforms, shaped by the forces of frost and water. Elders recall places where whalers went to find slate to be ground into the long lance tips used in the hunt. Some slate cobbles can be seen in the glacial till spilling down the banks surrounding Karluk Lagoon; slate pebbles from this source may have been utilized to make the incised pebbles common in the early house floor levels.

Graywacke and granite cobbles cover the bed of the Karluk river, Karluk lagoon, the spit, and the pocket beaches nestled between the steep cliffs that face the Shelikhov Strait. Both were used in easily manufactured utilitarian items; granite cobbles were used as a hammerstones, an

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occasionally as grooved cobbles. Small, largely unmodified spherical rocks of granite, formed by the high energy surf along the bases of the cliff faces south of Karluk Lagoon, were used as gaming balls. In one case, a sliver of granite was ground on one end to form a carving tool bit. Graywacke was the favored material for split cobble tools; despite the name of these artifacts, which I have kept because of its use in the literature, split cobble tools were actually made from a large flake struck from a beach cobble. This produces a rough but fairly sharp edge. At Karluk One, graywacke pebbles were notched to make sinkers; on sites adjacent to beaches made of slate shingles, slate is used.

Table 7:45 Lithic Materials and Relative Numbers of Artifacts Excluding Slate Scrap

Material	Artifacts (n)
Slate	551
Graywacke	469
Granite	298
Silicified slate	223
Chert	89
Chalcedony	59
Basalt	35
Quartz	19
Jet	13
Limestone	10

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Table 7:46 Artifacts Made from Slate

Artifact Type	(n)
Scrap	391
Ground fragments	273
Ulu blade fragments	132
Incised pebbles	129
Ulu blades	74
Stemmed projectile points	37
Endblades	36
Point preforms	28
Slate rods	25
Lance points w/medial ridge	20
Double edged knife blades	13
Endblade preforms	10
Knife blades	8
Whaling lances	4
Carving tool bit	4
Miniature ulu blade	3
Miniature projectile point	2
Burnishing stones	4
Flensing knife	1
Awl	1

Table 7:47 Artifacts Made from Graywacke

Artifact Type	(n)
Split cobble tools	262
Notched pebble sinkers	89
Balls	39
Scrap	26
Burnishing stones	17
Crude bifaces	6
U-shaped scraper	3
Retouched flake	3
Large battered cobbles	2
Bark wrapped stone	1

Table 7:48 Artifacts Made from Granite

Artifact Type	(n)
Balls	264
Hammertones	22
Grooved cobbles	8
Carving tool bit	1

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Table 7:49 Artifacts Made from Basalt

Artifact Type	(n)
Hammerstones	25
Bal!s	4
Small oil lamps	2
Large battered cobbles	2
Mauls	2
Crude biface	1
Burnishing stone	1
Grooved splitting adze	1

Table 7:50 Artifacts Made from Silicified Slate

Artifact Type	(n)
Adze chip	108
Flakes	87
Planing adze blades	57
Adze blade fragments	40
Burnishing stones	27
Adze blade preforms	24
Debitage	22
Retouched flakes	16
Splitting adzes	12
Endblades	8
Carving tool bits	7
Knife blades	7
Grooved splitting adzes	4
Splitting adze fragments	4
Ulu blade fragments	3
Hammerstones	2
Chipped projectile points	2
Ulu blade	1

Lithic materials such as basalt, chalcedony, and pumice, were obtained from the shoreline of the Alaska Peninsula, located some thirty miles across the Shelikhov Strait. These lithics are abundant there, and need only be picked up. Accordingly they were used in utilitarian items; hammerstones, abraders and the like. It is uncertain why chalcedony debitage was encountered at Karluk One, and in other late Koniag middens through out the archipelago (Clark: 1974:85). To date, no finished pieces or preforms made

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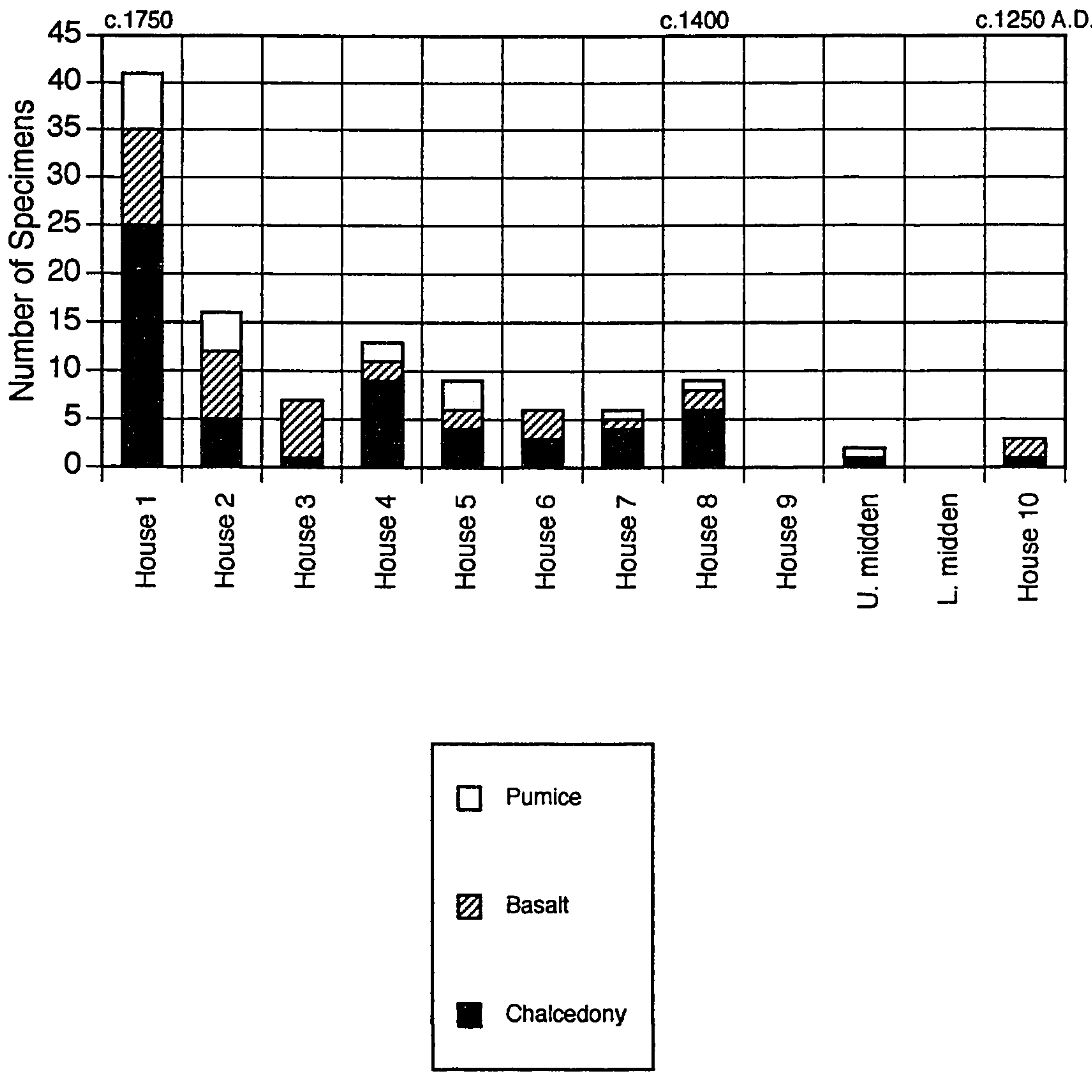
Chart 19: Lithics From the Alaska Peninsula: Chalcedony, Basalt, and Pumice at Karluk One



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from chalecdony have been found in a Koniag context, although small, chipped chalcedony points have been found in early Ocean Bay sites at Rice Ridge and during the 1993 excavations at Nuniliak. I have seen veins of chalcedony in the volcanic outcrops in Geographic Harbor, on the Katmai coast, which was loose enough to provide a ready supply of chalcedony several centimeters thick. The frequency of basalt, chalcedony, and pumice steadily increases at Karluk One in the years after A.D. 1400 (Chart 19).

Worked Jet Fragments

Lithics obtained through longer distance trade, such as jet and limestone, are similar to ivory, in that they are associated with status related items; such as labrets and beads. Amy Steffian's recent study (Steffian 1993) of archaeologically recovered coal indicates several possible points of origin. Labrets were found in late Kachemak contexts at the Uyak site in finished form, as well as preforms and blanks of unworked jet; suggesting more access to jet supplies through trade in the Kachemak phase. Jet labrets and beads were found in finished form at Karluk one and are described in Chapter 10; six ground jet fragments are probably fractured remains of labrets, or possible by products of manufacture.

Table 7:51 Worked Jet Fragments

Catalog	Artifact Type	Material	Context
1829	Ground fragment	Jet	House 1 roof sod
5883	Ground fragment	Jet	House 8 roof sod
749	Ground fragment	Jet	House floor 1
750	Ground fragment	Jet	House floor 1
3719	Ground fragment	Jet	House floor 6
2531	Ground fragment	Jet	House floor 7

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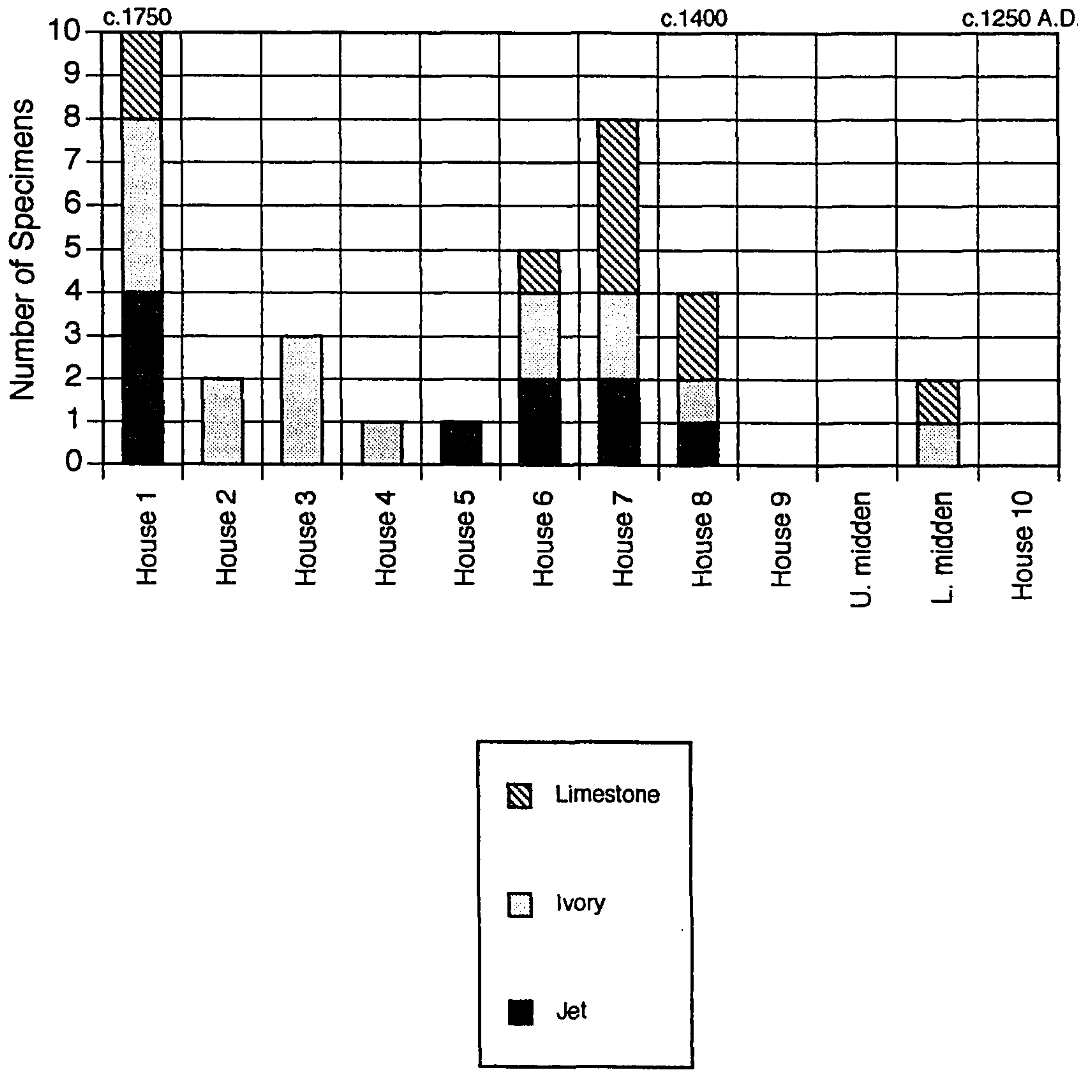
Chart 20: Materials Obtained Through Long-Distance Trade: Limestone, Ivory, and Jet artifacts at Karluk One.



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Limestone Objects

The white limestone, perhaps more accurately termed calcinite, originates in the Aleutian Islands. In Aleutian middens, this material is frequently used in labrets. The limestone labrets, beads, and some unidentified ground objects resemble Aleutian forms, and probably originated there. A tabular piece of flat limestone has been ground on all surfaces, and is sub-rectangular in shape and has been broken on one end. It is 4.4 cm wide, 5.5 cm long, and .5 cm thick. Another piece of limestone is haped like a flattened rifle bullet, this piece is 4.2 cm long, and has three encircling grooves near the tip. It also has a short stem. It is sub-rectangular in cross-section. Five limestone labrets and a bead found on the site are described in Chapter 10.

At Nuniliak, even more limestone was found than at Karluk One; including some fist sized unworked blocks. This is remarkable because the Nunuliak site is even more distant from the Aleutians, located some 70 north east of Karluk.

Table 7:52 Limestone Artifacts from Karluk One

Catalog	Artifact Type	Material	Context
4090	Piece	Limestone	House floor 1
5779	Object	Limestone	House 8 roof sod
6407	Piece	Limestone	House floor 8
6671	Piece	Limestone	Lower basal midden

Longer distance materials; jet, limestone, and ivory are were found in varying amounts in Karluk One house floors. It is interesting to note that there is a significant correllation of long-distance materials with the frequency of slate end blades used by the Koniag to tip war arrows (Chart 36). The labrets made from jet, limestone, and ivory do not resemble the wooden labret styles, and are therefore probably non-Koniag forms. They may have arrived as part

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of the spoils of war, as trophies, or perhaps even worn by war captives who were brought back to live out their lives as slaves in Koniag households.

Quartz Crystals

Table 7:53 Quartz Crystals

Catalog	Artifact Type	Material	Context
2663	Quartz crystal	Quartz	House floor 1
688	Quartz crystal	Quartz	House floor 1
2973	Quartz crystal	Quartz	House floor 1
4321	Quartz crystal	Quartz	House floor 1
4298	Quartz crystal	Quartz	House floor 1
2564	Quartz crystal	Quartz	House floor 2
3069	Quartz crystal	Quartz	House floor 4
4486	Quartz crystal	Quartz	House floor 5
3161	Quartz crystal	Quartz	House floor 6
5456	Quartz crystal	Quartz	House floor 6
4519	Quartz crystal	Quartz	House floor 7
4914	Quartz crystal	Quartz	House floor 7

Seven small crystals of clear quartz were found at Karluk One. As Clark noted, they are found in late prehistoric contexts in the Kodiak archipelago (1974:95). They are of uncertain geological origin; may may be coming from somewhere on the Alaska Peninsula. Cyrstals have been found in other sites on coastal Alaska; including Alaska Peninsula, St. Lawrence Island, and the Kobuk River (Clark 1974, Davis 1954, Collins 1937, Giddings 1952). The crystals found at Karluk One lack use-wear and may have been curated as charms. A shamans rattle collected by Fisher at Ugashik in 1885 was found to contain a quartz crystal (Crowell 1992:29). The crystals tend to be small in size, ranging from 0.8 to 3.9 cm in length.

Metallic Ore

A chunk of silvery metallic ore 2 cm in diameter may represent the source for the silvery glitter inclusions sometimes observed in the painted surfaces of some wood specimens. It was found on house floor 7.

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Iron Pyrite

Table 7:54 Iron Pyrite

Catalog	Artifact Type	Material	Context
1554	Piece	Iron pyrite	House floor 1
1558	Chunk	Iron pyrite	House floor 1
376	Piece	Iron pyrite	Profile 1 ; 112 cm bd
1602	Chunk	Iron pyrite	House floor 3
2420	Chunk	Iron pyrite	House floor 4
2506	Chunk	Iron pyrite	House floor 6
869	Piece	Iron pyrite	House 6 wall sod

Seven gold-colored iron pyrite crystals up to 2.3 cm in diameter were found, some possibly fractured by battering. Their function is uncertain. Like the quartz crystals, the iron pyrite fragments all came from late Koniag levels of the site.

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Chapter 8: Gaming Pieces and Toys

Gaming (*Cuumi Wamqutallrit*)

Artifacts associated with gaming and gambling are well represented in the Karluk One collection, reflecting the role of games had as a favorite social, recreational, and redistributive activity in Koniag society. Davydov (1977: 182) noted the high levels of exchange involved in Koniag gambling during the contact period:

> In their games of chance the Koniagas will gamble away all they have, though it must be said to their credit that they are extremely honest about this and never argue, though the game might provide many excuses for this; and it also happens that if someone wins a lot of a certain commodity from a man he will give away his own in return.

Well into the 20th century, gaming wagers could be quite high. Elders recall games where wagers included clothing, firearms, skiffs, and even women. According to Alutiiq elders from Nanwalek, a village on the Kenai Peninsula:

> People got together in one person's house and played a game--by betting or donating things like clothes and boats--and play that way. It was just like gambling. Whoever won a certain game, he got all the things they betted on. (Sergius Moonin and Juanita Melsheimer 1981:50)

There are several elderly couples in Kodiak villages that were brought together when the man won his wife in a gambling games that predate World War II. In 1994, traditional games, such as *uksgaaq*, are played during Lent. Stakes tend to be a few dollars. Many Alutiiq still gamble heavily, but through newer games like bingo and pull-tabs.

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Some games, like *kakangaq* , a throwing game, are described in ethnohistorical accounts (Davydov 1977, Merck 1980). Moreover, games were frequently shared by neighboring North Pacific societies. As such, the ethnographic literature offers some useful analogs to Koniag games. In the absence of a traditional ethnography from the Kodiak Archipelago, we are fortunate that many games survive in the living memory of Native peoples. Other games, such as *Uksgaaq* , remain part of the seasonal rhythm of village life on Kodiak Island.

Artifacts classified as gaming pieces include balls, gaming discs, tally sticks, incised pebbles, *uksgaaq* darts, and dice pieces. Evidence of gaming is less common in Karluk One housefloors dating between A.D. 1400 and about 1700 (Chart 22), probably reflecting a general downturn in the Koniag economy during those years. The lessening numbers of game pieces are associated with similar trends in labrets, and long distance trade items. By the eighteenth century, however, sea-mammal hunting had improved, fishing no longer dominates the Karluk One subsistence economy, and the number of gaming pieces and status related artifacts rises to near pre-A.D. 1400 levels.

With the exception of ivory dice pieces, the objects used as gaming pieces at Karluk One were quickly made of locally abundant material, and probably quickly discarded. Gaming pieces were almost always recovered from site housefloors in whole condition. In the process of abandonment of a house, gaming pieces seem to be very likely to be ignored. This is supported by both archaeological and contemporary ethnological observations on Kodiak Island. When we began excavation at Karluk in 1983, recently abandoned houses surrounded Karluk One. Most residents had moved to government housing at the newly constructed village in 1980. Many of these

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houses were littered with forgotten objects; children's toys, monopoly money, playing cards, and bingo chips.

Gaming Balls

Stone spheres are common in both Kachemak and Koniag sites on Kodiak (Clark 1974:130; Heizer 1956). Hrdliçka and Clark concurred that they were probably used as gaming balls. De Laguna found three stone balls in the course of her excavations on Yukon Island, in Kachemak Bay (1975:104). She also thought that they were gaming balls, based on observations made by Jochelson on Umnak Island, where he recorded a similar game known to the Aleuts as *a'gix* (de Laguna 1975, Jochelson 1925). Oral histories provide further evidence of stone ball gaming pieces. They were used in a game called *yaamak*, translated as 'rock', as recalled by elder residents of Karluk and Old Harbor. This game was last played in the village of Karluk in the first decades of the twentieth century however, the rules are not remembered; (Larry Matfay, personal communication 1988).

Bobby Stamp, a Chugach elder from Chenega in Prince William Sound, also recalled a game that used round rocks. Each player had two rocks which were thrown at a seal scapula or a particular sea lion bone. The closest rock counted as one point, and if the bone was struck, it counted as two points. If one players rock was struck by one thrown by his opponent, his rock's score was discounted. Scoring was kept with 12 sticks. As late as the 1940's kayaks could be won and lost in this game (Bobby Stamp 1988). Round rocks were also used in a game in Nanwalek, where they were thrown at a post (Moonin and Mesheimer 1981:50).

Although stone spheres dominate the Karluk One collection, specimens made from clay, bark, and wood were also recovered. Most of the

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stone spheres seem to be naturally round, although a few show signs of grinding (Plate 125: J-O). At least seven of a dark gray rock appear to have been polished (Plate 125: K, L). The vast majority are granite, probably obtained from the beach in front of the site. A single red chert ball, and several of limestone, graywacke, and basalt balls are also present. The stone spheres range from 1.6 to 6.2 cm in diameter. Seven are fire scarred, but no concentrations were noted by the hearth areas. A single cluster was found in association with a sub-floor drainage ditch under housefloor five.

Clay Balls

Eleven clay balls were found in late Koniag levels at Karluk One, made of locally available white clay (Plate 125: F-I). They appear to have been dried rather than fired and lack inclusions that would indicate tempering material. The clay spheres range from 1.9 to 4.2 cm in diameter. They may have been used for the same purpose as stone and bark balls. Clay balls have also been found in late Koniag contexts at Malina Creek, and in Kachemak houses at the Uyak site (Steffian 1994).

Table 8:1 Clay Balls

Catalog	Artifact Type	Material	Context
4664	Ball	Clay	House 1 roof sod
4769	Ball	Clay	House floor 1
1242	Ball	Clay	House floor 1
4683	Ball	Clay	House floor 1
2956	Ball	Clay	House 2 roof sod
1590	Ball	Clay	House floor 2
2886	Ball	Clay	House floor 2
1507	Ball	Clay	House floor 2
1732	Ball	Clay	House floor 2
4852	Ball	Clay	House floor 5
2514	Ball	Clay	House floor 6

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Chart 21: Gaming Balls; Changes in Numbers and Materials after 1400 A.D. at Karluk One

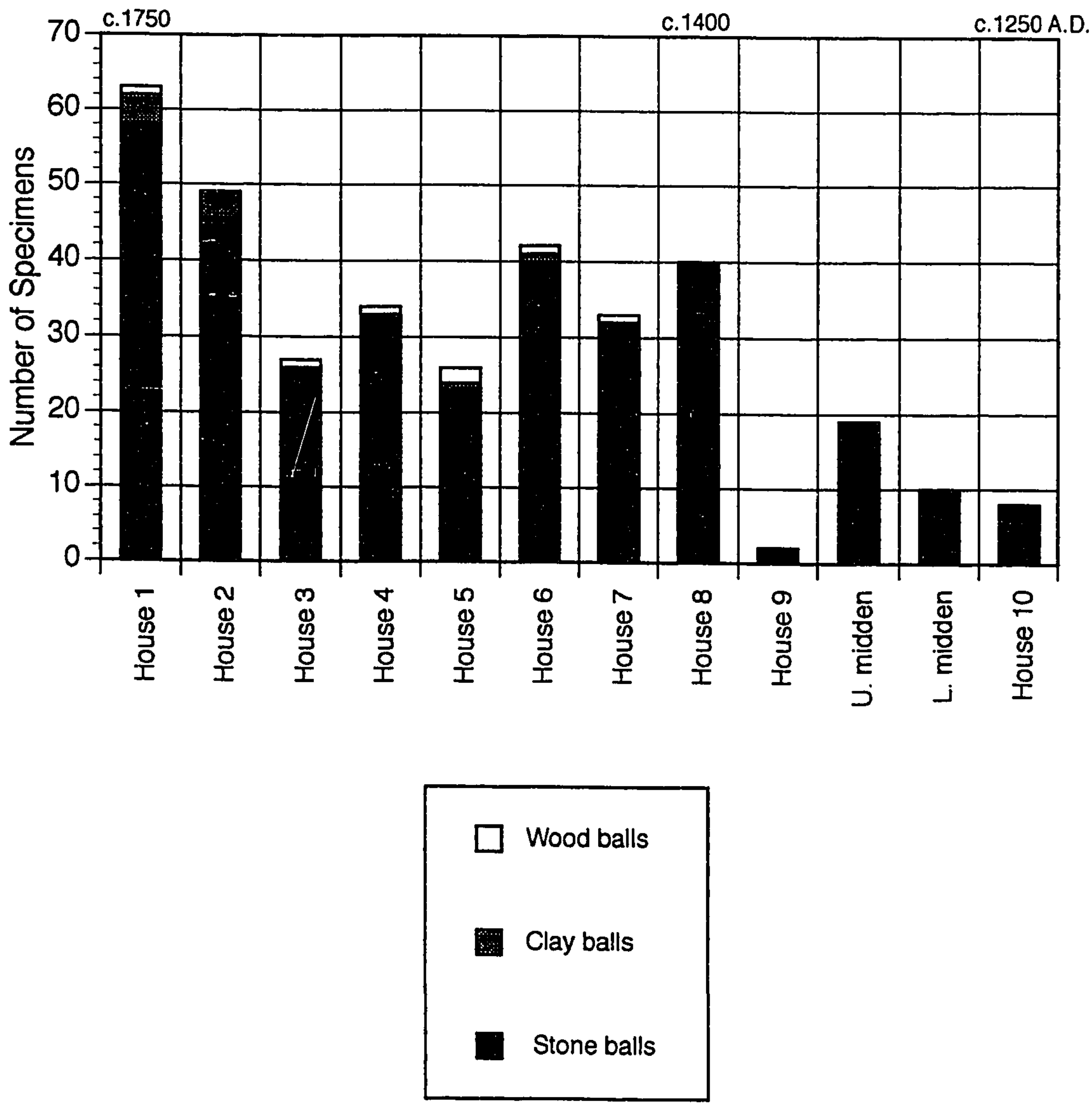

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Plate 125

Gaming balls

Object	Description	Catalog #
A	Ball, cottonwood bark	193/3178
B	Ball, cottonwood bark	193/2867
C	Ball, cottonwood bark	193/3032
D	Ball, wood	193/
E	Ball, wood	193/
F	Ball, unfired white clay	193/
G	Ball, unfired white clay	193/
H	Ball, unfired white clay	193/2956
I	Ball, unfired white clay	193/
J	Ball, unknown lithic	193/3890
K	Ball, silicified slate	193/5361
L	Ball, silicified slate	193/784
M	Ball, unknown lithic	193/6282
N	Ball, granite	193/3857
O	Ball, basalt	193/1971

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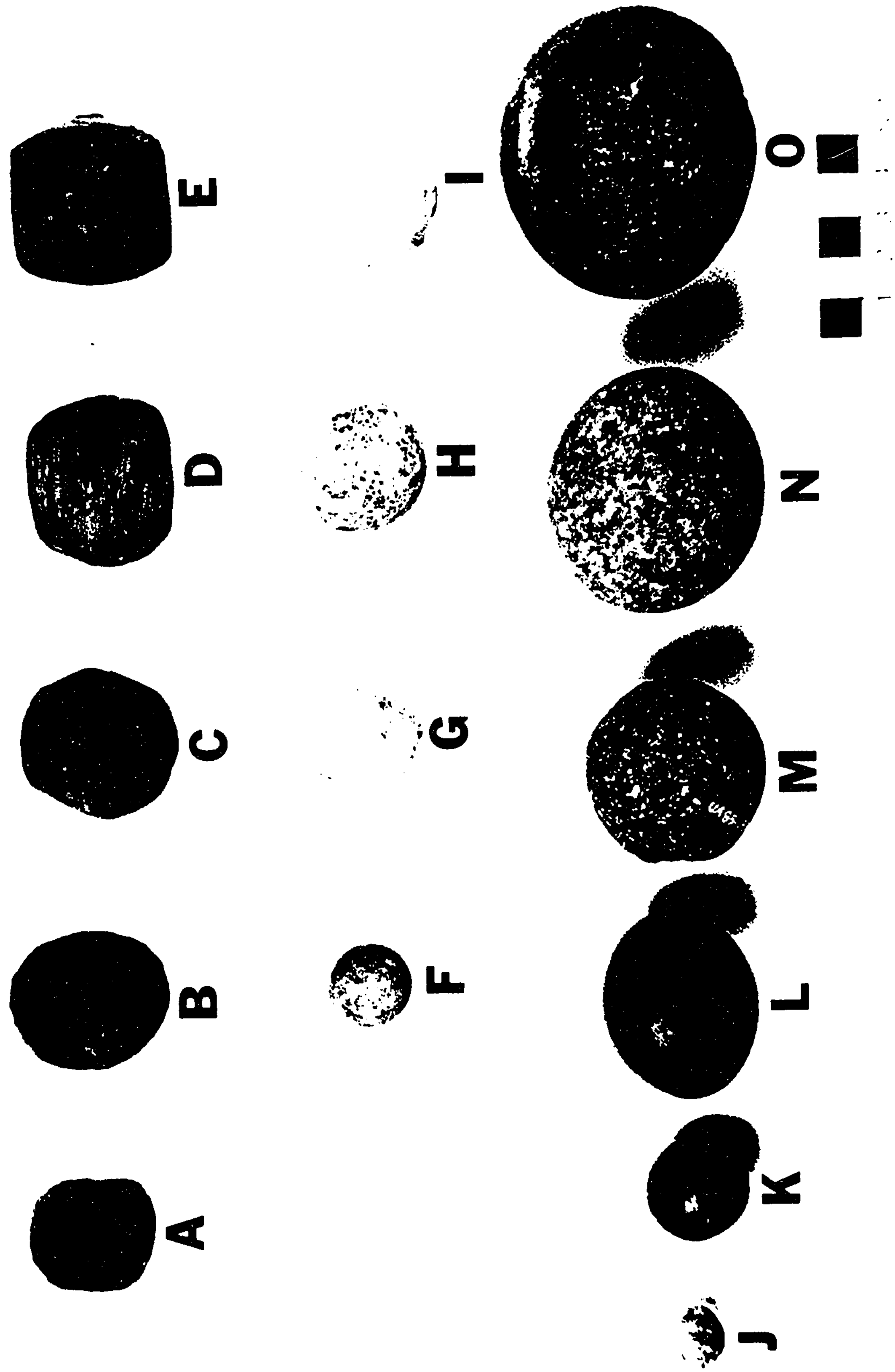

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Wood and Bark Balls

Table 8:2 Wood and Cottonwood Bark Balls

Catalog	Artifact Type	Material	Context
736	Ball	Wood	House floor 1
3032	Ball	Cottonwood bark	House floor 3
3075	Ball	Wood	House 4 wall sod
2794	Ball	Cottonwood bark	House floor 5
4225	Ball	Wood	House floor 5
3178	Ball	Cottonwood bark	House 6 wall sod
2867	Ball	Cottonwood bark	House floor 7

Four gaming balls are carved from cottonwood bark and range from 3.1 to 3.6 cm in diameter (Plate 125: A-C). Three balls are carved of wood, and are more cylindrical than spherical (Plate 125: D-E). They possibly served the same function as the balls made from other materials, although this is tentative.

Gaming (*kakangaq*) Discs

The game *kakangaq* appears in the archaeological record beginning in the 15th century, and continued to be played well into the nineteenth century, when it was recorded in the ethnohistoric literature (Davydov 1977; Holmberg 1985; Lisianski 1814; Merck 1980):

> The Koniags are passionate gamblers, and often lose all their belongings in a game they call kaganahk. It is played as follows: They place two tanned seal skins four to five yards apart on the ground and place on each a flat bone, approximately the size of a silver ruble, whose edges are marked with four black dots. The players, not exceeding four, but usually only two, divide into two groups, and bet different articles. Every player has five evenly large, round, wooden discs which he throws from the end of one pelt towards the bony plate on the other pelt, trying to cover the plate. If there are only two players, they both throw at the same time, but if there are four, one group plays before the other. After all the discs, which are marked with their owners' signs, have been thrown, the players check to see how they have landed. If one of the plates covers the pieces of bone, its owner

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> receives, from each other player, three sticks of bone, or tokens, which each player received in equal numbers at the start of the game. If the plate covers only one of the black dots, it wins two tokens; of the other plates only one, lying nearest, receives one token. Then the second group of players plays, and when, after several exchanges, one group has lost all its tokens it loses the articles gambled. (Holmberg 1985:52, [orig. 1861-63]).

A similar disc throwing game, called *kakan* was played by the Aleuts, and was recorded by Ivan Veniaminov in the nineteenth century (1984: 313). Two gaming discs were apparently recovered by Hrdliçka at the Uyak site; one of cottonwood bark and another of wood. Heizer identifies one of these pieces as a 'fat scraper' (1956: 29). I have seen one wooden gaming disc, identical to Karluk One specimens, collected from a historic barabara pit in Old Harbor by a private collector. Fisher collected a set of 11 ivory discs from Woody Island in the late nineteenth century and sent them to the Smithsonian as an example of 'a Native game of pitch' (Crowell 1988: Smithsonian record 207). He recorded the game as "Ka-gang-shak", probably from the Alutiiq *kakangaq* , which translates as 'target'. The 'target' piece, at which the discs were thrown is a lenticular disc of ivory with one concentric ring on its surface, and a hole through its center. An artifact fitting this description was found by Clark at Rolling Bay (1974:270, Plate 50:S). Among the Alutiiq speaking villages of the Kenai Peninsula, gaming discs carved from alder were used in a tossing game called *qamkaq* , with the target placed on a slanted piece of sod (Moonin and Melsheimer 1981:51).

The 116 gaming discs recovered in archaeological contexts at Karluk One are plano-convex in cross-section, (Plate 126, 107) round, ovate, or sub-rectangular in shape, and made from wood or cottonwood bark. Two gaming discs found on the sites's erosion face are made of whalebone. The top surface of these discs frequently has a round flat area, which sometimes

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Gaming Discs: Data Summary

Catalog	Artifact	Material	Context
674	Gaming disc	Wood	House 1 roof sod
3919	Gaming disc	Wood	House 1 roof sod
4120	Gaming disc	Wood	House 1 roof sod
4131	Gaming disc	Wood	House 1 roof sod
4734	Gaming disc	Wood	House 1 wall sod
725	Gaming disc	Wood	House floor 1
1305	Gaming disc	Wood	House floor 1
1849	Gaming disc	Wood	House floor 1
1868	Gaming disc	Wood	House floor 1
2115	Gaming disc	Wood	House floor 1
2664	Gaming disc	Wood	House floor 1
2677	Gaming disc	CWBark	House floor 1
2940	Gaming disc	Wood	House floor 1
3308	Gaming disc	Wood	House floor 1
3309	Gaming disc	Wood	House floor 1
3315	Gaming disc	Wood	House floor 1
3323	Gaming disc	CWBark	House floor 1
3324	Gaming disc	Wood	House floor 1
3538	Gaming disc	Wood	House floor 1
4327	Gaming disc	Wood	House floor 1
4334	Gaming disc	Wood	House floor 1
4728	Gaming disc	CWBark	House floor 1
4736	Gaming disc	Wood	House floor 1
4737	Gaming disc	Wood	House floor 1
4739	Gaming disc	Wood	House floor 1
2668	Gaming disc	Wood	House 2 roof sod
2676	Gaming disc	Wood	House 2 roof sod
2680	Gaming disc	Wood	House 2 roof sod
2708	Gaming disc	CWBark	House 2 wall sod
3328	Gaming disc	Wood	House 2 wall sod
3364	Gaming disc	CWBark	House 2 wall sod
3929	Gaming disc	CWBark	House 2 wall sod
787	Gaming disc	Wood	House floor 2
1014	Gaming disc	Wood	House floor 2
1378	Gaming disc	CWBark	House floor 2
1382	Gaming disc	Wood	House floor 2
1574	Gaming disc	Wood	House floor 2
1575	Gaming disc	Wood	House floor 2
1576	Gaming disc	Wood	House floor 2
1583	Gaming disc	CWBark	House floor 2
2685	Gaming disc	Wood	House floor 2
2689	Gaming disc	Wood	House floor 2
2699	Gaming disc	Wood	House floor 2
2715	Gaming disc	CWBark	House floor 2
3523	Gaming disc	CWBark	House floor 2
3524	Gaming disc	CWBark	House floor 2
3526	Gaming disc	CWBark	House floor 2
3527	Gaming disc	Wood	House floor 2
3531	Gaming disc	Wood	House floor 2
3941	Gaming disc	CWBark	House floor 2
4360	Gaming disc	Wood	House floor 2
4367	Gaming disc	Wood	House floor 2

Catalog	Artifact	Material	Context
1416	Gaming disc	CWBark	House 3 wall sod
2591	Gaming disc	CWBark	House 3 wall sod
4397	Gaming disc	CWBark	House 3 wall sod
4399	Gaming disc	Wood	House 3 wall sod
1407	Gaming disc	Wood	House floor 3
1597	Gaming disc	CWBark	House floor 3
1917	Gaming disc	CWBark	House floor 3
2342	Gaming disc	Wood	House floor 3
2755	Gaming disc	CWBark	House floor 3
2763	Gaming disc	Wood	House floor 3
3048	Gaming disc	Wood	House floor 3
3562	Gaming disc	CWBark	House floor 3
3968	Gaming disc	CWBark	House floor 3
3993	Gaming disc	Wood	House floor 3
3999	Gaming disc	Wood	House floor 3
4000	Gaming disc	Wood	House floor 3
4406	Gaming disc	Wood	House floor 3
4193	Gaming disc	Wood	House 4 roof sod
4194	Gaming disc	Wood	House 4 roof sod
4195	Gaming disc	Wood	House 4 roof sod
3073	Gaming disc	CWBark	House 4 wall sod
828	Gaming disc	Wood	House floor 4
1441	Gaming disc	Wood	House floor 4
1443	Gaming disc	Wood	House floor 4
2766	Gaming disc	CWBark	House floor 4
2780	Gaming disc	Wood	House floor 4
3083	Gaming disc	Wood	House floor 4
3097	Gaming disc	CWBark	House 5 roof sod
4779	Gaming disc	CWBark	House 5 wall sod
856	Gaming disc	CWBark	House floor 5
3678	Gaming disc	CWBark	House floor 5
3688	Gaming disc	Wood	House floor 5
4227	Gaming disc	Wood	House floor 5
4469	Gaming disc	CWBark	House floor 5
4470	Gaming disc	Wood	House floor 5
4636	Gaming disc	Wood	House floor 5
876	Gaming disc	Wood	House 6 roof sod
1465	Gaming disc	CWBark	House 6 wall sod
2492	Gaming disc	CWBark	House floor 6
2497	Gaming disc	Wood	House floor 6
2817	Gaming disc	Wood	House floor 6
3745	Gaming disc	CWBark	House floor 6
4033	Gaming disc	CWBark	House floor 6
4788	Gaming disc	Wood	House floor 6
5448	Gaming disc	CWBark	House floor 6
4497	Gaming disc	Wood	House 7 roof sod
2854	Gaming disc	Wood	House floor 7
2855	Gaming disc	Wood	House floor 7
4506	Gaming disc	Wood	House floor 7
5711	Gaming disc	CWBark	U. b. midden
6080	Gaming disc	CWBark	U. b. midden

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features a carved marking. Eight wooden discs and ten bark discs are marked on their dorsal surface with a simple carved cross, crescent, round dot, or notch. Two of the wooden specimens retain traces of red surface painting. The gaming discs found at Karluk One occur in a continuum of sizes, ranging from 2.8 cm to 23.1 cm in diameter and from 0.7 to 4.1 cm thick.

Gaming Disc Variants

Two types of variants occur in the gaming disc assemblage; discs with a single pebble inlay, and discs that have been split, hollowed out inside, then pegged back together. A unique specimen of a composite half of a disc, 5.7 cm long, has a hollowed center, and has carefully placed, nearly invisible pegging which held the two halves together when in use (Plate 127: X). A second wood disc, 6.9 cm in diameter, is incomplete, but was also carefully hollowed from the inside (Plate 127: Y). When a pebble was placed inside, hollowed gaming discs may have represented the Koniag equivalent of loaded dice. Placing a pebble inside may have also been a way of simply adding weight to the disc. Alternatively, the space could have accommodated a charm or some type of good luck piece.

Two bark discs, and one wood disc, ranging from 5.5 to 8.3 cm in diameter, have countersunk holes in their center into which a graywacke pebble has been inserted, (Plate 127: S, Z). Two other cottonwood bark and wooden, discs have shallow countersunk holes, but no longer retain a pebble inserts.

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Table 8:4 Gaming Disc Variants

Catalog	Artifact Type	Material	Context
1856	Gaming disc w/insert	CWBark/stone	House floor 1
768	Gaming disc w/insert	CWBark/stone	House floor 2
2692	Gaming disc;hollowed	Wood	House floor 2
4810	Gaming disc w/insert	Wood	House floor 6
2049	Gaming disc; hollowed	Wood	House floor 7
6853	Gaming disc w/insert	Wood	surface/erosion face
6854	Gaming disc w/insert	CWBark/stone	surface/erosion face

Tally Sticks

One hundred and eighty tally sticks were found at Karluk One. These sticks are similar in form to those used in gaming by the Tlingit, Chilkat, and other Northwest Coast groups (Culin 1907). A variety of different games utilized small sticks as tallys or as game pieces. Davydov's description of *kakangaq* mentioned the use of tally sticks:

> The players, or both teams, have an equal number of small sticks which are used as counters. The number of these varies between 21 and 26 depending on how hot or cold the players are. (1977:182).

At Karluk One, however, identifiable tally sticks are closely associated in both vertical and horizontal provenience with incised pebbles (Chart 24), which sheds some light on the function of the otherwise enigmatic incised pebbles. Simple whittled sticks are abundant in late Karluk One housefloors and may have been as a simple form of tally stick used in playing *kakangaq.* Finely carved tally sticks were recovered in large quantities in lower levels at Karluk One. These artifacts are remarkably similar to each other in material, size, and shape (Plate 126: A-K). They are cylindrical and measure from 4. to 6.8 cm in length, and 0.3 to 0.7 cm in diameter. They are well-carved, carefully smoothed, and manufactured from a dense wood, probably Pacific

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Plate 126

Gaming pieces

Object	Description	Catalog #
A	Tally sticks, Pacfic yew	various
B	'Stopka' dice game piece, fossil ivory	193/3163
C	'Stopka' dice game piece, walrus tooth	193/3413
D	Miniature gaming disc, wood	193/2668
E	Miniature gaming disc, wood	193/2115
F	Gaming disc, cottonwood bark	193/2715
G	Gaming disc, cottonwood bark	193/5448
H	Gaming disc, cottonwood bark	193/3523
I	Gaming disc with pebble insert, cottonwood bark, graywacke	193/6844
J	Gaming disc, wood	193/4497
K	Gaming disc, cottonwood bark	193/2591
L	Gaming disc, wood w/ red paint	193/6688
M	Gaming disc, wood	193/3309
N	Gaming disc, composite half of hollowed form, wood	193/2692
O	Gaming disc, hollowed, wood	193/6853
P	Gaming disc with pebble insert, cottonwood bark, graywacke	193/1856
Q	Gaming disc, cottonwood bark	193/6080
R	Gaming disc, wood	193/4739
S	Gaming disc, wood	193/1576
T	Gaming disc, wood	193/3324
U	Gaming disc, wood	193/4737

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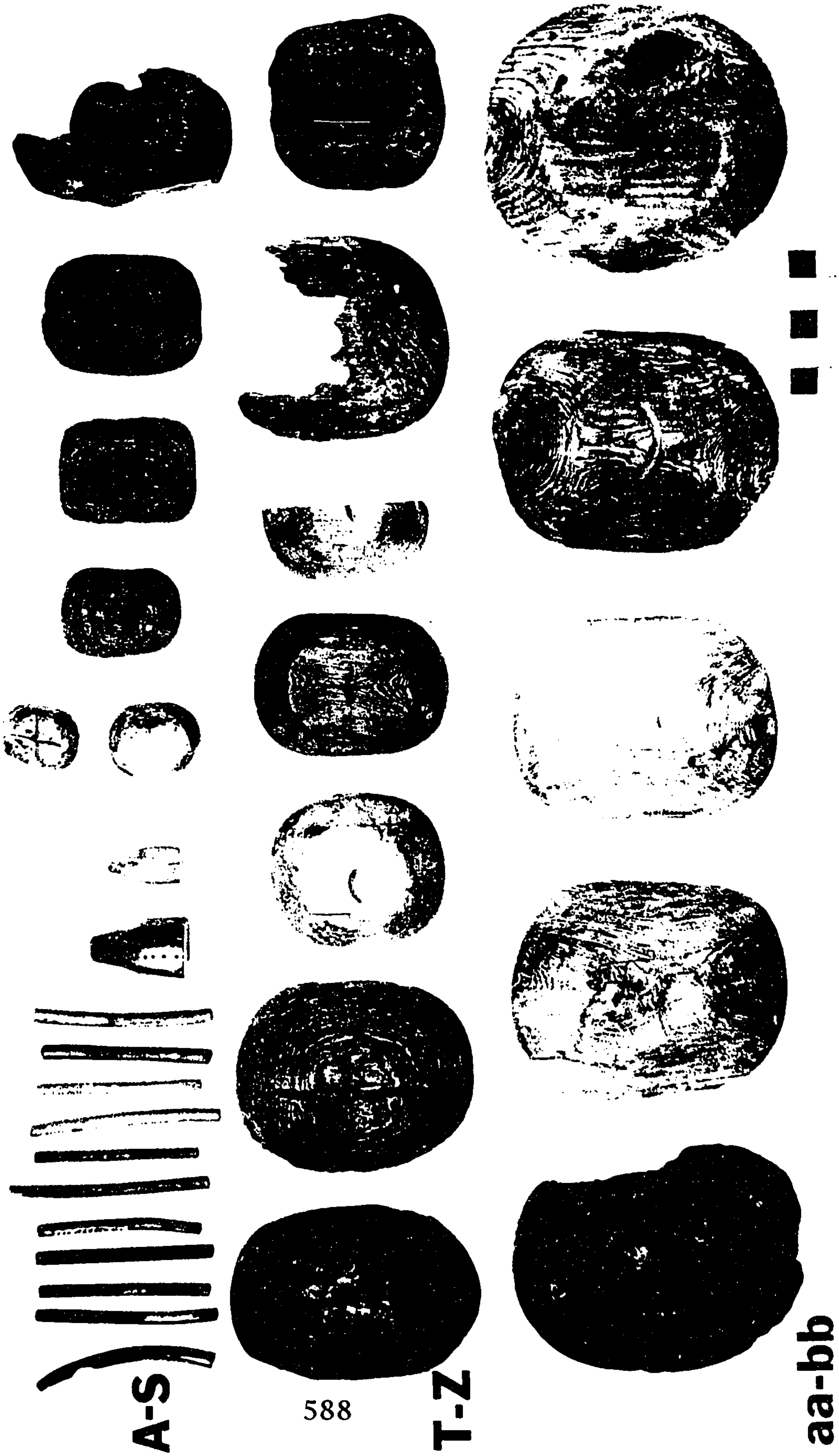

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Plate 127

Large gaming discs

Object	Description	Catalog #
A	Large gaming disc, wood	193/4193
B	Large gaming disc, cottonwood bark	193/5711
C	Large gaming disc, wood	193/3999
D	Large gaming disc, wood	193/4360
E	Large gaming disc, wood	193/4736
F	Large gaming disc, wood	193/3308

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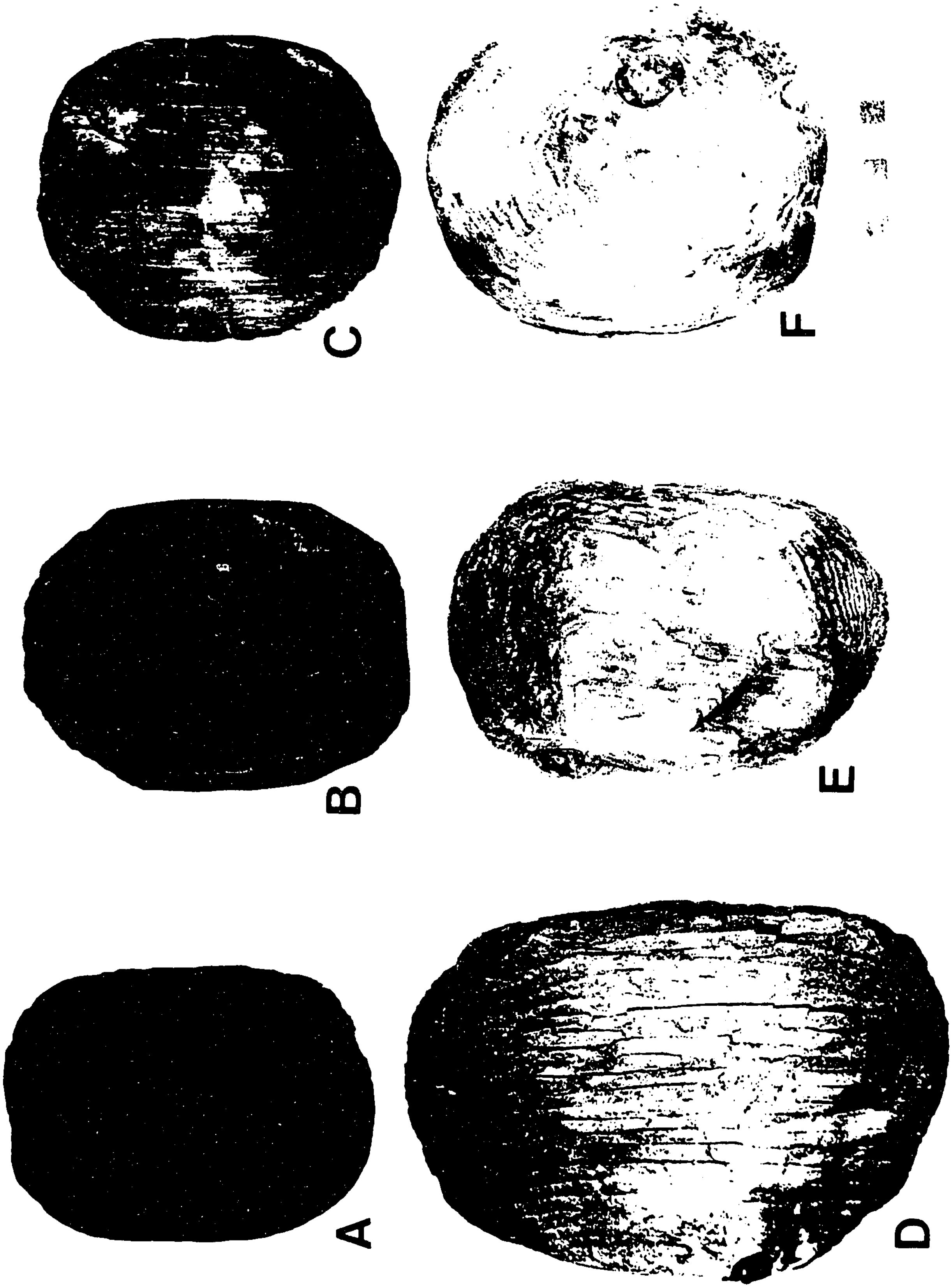

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yew. At least one tally stick retains traces of red surface paint. Eight crudely whittled splinters averaging 5.5 cm long were found in close association with each other and may have also served as tally sticks.

An unfinished tally stick from Karluk Ones shows a technique still used by Alutiiq craftsmen for carving pegs and dowels. The tally stick was carved at the end of a long stick, and only when finished, cut free. When pegging a cockpit ring on a kayak, or similar bentwood, the carver whittles the end of a stick to the proper shape, pushes the stick into the hole, and then cuts it off. This technique was also used to make anthropomorphic figurines. A face is craved into a stick, then the head and body, then the unfinished ends of the stick broken off from the figurine.

Eight tally sticks in the collection have been notched on one side. They may have been used in the game *kadahq*, a guessing game where two sticks, one notched the other plain, are hidden in the hands of one of the players, who face each other. A song is sung by the player who holds one stick in a hand behind his back, and another on his chest, as he sways in a dance like motion in front of his opponent. At the end of the song, his opponent points to the hand he thinks hides the marked stick. Players are typically cheered on by a group of onlookers, for like all Alutiiq games, *kadahq* is played as a form of entertainment at social gatherings.

Incised Pebbles

Slate pebbles incised with geometric lines and anthropomorphic figures were first recovered by Hrdliçka during excavations at the Uyak site and were described by Heizer (1947, 1956), who noted resemblances to design features in the Cape Alitak petroglyphs. Incised pebbles have subsequently been found at many Koniag phase sites in the Archipelago, as well as other

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late sites within the Alutiiq culture area (de Laguna 1956, Harritt 1988). Similar pebbles, although with incised different motifs, are found in the Tlingit culture area. Donald Clark surmises that these pebbles were associated with ritual (Clark 1962), and his subsequent research proved that incised pebbles were a diagnostic artifact of the Koniag phase (Clark 1974). Christopher Donta, in his Master's thesis (1988), and doctoral dissertation (1993), did a detailed analysis of the design elements on incised pebbles. Among other things he found that beads, chin tattoos, and clothing rendered on the most elaborate figurines suggest that the portrayed individuals are in ceremonial regalia. Many other incised pebbles are very simply decorated; with a few lines to indicating a face, or sometimes just some geometric scratches (Figure 19:A-BB).

Simpler designs are probably under-represented in the Karluk One assemblage, and probably in other assemblages as well. Incised pebbles are difficult to identify among the many thousands of pebbles encountered during a field excavation. Pebbles with simple scratches are seldom recovered; the more elaborate, deeper inscribed designs are much more likely to find their way into an artifact bag.

The spatial association of incised pebbles with tally sticks suggests that they were in fact used as gaming pieces. There may be a identifiable sequence of tossing games in the prehistoric record. Coin-shaped pebbles appear in the late Kachemak phase; and have been recovered in those contexts at KAR-31, Malina Creek, KAR-29, in Larsen Bay and the Uyak site (Crozier 1989:90; Steffian 1994). Incised pebbles appear along with tally sticks about A.D. 1300, and are gradually replaced by *kakangaq* discs in later assemblages (Chart 25). It is interesting to note that gaming discs occasionally have pebble inlays the

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same size as many of the slate incised pebbles. Many even including the small chip on one side universally found on incised pebbles.

Incised pebbles with geometric or anthropomorphic designs have been found in prehistoric sites throughout coastal Alaska, associated at various times with Indian, Eskimo, and Aleut cultures. Incised pebbles from late prehistoric sites are the most similar to each other, despite their geographically and culturally diverse contexts from Angoon (de Laguna 1964:170) to Chaluka (Aigner 1970:45). Gaming was an important means of social interaction and economic exchange throughout the North Pacific, and various games seem to have spread readily throughout the region.

Ritual and ceremony were intricately woven into the fabric of Koniag culture. If incised pebbles were indeed used in ritual by the Koniag, this ritual complex existed from about 1300 to A.D. 1400. This would seem an anomalously brief period for a ritual to exist in what otherwise is a religiously conservative culture. Although the incised pebbles were most likely used in gaming, this doesn't preclude the figures depicted on the pebbles from having some ideological content. As noted, Heizer saw similarities between the incised figurines and faces on the Alitak petroglyphs. Indeed the stylistic attributes of the eye brows and nose on the faces on the Alitak petroglyphs strongly resemble that of the incised pebbles. This distinctive style of depicting facial features appears to be a visual pun with the flukes of a sounding whale. Feeding whales frequently sound with the flukes and a section of tail sticking above the water; and image that looks like the nose and brow motif. When seen at sea the imagery of whale flukes is both impressive and forever unmistakable.

What differentiates the faces of incised figurines from those depicted on the Alitak petroglyphs is the treatment of the mouth. The broad,

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Figure 19

Incised pebbles from Karluk One and Old Karluk, (Kar-31)
(After Donta, 1988, 1993)
1:2 scale

Object	Description	Catalog #
A	Incised pebble, slate	193/7053
B	Incised pebble, slate	193/5780
C	Incised pebble, slate	193/7829
D	Incised pebble, slate	193/6489
E	Incised pebble, slate	193/6987
F	Incised pebble, slate	209/3733
G	Incised pebble, slate	193/7024
H	Incised pebble, slate	193/7060
I	Incised pebble, slate	193/2620
J	Incised pebble, slate	193/5827
K	Incised pebble, slate	193/7109
L	Incised pebble, slate	193/6024
M	Incised pebble, slate	193/5577
N	Incised pebble, slate	193/6021
O	Incised pebble, slate	193/6495
P	Incised pebble, slate	193/7108
Q	Incised pebble, slate	209/3942
R	Incised pebble, slate	193/6064
S	Incised pebble, slate	193/5191
T	Incised pebble, slate	193/7028
U	Incised pebble, slate	193/6051
V	Incised pebble, slate	193/5847
W	Incised pebble, slate	193/6030
X	Incised pebble, slate	193/6499
Y	Incised pebble, slate	193/5593
Z	Incised pebble, slate	193/6157
AA	Incised pebble, slate	209/5211
BB	Incised pebble, slate	193/6465

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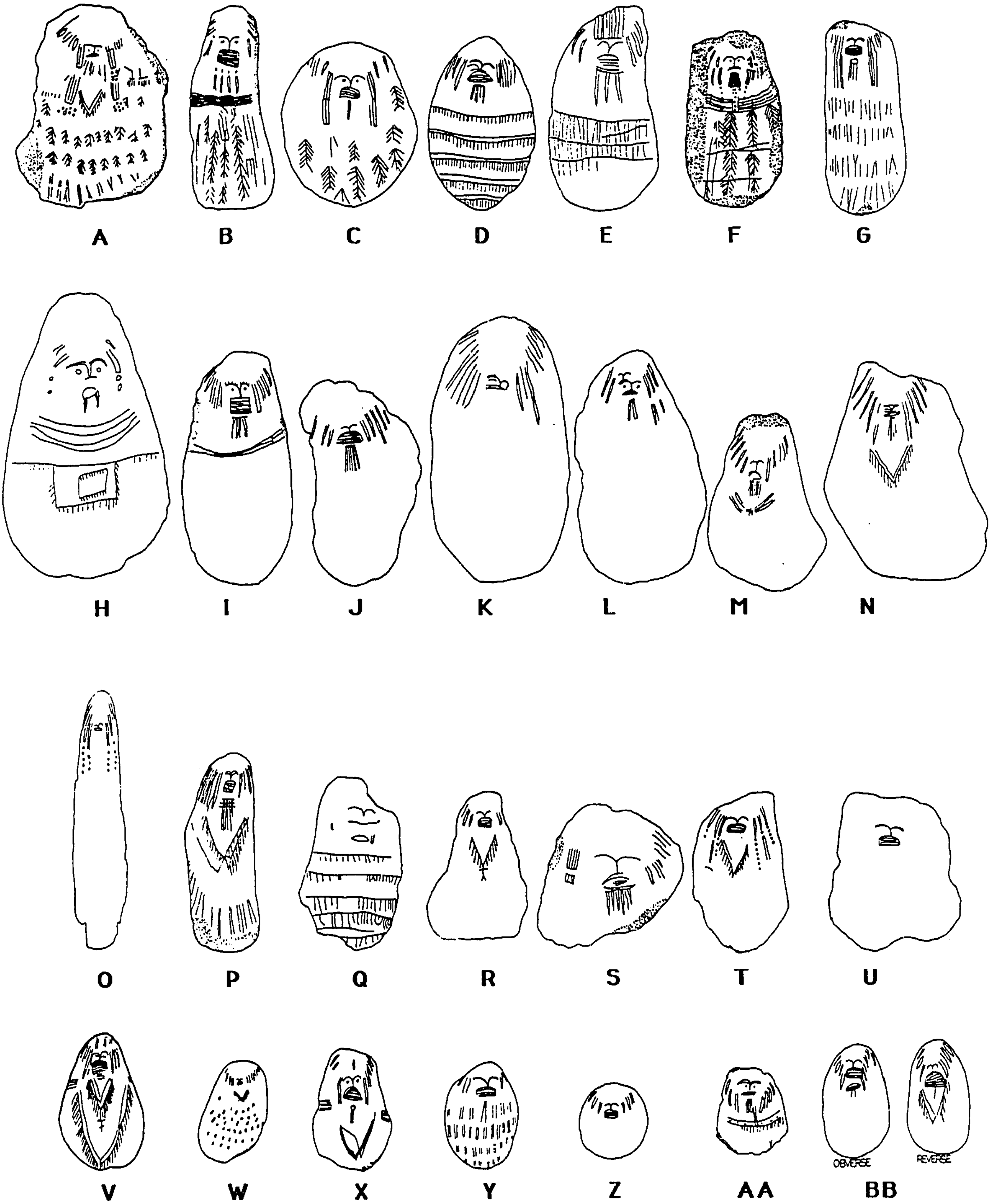

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Chart 22: Association of Incised Pebbles with Tally Sticks at Karluk One

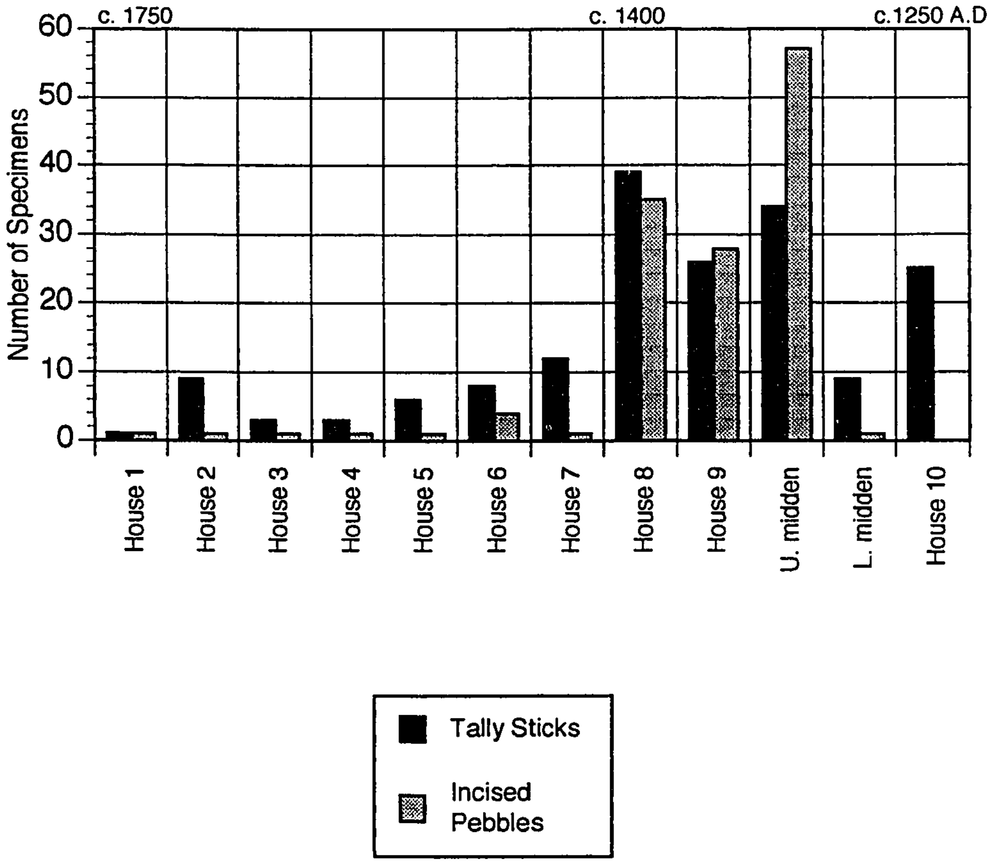

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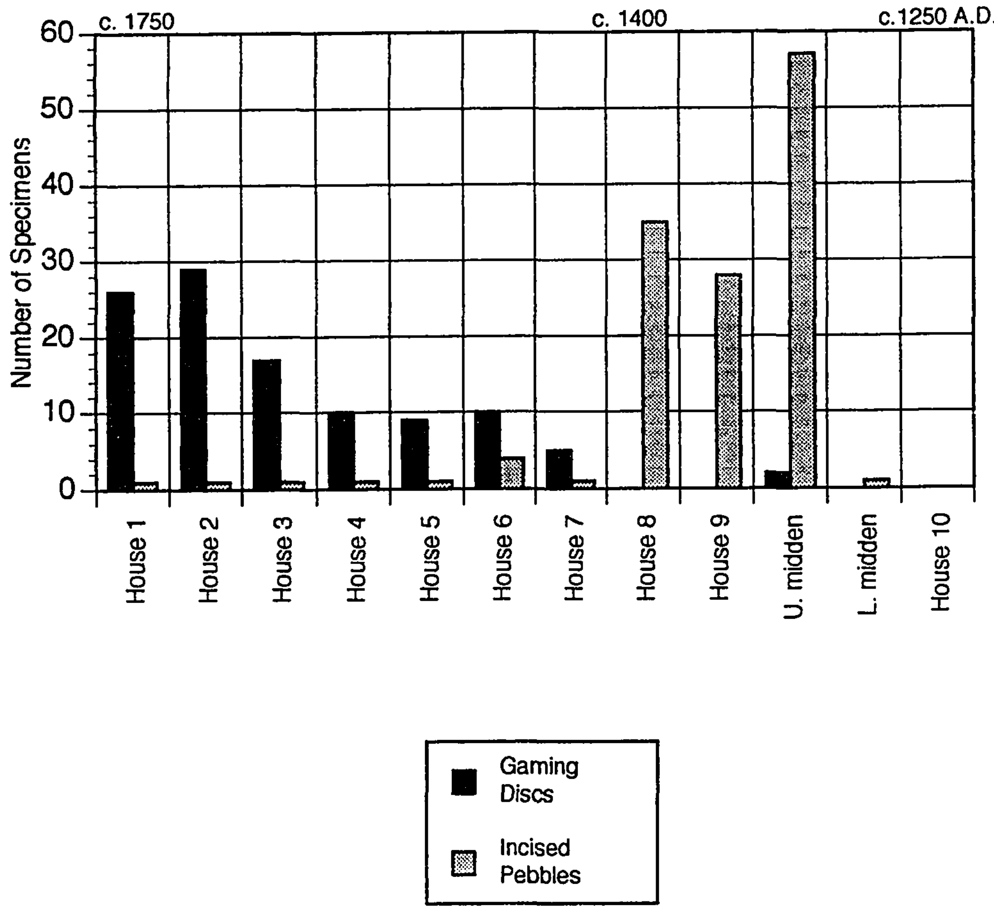
Chart 23: Gradual Replacement of Incised Pebbles by Gaming Discs after 1400A.D. in the Karluk One Assemblage



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downturned shape and the multiple horizontal lines representing the mouth on the incised pebbles is not seen elsewhere in Koniag artwork, with one exception. One of the petroglyph groups at Cape Alitak consists of a series of human faces. All but one are smiling, some have pairs of labrets. A single face, placed apart from the others has the same downturned mouth as seen on the incised pebbles. As such, figures on the incised pebbles and the single petroglyph at Alitak may represent a specific figure in Koniag mythology.

Ivory Dice Pieces

Two gaming pieces strongly resemble a piece illustrated by Lisianski, (1814:211), which was used in a dice game (Culin 1907:104). Lisianski described it this way:

> There is another favorite game called *stopka* which is a small figure cut out of bone. It is thrown up into the air, and if it falls on its bottom 2 are counted; if on its back, 3 and if on its bell, 1 only. This game consists in gaining 20, which are marked with short sticks (1814:211).

The dice pieces from Karluk One are roughly bullet-shaped, with a flat bottom and a wedge-shaped tips (Plate 126: L, M). One is a stylized seal head the other a stylized bear heads. A similar jet gaming piece was found on a housefloor at the Awa'uq refuge rock site. Like the Karluk One pieces, this specimen was heavily stylized, but nostrils were rendered in realistic detail. A cottonwood dice piece in the stylized but easily recognizable form of a bear head was found in Koniag levels at Malina Creek.

One die, in the shape of a stylized bear head, is carved from dark brown fossil ivory. It is 3.3 cm long and 2 cm in diameter (Plate 126: L). The top surface of the head is decorated with three rows of tiny drilled holes. The under surface has four evenly spaced tiny holes. The other specimen is

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carved from a single tooth. It is 2.2 cm long, and 1.2 cm wide (Plate 126: M). The underside of the snout has a single incised ventral line.

Uksgaaq Darts

Thirty-seven complete specimens and twenty-one fragments have been identified as darts used in the game of *Uksgaaq*. Like the gaming discs described above, the darts represent the only archaeologically recovered specimens. Known ethnographic examples include only those specimens made in the 20th century. A similar dart game, which Nelson called *yokh-whuk* was played by Western Eskimos in the Bering Sea region (Culin 1907:387; Nelson 1899:332).

Uksgaaq is still played in at least two of Kodiak's Native villages, particularly during Lent. It is a gambling game and today is most often played for small amounts of money. Elders recall games from as late as the 1940's in which the stakes were quite high; money, clothing, rifles, and other objects made a considerable pile on the floor. Modern dart shafts resemble the archaeological specimens from Karluk One, except that modern darts are slightly shorter, weighted with lead, and tipped with a sewing needle.

Two or four players sit in a kneeling position next to a target, a small wooden *monaq*, or porpoise, which dangles from a string attached to the ceiling. Players throw their darts at an identical target, hanging in the opposite corner of the room. Darts must stick in the *monaq*, and points are awarded according to the place in which it is struck. Today the *monaq* is kept in a jar of water between games to keep it soft, so darts will stick more easily.

One point is scored for striking the *monaq* in its front, or head half, two points for the back, or tail half, and three points for hitting a small circle, drawn in its mid-section. In addition, five points are awarded to any player

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Plate 128

Uksgaaq darts

Object	Description	Catalog #
A	Uksgaaq dart, wood	193/
B	Uksgaaq dart, wood	193/3352
C	Uksgaaq dart, wood	193/6727
D	Uksgaaq dart, wood	193/2759
E	Uksgaaq dart, wood	193/2176
F	Uksgaaq dart, wood	193/1653
G	Uksgaaq dart, wood	193/4409
H	Uksgaaq dart, wood	193/3382
I	Uksgaaq dart, wood	193/
J	Uksgaaq dart, wood	193/
K	Uksgaaq dart, wood	193/

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A-K

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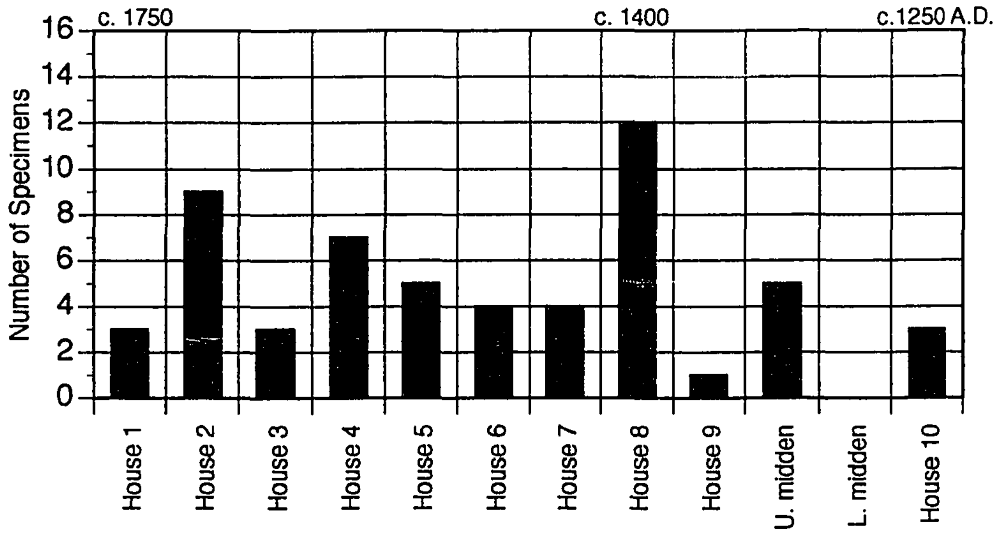
Chart 24: Uqshaq Dart Shafts at Karluk One



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who sticks his dart into the tiny wooden peg that holds the *monaq* to the string. If the dart of any player strikes and sticks firmly into the wooden shaft of another player's dart, the former player wins the game.

An archaeological example of the *monaq* is a cottonwood bark seal effigy with twin projections representing the front flippers, and incisions for the eyes and mouth (Plate 66: A). This specimen measures 17.3 cm long and 3.3 cm wide, and a single socket is present in the center of the seal. A porpoise-shaped *monaq* of cottonwood bark was found at Malina Creek, and also has a socket hole in the center. Perhaps prehistoric *Uksgaaq* players aimed at the center of the animal, but lacking metal points, the object was to stick the dart in the socket hole.

Although primarily a gambling game, *Uksgaaq* probably once played a role in developing sea mammal hunting skills. Darts are thrown from a kneeling position; the same position that Koniag hunters once assumed in a kayak, and a position that is extraordinarily uncomfortable without prolonged practice. It is interesting to note that a similar dart game is played in Native villages in the Aleutian Islands, where players sit with legs outstretched, the position traditionally preferred by Aleut kayakers. The game is traditionally forbidden to women, but often played by younger men.

The Karluk One *Uksgaaq* darts are a thin, carved stick which has a thickened pointed end, oval in cross-section. These darts fit nicely into the center of the target pieces described above. The body of the darts are cylindrical, with the proximal end whittled to a blunted point or left unmodified. Some specimens have warped over the centuries into a slightly curved shape. Two specimens have a barb-like notch carved in the thicker pointed end. Similar notches are placed in sticks in a children's game still played in Old Harbor. A long stick has a string attached to one end; a knot at

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the end of the string fits into the notch on the projectile; which is pulled back and released; the tension on the string throws the projectile a short distance. Thirty-three of the darts are very similar in size and shape, ranging from 13.9 to 23 cm long and from .7 to 1.2 cm in maximum diameter (Plate 128: A-K). Four pieces retain traces of black surface paint. Four darts are noticeably longer than the rest, ranging from 23.9 to 33 cm in length.

Toys and Miniatures

Throughout the Eskimo speaking world, miniature versions of implements used by adults were made for and by children to teach social roles. Gideon made the following observations about the roles of toys in the socialization of Koniag children:

> Little girls begin to be accustomed to their work at about six years of age: they polish thread, plait cords, and do so with sufficient skill and rather well. The boys, beginning about seven years of age, instead of games are busy making spears, toy baidarkas [kayaks] and toy paddles. They throw spears on the beach and thus become accustomed to future hunting techniques (1989:49 [orig. 1805-7]).

Davydov made similar notes on the use of toys among historic Koniag:

> From their very early years the children begin building baidarkas and launching them; they also fashion bows and arrows, learn to shoot at birds, or simply at a target (1977:165 [orig. 1802-7]).

Miniatures, were a common artifact from housefloors in all levels of Karluk One. Most were probably used as children's toys. Some may even have been made by children. According to the oral tradition however, miniatures were also sometime used in ritual. Finely detailed models of kayaks, complete with hunters and miniature hunting gear, were made well

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into the 20th century. Their prehistoric antecedents may have been miniature kayaks and *anyaqs* used in ritual. At least one model *angyaq* is represented by miniature frame fragments at Karluk One. This piece seems more likely to have some ceremonial significance than the more common, rudimentarily carved, miniature boats made of cottonwood bark. It is possible that some of the miniature hunting and fishing implements classified as toys were made in conjunction with finely detailed models. In today's villages, fathers still make cottonwood boats for their sons, which are towed along the shoreline with a string and a stick. Today's models, however, are carved to represent diesel powered salmon seiners.

Toy Kayaks, Anyaqs, Boatmen, and Paddles

Table 8:5 Toy Kayaks, Anyaqs, Boatmen, and Paddles

Catalog	Artifact Type	Material	Context
6852	Miniature kayak	Bark	surface/erosion face
4727	Miniature kayak	Bark	House floor 1
1301	Miniature paddle	Wood	House floor 1
3923	Miniature boatman	Wood	House floor 1
786	Miniature kayak	Wood	House floor 2
3042	Miniature boatman	Wood	House 3 Roof sods
1408	Miniature kayak	Wood	House floor 3
3620	Miniature kayak	Bark	House floor 3
1438	Miniature kayak	Bark	House floor 4
3061	Miniature paddle	Wood	House floor 4
4643	Miniature kayak	Bark	House floor 5
1194	Miniature kayak	Wood	House floor 6
4511	Miniature boatman	Wood	House floor 7
5880	Miniature kayak	Bark	House floor 8
6433	Miniature kayak	Bark	House floor 8
6037	Miniature kayak	Bark	Upper basal midden
5110	Miniature kayak	Bark	Upper basal midden
5609	Miniature boatman	Bark	House floor 9B
5607	Miniature kayak	Bark	House floor 9B

Seven complete toy kayaks were found at Karluk One, six made of cottonwood bark and one of wood (Plate 29: H-M). They exhibit different

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degrees of craftsmanship. Some may have been made by children. The toy kayaks range from 5.2 to 25.3 cm long and from 1.2 to 4.8 cm wide. A large bark toy kayak has a square hole carved into the base, possibly for insertion of a pebble to add stability in the water (Plate 129: M). Three bark fragments appear to be represent the bows of similar toy kayaks. One less detailed specimen appears to be a kayak in profile with a small rectangular notch representing the cockpit hole (Plate 129: H). This specimen retains traces of red pigment.

Open boats are represented by three simply carved bark specimens. Two complete pieces measure 9.4 to 10.3 cm in long. An additional two fragments are from larger bark toy boats, which originally measured at least 10 cm wide. Two fragmentary wooden toy boats have prows shaped like those of open skin-covered boats, called umiaks in Arctic literature, but known in Kodiak Alutiiq as *anyaqs*.

A miniature double bladed kayak paddle is 8.5 cm long, and may have been used in association with a toy kayak. A tiny wood fragment, 4.2 cm long, is also tentatively identified as a toy paddle.

Four carved, anthropomorphic, wood figurines were found in Karluk during the 1984-85 field seasons. Six more were found in 1987. They have peg-shaped bases, probably for insertion into cockpit holes of toy kayaks. Similar wood figurines, dressed in tiny gutskin garments, are also used in elaborate kayak models from ethnographic collections. As Lydia Black has noted (1991:24), the toy boatmen are complete with carved renderings of bentwood hunter's hats. The bentwood hats depicted on the figures resemble ethnographic hats from Kodiak and the Alaska Peninsula (Fitzhugh and Crowell 1988:164, figure 202). The figurines range from 4.6 to 6.1 cm in length and from 0.9 to 2 cm in diameter (Plate 129: D-G).

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Plate 129

Toy boats and boatmen

Object	Description	Catalog #
A	Fragment, toy angyaq, wood	193/
B	Fragment, toy angyaq, wood	193/
C	Fragment, toy angyaq, cottonwood bark	193/
D	Toy boatman, wood	193/4511
E	Toy boatman, cottonwood bark	193/3923
F	Toy boatman, cottonwood bark	193/
G	Toy boatman, cottonwood bark	193/
H	Toy kayak, wood	193/
I	Toy kayak, cottonwood bark	193/1438
J	Toy kayak, cottonwood bark	193/
K	Toy kayak, cottonwood bark	193/
L	Toy kayak, cottonwood bark	193/
M	Toy kayak, cottonwood bark	193/

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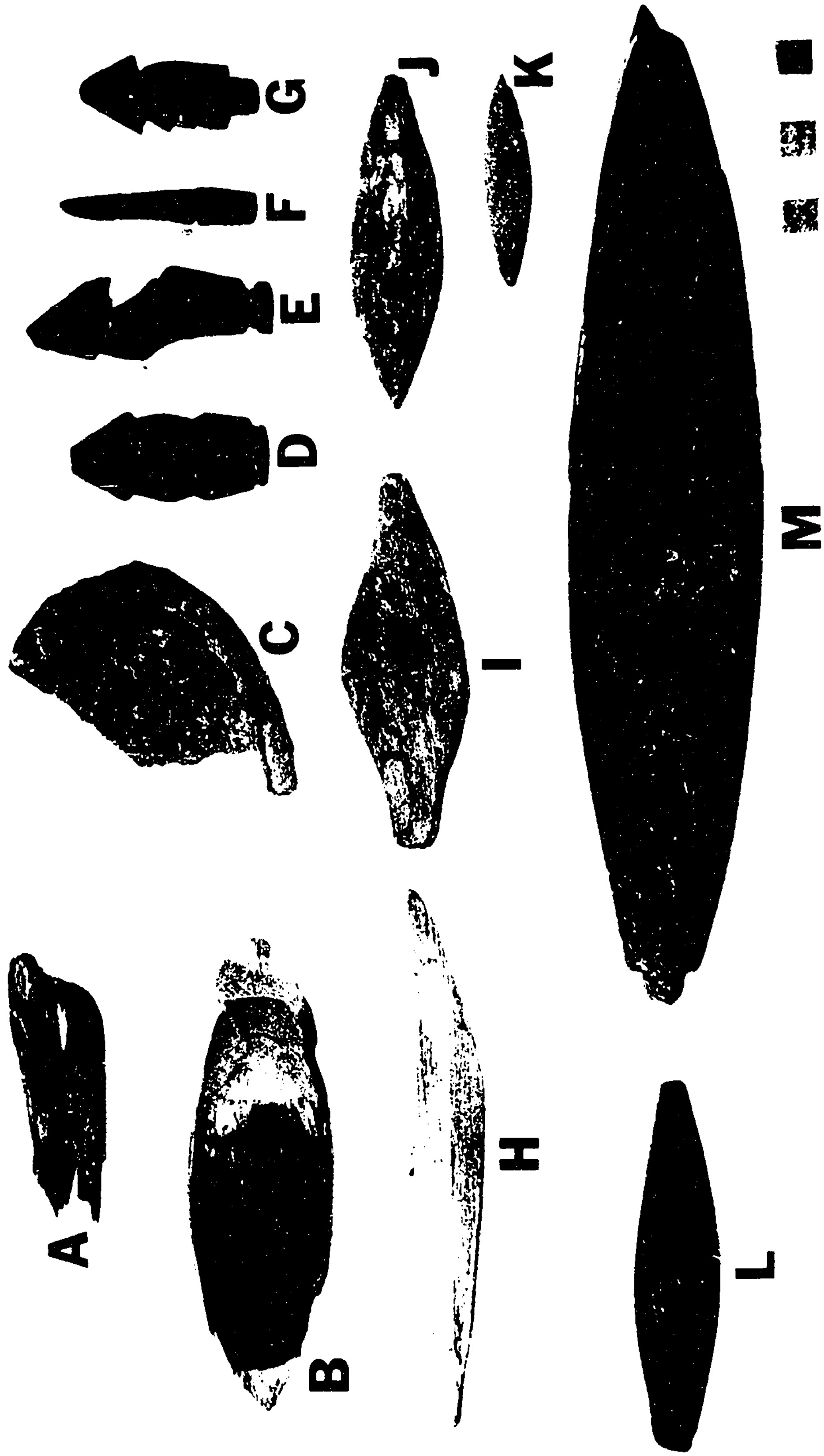

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Tops

Table 8:6 Tops

Catalog	Artifact Type	Material	Context
4357	Top	Bark	House 1 roof sod
3341	Top	Bark	House floor 1
2144	Top	Bark	House floor 1
2723	Top	Bark	House 2 wall sod
785	Top	Bark	House floor 2
4153	Top	Bark	House floor 3
850	Top	Bark	House 5 roof sod
1659	Top	Wood	House 5 roof sod
2626	Top	Wood	House floor 5
4228	Top	Wood	House floor 5
5155	Top	Bark	House floor 6
4886	Top	Bark	House floor 6
2019	Top	Bark	House floor 6
4835	Top	Bark	House floor 7
6441	Top	Bark	House floor 8
5819	Top	Bark	Upper basal midden
6171	Top	Bark	Upper basal midden

Tops were used by Eskimo societies in Alaska and Arctic Canada, and by Indians of the Northwest Coast (Culin 1907:736-737). Nelson recorded that tops were most often used by children as playthings. One game was played by each child spinning a top on the plank interior of the house, then running out of the house, around the house, and back inside before the top stopped spinning (1899:341). Fifteen complete and two fragmentary tops were found at Karluk One (Plate 130: A-Q). Most of the tops are composite pieces; consisting of a perforated disc and a spindle. Two tops still retain fragments of their spindles. Spindle holes are oval to round in shape. At least one single piece top, similar to one collected from Bristol Bay in the Smithsonian collection, is also present. Thirteen of the tops are made of bark and range in diameter from 3.1 to 9.6 cm. One bark top has four concentric grooves carved into its dorsal surface (Plate 130: N). Two of the tops are made from wood and

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Plate 130

Tops

Object	Description	Catalog #
A	Top fragment, cottonwood bark	193/5155
B	Top, cottonwood bark	193/1659
C	Top, cottonwood bark	193/5819
D	Top, wood	193/4228
E	Top, cottonwood bark, with spindle fragment	193/4835
F	Top, cottonwood bark	193/785
G	Top fragment, cottonwood bark	193/2723
H	Top, cottonwood bark	193/2144
I	Top, cottonwood bark	193/3341
J	Top, cottonwood bark, with spindle fragment	193/4886
K	Top, cottonwood bark, with spindle fragment	193/2019
L	Top, cottonwood bark	193/6171
M	Top, cottonwood bark	193/4153
N	Top, cottonwood bark	193/4357
O	Top, wood	193/6842
P	Top, cottonwood bark	193/850
Q	Top, cottonwood bark	193/6441

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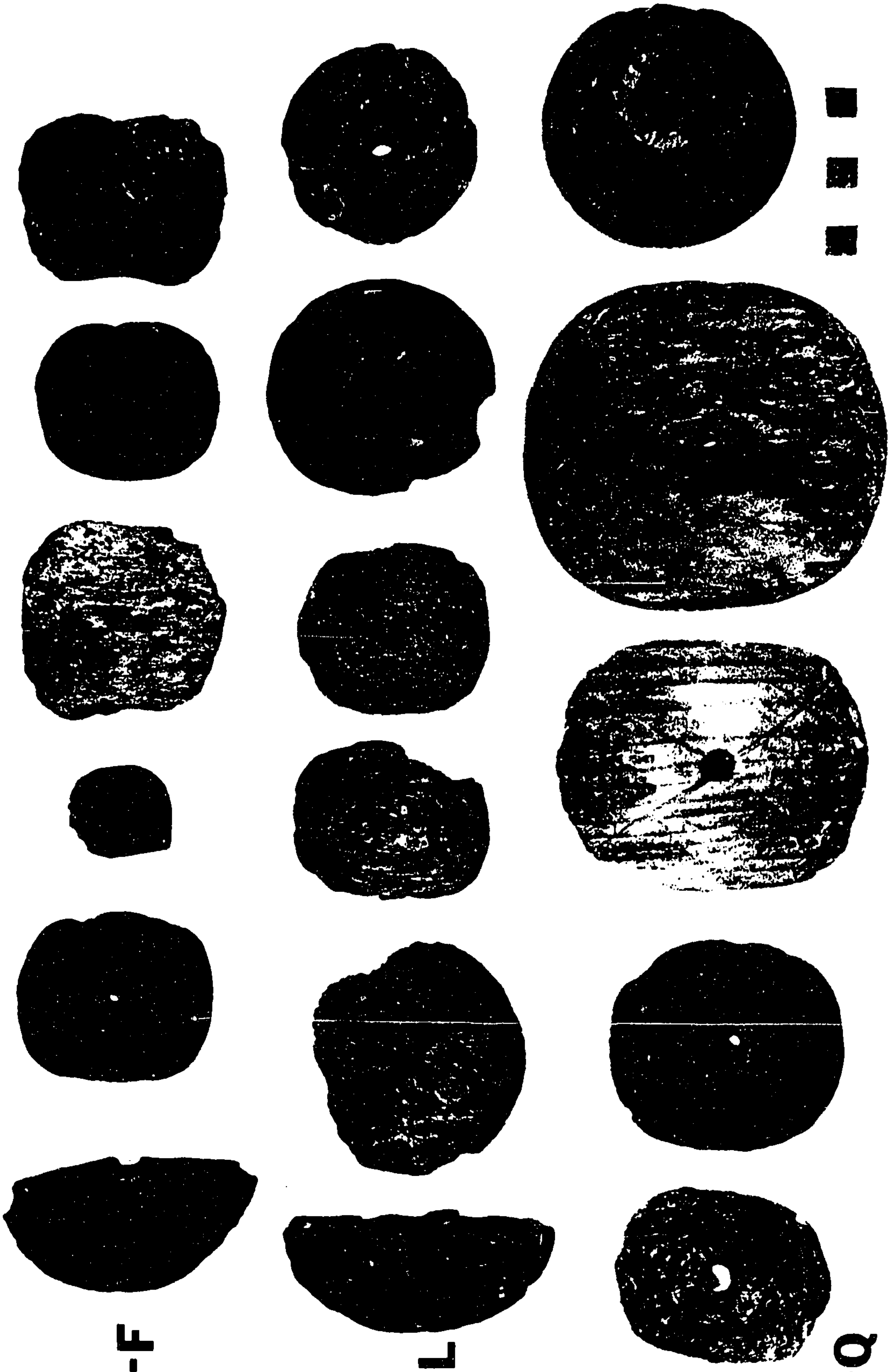

A-F

G-L

M-Q

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measure 6 and 9.3 cm in diameter (Plate 130: D, O). The larger wooden top is decorated with an x-shaped groove on its dorsal surface (Plate 130: O).

Toy Bows and Arrows

Table 8:7 Toy Bows

Catalog	Artifact Type	Material	Context
3917	Toy bow	Wood	House 1 roof sod
1362	Toy bow	Wood	House 2 wall sod
3977	Toy bow	Wood	House floor 3
3961	Toy bow	Wood	House floor 3
4391	Toy bow	Wood	House floor 3
4784	Toy bow	Wood	House floor 5
4062	Toy bow	Wood	House 6 wall sod
2500	Toy bow	Wood	House floor 6
1510	Toy bow	Wood	House floor 7
6338	Toy bow	Wood	House floor 8
5019	Toy bow	Wood	House floor 8
5029	Toy bow	Wood	House floor 8
5592	Toy bow	Wood	Upper basal midden
5043	Toy bow	Wood	Upper basal midden
5828	Toy bow	Wood	Upper basal midden
6513	Toy bow	Wood	Upper basal midden
5257	Toy bow	Wood	House floor 9B
5268	Toy bow	Wood	House floor 9B
6524	Toy bow	Wood	Lower basal midden
5854	Toy bow	Wood	Lower basal midden
6655	Toy bow	Wood	Lower basal midden

Five complete and sixteen fragmentary wood specimens represent miniature bows, most likely used as toys. However, some ritual usage cannot be discounted entirely (Plate 131). Nocking styles on the ends of some of the toy bows are accurate replicas of nocks on full-sized bows used by adults. Others are more simply made. However, it is clear that the bows were meant to be strung. The complete toy bows range from 40 cm to 14.2 cm in length. One finely made toy bow retains dark green paint with metallic glitter inclusions (Plate 131: H). Another complete bow retains traces of red surface paint on both faces (Plate 131: Q). Fifteen nocked end fragments and a single

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Plate 131

Toy bows and arrows

Object	Description	Catalog #
A	Toy bow fragment, wood	193/5854
B	Toy bow fragment, wood	193/6338
C	Toy bow fragment, wood	193/4062
D	Toy bow fragment, wood	193/5019
E	Toy bow, wood	193/5403
F	Toy bow, wood	193/
G	Toy bow fragment, wood	193/6729
H	Toy bow fragment, wood	193/5828
I	Toy bow fragment, wood	193/3917
J	Toy arrow fragment, wood	193/6709
K	Toy arrow fragment, wood	193/6371
L	Toy arrow fragment, wood	193/5024
M	Toy bow fragment, wood	193/
N	Toy bow fragment, wood	193/1362
O	Toy bow fragment, wood	193/5257
P	Toy bow fragment, wood	193/6513
Q	Toy bow, wood	193/3977
R	Toy bow, wood	193/1510
S	Toy bow, wood	193/6524

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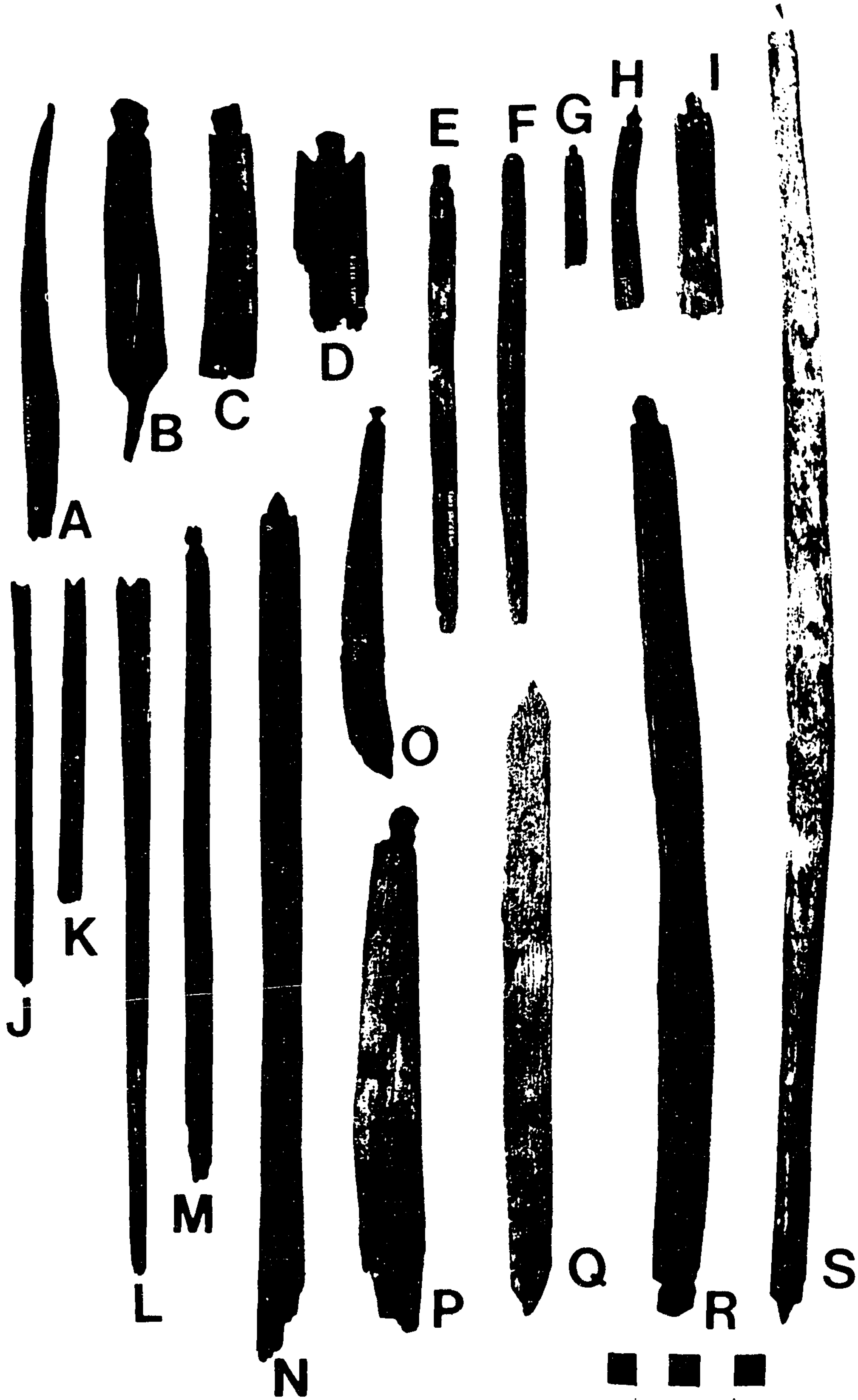

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mid-section fragment represent small toy bows of similar size, probably about 25-30 cm long when complete. They were found on house floor 8 and below, levels that pre-date A.D. 1400. This is consistent with the greater number of adult-sized bow fragments found in those contexts (Chart 6).

Table 8:8 Toy Arrow Shaft Fragments

Catalog	Artifact Type	Material	Context
6709	Toy arrow shaft	Wood	General excavation
6371	Toy arrow shaft	Wood	House floor 8
5024	Toy arrow shaft	Wood	House floor 8

Three slender wooden shaft fragments with miniature arrow nocks on one end have been tentatively identified as toy arrows (Plate 131: A-C). They range from 0.5 to 0.9 cm in diameter.

Miscellaneous Miniatures

Table 8:9 Miscellaneous Toys/Miniatures

Catalog	Artifact Type	Material	Context
1341	Miniature barbed harpoon point	Wood	House floor 1
4340	Miniature net float	CW Bark	House floor 1
2964	Miniature drum handle	Wood	House floor 2
6882	Miniature scoop	Bark	House floor 2
1905	Miniature throwing board	Wood	House floor 2
2744	Miniature ulu blade	Slate	House 3 roof sod
2747	Miniature ulu blade	Slate	House 3 roof sod
2334	Miniature socket piece	Bone	House floor 3
1099	Miniature ulu blade	Slate	House floor 3
1674	Miniature barbed harpoon point	Bone	House floor 6
5466	Miniature drum handle	Wood	House floor 6
4885	Miniature oil lamp	Diorite	House floor 6
3718	Miniature projectile point	Slate	House floor 6
4921	Miniature barbed harpoon point	Bird bone	House floor 7
4518	Miniature barbed point	Bird bone	House floor 7
6034	Miniature projectile point	Slate	House floor 8

Three complete, miniature, ground slate ulu blades have straight backs (Plate 132: L-N). They measure from 4.9 to 6.8 cm long, and from 3.2 to 3.6 cm in maximum width. Clark found seven similar specimens at Rolling Bay

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(1974: 85), and suggested they may have been functional cutting tools. However, their precise resemblance to full-sized ulu blades has led to their present inclusion with the wide range of miniature items found at Karluk One. Beautifully finished miniature ulus were also found at the Uyak site (Steffian 1994). Toys and miniature items are found on all but the earliest Karluk One house floors (Chart 27).

A miniature spruce bark rock scoop with a cylindrical handle is 7.7 cm long (Plate 132: P). An antler gut scraper is also a faithful copy of larger specimens, but only 9.2 cm in length (Plate 132: O).

A miniature ground stone lamp consists of a hemisphere of diorite with a faintly pecked bowl on its flat side. It measures only 4.9 cm in diameter and 2.2 cm in height (Plate 132: Q), and resembles miniature lamps found by Clark at Rolling Bay (1974:130), who also suggested that they were unlikely to have been used except as children's toys.

The handle section of a toy, wood, throwing board is crudely carved, but an unmistakable copy of a full-sized throwing board (Plate 132: J). It retains traces of red surface painting and is 2.5 cm in maximum diameter. There is an index finger hole on the child-sized grip, but no bone finger peg, as in full-sized throwing boards.

A rather surprising miniature object is a copy of larger examples of notched bark net floats, which measures only 2.4 cm long and 1.3 cm wide (Plate 132: I). An alternative explanation is that this particular miniature was part of a detailed model used in adult ritual. Identical specimens were found during the 1994 excavations at Karluk One.

Two small replicas of wood drum handles measure 5.3 and 6.5 cm long and 1.3 and 1.5 cm in diameter (Plate 132: G, H). They are cylindrical with a square-shaped notch near one end.

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Plate 132

Toys and miniatures

Object	Description	Catalog #
A	Toy harpoon point, bird bone	193/1674
B	Toy projectile point, bird bone	193/4513
C	Toy projectile point, bird bone	193/4921
D	Toy projectile point, slate	193/6034
E	Toy socket piece, bone	193/2334
F	Toy projectile point, slate	193/3718
G	Toy drum handle, wood	193/2964
H	Toy drum handle, wood	193/6774
I	Toy net float, cottonwood bark	193/4340
J	Toy throwing board fragment, wood	193/1905
K	Toy or fertility ritual doll, wood	193/3960
L	Toy ulu blade, slate	193/2747
M	Toy ulu blade, slate	193/2744
N	Toy ulu blade, slate	193/1049
O	Toy gut skin scraper, antler	193/3020
P	Toy spoon or rock scoop, cottonwood bark	193/6882
Q	Toy oil lamp, diorite	193/4885

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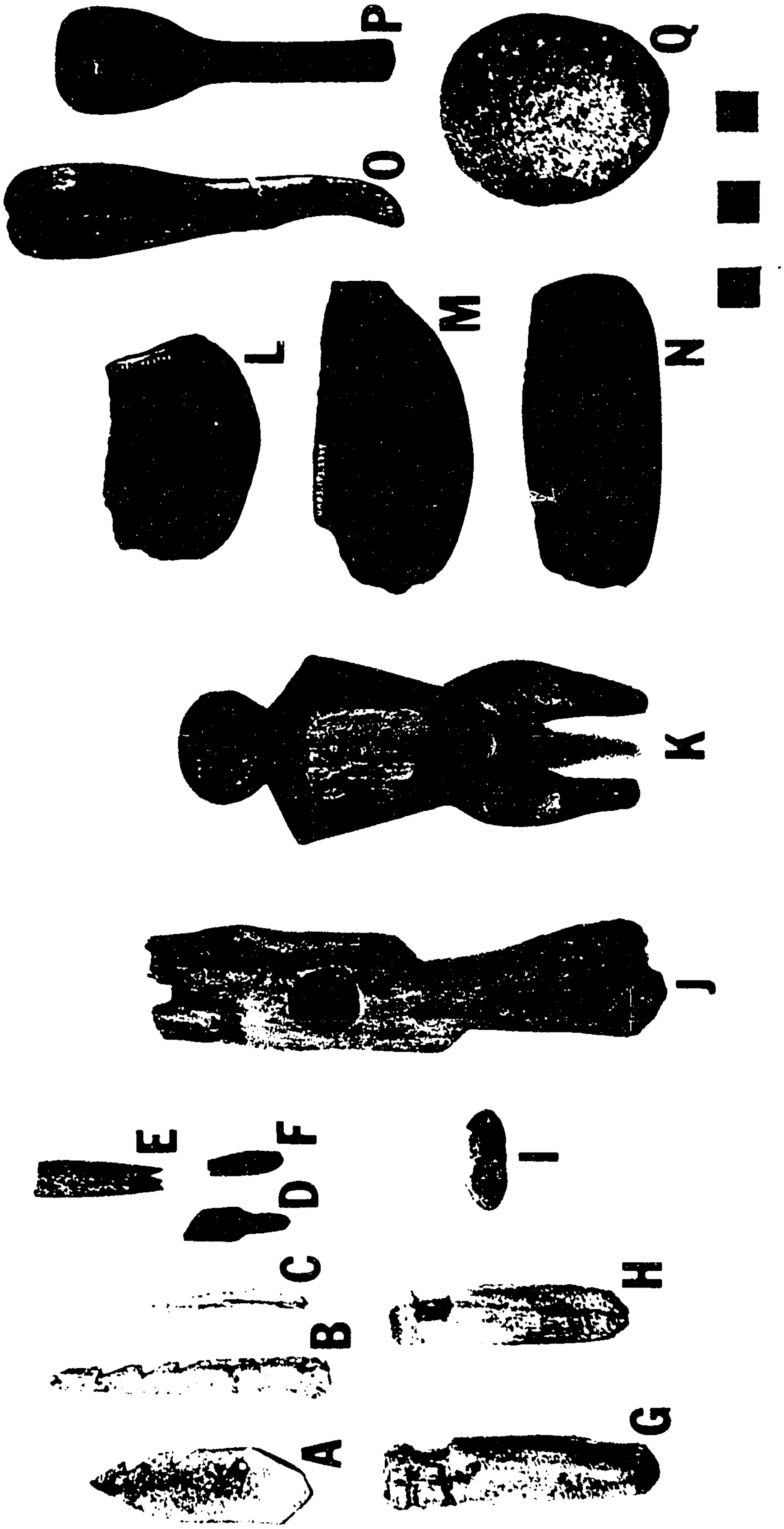

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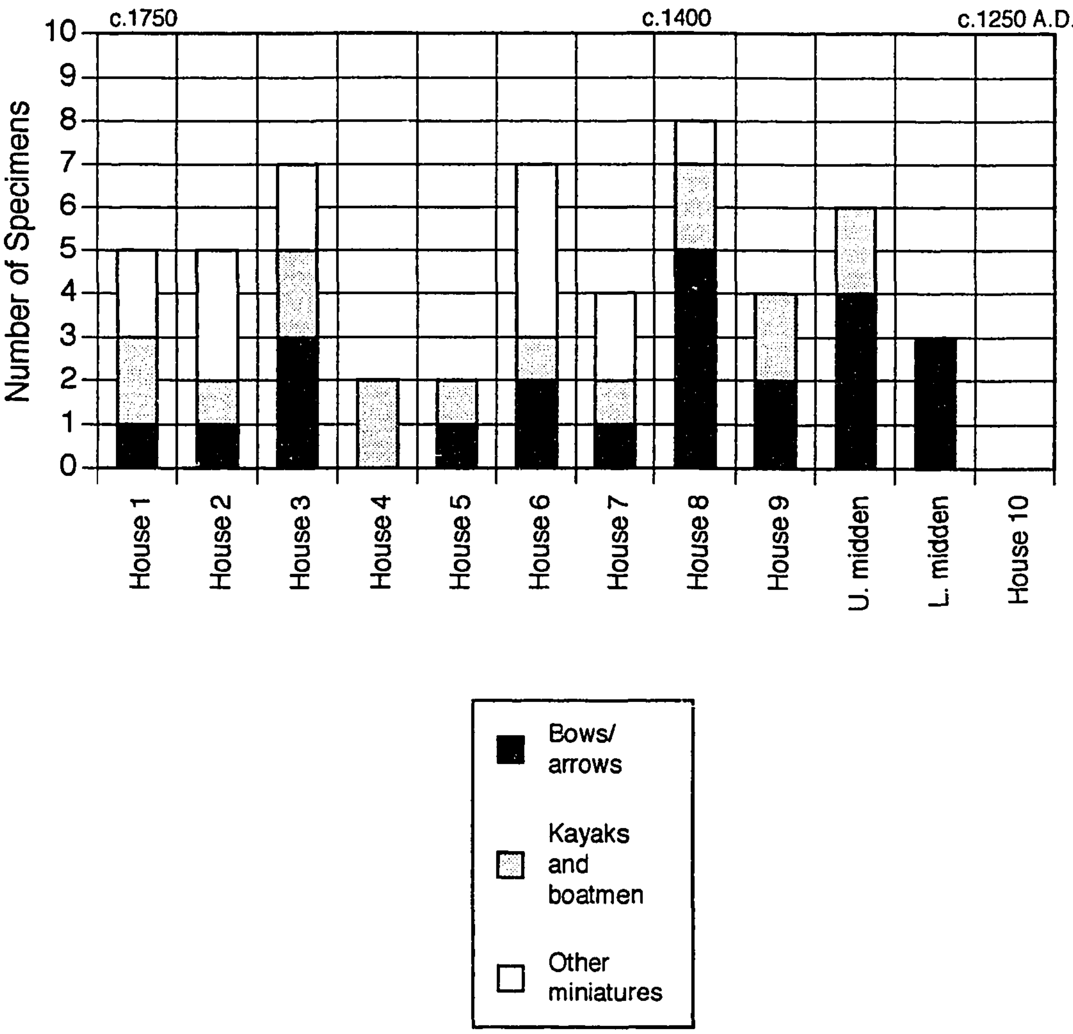
Chart 25: Miniatures and Toys From Karluk One



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Three unilaterally barbed bone points are of crude workmanship and miniature size. They do not appear functional, and have therefore been classified as toys (Plate 132: A-C). One is a harpoon point with a tiny line hole near the base (Plate 132: A). They range from 4.3 to 6.7 cm long. Two miniature ground slate points are represented by a stemmed base and a mid-section. These points would have measured about 3 cm in length (Plate 132: D, F). A miniature version of bone socket pieces used with hunting darts is 3 cm long and 0.8 cm in diameter (Plate 132: E). It has a shallow socket about 0.4 cm deep which does not appear functional. Twin prongs extend from the base. A wooden shaft, 0.7 cm in diameter and 4 cm long, has a single barbed point carved on its distal end. It apparently represents a toy harpoon complete with a carved rendering of a miniature barbed harpoon point in wood. It is also possible that these items may have equipped a boat model.

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Chapter 9: Artifacts Associated with Personal Adornment, Ceremony, and Warfare

Labrets

Labrets, decorative lip plugs, were worn in perforations in the lip, below the lip, and in the cheek. Cybulski (1992) suggests that they may have been in use in British Columbia as early as 3000 B.P., based on dental facets from the Pender canal skeletal assemblage. The oldest known examples in coastal Alaska were recovered from the Chaluka mound, on Umnak Island in the Aleutian Island Chain; and date to 1700 B.C. (Aigner 1966, Giddings and Anderson 1985:205, Laughlin and Marsh 1951). Labrets appeared on the Alaska Peninsula and the Kodiak Archipelago in Kachemak deposits by at least 1500 B.C. (Clark 1975, Dumond 1971); and were used by early prehistoric coastal Indian cultures in southeastern Alaska and British Columbia by about 1000 B.C. (Hall and German 1975:281; Keddie 1981:65). In the southern end of the Northwest Coast culture area; in southern British Columbia and northern Washington state, labrets were also used from 1000 B.C.; but fell into disuse by A.D. 500 (Keddie 1981:66).

A similar phenomena occurred at the northern extreme of the distribution area of labrets in Alaska; where they were present by 700 B.C. among Bering Sea Eskimos, but also disappear around A.D. 500 (Giddings 1960; Giddings and Anderson 1985). Labrets reappear in northern Alaska shortly after A.D. 1400, where they were used well into the 19th century by coastal Eskimo groups as far east as the Mackenzie River Delta (McGhee 1971; Murdoch 1892:143). Labret use was also recorded by ethnographers among the Athapaskan of the lower Yukon, who interacted with Yupik peoples (Osgood 1970).

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Labrets are usually discussed in connection to social ranking, for the ethnographic literature universally links labrets to status and prestige. I believe that for the Alutiiq, and probably others, labrets represent a wider complex of culturally based behaviors with concurrent roles. Labrets were probably linked to social ranking, symbolic identification with animal spirit helpers, and to physiological consequences labret installation. These roles are discussed individually below; but for the Alutiiq, probably indivisible.

Labrets, People, and Birds

Paired labrets worn by Yupik speakers, and tusk imagery on Yupik parkas, may have symbolized identification with walrus (Fitzhugh and Kaplan 1982:146-147). For the Alutiiq, birds rather than sea mammals were most closely identified with humans. Lydia Black noted the prevalence of bird imagery on Alutiiq bentwood hunting hats (Black 1991:36-40; Ivanov 1930), feather parkas, and artwork (Black 1989). This point is underscored by the number of bird images on the prehistoric artwork from Karluk One, including several pieces representing bird/man transformation; a carving of man and a bird standing back to back, and a figure from Malina Creek with the body of a puffin, and a human face. The visual punning in Alutiiq artwork, and verbal punning (not synonyms) common in the Alutiiq language reflects a traditional world view where categories exist, but are much more mutable than those of the western world. A person, for example can be a bird, but not a bird, at the same moment. The Alutiiq suffix *ruaq* is translated into English as 'like a thing, but not really that thing', but in reality has a more subtle, idiomatic connotation.

Alutiiqs from Alaska Peninsula villages, where acculturation is considerably less pronounced than elsewhere in the Alutiiq area, told me that

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upon reaching adolescence, a young man discovered what animals were to be his helpers for the rest of his adult life. After several weeks of instruction and fasting, followed by a ritual hunt, the identities of the animal helpers were revealed; either in a vision, or an event that could be interpreted as an augury. Each hunter had two such helpers; a mammal or sometimes a land bird to protect him during hunts on land, and a sea mammal, or more often, a sea bird for protection and consultation while at sea. This practice continued into at least the 1960s, and many Alutiiq men continue to look for their special bird/protectors for luck and information while at sea.

Experienced mariners are also aware that the presence and behaviors of certain seabirds can warn of bad weather, lead the way toward schooling fish, and indicate where currents,, or shallow waters are present. In clear weather feeding sea mammals can be seen from miles away because of the small flock of seabirds that dive and wheel overhead, swooping occasionally to snatch scraps of fish. In the fog, bird cries from the rookeries indicate where landmarks are located. Hunters on land are well aware that the presence of nearby bears, or the location of game animals can be betrayed by eagles, magpies, crows, or ravens. As such, Alutiiq belief systems provided a context for storing and sharing vital information and the acute observational skills needed for viewing the natural world with an extraordinarily sharp level of resolution.

Labrets may have been part of a complex of ritual and material culture that symbolized the relationships between humans and birds. Parka and clothing decorations mimic plumage. It is possible that the labrets mimic beaks. Tabular labrets jut out in a beak-like manner and the long lateral labrets forced the mouth into a v-shape not unlike that of a bird. The word for labret in Alutiiq is lost; but as speakers of a Yupik language, the prehistoric

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Alutiiq probably used several terms for labrets based on the style; and perhaps on the name of the bird being represented. In the Yukon-Kuskokwim area, several Yupik terms for labret have survived into living memory (Jacobsen 1984). All of the surviving Yupik terms for labret bear similarities to Yupik names for birds (Table 9:1).

Table 9:1 Comparison of Yupik Terms for Labrets and Birds

Yupik	English
caqiqisaq, *caqiaraq*	Side labret Steller's eider duck
cungapak, *cungaqvak*	Labret Hawk
mengkuk *mengqucivak*	Labret Hawk-owl
tuutaq *tuutangayak*	Labret Canada Goose

The Physical Anthropology of Labret Usage

The labrets found on the Kodiak Archipelago and the Aleutian Island Chain are the largest in the New World in terms of the opening required in the wearers face. In the Old World, only certain groups in central Africa wear larger labrets. At Karluk One, several labrets exceeded 10 cm long and 4 cm wide. Wooden figurines with representational labrets show that the largest labrets were worn in pairs, forcing the mouth into a pronounced V-shape. Round, flat labrets worn during the Kachemak phase were made from ground and highly polished jet, slate, ivory and bone, and would have left round holes taking up much of the wearer's cheek. I have seen Kachemak jet labrets in private collections that approach the size of a hockey puck. Explaining the use of labrets to museum visitors or field school students seldom fails to elicit an involuntary wince.

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It is clear from the sheer size of labrets that there must have been a considerable physical cost to the labret wearer in the form of pain, possible infection, tooth wear, tooth loss inconvenience, and even facial deformation. A consideration of labret use from a cost-benefit perspective underscores the deeply held importance of labrets to the Alutiiq. It is also evident from the archaeological record at Karluk One that labrets changed in style and size over time. The size of the labret hole people were willing to endure changed, perhaps in relation to circumstances in the natural and social environment.

To study this possibility, the diameter of labrets found on Karluk One housefloors was measured; given the variety of styles, and the range in flange sizes, only the portion of the labret that actually came in contact with the labret hole was measured. In other words, the labret diameter measurements were taken that minimally reflect the actual size of the incision in the wearer's lip or cheek. During the 150 or so years that preceded European contact, the mean diameter of labrets decreased by 46% (Table 29). This trend toward smaller labrets apparently continued into the 19th century, as the labrets seen by Europeans were quite small in comparison with archaeologically recovered specimens.

Ethnohistorical accounts, however, indicate that at least some of the larger labrets survived into the contact period:

> The men of Kodiak also decorate themselves. Some of them pierce their lower lip like the women and others slit it completely, so they look as though they have two mouths. When they drink or eat, the food drops out of their lower lip which makes this form of self-adornment even more repulsive (Davydov 1977: 150 [orig. 1802-1807]).

Labrets so repelled Europeans that they were quickly abandoned by the acutely status-conscious Alutiiq. It is also probable that much of the social

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information transmitted by labrets, nose pins, tattooing, and other permanent status markers became irrelevant after the population loss and social changes that followed contact. Some labrets were depicted by drawings made of Kodiak people during the early 19th century, but they are quite small, and often worn in a row and with short strings of beads attached. Evidently labrets at that time were worn mostly by women (Davydov 1977). Anthropomorphic masks collected in the 19th century by Vosnesenski and Pinart (Lipshits 1955; Lot-Falck 1957) were depicted wearing large labrets, although the practice among living Alutiiq ceased nearly a century before.

The physical pain involved in the initial incision of the labret hole must have been considerable. The ethnographic literature provides conflicting information on the age at when labrets were installed. During the 19th century, Bering Sea Eskimos cut labret holes at the conclusion of puberty in recognition of the passage to adulthood (Nelson 1899:48; Spencer 1959:241). In the late 19th century, most Bering Sea Eskimo men were still being fitted with labrets. From his informants, Nelson (1899:48), was able to describe how a young man was fitted with a labret:

> The hole is made just below each corner of the mouth and at first a long, thin, nail-like plug of ivory, about an inch in length, having a slight enlargement at the inner end, is thrust through the opening and left for some time. After the wearer becomes accustomed to this, a somewhat larger plug is made...and inserted in the hole for the purpose of enlarging it. The process is repeated, a larger plug being used on each occasion until the hole is of the size desired. In many cases it is so large that the teeth are visible through the opening when the labret is not in place.

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During the historic period, labrets were adopted by Athapaskan speakers who were in regular contact with the Yupik (Keddie 1989). In Osgood's notes on Ingalik material culture, he observed that labrets were not a mark of wealth among the Athapaskan speaking Ingalik, but considered attractive adornment and that the prestige was acquired from the pain endured when the labret holes were cut (1970:286). Osgood (1970:286), provides the most vivid description of this experience:

> The young man sits on the floor with his legs out. Three men hold his head. The cutting is done by an experienced man...After the holes are cut, labret plugs are put in to keep them from closing up. The chin is wrapped up with a piece of tanned skin and the young man goes to stay in the corner underneath the bench in the kashim until he recovers. This takes about three weeks during which he eats no hot food... The boy's face swells up from the cutting. Should he suffer so much as to remove the labret plugs, his father, who comes to see how the wound is healing, will then force him to be cut again. This hurts worse than ever. It is said that the boy stays under the bench in the kashim because others would laugh at him for his swollen face.

Osgood also noted that the Ingalik cut labret holes to full size, without using intermediate stretchers. However, the labrets he illustrates indicates that they required an incision of only 1-2 cm (1970:286). Only three 'starter' labrets, as described by Nelson, were found at Karluk One. Most of the smaller labrets required a labret hole at least 2-4 cm wide. It is likely that the Koniag initial incision experience was at least as harrowing as that of the Ingalik. Acquiring prestige through a public demonstration of resistance to pain was mentioned by Russian observers (Davydov 1977:158) and may have

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some relevance to understanding the relationship between labrets and status among the Koniag.

Philomena Knecht suggests that physical changes in the muscles of the face associated with the installation and use of labrets may have, in on respect, had a positive effect on Native health (personal communication, 1988). Eskimo-Aleut peoples have unusually short Eustachian tubes, primarily because the large mandible that also typifies the Eskimo-Aleut populations (Heathcote 1986, Stewart 1933). The Eustachian tube leads from the tympanic cavity in the middle ear to the posterior nasal cavity. The tube is normally closed, but when swallowing or yawning, muscles stretch the tube opening and allows air to flow between the throat and tympanic cavity. This brings the pressure inside the middle ear into equilibrium with surrounding atmospheric pressure. Ideally, the intermittent opening of the Eustachian tube through swallowing maintains nearly ambient pressures. However colds, or inflammation of the Eustachian tube can effectively block this function (Bunting 1968; Greene 1933; McGurkin 1961).

The short length of the Eustachian tube in Eskimo-Aleut populations makes them especially susceptible to ear problems. This is readily attested to by physicians at the Kodiak Area Native Association medical clinic, which treats Native patients from Kodiak Island's six Native villages. Ear diseases are endemic in Alaska Native populations. In fact, otitis media, a degenerative ear disease, is the 2nd most frequent cause of morbidity in Aleuts, Eskimos, and Indians (Maynard et. al 1972). Eskimo infants being bottle fed in a prone position accumulate unswallowed milk. It can then be coughed into the short eustachians which become quickly inflamed, subsequently causing an inner ear infection. At least 38% of Eskimo infants

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in western Alaska suffer from otorrhea (inflammation) during the first year of life (Maynard et al. 1972).

In examining prehistoric skulls of adult Native Americans, J.B. Gregg (1933), found abundant evidence of chronic ear disease. Irritations left visible traces of bony buildup in the ear canals of prehistoric crania that would have caused painful ballooning of the Eustachian tube when these people were alive. Stewart (1979:268) found 15 examples of cholesteatoma in a study of Aleut and Eskimo skulls. Zimmerman recorded evidence of chronic otitis media and mastoiditis in an autopsy of an Aleut mummy (Fortuine 1989:67; Zimmerman 1981). Eskimo, Aleut, and Alaska Indians have differently shaped ear canals in the skull when compared to other Native Americans; according to Stewart (1933:491):

> Between the middle ear and the external porus the external auditory meatus may take the form of a more or less cylindrical tube, or may become funnel shaped, especially in the outer half. In California Indians these forms may be further modified by the presence of exostoses [tumor on bone surface]. Among the Eskimos, Aleuts, and Alaskan Indians exostoses almost never occur. However, individuals in the latter groups may present a degree of hyperostosis such that the meatus becomes more and more constricted from within outward, with the floor sloping upward...It will be noted that high percentages of tube-like and slightly funnel shaped meatus occur among the Eskimos and related Indians, while the tube-like form is missing and the slightly funnel shaped meatus occurs infrequently among California Indians.

In examining the external auditory meatus, or ear canal of Eskimo skulls, Stewart concluded that "..in the Eskimo the thickening of this part of the bone often exceeds that seen in other races, while the meatus is then

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correspondingly constricted so as to suggest interference with function" (1933:481).

In summary, the shortened ear passage causes problems in equalizing pressure, particularly in response to the great variations in atmospheric pressure experienced by Alaskans. There is fairly widespread agreement in the medical literature that periods of variable weather, rather that temperature, are the predisposing factor in the development of middle ear infections (Suehs 1952:998-1027). Chewing and swallowing acts on certain muscles that help relieve pressure in the middle ear. The external pterygoid muscles pull the condyle of the mandible forward in triggering this action. This is also the place where labrets are installed.

In cutting labret holes Simpson (Simpson 1875: 239-40, Dall 1882:92) noted that "dilation takes place in the direction of the fibers of the muscle surrounding the mouth". In other words, labrets served to accentuate, not defeat the muscles needed to equalize pressure in the middle ear. Ethnohistoric descriptions of labret wearing Natives nearly always mention the distortion of the face caused by the weight of the labret pulling down the lip and jaw. In historic photographs and drawings of Alaska Natives wearing labrets, their mouths are nearly always slightly open (see Emmons and de Laguna 1991: 238, 247, 264; Nelson 1899: Plate XIII, Figure 9, Figure 10).

The distribution of labrets in North America corresponds with both the distribution of the cranial-Eustachian traits described by physical anthropologists, and with areas of intense weather systems. The world wide distribution of labrets; including Central America, the Amazon, Central Africa, and tropical India (Keddie 1980), corresponds with regions characterized by some of the most intense low pressure systems on Earth. The first appearance of labrets 3700-3500 years ago in the Aleutians and

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Kodiak corresponds with weather fluctuations in the Neoglacial period that triggered expansion in Kenai glaciers around 3600 years B.P. (Mann, 1994; Wiles 1992). Again, labrets fell in disuse in the northern and southern extremes of their range; they were only adopted by the Eskimos north of the Alaska Peninsula again shortly after A.D. 1400, which also happens to be the period of climatic fluctuation known to the literature as the little ice age.

There is no doubt that more evidence is needed to clarify the relationship between labret use to the physiology of Alaska Natives, however the possibilities are intriguing. The idea is not entirely unexplored, however. Chinese acupuncturists place the acupuncture points for the inner ear precisely on the two points below the lip where Alaska Natives wore twin labrets.

Labrets and Social Information

As previously mentioned, labrets in anthropological literature are associated with the conveyance of social information, primarily about the status of the wearer. However, few details are provided except that labrets reflect the age-grade, and to some extent signal the social rank of the wearer. Among the Tlingit, George Emmons (Emmons and De Laguna 1991:245) recorded that:

> The medium sized ones, shaped like a spool and universally worn by women of middle age and low rank, just filled the aperture of the lip, and projected very little. These were of bone, ivory and marble. The largest labrets were made out of wood for the sake of the lightness...These were worn by older women of high rank. The labret was never removed in the presence of strangers. Slaves were not allowed to wear labrets .

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De Laguna notes that 18th century observers in the Northwest Coast culture area noted that all married women wore labrets, and that there was a relationship between the size of the labret and the social rank of the wearer "..It should seem, that the female who is ornamented with the largest piece of wood, is generally most respected by her friends, and by the community in general" (Emmons and de Laguna 1991:246). Among the Bering Sea Eskimo and the Ingalik of the upper Yukon, however, labrets apparently reflected attainment of adult male status. In considering which analog may best apply to the Kodiak Archipelago, it is interesting to note that several wealth and status-linked traits of the late prehistoric and historic Koniag such as spruce root hats (sometime featuring potlatch buns), use of dentalia shells, grease bowls, slavery, possible use of a cradleboard in cranial deformation, and grooved labrets were shared not with fellow Yupik speakers, but with the Tlingit. Although the Koniag developed a sophisticated culture in their own right from an Eskimo/Aleut cultural base, by the late prehistoric period they apparently adopted some aspects of the Tlingit material culture for displaying status.

The ethnographic data on the links between social information and labret use on Kodiak is scanty; according to Davydov's description of labrets, "there is a great deal of respect for the girl islander who has the most" (1977:148-149). By 1790, only six years after the establishment of a permanent Russian presence on the Kodiak Archipelago, labrets were already being discarded. Martin Sauer described the Koniag wife of a Russian officer, "She is a handsome woman, but punctured on the chin, and her under lip is perforated" (1802:173). Lisianski's (1814:195) description reflects changes that occurred after contact, driven by the subsequent collapse of Koniag social or political structures:

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> Formerly they wore strings of beads suspended from apertures in the lower lip, or else placed in these apertures small bones resembling a row of artificial teeth...while the men had a stone or bone four inches long in a cut made in the lower lip, but these embellishments are now seldom seen.

The Karluk One Labret Assemblage

A large collection of labrets, probably the largest from any single site, was recovered from Karluk One, largely due to the preservation of organic materials. Of the 128 total labrets found at Karluk One during the 1983-85 field seasons, 108 were made from wood or spruce bark. Labret use apparently peaked at the site shortly after the onset of the Little Ice Age, labrets from housefloors dating to about A.D. 1500-1600 exceed those from other contexts in stylistic variation, size range, and numbers (Chart 30). The peak in labret use may indicate that during those years a premium was placed on indicating, and perhaps proving, status as newcomers from around the Archipelago, and perhaps the Alutiiq villages of the Alaska Peninsula settled along the Karluk River.

As already discussed, the labret's role in providing social information in Koniag society is not known. Based on ethnographic analogs, labrets at least indicated age-grade, and might have also reflected real or fictive kinship affiliations. The association of birds and labrets might be clues to clan-based structures among the Koniag. Clans among the Chugach were named after sea mammals or birds (Bobby Stamp 1988). One Chugach clan with particularly low status was named after seagulls that scavenge in the wake of successful hunters and fishermen. After a generation or two, whatever social roles are signaled by labrets may have become somewhat more stabilized in

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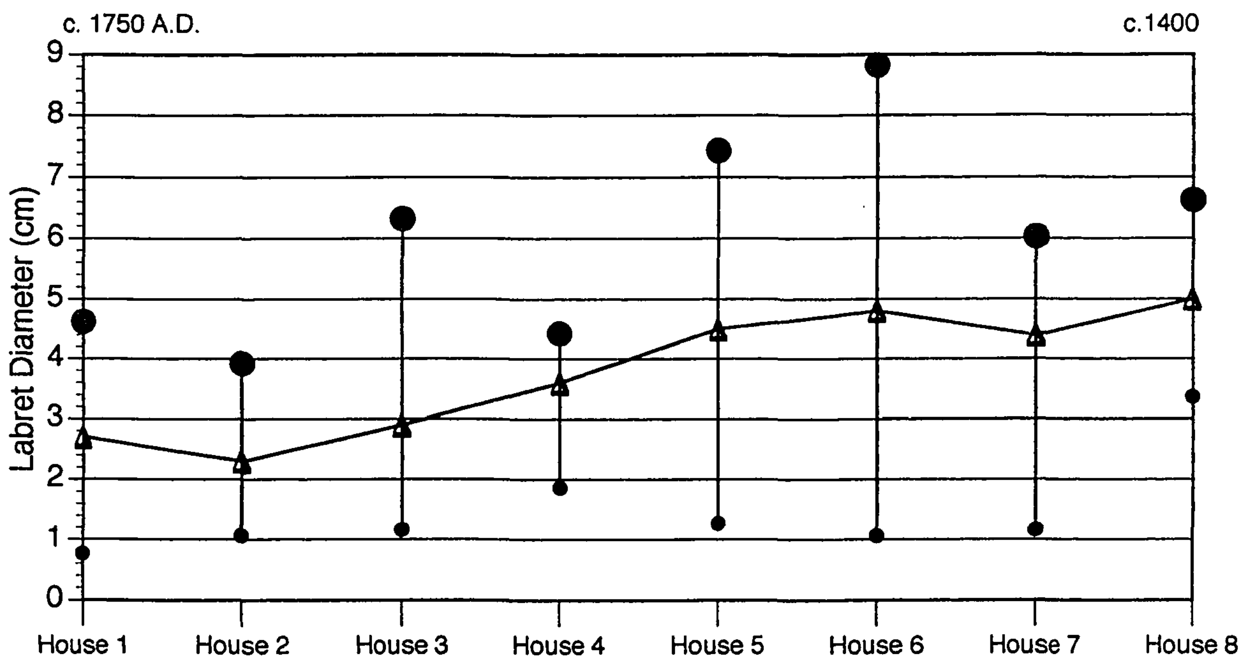
Chart 26: Range and Median Diameters of Labrets Recovered from House Floors at Karluk One.



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the larger community, and gradual shrinkage in the mean diameter of labrets continued into the historic period.

An alternative explanation is that as with labret size increases with age, the overall decline in large labrets reflects a progressively younger population as nutritional stress and other factors decreased Koniag life expectancy. This is possible, however, the decline in labret size in Table 29 (46%), would be rather extreme unless other factors, such as a late prehistoric epidemic, for which there is no evidence, were present.

Several types of labrets co-occur on the Koniag housefloors at Karluk One; they do not sort out into any recognizable pattern according to household. It is apparent from anthropomorphic figurines in the Karluk One assemblage that labrets were worn by both sexes in the Koniag phase, and different styles may have been worn by men and women. Among the Bering Sea Eskimos, labrets were sometimes curated; men would save the smaller labrets as they were replaced by progressively larger ones, perforate and string them, then present them to their wife (Nelson 1899). While such perforated labrets have not been found on sites in the Kodiak Archipelago, curation of labrets seems likely, given their high numbers, and the fact that clusters of stylistically similar labrets were found on one house floor at Karluk One, and on Kachemak housefloors at the Uyak site (Amy Steffian, personal communication 1994; MacMahon 1993). It is possible that more than one labret, or set of labrets, were made for an individual. At least one grooved labret was found at Karluk One with a strip of birch bark carefully wrapped around the groove as if to protect it during storage.

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Tabular Labrets

Table 9:2 Tabular Labrets

Catalog	Artifact Type	Material	Context
3353	Tabular labret	Bark	House floor 2
2981	Tabular labret	Bark	House floor 2
3001	Tabular labret	Wood	House floor 2
1412	Tabular labret	Wood	House floor 3
1771	Tabular labret	Wood	House floor 3
3039	Tabular labret	Wood	House floor 3
1113	Tabular labret	Wood	House floor 4
3427	Tabular labret	Wood	House 5 roof sod
1155	Tabular labret	Wood	House floor 5
1158	Tabular labret	Wood	House floor 5
3703	Tabular labret	Wood	House floor 6
3145	Tabular labret	Wood	House floor 6
2816	Tabular labret	Wood	House floor 6
3750	Tabular labret	Wood	House floor 6
3404	Tabular labret	Wood	House floor 6
3170	Tabular labret	Wood	House floor 6
3406	Tabular labret	Wood	House floor 6
4830	Tabular labret	Wood	House floor 6
3782	Tabular labret	CW Bark	House floor 6
4815	Tabular labret	Wood	House floor 6
4080	Tabular labret	Wood	House floor 6
4818	Tabular labret	Wood	House floor 6
4819	Tabular labret	Wood	House floor 6
4820	Tabular labret	Wood	House floor 6
4822	Tabular labret	Wood	House floor 6
4827	Tabular labret	Wood	House floor 7
2037	Tabular labret	Wood	House floor 7
2874	Tabular labret	Wood	House floor 7
5471	Tabular labret	Wood	House 7 wall sod
2870	Tabular labret	Wood	House floor 7
5998	Tabular labret	Wood	House floor 8

There are twenty-nine wood and five cottonwood bark tabular shaped labrets with a wide encircling flange in the Karluk One assemblage (Plate 133: A-gg). The retaining flange on this type of labret is wider than any other type of labrets encountered at the site.

Tabular labrets are rectangular to tombstone-shaped, and feature a wide, even basal flange which is gently curved in a concave shape. They are

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Plate 133

Tabular labrets

Object	Description	Catalog #
A	Tabular labret, wood	193/3427
B	Tabular labret, wood	193/1113
C	Tabular labret, wood	193/2870
D	Tabular labret, wood	193/3750
E	Tabular labret, wood	193/3709
F	Tabular labret, wood	193/1158
G	Tabular labret, cottonwood bark	193/5998
H	Tabular labret, cottonwood bark	193/6793
I	Tabular labret, cottonwood bark	193/3353
J	Tabular labret, wood	193/1771
K	Tabular labret, wood	193/1412
L	Tabular labret, wood	193/3170
M	Tabular labret, cottonwood bark	193/2037
N	Tabular labret, wood	193/3353
O	Tabular labret, wood	193/4080
P	Tabular labret, wood	193/2874
Q	Tabular labret, wood	193/6706
R	Tabular labret, wood	193/3169
S	Tabular labret, wood	193/4827
T	Tabular labret, wood	193/3404
U	Tabular labret, wood	193/2816
V	Tabular labret, wood	193/4830
W	Tabular labret, cottonwood bark	193/3039
X	Tabular labret, wood	193/2987
Y	Tabular labret, wood	193/3145
Z	Tabular labret, cottonwood bark	193/3782
AA	Tabular labret, wood	193/4822
BB	Tabular labret, wood	193/5471
CC	Tabular labret, wood	193/4820
DD	Tabular labret, wood	193/3406
EE	Tabular labret, wood	193/3039
FF	Tabular labret, wood	193/4818
GG	Tabular labret, wood	193/4815

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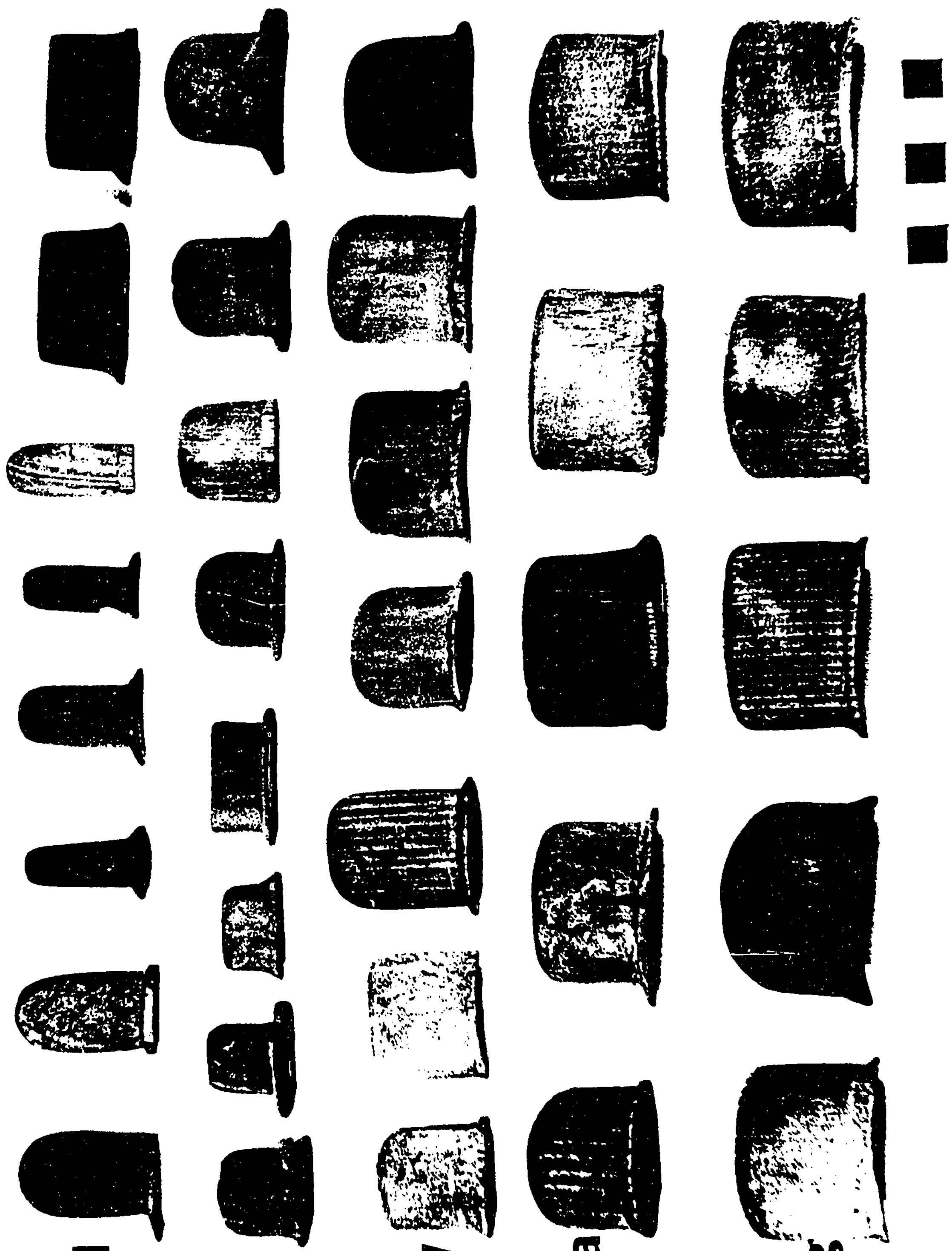

A-H

I-P

Q-W

X-aa

cc-gg

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flattened oval in cross-section, and range in size from 2.2 to 5.2 cm in maximum diameter. Two specimens retain traces of red paint. At Karluk One, tabular labrets were found in contexts dating between after 1400 A.D.

Keddie (1980) has suggested a descriptive typology for labrets; medial labrets were worn immediately below the lip, while lateral labrets were worn at the corners of the mouth. Keddie's suggestion is logical, however, it is not always easy to operationalize. It is sometimes difficult to tell exactly where some labrets were worn. Tabular labrets are a case in point. At least one anthropomorphic figurine from Karluk One is wearing a tabular labret medially. However, some of the tabular forms have asymmetrical flanges, suggesting that they were worn in matching pairs. It is not known whether the Koniag wore lateral and medial labrets in conjunction, however, ethnohistoric observations of multiple labrets suggests they might have.

Grooved Labrets

Table 9:3 Grooved Labrets

Catalog	Artifact Type	Material	Context
995	Grooved labret	Wood	House 1 roof sod
3471	Grooved labret	Wood	House 2 wall sod
1373	Grooved labret	Wood	House floor 2
723	Grooved labret	Wood	House floor 2
1097	Grooved labret	Wood	House floor 3
3095	Grooved labret	Wood	House 5 roof sod
4021	Grooved labret	Wood	House 5 roof sod
4218	Grooved labret	CW Bark	House floor 5
1988	Grooved labret	Wood	House floor 5
4042	Grooved labret	Wood/tooth	House floor 5
4638	Grooved labret	Bark	House floor 5
4061	Grooved labret	Bark	House 6 wall sod
3730	Grooved labret	Wood	House floor 6
3806	Grooved labret	Bark	House floor 7
6885	Grooved labret	Wood	House floor 7
2864	Grooved labret	Bark	House floor 7
5163	Grooved labret	Wood	House floor 7
5169	Grooved labret	Wood	House floor 7
5529	Grooved labret	Wood	House floor 8

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Fifteen wooden and eleven cottonwood bark labrets have been classified as grooved labrets, based on an encircling groove which defines the flange (Plate 134: A-R). Depictions on Koniag anthropomorphic figurines, masks and petroglyphs suggest that these labrets were worn laterally in pairs, beginning at the corner of the mouth and slanting upward into the cheek. Some, however are symmetrically oval in shape, and strongly resemble medial labrets worn historically by women along the Northwest Coast. De Laguna (1975:205) has suggested that lateral labrets may be unique to Eskimo cultures.

Grooved labrets have the largest diameter of the labret types in the Karluk One assemblage, ranging from 4.1 to 11.1 cm in diameter. Width along the short axis of the grooved cheek labrets ranges from 1.4 cm to 4.4 cm. The largest specimen, 11.1 cm long, and 3.1 cm wide, is a finely carved hardwood piece that has a long horizontal groove on the central outer surface, which was filled with traces of red pigment when first encountered (Plate 134: R). Another unique specimen of grooved cheek labret has an oval perforation at its center which may have originally contained an inset of some sort, and still retains a sea otter molar inset on its surface (Plate 134: M).

Labret Hole Stretchers

Table 9:4 Labret Hole Stretchers

Catalog	Artifact Type	Material	Context
3363	Labret hole stretcher	Cottonwood bark	House 2 wall sod
2595	Labret hole stretcher	Alder wood	House floor 3
2819	Labret hole stretcher	Alder wood	House floor 6
918	Labret hole stretcher	Cottonwood bark	House floor 7
5160	Labret hole stretcher	Cottonwood bark	House floor 7
920	Labret hole stretcher	Cottonwood	House floor 7
5221	Labret hole stretcher	Wood	House floor 8
6057	Labret hole stretcher	Cottonwood bark	House floor 8

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Stretchers were worn temporarily in labret holes when a larger sized labret was desired. A series of progressively larger stretchers was worn until the labret hole expanded to the desired size. Osgood recorded the use of such temporary 'plugs' among the Ingalik, which were used to keep fresh incisions from closing up. The finished labret was worn after healing had taken place. Karluk One labret hole stretchers may also have functioned this way. However they are four to six cm long, which would represent a grimly long initial incision, or even a pair of incisions.

The stretchers resemble grooved labrets but they are only flanged, or grooved, on one end. In addition, they were fairly crudely made from soft, easily carved woods, such as cottonwood, cottonwood bark, and alder, identified because the bark had been left on. The choice of these materials may represent more than an attempt to economize on an item used only briefly. Tree bark contains tannic acid which may have aided in the process by toughening the skin around a labret hole. An old outdoorsman's remedy for a blistered foot is to place a used tea bag against the blister for a few hours; the tannic acid in the tea toughens the tender skin enough to walk without further damage. As such, the bark on the labret stretchers may have helped make the process of enlarging or installing a labret hole more bearable. It is worth noting that bark was also used to make some of the nail shaped 'starter' labrets found at Karluk One.

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Plate 134

Grooved labrets and labret hole stretchers

Object	Description	Catalog #
A	Labret hole stretcher, cottonwood bark	193/5160
B	Labret hole stretcher, cottonwood bark	193/5221
C	Labret hole stretcher, alder wood	193/723
D	Labret hole stretcher, cottonwood bark	193/2864
E	Labret hole stretcher, cottonwood bark	193/918
F	Grooved labret, cottonwood	193/6885
G	Grooved labret, wood	193/3808
H	Grooved labret, wood	193/3730
I	Grooved labret, wood	193/1097
J	Grooved labret, cottonwood bark	193/4218
K	Grooved labret, wood	193/6825
L	Grooved labret, cottonwood	193/4021
M	Grooved labret, wood with inset sea otter molar	193/4042
N	Grooved labret, cottonwood bark	193/995
O	Grooved labret, wood	193/3095
P	Grooved labret, wood	193/4638
Q	Grooved labret, wood	193/4061
R	Grooved labret, wood	193/3471

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A-E F-J K-N O-R

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Lateral Ovoid Labrets

Table 9:5 Lateral Ovoid Labrets

Catalog	Artifact Type	Material	Context
3311	Labret; lateral ovoid	Wood	House 1 roof sod
2935	Labret; lateral ovoid	Wood	House floor 1
692	Labret; lateral ovoid	Wood	House floor 1
4155	Labret; lateral ovoid	Wood	House floor 3
2774	Labret; lateral ovoid	Wood	House floor 4
2782	Labret; lateral ovoid	Wood	House floor 4
846	Labret; lateral ovoid	Wood	House 5 roof sod
5447	Labret; lateral ovoid	Wood	House floor 6
5153	Labret; lateral ovoid	Wood	House floor 6
3757	Labret; lateral ovoid	Wood	House floor 6
894	Labret; lateral ovoid	Wood	House floor 6
889	Labret; lateral ovoid	Wood	House floor 6
890	Labret; lateral ovoid	Wood	House floor 6
893	Labret; lateral ovoid	Wood	House floor 6
3776	Labret; lateral ovoid	Wood	House floor 6
891	Labret; lateral ovoid	Wood	House floor 6
892	Labret; lateral ovoid	Wood	House floor 6
913	Labret; lateral ovoid	Wood	House 7 roof sod
4079	Labret; lateral ovoid	Wood	House floor 7
3198	Labret; lateral ovoid	Wood	House floor 7
2039	Labret; lateral ovoid	Wood	House floor 7
4925	Labret; lateral ovoid	Wood	House floor 7
5475	Labret; lateral ovoid	Wood	House floor 7

Twenty-six wood labrets were also worn laterally in pairs in the cheek or under the corners of the mouth (Plate 135: A-V). These labrets are oval or egg-shaped and unevenly flanged, although the flange encircles the entire labret. The base on these specimens is flat. Eight of the ovoid labrets have a central ridge running the length of the top surface. They range from 3.2 to 7.2 cm in diameter. This form of labret protrudes further from the face than others in the collection, from about 1.3 to 3.1 cm. One of these labrets was found with a strip of birch bark carefully wrapped around its groove, probably for protection during storage (Plate 135: G). Seven of the ovoid labrets were found in a cluster in the southeast corner of house 6 with a pair of labret pre-

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forms. Two of the finished oval labrets (Plate 166;P,-Q), were made from the same piece of wood. Examination of the wood grain indicates that the bases of the labrets were originally joined.

End Flanged Labrets

Table 9:6 End-flanged Labrets

Catalog	Artifact Type	Material	Context
2872	Labret;end flanged	Bark	House floor 7
6418	Labret;end flanged	Wood	House floor 8
6459	Labret;end flanged	Wood	House floor 9A

Two labrets made of dense wood, possibly pacific yew, are flanged at the two ends and are rectangular in cross-section (Plate 136: X-Y). Clark (1974:131) suggested that end-flanged labrets probably pre-dated labrets with an encircling flange or groove. This observation is supported by the Karluk One data, which indicates that end-flanged labrets apparently fell into disuse sometime after A.D. 1600. A cottonwood bark labret with poorly defined end flanges is crudely made and may be unfinished (Plate 136: V).

Wing-Shaped Labret

An incomplete wing-shaped wooden labret (Plate 136: U) is reminiscent of a specimen illustrated by Lisianski ( ). It is missing one wing, but assuming symmetry, would have been at least 8 cm wide when complete. The flange is oval and 2.3 cm in diameter. The labret retains much of its original red surface paint.

Wooden Labret Preforms

Two flat, slightly ovate, wood cylinders found in association with a cluster of eight ovate lateral labrets on house floor 6, have been carefully

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Plate 135

Lateral ovoid labrets

Object	Description	Catalog #
A	Ovoid labret, wood	193/4925
B	Ovoid labret, wood	193/4079
C	Ovoid labret, wood	193/413
D	Ovoid labret, wood	193/5475
E	Ovoid labret, wood	193/4153
F	Ovoid labret, wood	193/2774
G	Ovoid labret, cottonwood, with birch bark wrapping	193/2792
H	Ovoid labret, wood	193/692
I	Ovoid labret, cottonwood	193/3311
J	Ovoid labret, wood	193/3757
K	Ovoid labret, wood	193/6707
L	Ovoid labret, wood	193/5447
M	Ovoid labret, cottonwood	193/3172
N	Ovoid labret, cottonwood	193/892
O	Ovoid labret, wood	193/889
P	Ovoid labret, wood	193/873
Q	Ovoid labret, wood	193/7763
R	Ovoid labret, wood	193/890
S	Ovoid labret, cottonwood	193/5153
T	Ovoid labret, cottonwood	193/887
U	Ovoid labret, cottonwood	193/891
V	Ovoid labret, wood	193/3170

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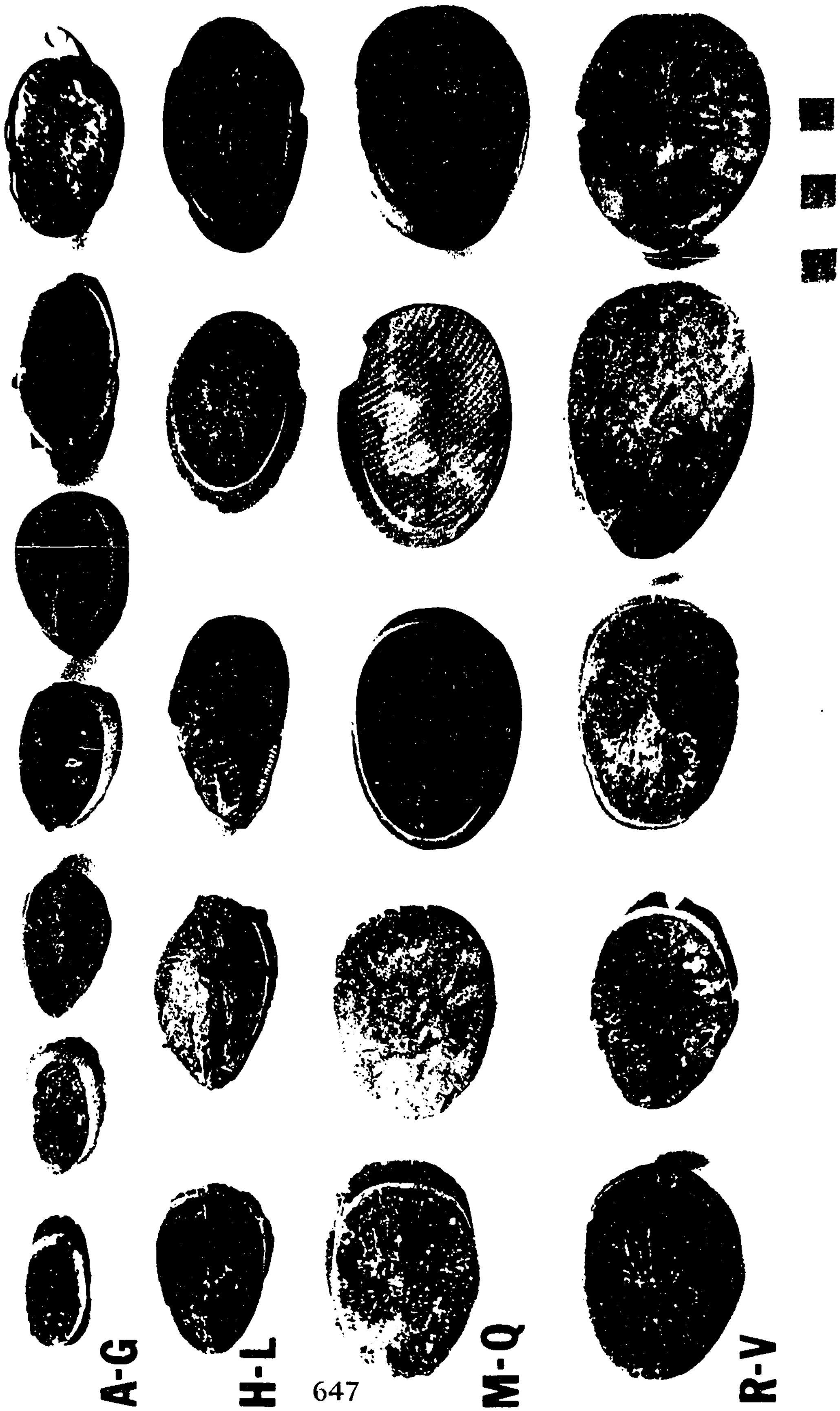

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trimmed. These specimens have been tentatively identified as labret preforms (Plate 136: Y,Z). They are 5.2 cm and 6 cm in diameter, and 3.2 cm in thick.

Starter Labrets

Three 'starter' labrets were found at Karluk One, were probably designed to keep a new incision from closing. One of these is made of bark and is nail-shaped (Plate 136: E). The flange is .9 cm wide and the labret is 2.5 cm long. Two other nail-shaped bone specimens measure 2.1 and 4.6 cm long, with flanges about .5 cm wide (Plate 136: C,D).

Five wood and three spruce bark labrets are similar to tabular labrets, but are round in cross-section, creating a spike-shaped appearance (Plate 133: B-D). They are simply carved and may have been intended as intermediate starter labrets. They range from 2.1 to 3.5 cm long, and 0.8 to 2.4 cm in diameter.

Limestone Labrets

Table 9:7 Limestone Labrets

Catalog	Artifact Type	Material	Context
6542	Labret	Limestone	House floor 6
3421	Labret	Limestone	House 7 roof sod
921	Labret	Limestone	House 7 wall sod
2859	Labret	Limestone	House floor 7
2868	Labret	Limestone	House floor 7

Two complete labrets and three labret fragments are carved of soft white material usually called limestone. In fact this material is a form of calcium carbonate generated by a species of seaweed native to the Aleutian islands. All of the limestone labrets found at Karluk One as well as similar labrets from Malina Creek appear to resemble Aleutian forms (Plate 136: O,P). One is sub-rectangular in cross-section, and flanged only on the long axis (Plate 136: P). It is 2.4 cm wide, and 2.2 cm long. Another is also sub-

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rectangular in cross-section but is rather cone-shaped (Plate 136: O). It is 1.9 cm wide and 3.5 cm long.

Ivory and Fossil Ivory Labrets

Table 9:8 Ivory and Fossil Ivory Labrets

Catalog	Artifact Type	Material	Context
3375	Labret	Ivory	House floor 1
1561	Labret	Fossil ivory	House floor 1
4316	Labret	Ivory	House floor 1
4372	Labret	Ivory	House floor 2
6881	Labret	Ivory	House floor 2
2344	Labret	Fossil ivory	House floor 3

Four labrets are carved from small ivory sea mammal teeth, probably walrus molars. Three are simply carved hat-shaped pieces, evenly flanged and range from 1.1 to 2.1 cm in diameter (Plate 136: K,M,N). Another specimen is badly weathered (Plate 136: L), and was found in association with a human cranium. It was made from a tip of a whale tooth or walrus tusk, and is 2.2 cm in diameter and 2.2 cm high. The ivory labrets are typical of those worn by historic Bering Sea Eskimos, and may be non-local forms

Two fossil ivory labrets, like others made from non-local materials in the Karluk One collection, seem stylistically atypical of the Kodiak Archipelago. One is oval in cross-section, with a pair of broken tusk-like protrusions on the top surface. It resembles Aleutian specimens (Plate 136: A), and is 3.1 cm in diameter. A smaller specimen has a wedge-shaped projection and a small oval base (Plate 136: B). It is 1.2 cm in diameter and 1.9 cm long.

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Plate 136

Miscellaneous labrets and labret preforms

Object	Description	Catalog #
A	Labret with twin projections; fossil ivory	193/2344
B	Labret, ivory	193/1561
C	Starter labret, bone	193/1611
D	Starter labret, bone	193/1372
E	Starter labret, cottonwood bark	193/2703
F	Spike labret, wood	193/3935
G	Small tabular labret, cottonwood bark	193/4701
H	Spike labret, wood	193/2981
I	Spike labret, wood	193/1664
J	Spike labret, wood	193/2694
K	Labret, walrus molar	193/4372
L	Labret, tooth (cetacean?)	193/3488
M	Labret, walrus molar	193/6881
N	Labret, ivory	193/4316
O	Labret, limestone	193/2859
P	Labret, limestone	193/2868
Q	Labret, antler	193/2959
R	Labret, antler	193/4188
S	Labret with perforated projections, antler	193/2475
T	Grooved labret fragment, jet	193/4909
U	Spike labret, jet	193/1840
V	Wing shaped labret fragment, wood w/red paint	193/2113
W	Labret, cottonwood bark	193/2872
X	End-flanged labret, wood	193/6459
Y	End-flanged labret, wood	193/6418
Z	Labret preform, wood	193/3810
AA	Labret preform, (top view), wood	193/4968

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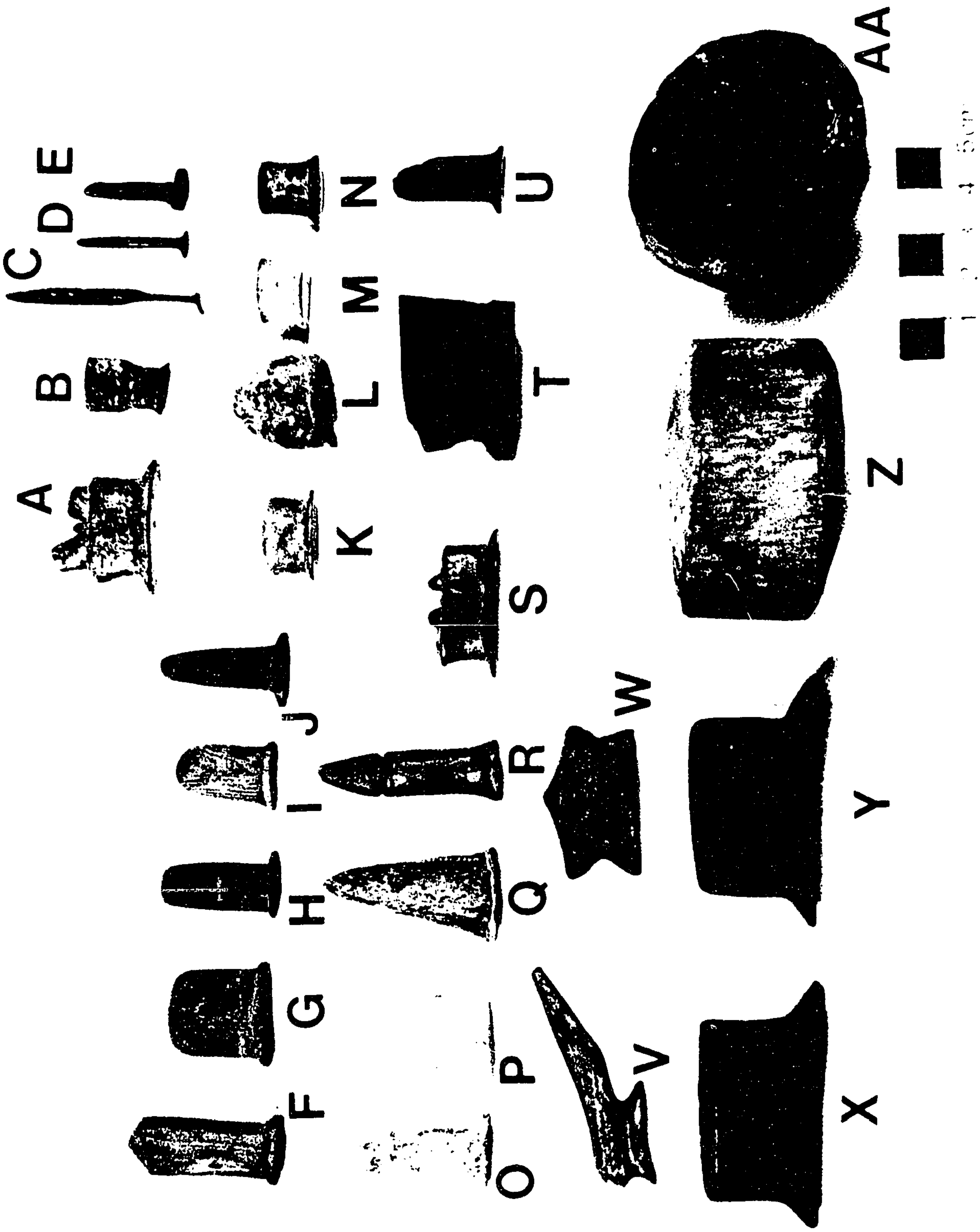

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Antler Labrets

Table 9:9 Antler Labrets

Catalog	Artifact Type	Material	Context
2959	Labret	Antler	House 1 roof sod
4188	Labret	Antler	House floor 3
2475	Labret	Antler	House floor 5

Three antler labrets like other antler artifacts and fragments from Karluk One, is probably made from Alaska Peninsula caribou. Two are antler tine tips, which have a slight flange at the base (Plate 112: Q, R). One has an additional encircling groove near the tip (Plate 112: R). They measure 4 and 4.2 cm long. A third antler labret is oval is cross-section (Plate 112: S). It originally had four small perforated projections on its top surface, two of which are intact. These projections probably held strings of beads as illustrated in small labrets from the historic period. It is 3.4 cm in diameter.

Jet Labrets

Table 9:10 Jet Labrets

Catalog	Artifact Type	Material	Context
6821	Labret	Jet	surface/erosion face
1840	Labret	Jet	House floor 1
1160	Labret	Jet	House floor 5
4909	Labret	Jet	House floor 7

Jet Labrets and other ornaments are common in Kachemak phase assemblages (Steffian 1992) and continue to be used to a lesser extent through the Koniag and even historic period (Knecht and Jordan 1985). Three jet labret fragments and one complete jet labret were found at Karluk One. One specimen is identical to the round spike labrets made of wood described above (Plate 136: U). It is 1.6 cm wide and about 2.5 cm long. About half of a fragmentary jet labret is flat-based , and appears to have been a larger, grooved

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cheek type (Plate 136: T). It is 2.7 cm thick, and when complete would have measured at least 7 cm in maximum diameter. Two additional jet labrets of uncertain form were represented by fragments.

Nose Pins

Table 9:11 Nose Pins

Catalog	Artifact Type	Material	Context
4707	Nose pin	Wood	House floor 1
4429	Nose pin	Wood	House floor 4
1665	Nose pin	Wood	House floor 6
5220	Nose pin	Wood	House floor 8

Four carefully carved wooden prongs are tentatively identified as nose ornaments, intended to be worn through a perforated nasal septum (Plate 136: K-M). These artifacts are slightly curved, taper to points at either end, and oval in cross-section. They range from 5.2 to 8 cm long and from 0.4 to 0.5 cm in diameter. Tikhenov illustrated 19th century Alutiiq wearing nose pins in several of his water colors (Fitzhugh and Crowell 1989:).

Beads

Table 9:12 Beads

Catalog	Artifact Type	Material	Context
56	Bead	Amber	surface/erosion face
387	Bead	Amber	Disturbed
2177	Bead	Limestone	House floor 1
4338	Bead	Amber	House floor 1
1184	Bead	Jet	House floor 6

Three beads found at the site are made from dark, translucent amber. Only one was found in a clear prehistoric context. Similar amber beads were found in association with a Karluk barabara dating from the 1840s (Knecht and Jordan 1985). Amber was recovered in small quantities on the beaches of small islands at the south end of Kodiak. They were a highly valued item,

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Chart 27: Changes in Labret Styles and Numbers at Karluk One after 1400 A.D.

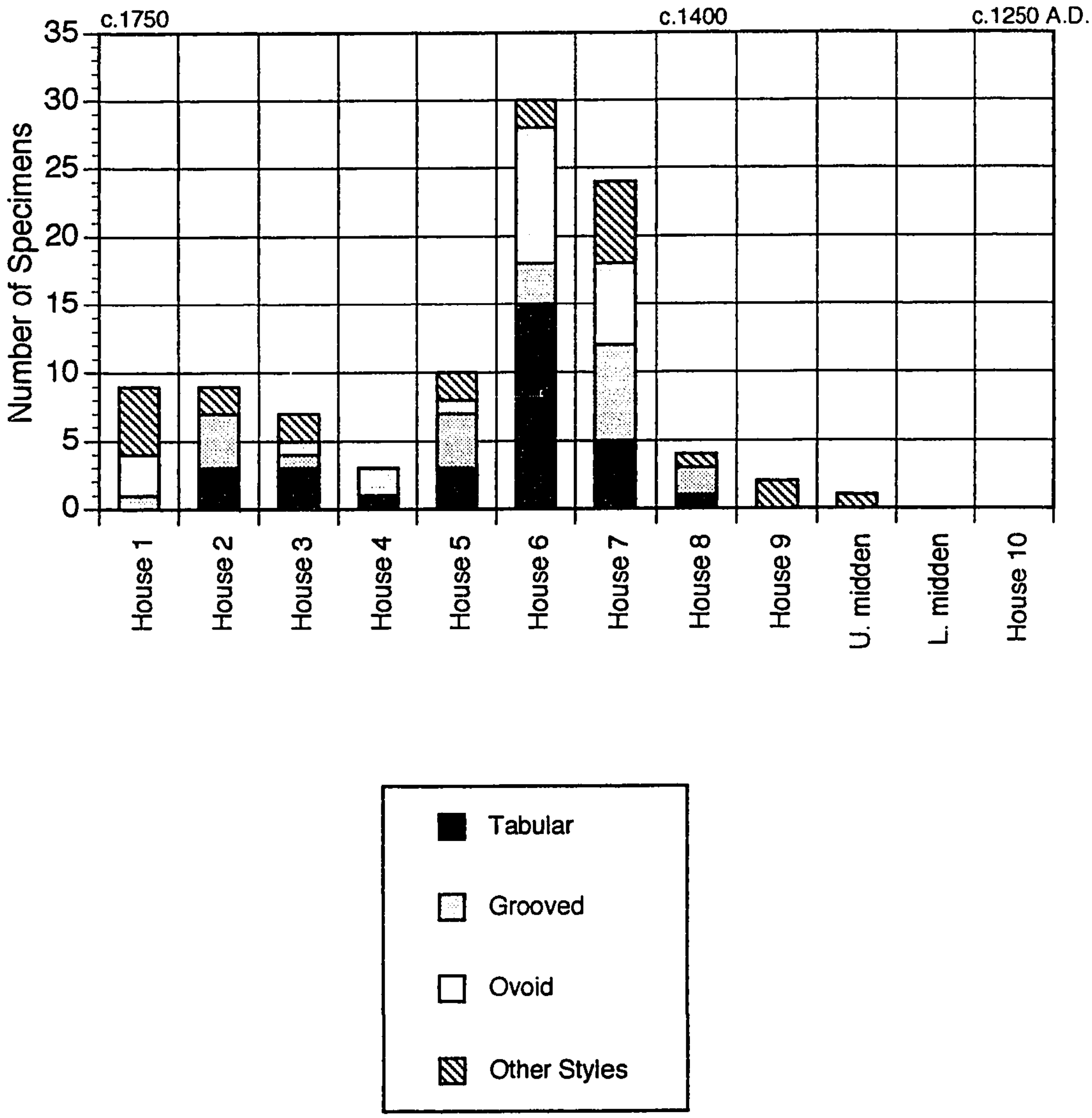

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Plate 137

Miscellaneous ornaments

Object	Description	Catalog #
A	Bird bone tube	193/2167
B	Bird bone tube	193/2304
C	Bird bone tube	193/3838
D	Bird bone tube	193/4903
E	Bird bone tube	193/5283
F	Bird bone tube	193/
G	Bead, limestone	193/2177
H	Bead, jet	193/1184
I	Bead, amber	193/56
J	Bead, amber	193/387
K	Nose pin, wood	193/1665
L	Nose pin, wood	193/4707
M	Nose pin, wood	193/5520

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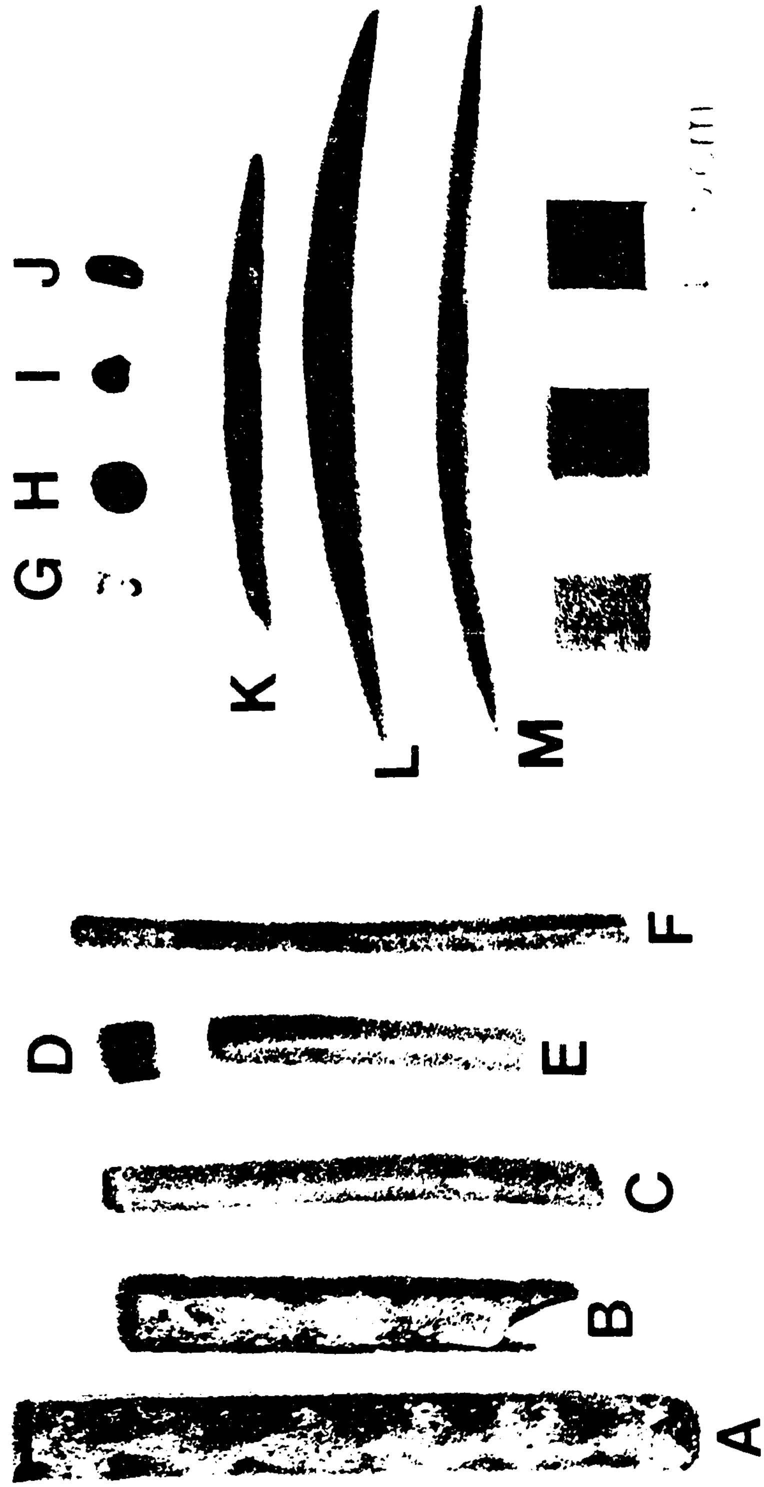

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during the contact period lighter colored amber preferred over the darker type (Gideon 1989:41; Lisianski 1814:195). According to Merck (1980:193), amber was called *amat* . A useful characteristic of amber is that it is sometimes is light enough to float on sea water, and was reported to have been abundant on shorelines after an earthquake, probably from offshore fossil deposits lying off the south end of the Archipelago.

One amber bead is ground into a cylindrical shape .7 cm long and 0.3 cm in diameter (Plate 137: J). It is perforated by a tiny bi-conical hole through the long axis. The amber bead from housefloor 1 appears to have been made by simply perforating an otherwise unmodified tiny nodule of amber (Plate 137: I). This bead is 0.3 cm in diameter.

A single round polished jet bead is 0.5 cm in diameter (Plate 137: H). Jet beads and labrets are much more common in Late Kachemak sites (Steffian 1992), however some jet jewelry was used until the mid-19th century (Knecht and Jordan 1985). A round bead of soft white 'limestone', the same material used in manufacturing labrets, is 0.5 cm in diameter (Plate 137: G).

Artifacts Associated with Ritual and Ceremony

Koniag Ceremonialism

Full-sized masks, miniature masks, mask hoops, mask attachments, and drum parts in the Karluk One assemblage reflect an increase in public ceremonialism during the Late Koniag period (Chart 28). Ceremonialism was done in a festive context and included the entire community in feasting, dancing, and song. This bound the community together by ratifying common belief systems and social roles of the participants (Donta 1993; Jordan 1989; Lantis 1947). Some mythological religious symbolism was shared by the Yupik and Alutiiq. An image of the Yupik sea-monster *palraiyuk* (Nelson

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1899:445) can be seen on a ethnographic sealskin float from Kodiak at the Museum of Archaeology and Ethnology in St. Petersburg (Fitzhugh and Crowell 1988:157). It is also depicted on the Alitak petroglyphs (Knecht field notes 1992). Mask hoops, mask bangles shaped like feathers, hands, and other symbols were also used in both Yupik and Alutiiq ceremonialism, reflecting their shared cultural heritage.

Despite these similarities there are differences in the masks used by Yupik and Alutiiq peoples. Yupik masks, such as those collected by Nelson, make use of a set of repeating symbols: thumbless and pierced hands, an *inua* spirit depicted as a emerging, smaller face (Fitzhugh and Kaplan 1982). Although these symbols reoccur, Yupik masks are highly individualized in appearance. Alutiiq masks, by at least A.D. 1400, much more standardized. Identical forms are represented repeatedly on both full-sized and miniature masks across the entire Alutiiq culture area. This standardized religious iconography suggests a greater and more constraining level of social integration among the Alutiiq.

Today 'masking' takes place in Alutiiq villages from January 8 through January 17, reflects the last vestige of prehistoric masking ritual, although it is now thoroughly mixed with Russian and American additions. It is a festive event with a serious side and involves some aspects of traditional, and Russian Orthodox belief systems. Participants, mostly younger people, disguise the body by using padded clothing and adopting strange and comical walks. The face is hidden under a homemade mask. Masks used today usually consists of a pillowcase tied around the neck with cut eye holes. As recently as the 1960s more elaborate masks were made using wood and fur. The voice is disguised by use of a whistle or a 'kazoo' under the mask.

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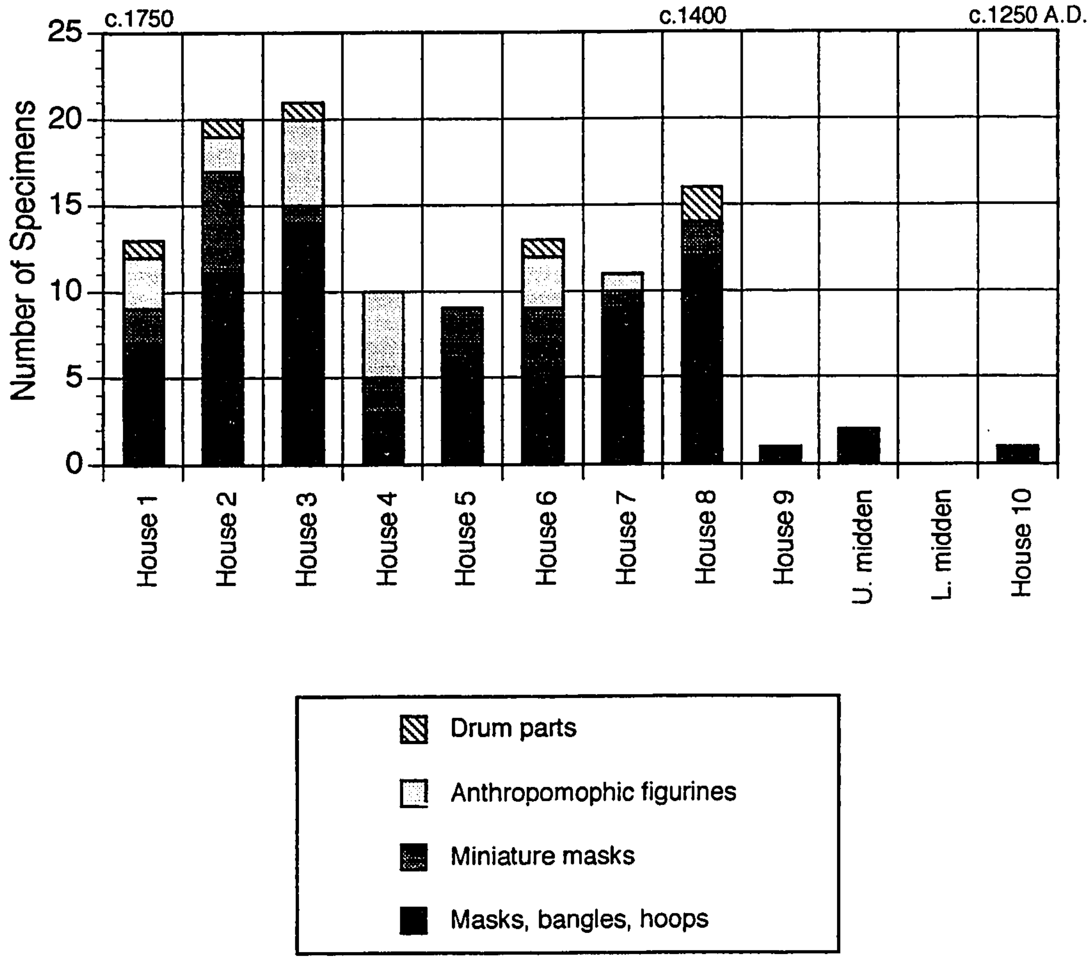
Chart 28: Artifacts Associated with Ceremony and Ritual at Karluk One



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In the Alutiiq village of Chignik Lake, on the Alaska Peninsula, dancers go from house to house accompanied by an accordion player. They dance to polka music for about an hour at each house. The hosts provide refreshments and try to guess the identity of the dancers. Anyone whose identity is revealed must unmask and quit for the night. The dancers communicate through gestures and whistles. After dancing, the dancers must immediately go to the shoreline and wash their hands and faces in the sea, "otherwise the mask will stay on." Until the 1960's, dancers went naked into the sea and cleansed themselves completely, and masks were burned or destroyed soon afterward.

The masking season, somewhat like Halloween in America, is a time when strange events can occur. Every village has a rich oral tradition describing weird events, often with multiple witnesses, that occurred during masking. In the village of Old Harbor, for example, a group of maskers had finished dancing for the night and were walking down the dark street talking amongst themselves and taking their masks off. One of the maskers said nothing, and refused to unmask. The other maskers, first curious, then alarmed, removed the mask of the mysterious stranger. There was no face behind the mask, only an empty space. They heard a scream and a bright light shot skyward leaving the empty clothing collapsed in a heap.

Wooden Masks

Masks are mentioned in passing by many historic observers. While attending a festival, Shelikhov saw "various and strange masks made from wood painted in various colors" (Desson 1988; Shelikhov 1981:55). Merck noted that face painting was common, and recorded the name *hayut* for masks (1980: 100). Today, the Alutiiq have two names for masks, *giinaruaq,*

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'like a face, but not really' and *agayullquutaq;,* 'things to hold sacred.' The figures represented by the masks held a specific place in Koniag mythology and oral literature as well. The best ethnographic data on masks is from 76 Alutiiq masks collected by Pinart in 1871-72, along with notes on their Alutiiq names and accompanying dances and songs (Desson 1988). Photographs of the masks and Pinart's notes are being analyzed by Dominique Desson in conjunction with her ongoing dissertation research at the University of Alaska Fairbanks.

Three full-sized wooden masks were found at Karluk One. A mask in the form of a short-beaked bird, possibly an owl or a puffin, was found inside a large storage box associated with housefloor two (Plate 138). This mask is 23.3 cm long, 13.8 cm wide and 8.6 cm thick. The exterior of the mask is expertly carved and very smooth, however marks left by a narrow carving tool bit, probably a rodent incisor, are present on the interior surface. There are four holes on the edge of the mask, each on the long and short axes. A hoop fragment was associated with this mask, but was no longer attached when the mask was excavated (Plate 138). The hoop is oval in cross-section and about 1.7 cm in diameter. Recognizably zoomorphic masks are rare the Alutiiq area. Although masks collected on Kodiak by Voznesenski in the 1840s that appear to be anthropomorphic, actually represent birds, or bird-men beings (Fitzhugh and Crowell 1988: 88, Figure 96, 270, 368).

A plank mask, recovered on housefloor three, is approximately fifty percent complete (much of the remaining portion of this mask was subsequently recovered during the 1987 excavations). The mask is 45.2 cm long (Plate 139). Three deeply carved holes on the obverse surface of the mask formed wood loops for attaching cordage so it could be worn. Three small holes between the eye slits may indicate that a slat of wood was pegged

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Plate 138

Bird mask and associated mask hoop

Object	Description	Catalog #
A	Bird mask, possibly an owl, wood	193/1044
B	Mask hoop fragment, wood	193/1046

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Plate 139

Plank mask fragment

Wood, Catalog # 193/3386

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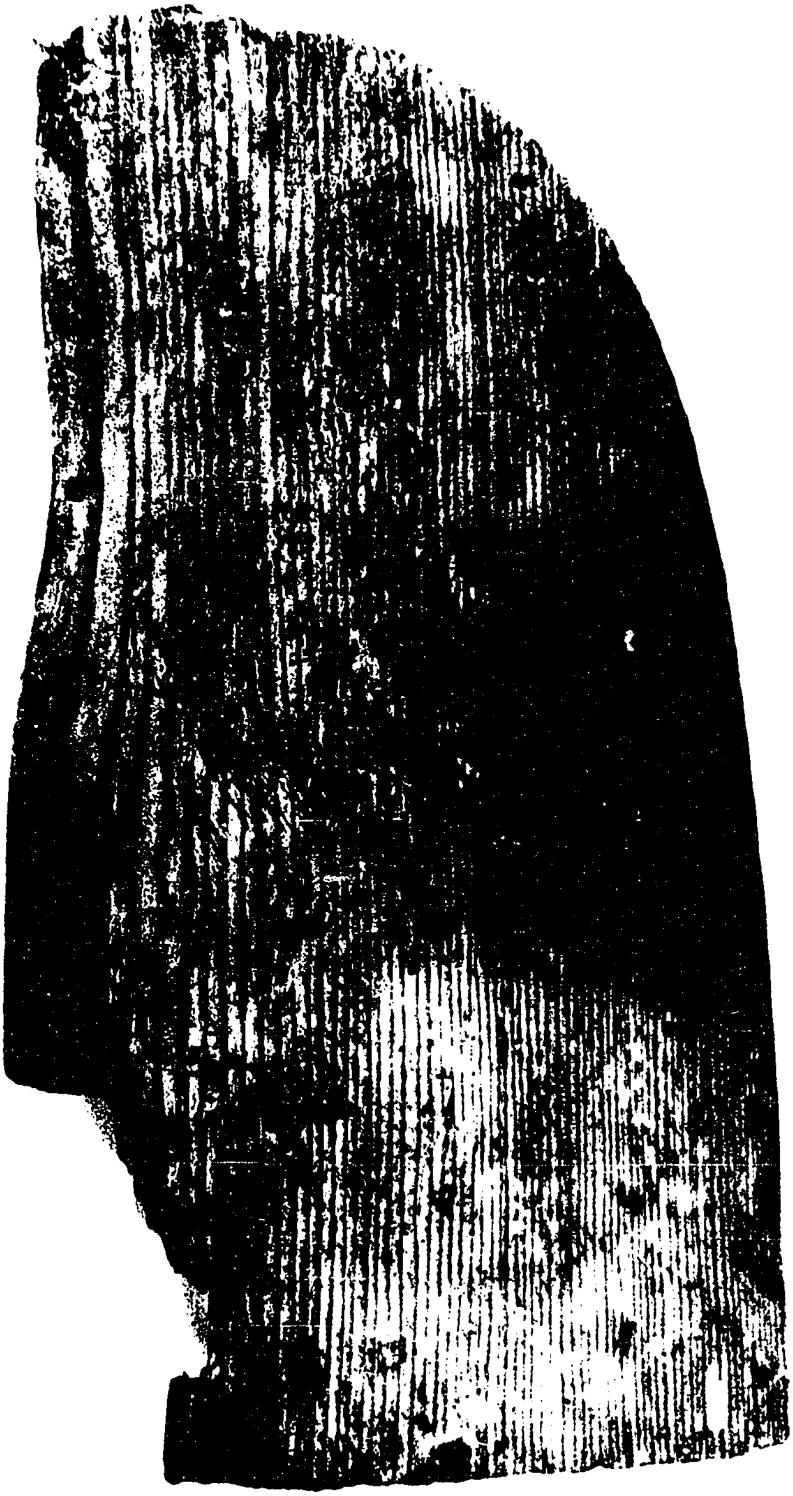

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Plate 140

Anthropomorphic mask fragments

Wood, Catalog # 193/4671

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down the center of the mask, such as seen on ethnographic specimens. Numerous small holes have been drilled around the edge of the mask, and may have been used to attach a hoop and/or mask bangles.

An anthropomorphic mask was recovered in association with an adult male burial in square 11 (Plate 140). Found near the surface of the site, this mask is poorly preserved. However, it appears to be a fairly realistic representation of a human face, possibly a portrait of the deceased. It is about 18 cm long and 10 cm wide. Long cheek labrets are represented, slanting up from the mouth. A pair of attachment holes are present on either side of the mask.

Feather Shaped Mask Bangles

At least fifty wooden mask bangles and bangle fragments represent feather-shaped mask attachments, such as those attached to the hoops of ethnographic masks such as the one Voznesenski called the 'happy fellow' (Fitzhugh and Crowell 1988:50; Lipshits 1955:Plate 141). They range from 9.8 to 23.2 cm long. Six retain red and black surface paint. Two are decorated with diagonal stripes. Two others have red geometric designs painted on with a small brush.

Fifteen fragmentary specimens represent similar mask bangles. Two retain red painting, two gray, and one is painted black with silver glitter inclusions. There are attachment notches on the cylindrical bases of many bangles.

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Table 9:13 Feather Shaped Mask Bangles

Catalog	Artifact Type	Material	Context
968	Mask bangle fragment; feather shaped	Wood	House 1 roof sod
708	Mask bangle fragment; feather shaped	Wood	House floor 1
709	Mask bangle fragment; feather shaped	Wood	House floor 1
772	Mask bangle; feather shaped	Wood	House 2 roof sod
773	Mask bangle; feather shaped	Wood	House 2 roof sod
3379	Mask bangle; feather shaped	Wood	House 2 roof sod
1021	Mask bangle fragment; feather shaped	Wood	House floor 2
1024	Mask bangle; feather shaped	Wood	House floor 2
1064	Mask bangle fragment; feather shaped	Wood	House floor 2
2571	Mask bangle; feather shaped	Wood	House 3 roof sod
2730	Mask bangle; feather shaped	Wood	House 3 roof sod
2740	Mask bangle; feather shaped	Wood	House 3 roof sod
3010	Mask bangle; feather shaped	Wood	House 3 roof sod
1404	Mask bangle; feather shaped	Wood	House floor 3
1405	Mask bangle; feather shaped	Wood	House floor 3
1420	Mask bangle fragment; feather shaped	Wood	House floor 3
1723	Mask bangle; feather shaped	Wood	House floor 3
2392	Mask bangle fragment; feather shaped	Wood	House floor 3
4633	Mask bangle; feather shaped	Wood	House floor 3
2603	Mask bangle; feather shaped	Wood	House 4 wall sod
1969	Mask bangle; feather shaped	Wood	House floor 4
2456	Mask bangle; feather shaped	Wood	House floor 4
845	Mask bangle; feather shaped	Wood	House 5 roof sod
4781	Mask bangle fragment; feather shaped	Wood	House 5 wall sod
2786	Mask bangle; feather shaped	Wood	House floor 5
3118	Mask bangle fragment; feather shaped	Wood	House floor 5
3393	Mask bangle; feather shaped	Wood	House floor 5
4829	Mask bangle fragment; feather shaped	Wood	House floor 5
3811	Mask bangle; feather shaped	Wood	House floor 6
4041	Mask bangle; feather shaped	Wood	House floor 6
4048	Mask bangle fragment; feather shaped	Wood	House floor 6
4244	Mask bangle; feather shaped	Wood	House floor 6
4495	Mask bangle fragment; feather shaped	Wood	House 7 roof sod
3186	Mask bangle; feather shaped	Wood	House floor 7
4505	Mask bangle; feather shaped	Wood	House floor 7
4826	Mask bangle; feather shaped	Wood	House floor 7
4847	Mask bangle; feather shaped	Wood	House floor 7
4923	Mask bangle; feather shaped	Wood	House floor 7
6910	Mask bangle fragment; feather shaped	Wood	House floor 7
5777	Mask bangle fragment; feather shaped	Wood	House 8 roof sod
5970	Mask bangle; feather shaped	Wood	House 8 roof sod
5973	Mask bangle; feather shaped	Wood	House 8 roof sod
5995	Mask bangle; feather shaped	Wood	House 8 roof sod
6328	Mask bangle; feather shaped	Wood	House 8 roof sod
5797	Mask bangle; feather shaped	Wood	House floor 8
6318	Mask bangle; feather shaped	Wood	House floor 8
6321	Mask bangle; feather shaped	Wood	House floor 8
5241	Mask bangle; feather shaped	Wood	House floor 9A
5115	Mask bangle; feather shaped	Wood	Upper basal midden
6472	Mask bangle fragment; feather shaped	Wood	Upper basal midden

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Miscellaneous Mask Bangles

Table 9:14 Miscellaneous Mask Bangles

Catalog	Artifact Type	Material	Context
3006	Mask bangle; wand shaped	Wood	House floor 2
3019	Mask bangle; wand shaped	Wood	House floor 2
3045	Mask bangle; paddle shaped	Wood	House floor 3
4240	Mask bangle; wand shaped	Wood	House floor 6
4248	Mask bangle; paddle shaped	Wood	House 7 roof sod
5515	Mask bangle; paddle shaped	Wood	House floor 8
6031	Mask bangle; wand shaped	Wood	House floor 8
5867	Mask bangle; wand shaped	Wood	House floor 10

Five slender wand-shaped sticks may also be mask bangles. One has a small decorative knob on the end. Another retains red surface paint. They range from 15 to 45 cm long and 0.4 to 1 cm in diameter.

Three wood mask bangles are paddle-shaped, strongly resembling those on an ethnographic mask from Kodiak that represents a bird/man (Fitzhugh and Crowell 1988; Lipshits 1955). One bangle is a flat square, about 4.3 cm on a side, with a short carved stem. Another mask bangle consists is a flat, thin, wood oval 5 cm in diameter. It has squared ends; two small holes placed near the probable distal end may have held feathers. The proximal end is notched for attachment to the mask hoop, or perhaps to one of the wand-shaped bangles. A third paddle shaped mask bangle is flat and spoon-shaped. Three concentric grooves decorate the top surface. This bangle is 3.1 cm wide, and has a fractured stem.

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Mask Hoop Fragments and Attachment Pegs

Table 9:15 Mask Hoop Fragments and Attachment Pegs

Catalog	Artifact Type	Material	Context
3314	Mask hoop peg	Wood	House 1 roof sod
4687	Mask hoop fragment	Wood	House 1 roof sod
4324	Mask hoop fragment	Wood	House floor 1
1046	Mask hoop fragment	Wood	House floor 2
3003	Mask hoop peg	Wood	House floor 2
812	Mask hoop peg	Wood	House floor 3
5473	Mask hoop fragment	Wood	House floor 7
5991	Mask hoop peg	Wood	House 8 roof sod
6342	Mask hoop peg	Wood	House floor 8
6094	Mask hoop peg	Wood	Upper basal midden

Three bent wooden shafts resemble one found in association with the bird mask described above and have been tentatively identified as mask hoop fragments. The hoop fragments are oval in cross-section and range from 0.9 to 1.8 cm in diameter. Seven, cylindrical, notched wood pegs resemble the pegs on ethnographic masks to which the surrounding wooden hoops are attached. The hoop edge was intended to fits into the notched end of the peg. These pegs range from 6.1 to 8.1 cm long, and 1 to 1.2 cm in diameter. An additional two mask pegs have a slanted hole in the distal end through which a mask hoop may have passed. They are 11.3 and 14 cm long. One attachment peg retains traces of red paint.

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Plate 141

Mask bangles and hoop parts

Object	Description	Catalog #
A	Mask hoop support, wood	193/
B	Mask hoop support, wood	193/3314
C	Feather shaped mask bangle, wood w/black and red paint	193/3393
D	Feather shaped mask bangle, wood	193/3740
E	Feather shaped mask bangle, wood w/red paint	193/
F	Feather shaped mask bangle, wood w/black paint	193/1404
G	Feather shaped mask bangle, wood	193/
H	Feather shaped mask bangle, wood w/black and red paint	193/1405
I	Feather shaped mask bangle, wood	193/
J	Mask hoop support, wood	193/
K	Mask hoop support, wood	193/5591
L	Mask hoop support, wood	193/6094
M	Mask hoop support, wood	193/6724
N	Wand shaped mask bangle, wood	193/
O	Wand shaped mask bangle, wood	193/3019
P	Paddle shaped mask bangle, wood	193/5515
Q	Paddle shaped mask bangle, wood	193/4248
R	Paddle shaped mask bangle, wood	193/3045

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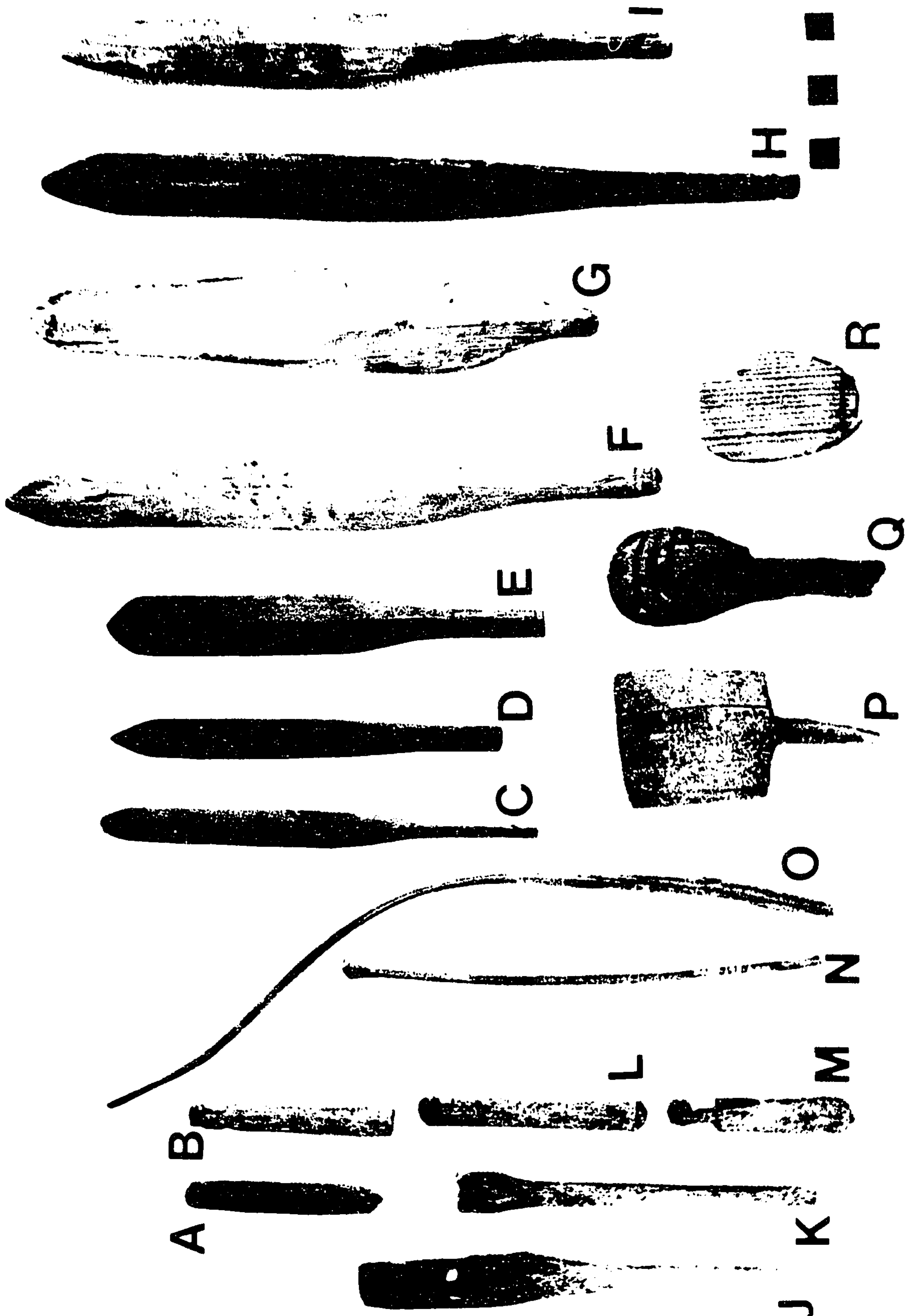

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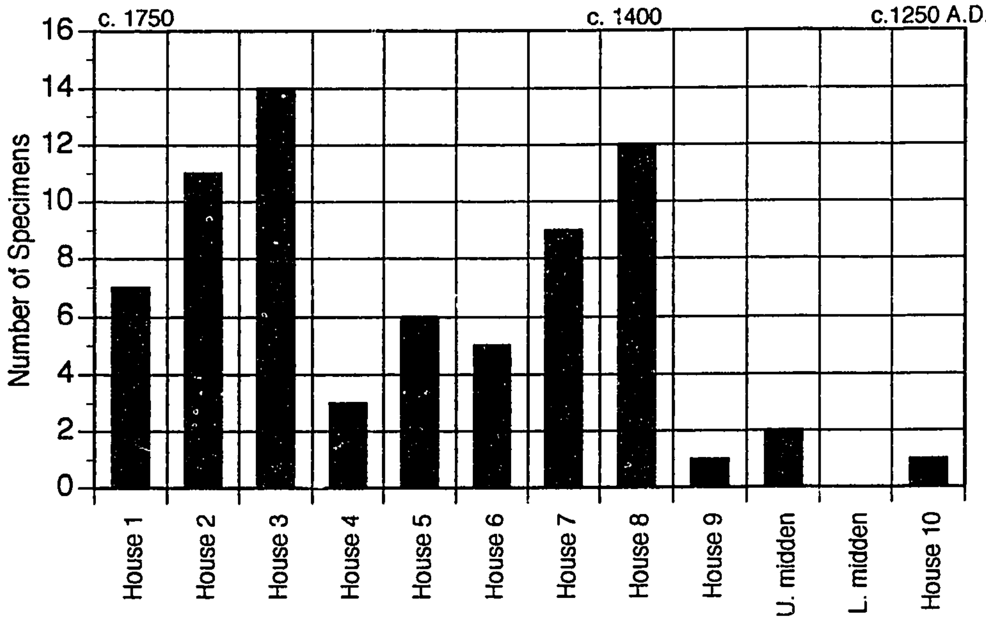
Chart 29: Mask Bangles; Numbers and Provenience at Karluk One



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Miniature Masks

Table 9:16 Miniature Masks

Catalog	Artifact Type	Material	Context
1838	Miniature mask	Wood	House floor 1
3455	Miniature mask	Cottonwood bark	Burial; House 1 level
2704	Miniature mask	Wood	House 2 wall sod
2976	Miniature mask	Cottonwood bark	House floor 2
4732	Miniature mask	Cottonwood bark	House floor 2
4135	Miniature mask	Cottonwood bark	House floor 2
4325	Miniature mask	Wood	House floor 2
2553	Miniature mask	Wood	House floor 2
3546	Miniature mask	Cottonwood bark	House floor 3
4410	Miniature mask	Cottonwood bark	House floor 4
4408	Miniature mask	Cottonwood bark	House floor 4
4026	Miniature mask	Cottonwood bark	House floor 5
1454	Miniature mask	Cottonwood bark	House floor 5
4803	Miniature mask	Cottonwood bark	House floor 5
4778	Miniature mask	Wood	House 6 wall sod
3128	Miniature mask	Wood	House floor 6
3401	Miniature mask	Cottonwood bark	House floor 6
3792	Miniature mask	Wood	House floor 6
3828	Miniature mask	Cottonwood bark	House 7 wall sod
6311	Miniature mask	Wood	House 8 roof sod
4990	Miniature mask	Cottonwood bark	House floor 8
5234	Miniature mask	Cottonwood bark	Upper basal midden

Miniature masks in the Karluk One assemblage stylistically resemble full-sized masks collected on Kodiak and elsewhere in the Alutiiq Culture Area by Pinart (Lot-Falck 1957). Sixteen recovered from Karluk One are made from cottonwood bark and two from wood (Plate 142). Like other miniature objects from Karluk One, miniature masks exhibit a wide range of workmanship. About half of them were rendered in great detail. These are hollowed in back, sometimes even have bored eye holes and holes for cordage attachment to the wearers face, just as a full-sized mask. Others have a partially hollowed or a plain back.

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The function of these miniature masks is unknown. Their use is not noted in the ethnohistoric literature, nor were any collected. It is possible that they are in fact made for, or in some cases by children. The divisions between sacred and secular that typify Western culture may not have existed for the Koniag. Teaching children the Alutiiq belief system through miniature masks may have been analogous to the use of miniatures of other adult items such as kayaks and ulus. Whatever their function, the miniature masks effectively increase the stylistic sample of masks in use by prehistoric Alutiiq. Ten miniature masks represent pointed-headed figures, six are of round-headed figures, and two are renderings of plank masks.

Figures with pointed heads, called *kalags,* were spirit helpers of Alutiiq shaman (Birket-Smith 1953:124). Crowell (1988:136) noted that similar spirits with pointed heads were known among Siberian societies, such as the Koryak *kalas* and the Chukchi *keles.* Reincarnation was part of the traditional belief system of the Alutiiq. According to oral traditions the power of an individual, good or evil, was stored above the head. Very powerful persons have elongated heads; perhaps symbolized in masks and ceremonial headgear known among the Alutiiq. This recollection is supported by Pinart who noted that men can be reincarnated as many as five times, but if a man has been evil during his first four lives he becomes and evil spirit. His head stretches out and becomes pointed (Pinart 1873, translated by Desson 1988). According to Alutiiq oral traditions, very good people could also develop into spirit beings with extended heads, but with rounded ends, as depicted in the long plank masks.

Ten miniature masks represent the malevolent *kalags,* and are the most common figure represented by the miniature masks from Karluk One. The largest miniature mask, several times larger than the rest, may have

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Plate 142

Miniature masks

Object	Description	Catalog #
A	Miniature mask, cottonwood bark	193/3401
B	Miniature mask, wood, red paint	193/6311
C	Miniature mask, cottonwood bark	193/4026
D	Miniature mask, cottonwood bark	193/3792
E	Miniature mask, cottonwood bark	193/4135
F	Miniature mask, cottonwood bark	193/2553
G	Miniature mask, cottonwood bark	193/4410
H	Miniature mask, cottonwood bark	193/3546
I	Miniature mask, cottonwood bark	193/4803
J	Miniature mask, cottonwood bark	193/4408
K	Miniature mask, cottonwood bark	193/2704
L	Miniature mask, cottonwood bark	193/4732
M	Miniature plank mask, cottonwood bark	193/2976
N	Miniature plank mask, cottonwood bark	193/1454
O	Miniature mask, reworked net float, cottonwood bark	193/1838
P	Miniature mask, cottonwood bark	193/4324
Q	Miniature mask, cottonwood bark	193/4778
R	Miniature mask, from near a burial, cottonwood bark	193/3455

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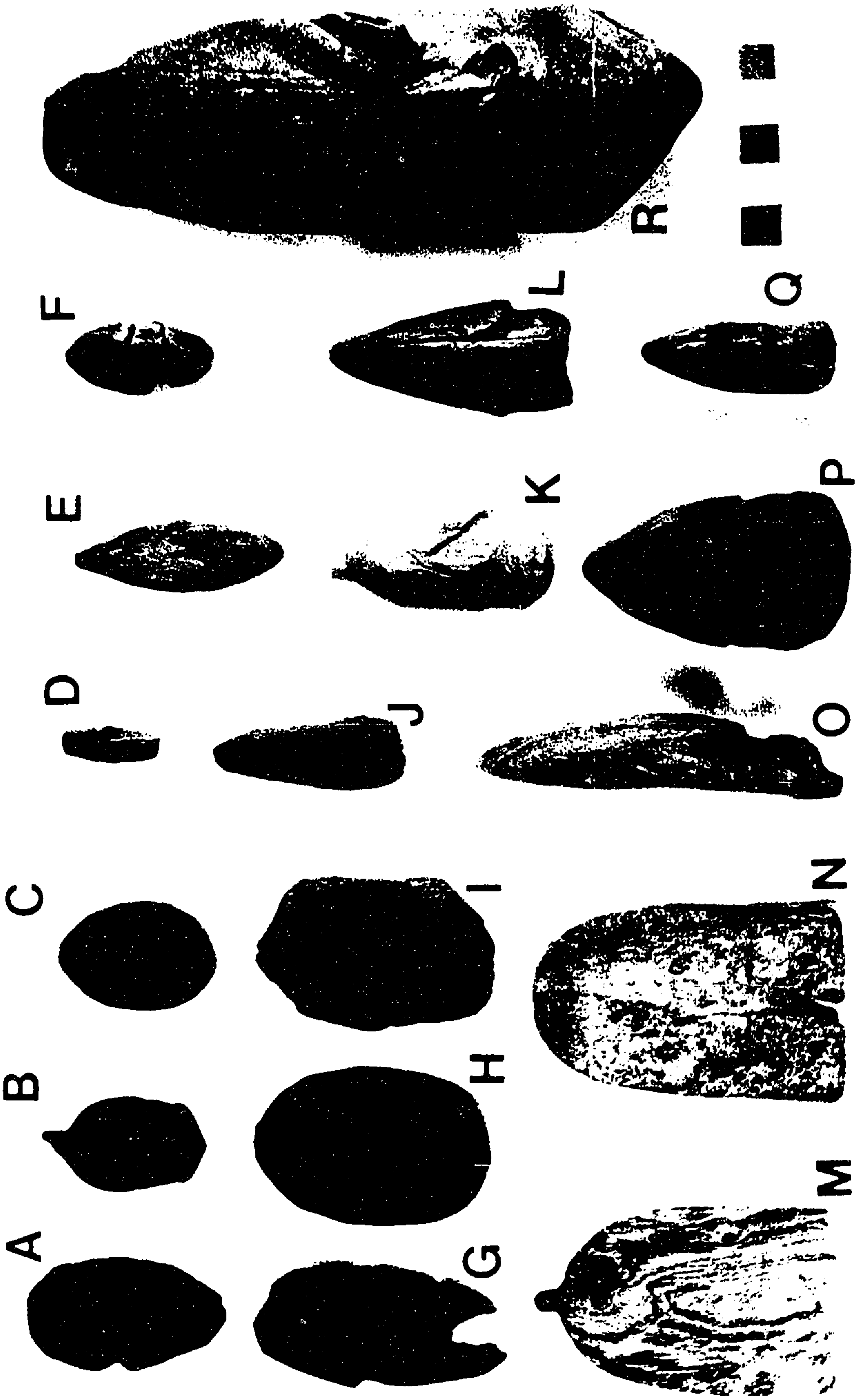

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served a ritual function (Plate 142:R). It was made from cottonwood bark and represents a pointed-headed figure with slanted eyes and wide flaring nostrils. A projecting v-shape mouth may represent large labrets, and/or a bird-man spirit. A series of deep vertical cut marks have been scored into the forehead of the figure. It measures 15.8 cm long and 5.5 cm wide. Two partially drilled holes in the back indicate that this mask may have been ritually 'killed' before burial. It was found near the burial in the house 1 level, and may have been attached to a post marking this grave.

Other miniature masks with pointed heads are also carved from cottonwood bark, but are not as well made. Most are hollowed out, as if they were intended to be worn. A cottonwood bark net float was apparently modified with some crude carving to form a pointed-headed figure. This specimen is 9.1 cm long and 1.6 cm wide (Plate 142:O). The object retains much of the original net float shape and has not been hollowed out.

Plank masks are known only from Aleutian and Kodiak Island ethnographic collections (Black 1982:44), and from one full-sized and two miniature plank masks found at Karluk One. A miniature cottonwood bark replica of a plank mask is 7.6 cm long and 4.8 cm wide (Plate 142:N). Two perforations near the base may represent eye holes. Two horizontal slits are present above them. The back has been hollowed out so far that it has partially broken through to the front. The other cottonwood bark miniature plank mask has two small incised slits representing eyes (Plate 142:M). A small stem is present on the curved top edge. It is 7.4 cm long and 4.8 cm wide. A third, fragmentary specimen may also represent a miniature plank mask.

A number of other figures in the Koniag pantheon are probably represented by a number of round-headed miniature masks (Plate 142:A-I).

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Only one has been carved from a hard wood, the others are all of cottonwood bark. The hard wood specimen is a finely carved round-headed figure, which measures 4.2 cm long and 2.4 cm wide (Plate 142:B). It retains red pigment on the mouth and forehead and a black band across the middle of the face. A small stem is present at the top of the mask and its back has been carefully hollowed out. The mouth is distended into an exaggerated v-shape, probably representing the use of large cheek labrets. The maskette is virtually identical to a full-sized mask collected by Pinart in the 1870s (Lot-Falck 1957: 44, Plate I).

Another nicely carved, round-headed figure of cottonwood bark has a projecting mouth with a slight grin (Plate 142:C). It is 3.9 cm long and 2.7 cm wide, and the back is hollowed. A round-headed cottonwood bark maskette is 5.9 cm long and 3.9 cm wide. It has a projecting mouth in a horizontal oval shape (Plate 142:H). The back is hollowed and the eyes and mouth are nearly perforate. Crudely carved from a chip of cottonwood bark chip, but nevertheless quite expressive, is a round-headed figure, 5.9 cm long and 3. 6 cm wide (Plate 142:I). The back is flat, but the eyes and mouth are perforated.

Drum Fragments

Table 9:17 Drum Fragments

Catalog	Artifact Type	Material	Context
1332	Drum rim	Wood	House floor 1
789	Drum handle	Wood	House floor 2
3558	Drum rim	Wood	House floor 3
4882	Drum rim	Wood	House 6 roof sod
5507	Drum handle	Wood	House floor 8
5556	Drum rim	Wood	House floor 8

Only one ethnographic collection is known to have an Alutiiq drum; one of the four drums collected by Etholen in 1846 now in the National Museum of Finland (Varjola 1990: 240-241). As elsewhere in the circum-polar world, Koniag drums were flat and circular, made by drawing a skin over a

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circular bentwood frame with a short handle. The face of the drum is thin and translucent, and is often made from a stomach of a sea mammal. The drum is highly sensitive to changes in temperature and humidity; drummers today keep a Windex bottle filled with water near them to moisten the drum surface as needed (Chuna McIntyre, personal communication 1988). Tuning the drum was done by moistening the surface to loosen the skin, lowering the tone. Holding the drum near the fire dried the skin producing a tighter surface and a higher tone. A line of drums could thus be harmonized as desired. Today's Native dancers, performing in auditoriums away from home avoid the problem by using artificial materials for drum coverings.

Two complete wood drum handles are cylindrical (Plate 143:E,F), but lack the anthropomorphic and zoomorphic figures that grace the ethnographic drum handles from Kodiak in the Etholen collection. One of the Karluk One drum handls has a rounded end, a 1.4 cm wide notch, and two encircling grooves on the distal end for attaching the drum rim (Plate 143:E). It is 8.4 cm long and 2.8 cm in diameter. A second specimen is 9.3 cm long and 2.9 cm in diameter (Plate 143:F). It has a 1.5 cm wide notch on both ends, both of which have been broken, perhaps indicating that it was reused after the first break, but discarded after the second.

Four wooden fragments have been tentatively identified as drum rim pieces, based on a deep groove on the outside curved surface of each specimen (Plate 143:A-D). These rim fragments are sub-rectangular in cross-section, and range from 0.9 to 1.3 cm thick. The central grooves range from 0.3 to 0.4 cm wide. One piece has a beveled edge and three carved holes at the tip where the ends of the bentwood rim would have been lashed together.

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Plate 143

Drum parts

Object	Description	Catalog #
A	Drum rim fragment, wood	193/5556
B	Drum rim fragment, wood	193/4882
C	Drum rim fragment, wood	193/1332
D	Drum rim fragment, wood	193/3558
E	Drum handle, wood	193/789
F	Drum handle, wood	193/5507

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Model Angyaq Parts

Table 9:18 Angyaq Model Parts

Catalog	Artifact Type	Material	Context
2554	Model angyaq frame part	Wood	House floor 2
3653	Model angyaq frame part	Wood	House 4 roof sod
3639	Model angyaq frame part	Wood	House 4 wall sod
4203	Model angyaq frame part	Wood	House floor 4
3646	Model angyaq frame part	Wood	House floor 5
4245	Model angyaq frame part	Wood	House floor 6

Four carved wooden objects are shaped somewhat like boat cleats. They are miniatures fragments of angyaq deck beams (Plate 149:D, E). They range from 4.6 to 10.4 cm in length and three retain red surface paint. They have small holes placed on their under surfaces for lashing to the keelson and rib components of the frame. According to evidence provided by ethnographic angyaq models, the Kodiak open boats were unique as they featured a large, rounded bow. This was probably designed for launching and landing in surf. The bow provided floatation and thus preventing it from being buried in oncoming waves. When landing, paddlers could simply reverse position and land stern first, while the bow prevented swamping by following seas. A bow piece for a model angyaq is represented by a flat, prow shaped piece of hard wood, 9.5 cm long. There are external planks along the gunwales adjacent to the bow on models in museum collections. A similar piece from Karluk One is a thin, flat piece of wood, 9 cm long, with red surface paint on one side. It is broadly triangular, with six small holes in a row on the surface (Plate 149:A).

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Anthropomorphic Figurines

Table 9:19 Anthropomorphic Figurines

Catalog	Artifact Type	Material	Context
1743	Figurine;human	Wood	House floor 1
3342	Figurine;human	Wood	House floor 1
3923	Figurine;human	Wood	House floor 1
3508	Figurine;human	Wood	House floor 2
3042	Figurine;human	Bark	House 3 roof sod
3564	Figurine;human	Wood	House floor 3
1752	Figurine;human	Wood	House floor 3
2743	Figurine;human	Wood	House 3 roof sod
4010	Figurine;human	Wood	House 4 roof sod
1656	Figurine;human	Wood	House floor 4
2365	Figurine;human	Wood	House floor 4
2404	Figurine;human	Wood	House floor 4
1985	Figurine;human	Wood	House floor 4
3733	Figurine;human	Wood	House floor 6
3695	Figurine;human	Wood	House floor 6
4063	Figurine;human	Wood	House floor 6
1695	Figurine;human	Wood	House floor 7

Anthropomorphic figurines were used by the Alutiiq in conjunction with at least three different ritual functions, some of which surviving well into the 20th century. The oral tradition on Kodiak is replete with tales of malevolent shamans who made wooden images of individuals that they wished to harm. Sometimes scraps of hair or clothing from the intended victim was tied to the doll; hair clippings and even clothes lines could be guarded accordingly. Once the doll was made it was mutilated in some manner, and could be left tied near a trail or a doorway where the victim could pass (Knecht 1988). Most of the wooden figurines found at Karluk One apparently fall into this category.

Nine complete figurines and one fragmentary specimen consist of a carved human head atop a stake-shaped, limbless body (Plate 144:). These figurines bear signs of a variety of mutilations; cut marks, deep gouges, and burns. According to the oral tradition, such ritual was considered anti-social,

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even criminal behavior. The provenience of the dolls found at Karluk One reflects this. Nearly all were found tucked in the wall sods of the side room of houses. Faces on the figurines are individualistic and may represent portraits. Carefully rendered labrets, and painted v-shaped lines on the chest; representing clothing or tattoos, were added to further distinguish the victim.

One figurine was carved from a pine knot (Plate 144:A). The knot has been carved into a human face, and the surrounding wood left unmodified to serve as a body, creating the image of the figurine as if it were wrapped in a sleeping bag. It is 17.4 cm long. The face has a single tabular labret protruding down from the lower lip. Deep vertical cut marks exist on the chest of the figure.

Red painting exists on the forehead of one figurine, which also has two v-shaped stripes painted on the chest. The mouth protrudes in a v-shape, as if distorted by labrets. Fine horizontal cut marks exist across the chest, and a gouge has been carved out of the top of the figure's head.

Facial features that may represent an elderly individual exist on another figurine(Plate 144: C). This figure also has ears; and mouth is a distended v-shape which slants down, probably representing lateral labrets. The chest, back, and back of the head are covered with many fine cut marks.

A figurine has an oval head, projecting mouth, and a sub-rectangular body. Clothing or possible tattoos are represented by painted black lines in a v-shape on the chest. The lower part of the figure also retains traces of red paint (Plate 144:D). Many fine cut marks exist on the lower back of the figure.

A similar figurine has an oval head and a stake-shaped body sharpened to a tip at the base. Its mouth is triangular in shape, and is depicted with two lateral labrets (Plate 144:E). It retains traces of reddish brown paint and a deep gouge has been carved into the top of the head.

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A fragmentary piece represents the body of an anthropomorphic figure (Plate 144:F), which is stake-shaped and 7.3 cm long. The head has been snapped off and a large gouge has been carved into the chest. Numerous short cut marks exist on the back. The figure retains traces of red pigment on the shoulders.

A preform of a figurine has an unfinished face which lacks any detail, with the exception of a pair of horizontal incised lines which represent eyes (Plate 144:G). Another preform is a crudely carved figurine that also lacks detail. The eyes and nose are recognizable (Plate 144:H). A cut notch exists under the front of the figure's neck.

Only one specimen in the assemblage lacks any obvious intentional damage. This figurine has a mouth distended into a protruding v-shape (Plate 144:I). It is one of two anthropomorphic figurines in the assemblage that were depicted with ears.

A figurine with an oval head has a wedge-shaped body that tapers to a blunt point and a v-shaped mouth. Two long oval lateral labrets have been represented realistically on either side of the figure's mouth (Plate 144:J). Three deep cut marks were made diagonally across the back of the figure. It is 15.9 cm long.

Another ritual use of anthropomorphic figurines was recorded by Lisianski, who recorded that dolls were used by women with no children (1814:178) in an effort to become fertile. A small number of wooden dolls in the assemblage have legs, genitalia, and originally had human hair tied to their heads. They are probably associated with fertility ritual.

A single wooden doll is well carved from a dense wood and differs from ceremonial dolls in that it has a lower body (Plate 129:K). It lacks arms, but has anatomically correct female genitals, and a pair of bent, footless legs.

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The face lacks labrets and has a grooved ring around the back of the head, probably to affix hair. This piece is 10.5 cm in length. An additional anthropomorphic figurine may also represent a fertility doll, although the head is sub-rectangular and featureless. The figure lacks arms, but has two short projections that represent legs and appears to have female genitals.

A spectacular find made during in the 1987 season seems to confirm the function of the similar specimens described above. It is a doll rendered in an obviously pregnant state, complete with protruding abdomen, and hands holding the lower back. It was found with human hair attached to its head (Fitzhugh and Crowell 1988:136).

An additional use of wooden figurines was recorded by Fisher (1884, Crowell 1992:27). Fisher collected a large wooden anthropomorphic image, 70 cm long, complete with clothing. It was brought forth annually by a shaman amidst unspecified 'festivities', a rite that seems related to Yupik doll festivals (Nelson 1983:494; Crowell 1992). Kodiak village elders recall that dolls were brought forth and that offerings of a bit of tobacco, money, or something similar were made; in return the doll could be asked a question about what the future would bring. Answers were given in a high barely audible voice about the seasons forecast regarding luck with hunting, fishing, and other issues. This ritual continued on Kodiak Island until at least the 1920's. None of the dolls could positively be linked with this practice, hut it is interesting to note that the doll in the Fisher collection also bears deep cut marks on its chest, which were originally hidden under its clothing (Crowell: personal communication 1988).

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Plate 144

Anthropomorphic figurines

Object	Description	Catalog #
A	Anthropomorphic figurine, w/medial tabular labret, wood	193/3733
B	Anthropomorphic figurine, w/red paint, wood	193/3695
C	Anthropomorphic figurine, wood	193/2743
D	Anthropomorphic figurine, w/black paint, wood	193/3508
E	Anthropomorphic figurine, wood	193/1985
F	Anthropomorphic figurine fragment, wood	193/4010
G	Anthropomorphic figurine, possibly unfinished, wood	193/1656
H	Anthropomorphic figurine, wood	193/2301
I	Anthropomorphic figurine, wood	193/3564
J	Anthropomorphic figurine, w/lateral labrets, wood	193/4063

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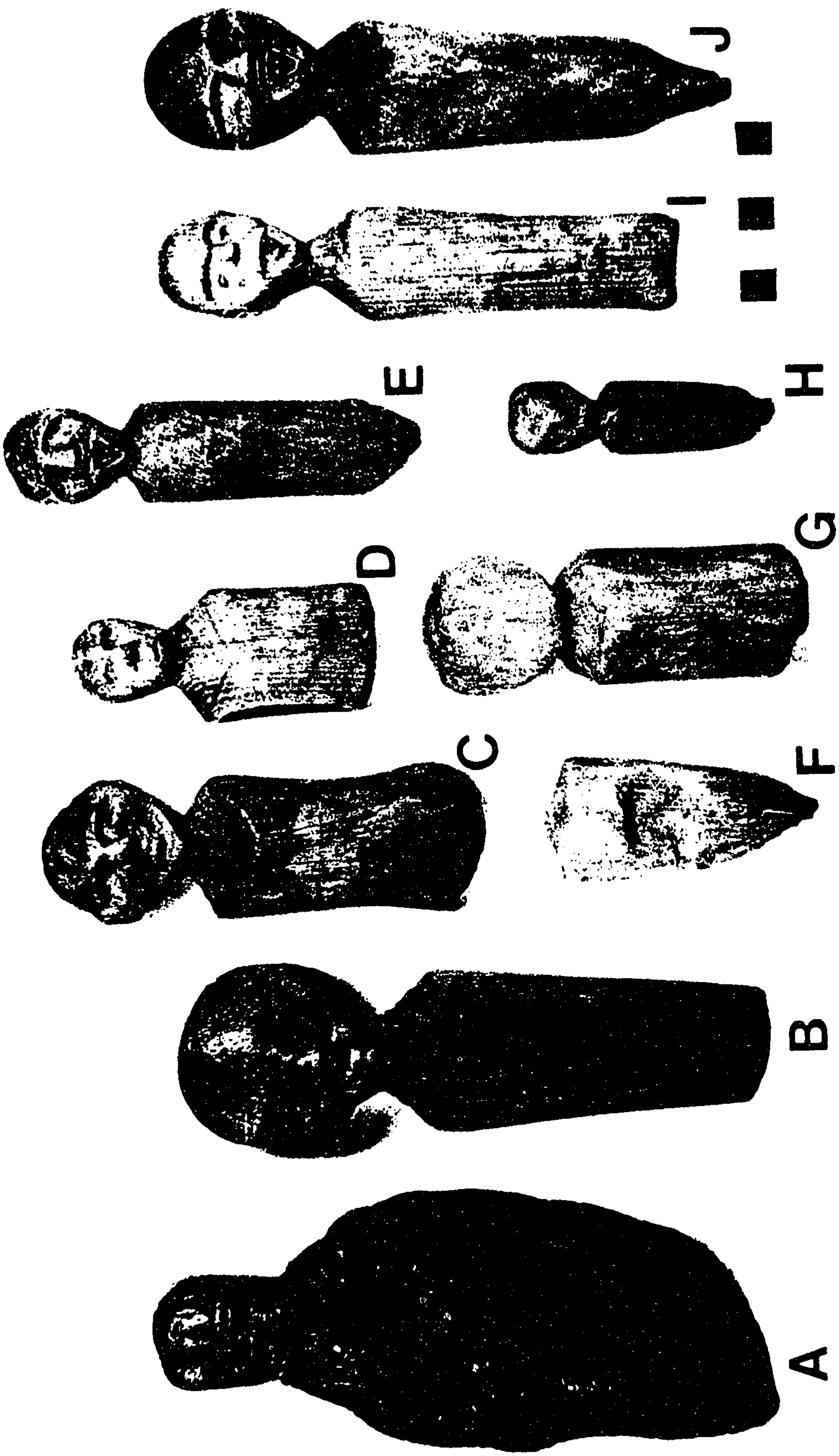

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Zoomorphic Figurines

Table 9:20 Zoomorphic Figurines

Catalog	Artifact Type	Material	Context
6888	Bird/man figurine	Wood	Surface/erosion face
2556	Seal figurine	Wood	House floor 2
1663	Handle with puffin figurines	Pacific yew	House floor 5
4804	Handle with puffin figurines	Wood	House floor 5
4888	Puffin figurine	Wood	House floor 6
932	Bird figurine	Bone	House floor 7
1695	Bird figurine	Cottonwood bark	House floor 7
4976	Puffin figurine	Cottonwood bark	House floor 8
6476	Bird figurine	Cottonwood bark	Upper basal midden

The zoomorphic carvings of birds in the Karluk One assemblage are of uncertain function, however they reflect the importance of birds in Koniag ritual life and world view. Two specimens represent possibly handles, or a form of dance wand. They are decorated with images of puffins on either end. One such specimen has been very well carved of pacific yew and retains traces of gray paint with inclusions of silver-colored glitter (Plate 145:J). It measures 15.7 cm long.

A carefully carved shaft of dense wood has narrow encircling grooves exist between the carved bird heads and the body of the shaft (Plate 145:I). Three bands of surface painting exist near the center of the shaft; consisting of a broad stripe of red pigment with narrow stripes of black on either side. This specimen is 18.1 cm long.

Several figurines represent birds. An effigy of a puffin is 8.5 cm long and has a cylindrical peg extending from its base 1.5 cm in diameter (Plate 145:L). This specimen retains patches of dark grayish-green and red paint. A smaller bird effigy of a puffin is crudely carved from cottonwood bark (Plate 145:K). It is 4.3 cm long. A cottonwood bark figurine resembles the body of a long-necked bird in flight (Plate 145:F). It lacks wings and small hole exists on

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Plate 145

Anthropomorphic and zoomorphic figurines

Object	Description	Catalog #
A	Human/bird figure, cottonwood bark	193/1595
B	Human figurine; hunter's hat decoration, bone	193/4382
C	Anthropomorphic figurine fragment, wood	193/3342
D	Anthropomorphic figurine fragment, wood	193/1743
E	Bird figurine, bone	193/932
F	Bird figurine, cottonwood bark	193/6476
G	Human/bird transformation figure, wood	193/6888
H	Seal effigy, wood with red paint	193/2556
I	Handle w/puffin heads, wood w/red, black paint	193/4804
J	Handle w/puffin figures, wood w/ grey, glitter paint	193/1804
K	Puffin figurine, cottonwood bark	193/4888
L	Puffin figurine, wood, with green and red paint	193/4976

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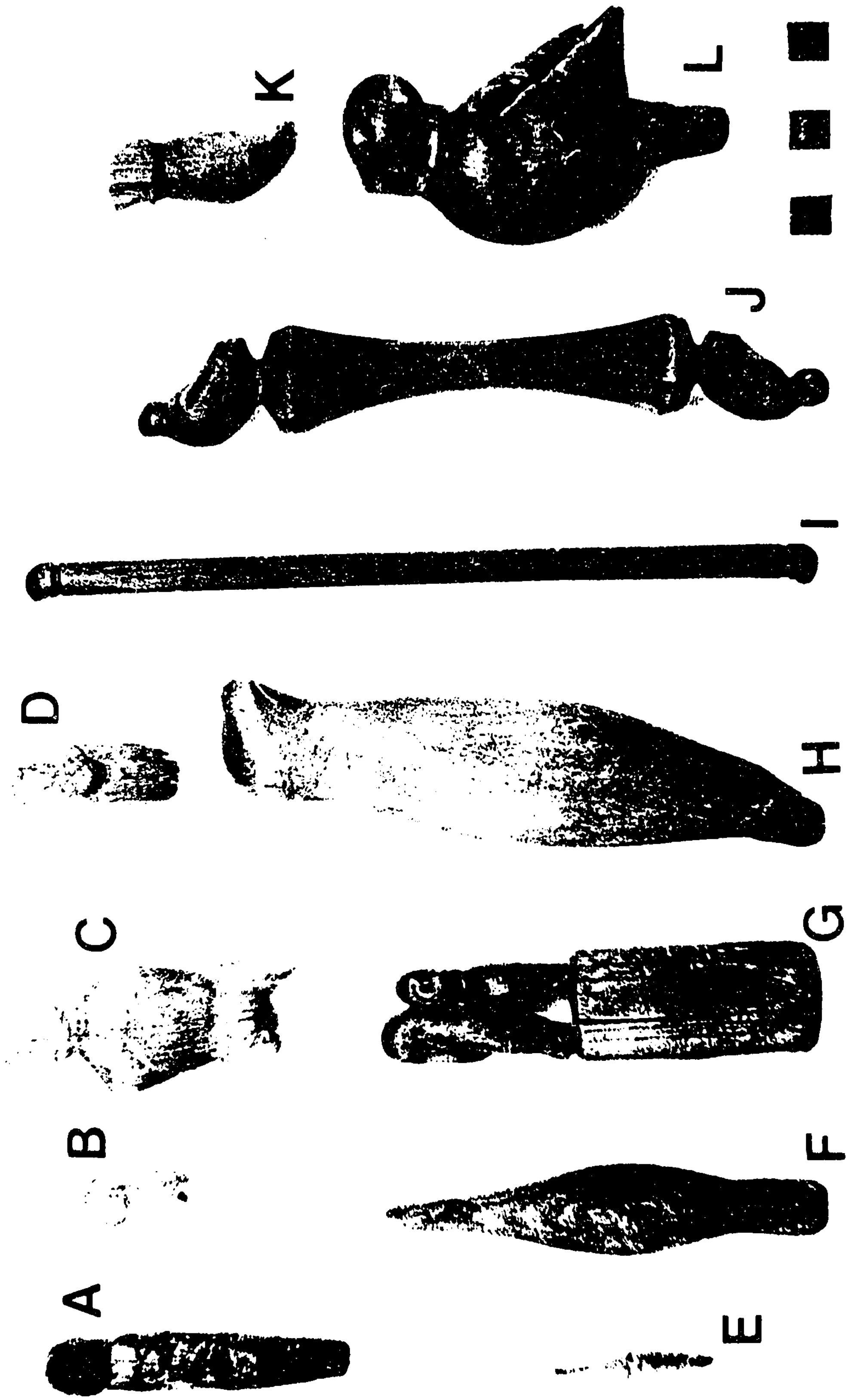

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the center of the base, suggesting it may have possibly topped a staff or mask attachment. It is 10.4 cm long. A smaller bone bird effigy is similar; an encircling groove exists around the mid-section possibly to tie on a bit of feather to represent wings (Plate 145:E). It is 4.2 cm long.

A carving symbolizing the transformation of man and bird was found eroding from the Karluk One site by Ronnie Lind of Karluk Village (Figure 20). The piece seen at the Baranof Museum floating in a bottle of vodka as a means of temporary conservation by Richard Jordan during a working visit to Kodiak Island in 1981, and inspired him to begin archaeological investigations at Karluk. The piece is 9.9 cm long. It has a cylindrical base on top of which a human and bird figurine stand back-to-back. Fine horizontal cut marks encircle the cylindrical base, suggesting that something was affixed to this part of the piece. A horizontal row of four tiny holes exist across the chest of the human figure and tiny holes are in both shoulders of the bird figure.

A piece of cottonwood bark 6.9 cm long has one end in the form of a beaked bird head and may also symbolize transformation (Plate 145:A). Human faces are depicted on both sides of the mid-section on this piece.
Sea mammals are less common than birds in the representational art from Karluk One, despite their relatively greater economic importance. A figurine in the shape of a seal is nicely carved, and is 14.2 cm long (Plate 145:H). It is incomplete, vertically split down the length of the specimen. The underbelly of the seal retains paint. The dorsal surface and the top of the head have traces of black paint.

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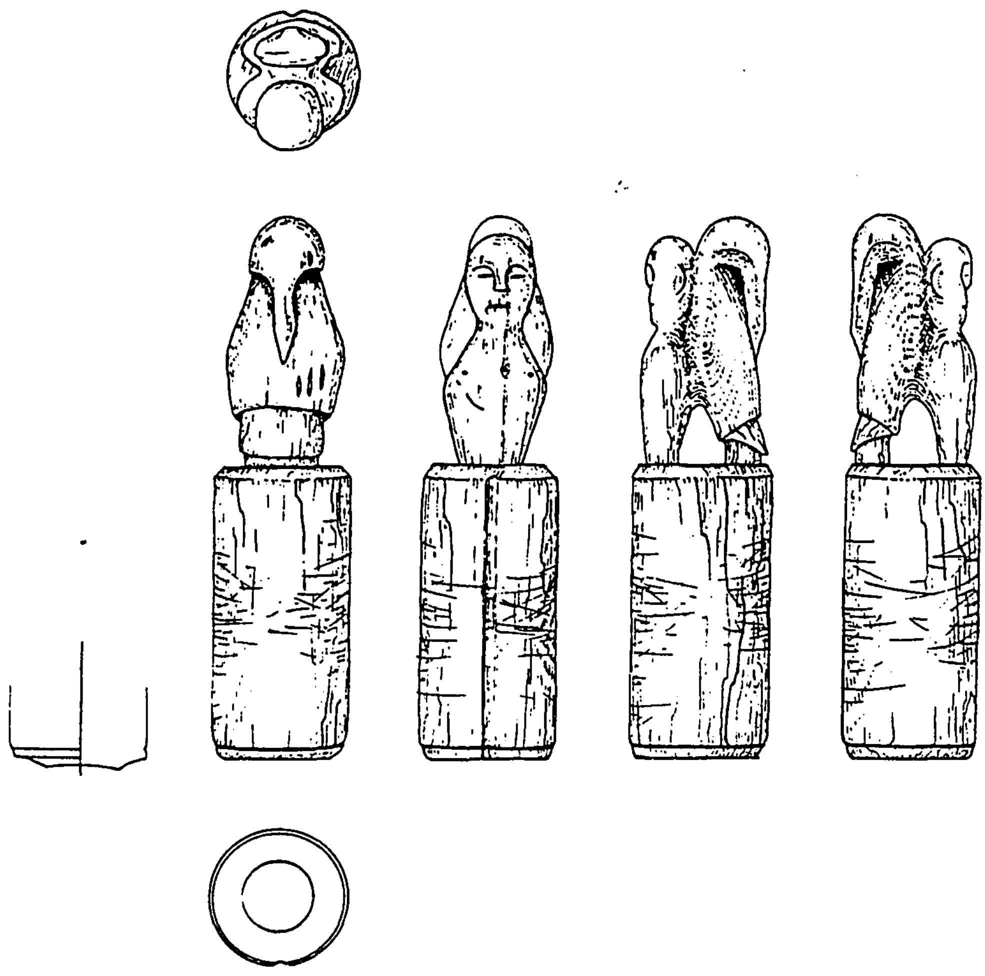

Figure 20: Figurine of a human and bird in transformation

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Wooden Plate Armor

Table 9:21 Slat Armor

Catalog	Artifact Type	Material	Context
3146	Slat armor	Wood	House 6 wall sod
1521	Slat armor	Wood	House floor 7
6367	Slat armor	Wood	House floor 8
6380	Slat armor	Wood	House floor 8
5519	Slat armor	Wood	House floor 8
6381	Slat armor	Wood	House floor 8
6415	Slat armor	Wood	House floor 8
5841	Slat armor	Wood	Lower basal midden

Six wooden plates of slat armor in the Karluk One assemblage are reminiscent of specimens from the Bering Sea (Plate 146: B-G). Similar specimens were recovered by De Laguna (1956: 230) at Palutat Cave in Prince William Sound. Merck noted that the Koniag "wore a wooden suit of mail, called attkhaat..." (1980:109). Gideon (1980 [orig. 1803]:42) also described Koniag armor:

> In warfare they used shields [armor], *kubakhhkinakh*, of wooden slats, not less than half a vershok thick [2.2 cm], one vershok broad [4.4 cm], and three and half handspans long on the back and two handspans in the front, tightly secured together by sinew thread. To it they attached a breastplate, *khakaat'*, made of thin rods which were so skillfully and tightly interwoven with the same kind of thread that even a spear of a strong warrior could be easily stopped by it.

Six pieces of wooden slat armor are rectangular with one beveled edge to allow plates to overlap; twin carved holes near either end allowed the slats to be linked together (Plate 146:B-G). The armor slats range in size from 8.5 cm to 10.5 cm long, and from 1.8 to 2.7 cm wide. A single section of slat armor recovered from the basal midden is oval in cross-section (Plate 146:A), which closely resembles pieces from a complete suit of armor collected on the Aleutians by Dall, and illustrated by Hrdliçka (1945:137). Judging from

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Plate 146

Slat armor and shield brace

Object	Description	Catalog #
A	Cylindrical armor piece, wood	193/5841
B	Slat armor piece, wood	193/5519
C	Slat armor piece, wood	193/6367
D	Slat armor piece, wood	193/6380
E	Slat armor piece, wood	193/6381
F	Slat armor piece, wood	193/1521
G	Slat armor piece, wood	193/6415
H	Shield brace, w/red paint, wood	193/6505

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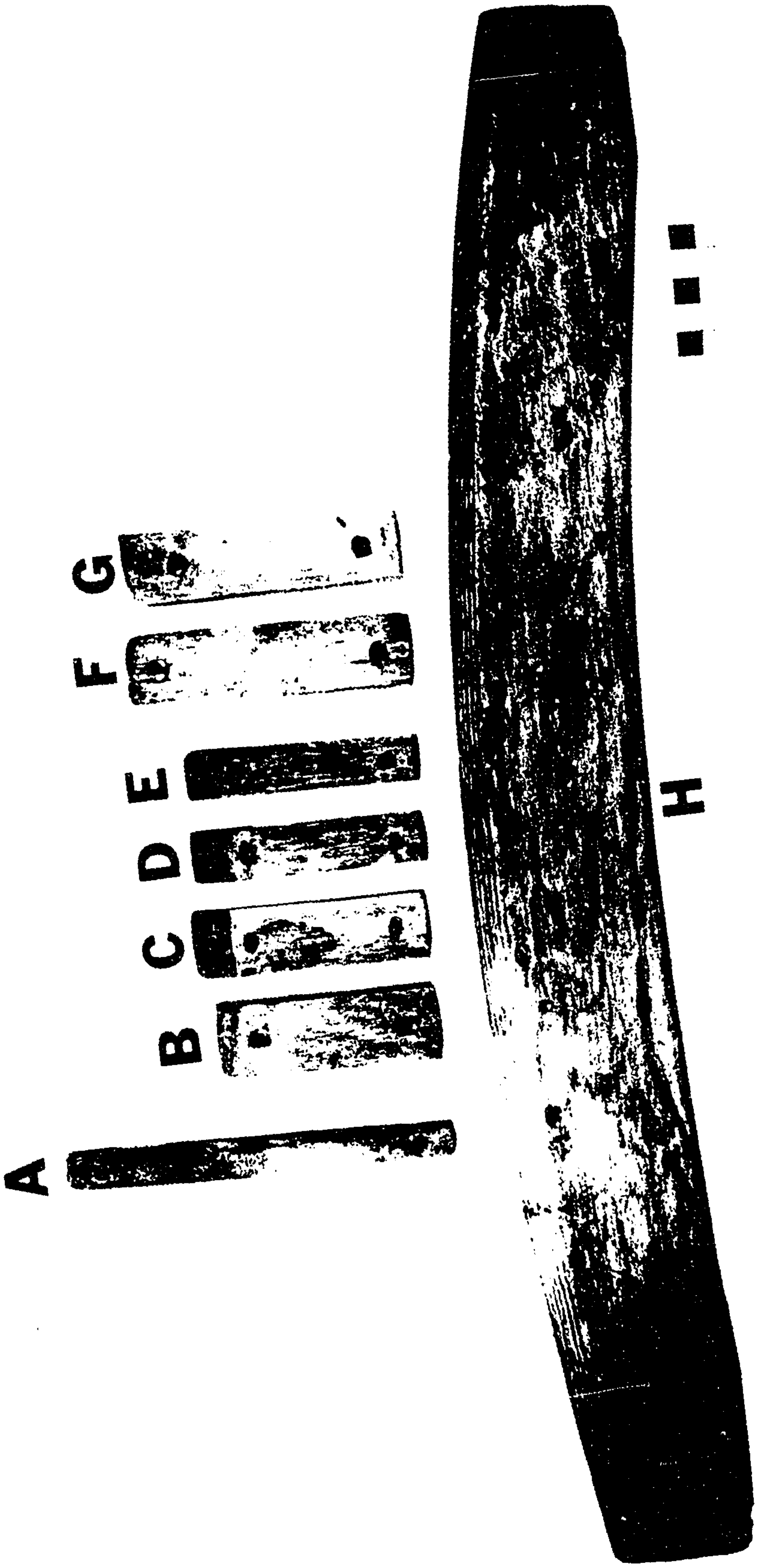

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Gideon's description, it probably represents a fragment of the 'breastplate' armor. Tlingit warriors also wore armor with similar slat components. The Karluk One specimen is 14.6 cm long and 1.5 cm in maximum diameter. Two carved holes exist near either end for attachment to other plates.

Shield Brace

A complete wooden shield brace resembles a specimen from the Aleutians illustrated by Hrdliçka (1945: 136). It is a slightly curved plank 59.3 cm long and 6.9 cm in maximum width and is 1 cm thick (Plate 146: H). It has a beveled top edge; two rows of holes were drilled for attachment to the vertical planks of the shield body. Shadows of diagonal lashing can still be seen between the holes. The shield brace retains traces of red paint. It was found on house floor 9. Plank components of a square shaped shield, bearing twin rows of drilled holes were found during the 1987 season. A virtually complete plank shield was found in 1994, complete with a pair of shield braces held on with spruce root and baleen lashing.

Miscellaneous Artifacts

Bird-Bone Tubes

Table 9: 22 Bird Bone Tubes

Catalog	Artifact Type	Material	Context
2167	Trimmed mid-section	Bird bone	House floor 1
2304	Trimmed mid-section	Bird bone	House floor 2
1200	Trimmed mid-section	Bird bone	House floor 6
4903	Trimmed mid-section	Bird bone	House floor 6
3838	Trimmed mid-section	Bird bone	House floor 7
3194	Trimmed mid-section	Bird bone	House floor 7
5283	Trimmed mid-section	Bird bone	House floor 10

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Three mid-sections of bird long bones have been cut and trimmed at the ends and may represent beads or parts of other decorative paraphernalia (Piate 137: A-F). They range in length from 0.6 to 7.3 cm.

Whalebone Vertebral Discs

Table 9:23 Whale Vertebral Discs

Catalog	Artifact Type	Material	Context
4169	Whale vertebral disc	Whale bone	House floor 3
4179	Whale vertebral disc	Whale bone	House floor 3
4419	Whale vertebral disc	Whale bone	House floor 3
4417	Whale vertebral disc	Whale bone	House floor 4
1963	Whale vertebral disc	Whale bone	House floor 4
3687	Whale vertebral disc	Whale bone	House floor 5
3689	Whale vertebral disc	Whale bone	House floor 5
4869	Whale vertebral disc	Whale bone	House floor 5
4870	Whale vertebral disc	Whale bone	House floor 5
4494	Whale vertebral disc	Whale bone	House floor 6
4832	Whale vertebral disc	Whale bone	House floor 7
5255	Whale vertebral disc	Whale bone	House floor 9B
5311	Whale vertebral disc	Whale bone	House floor 10

Nine cracked, but complete epiphyseal plates, or vertebral discs have been naturally separated from whale vertebra range from 21.2 to 25.1 cm in diameter. Clark found three specimens at Rolling bay which in one case had a ground surface, and others which had been trimmed around the edges (1974:136). All of the Karluk One specimens seem to have been ground or worn slightly on the top surface. The function of these pieces is unknown. They are common in both Kachemak and Koniag archaeological sites, as well as in prehistoric sites on the Aleutian Islands (Clark 1974, Heizer 1956:69, Hrdliçka 1944), As Clark remarked: "It is tempting but presumptuous to think of these discs as dinner plates" (1974:136).

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Table 9:24 Bi-Pointed Wooden Objects

Catalog	Artifact Type	Material	Context
979	Bi-pointed object	Wood	House 1 roof sod
2069	Bi-pointed object	Wood	House floor 7
2174	Bi-pointed object	Wood	House floor 1
2771	Bi-pointed object	Wood	House floor 4
3028	Bi-pointed object	Wood	House 3 roof sod
5168	Bi-pointed object	Wood	House floor 7
5223	Bi-pointed object	Wood	House floor 8
6365	Bi-pointed object	Wood	House floor 8

Bi-Pointed Wooden Objects

Seven short lengths of cylindrical wooden shafts are bi-pointed (Plate 150 E-J). They range in length from 5.5 to 9.4 cm and in maximum diameter from .8 cm to 2 cm. Toy tops collected from the Bristol Bay area, now in Smithsonian collections bear some resemblance to some, but not all of the wooden bi-points from Karluk One (Culin 1907). It is uncertain whether or not bipointed wooden shafts truly represent a discrete artifact type.

Bark Objects

Table 9:25 Cottonwood Bark Objects

Catalog	Artifact Type	Material	Context
3102	Object/fish hook?	Cottonwood bark	House floor 5
2969	Object/fish hook?	Cottonwood bark	House floor 2
6844	Object/fish hook?	Cottonwood bark	Surface/erosion face

Three elongate carved pieces of cottonwood bark have a diagonal notch on one face, which if a barb was hafted may have formed some type of fish hook (Plate 147). Counter-sunk attachment holes exist on one ends of these pieces. The two complete specimens are 9.4 and 9.8 cm long.

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Plate 147

Objects of Unknown Function

Object	Description	Catalog #
A	Object, wood	193/3662
B	Object, cottonwood bark	193/2969
C	Object, cottonwood bark	193/6844
D	Object, cottonwood bark	193/3102

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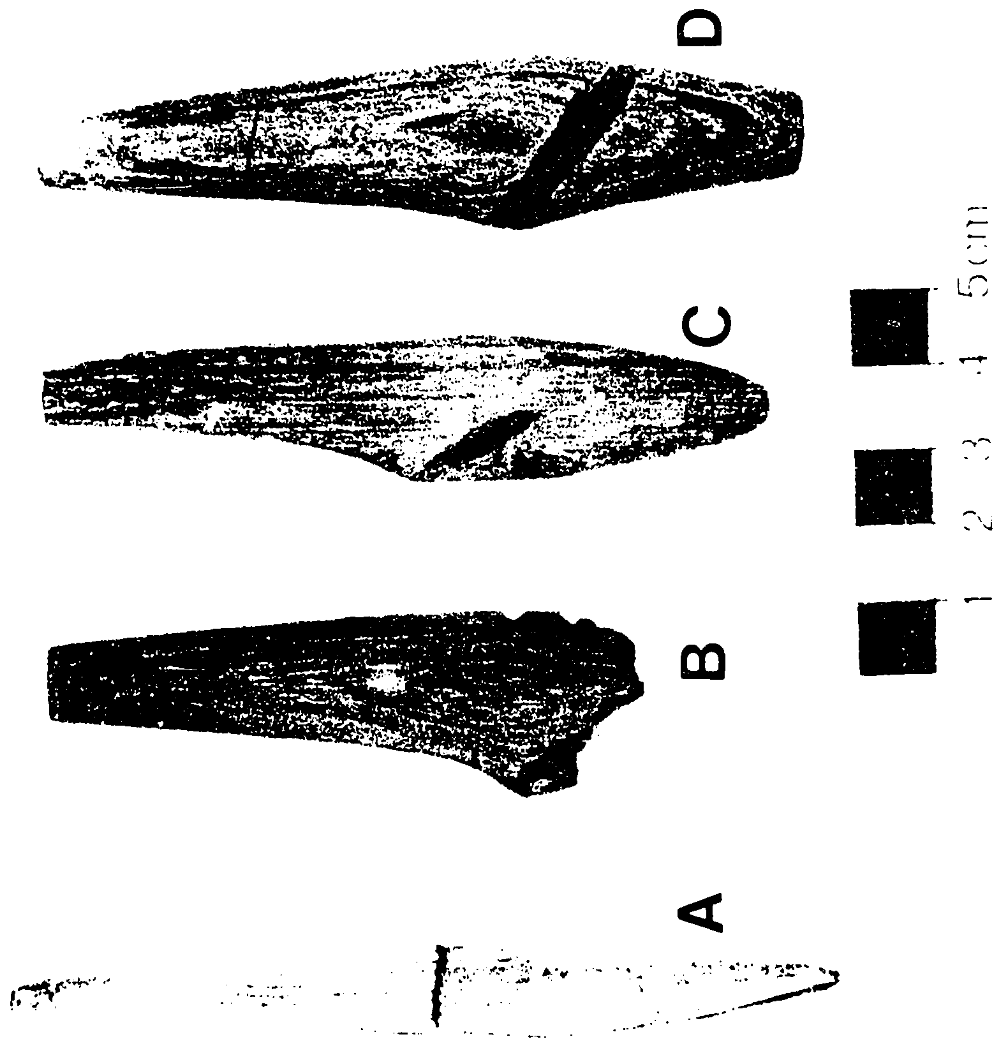

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Miscellaneous Artifacts

Table 9:26 Miscellaneous Artifacts of Unknown Function

Catalog	Artifact Type	Material	Context
1863	Worked tooth/tusk	Ivory	House floor 1
6151	Tusk tip	Ivory	House floor 10
3181	False bear claw	Antler	House floor 6 wall sod
4448	False bear claw	Bone	House floor 4
367	Notched shaft/rasp?	Wood	Profile 1
5152	Notched shaft/rasp?	Wood	House floor 6 roof sod
3644	Painted plank	Wood	House floor 5
5620	Mushroom shaped object	Cottonwood bark	Upper basal midden
919	Rectangular labret like object	Cottonwood bark	House floor 7
6427	Disc: lid?	Fossil Ivory	House floor 8
3540	Wrist band	Wood	House floor 3
5785	Miniature adze blade?	Slate	House floor 8
5646	Drill bit?	Silicified slate	House floor 10
1344	Miniature bowl?	Cottonwood bark	House floor 1
3017	Perforated shaft	Wood	House floor 3 roof sod
2374	Grooved whittled stick	Wood	House floor 3
1141	Perforated vertebral disc	Halibut bone	House floor 5 rood sod
1354	Miniature vessel base?	Wood	House floor 1
997	Whale fluke effigy?	Slate	House floor 1 roof sod
5463	Bow accessory?	Bone	House floor 6
3473	Painted peg	Wood	General midden
1382	Spool end?	Wood	House floor 2
1383	Spool end?	Wood	House floor 2
4503	Crescentic piece	Wood	House floor 7
1918	Mask ear?	Wood	House floor 3
923	Boat part?	Wood	House floor 7
6048	Curved shaft	Wood	House floor 8
5624	Dance wand?	Wood	House floor 10

A worked sea mammal tooth is 4.5 cm long and 2.3 cm in maximum diameter. The tip of the tooth has been carved, leaving a triangular-shaped socket. An ivory tip is probably from a walrus tusk, measuring 4.3 cm long and 2.5 cm in maximum diameter (Plate 148:A). The base is flat, but it is otherwise unmodified. Two artifacts have been carved into the shape of a bear claw; real bear claws, such as those used in jewelry and other items by Indians, are absent in the archaeological and ethnographic record from the

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Kodiak Archipelago (Plate 148:B,C). A shamans belt collected at Ugashik by Fisher is hung with bear claws, as well as other charms. According to Alutiiq oral tradition, bear claws were never displayed by Alutiiq hunters; bear skins were used, but with the paws removed. To the Alutiiq, a bears claws were his weapons; display of an enemy's weapons would convey disrespect.

Two wooden shaft fragments are oval in cross-section (Plate 148:D,E). They are 1.9 and 2.2 cm in maximum diameter. One has eight v-shaped notches on one edge, and five less well-carved notches on the opposite edge. The other specimen has five badly worn notches on one edge. These artifacts may represent musical rasps.

A flat section of thin plank is nearly square in shape with one pair of corners rounded off (Plate 148:F). It is 9 cm long on a side, and is 0.6 cm thick. The top surface retains much of its original paint, with one diagonal half painted red, the other black. Two small holes exist near the center of the piece. It may be a box lid, or alternatively, a piece of ceremonial regalia. Fine vertical cut marks exist on the reverse of the piece, which is unpainted.

A carved cottonwood bark object is mushroom-shaped (Plate 148:G). It is 6.5 cm long, and 3.8 cm wide. It is plano-convex in cross-section. The stem has a short flange on either end of its long axis, as if it were a labret. The ovate end is partially hollowed out and has been used twice as a drill rest. The function of this piece is enigmatic. Another carved piece of cottonwood bark is sub-rectangular in shape (Plate 148:H), and is 5.8 cm long, 2.8 cm wide, and about 2.1 cm thick. It has a groove which encircles the edge, as if it were a grooved cheek labret, but the rectangular shape would seem an unlikely one for a labret. The top surface is partially missing, but has three rows of oval holes.

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Plate 148

Miscellaneous artifacts

Object	Description	Catalog #
A	Worked tusk tip; walrus ivory	193/6151
B	False bear claw, antler	193/4448
C	False bear claw, antler	193/1347
D	Notched stick, possibly a rasp, wood	193/347
E	Notched stick, possibly a rasp, wood	193/5152
F	Small board, black and red paint, wood	193/3644
G	Labret like object, with two drill sockets, cottonwood bark	193/5620
H	Labret like object, cottonwood bark	193/919
I	Box lid, fossil ivory	193/6427
J	Wristlet for gutskin jacket, wood	193/3450
K	Hammer head, fossil ivory	193/3055

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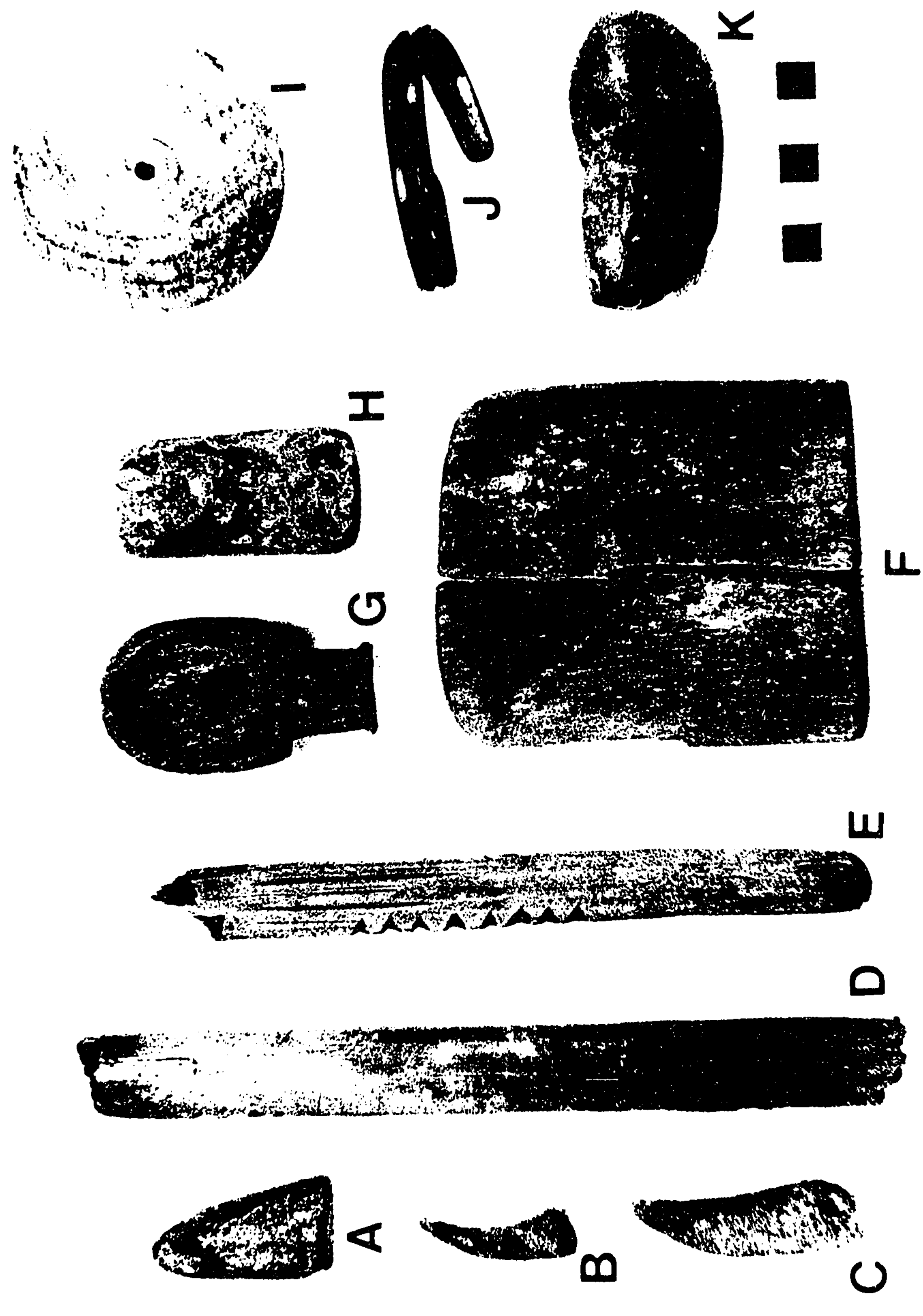

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A disc-shaped piece of carved fossil ivory is 6.7 cm in diameter (Plate 148:I). A perforated lug exists on the reverse side, suggesting that it functioned as a box lid. A partially drilled hole in the center may have accommodated a knob of some type. The central hole is encircled by an incised circle.

A finely carved piece of hard wood has been carved and bent into a bracelet shape (Plate 148:J). It is plano-convex in cross-section, and has a groove in the center of the outside surface which runs the length of the piece. It may have functioned as a kayaker's wristlet, with cordage holding the sleeve end of the kamleika firmly to the kayaker's wrist, making it more watertight.

A flat piece of ground slate is sub-rectangular (Plate 149:F). It is 4.1 cm long and 1 cm wide. It may be a carving bit preform or a toy adze blade. A piece of chipped and ground gray silicified slate is 4 cm long, and has a wedge-shaped end (Plate 149:G). One end has been ground into a cylindrical point, which has been broken off. It may be a drill bit.

A bowl-shaped piece of carved cottonwood bark has broken out through the bottom (Plate 149:H). Measuring only 2.3 cm in diameter, it may be a miniature/toy replica. An enigmatic carved wooden object 9.5 cm long consists of a tapered shaft with a 3.9 cm long oval hole carved in the middle (Plate 149:I). It retains traces of red surface paint and is possibly a type of mask bangle. A small pointed wood shaft 6.8 cm long has a groove running down the center of the length of the specimen (Plate 149:K). A notch exists in the side of the shaft near the tip. Perforated halibut vertebrae have been found singly and in articulated groups in Kachemak phase contexts. At Karluk One, a 2.3 cm diameter vertebral disc cap from a halibut vertebra has a perforated center (Plate 149:L). A flat wooden oval is 5.2 cm in maximum diameter, and

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Plate 149

Miscellaneous artifacts

Object	Description	Catalog #
A	Model anyaq bow plate, wood, w/ red paint	193/3646
B	Model anyaq part, wood	193/4203
C	Model anyaq part, wood	193/4245
D	Model anyaq deck beam, wood, w/ red paint	193/3633
E	Model anyaq deck beam, wood, w/ red paint	193/3653
F	Ground slate object, possible, miniature adze blade	193/5785
G	Ground stone object, possible drill bit	193/5646
H	Hollow hemisphere, cottonwood bark	193/1354
I	Perforated object, wood	193/3017
J	Model anyaq bow piece, wood	193/2554
K	Object with central groove, wood	193/2374
L	Peforated and ground halibut vertebral plate	193/1141
M	Flate oval object, possible toy bowl part, wood	193/1854
N	Whale fluke effigy, ground slate	193/997
O	Object, possible bow string support, bone	193/5463
P	Model anyaq part, wood w/red paint	193/3473
Q	Object, wood w/ black graphite paint	193/1380
R	Object (articulated with Q), wood w/ black graphite paint	193/1383
S	Float inflator valve fragment, wood	193/1122
T	Object, ground limestone	193/5779
U	Object, ground limestone	193/6407

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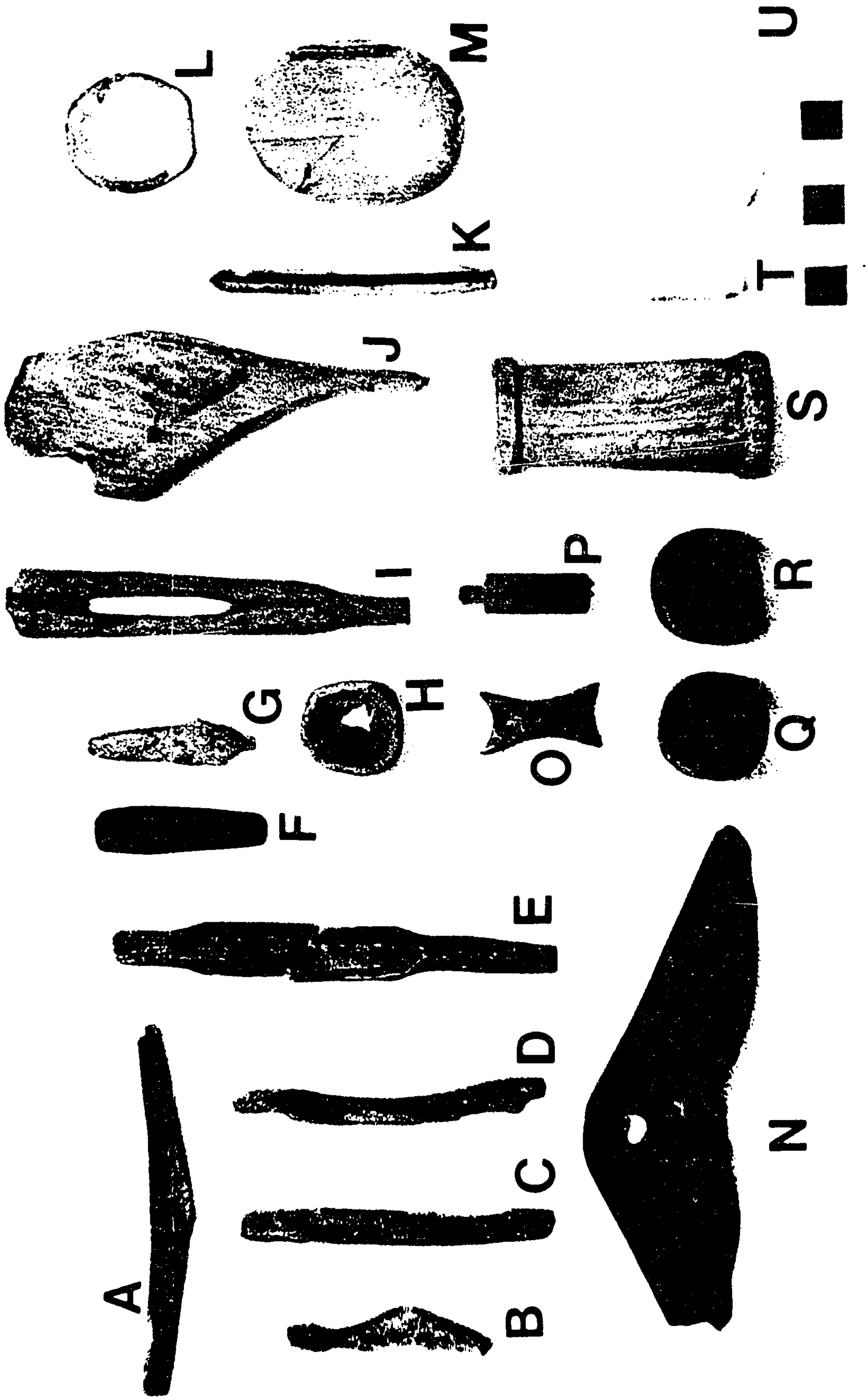

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Plate 150

Objects of Unknown Function

Object	Description	Catalog #
A	Cresentic piece, wood	193/4503
B	Mask ear?, wood	193/1918
C	Paddle shaped piece, wood	193/
D	Conical piece, wood	193/5223
E	Bi-pointed object, wood	193/979
F	Bi-pointed object, wood	193/2069
G	Bi-pointed object, wood	193/2174
H	Bi-pointed object, wood	193/2771
I	Bi-pointed object, wood	193/3028
J	Bi-pointed object, wood	193/5168
K	Kayak frame part?, wood	193/923
L	Object, wood	193/6048
M	Object, wood	193/5624

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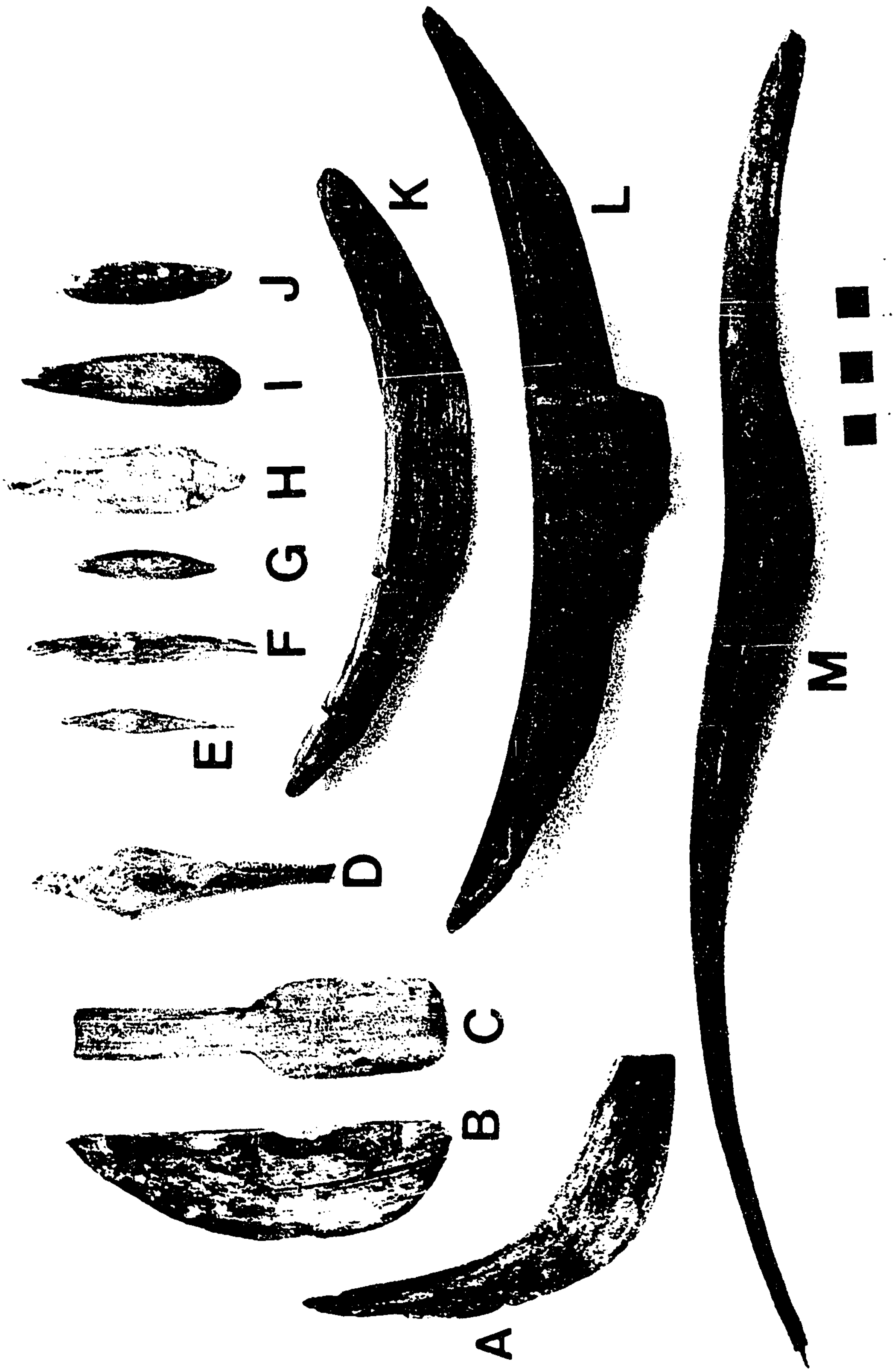

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.5 cm thick (Plate 149:M). It resembles a bentwood vessel bottom, and may represent a fragment of a miniature. Vertical cut marks exist on the bottom.

A flat crescent-shaped piece of chipped and ground slate is shaped very much like the flukes of a whale (Plate 149:N). Measuring 12 cm long, it has a large carved hole at the point where the 'flukes' may have been affixed to the body of a whale effigy. The edges are ground, but dulled, and not beveled, as in ulu or knife fragments. A flat bone piece is bow-tie shaped, and may have possibly been used to tighten the tension between the sinew cable and the wooden body of a bow. It is 2.3 cm long (Plate 149::O).

A rectangular piece of wood, square in cross-section, has been painted red and has a peg carved on one end (Plate 149:P). A similar peg was probably on the other end, but has been broken off. Donta (1993:291) has suggested that this piece is a type of mask bangle. Two checker-sized carved wood pieces are identical in appearance. They are 2.5 cm in diameter and sub-rectangular in cross-section (Plate 149:R). A concave depression is carved into the center of each piece. The bottom of each piece is concave, broken ends of but apparently a thin central shaft apparently once articulated the pieces in a spool shape.

A crescent shaped piece of wood is triangular in cross-section. The tip is notched, and the base is perforated (Plate 150:A). It retains traces of red surface paint. A flat crescent-shaped wood piece 11.7 cm long has three holes and countersunk lashing grooves along the straight edge. It may be an ear of an anthropomorphic mask (Plate 150:B). Another crescent-shaped piece of wood measures 18.9 cm across the arch (Plate 150:K). It is triangular in cross-section; two small holes perforate the mid-section, and four grooves exist near the base. Its surface retains traces of red paint. It may represent a boat part.

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A curved wooden shaft has beveled edges and a square in the middle with two parallel grooves in its top surface. It measures 17.2 cm across the arch. It retains much of its black surface paint (Plate 150:L). A very similar piece to this one, but with longer ends, was found in 1994. A rather bizarre wooden object consists of a piece of curved, tapered wood,. measuring 41.2 cm in length. It is triangular in cross-section (Plate 150:M). A thickened middle portion has a carved triangular indentation 2.2 cm across. There is a perforation in the body near that point, and to confuse things even further, a u-shaped open socket on one end. It retains patches of black surface paint. It is largely complete; it is possibly a dance wand.

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Chapter 10: Culture Change During the Koniag Phase

The Early Koniag Phase; 1200-14C0 A.D.

The Koniag phase has previously been viewed as a single culture-period, with substantial differences between it and the preceding Kachemak phase. Newly acquired data from Karluk One and other sites around the Kodiak Archipelago indicate that many of the changes formerly considered diagnostic of the Koniag phase, which was originally thought to date from A.D. 1000 A.D., in fact date from A.D. 1400. This casts further doubt on the model of an influx of Thule settlers from north Alaska around A.D. 1000.

The Kachemak style house form sometimes included a storage alcove along one wall of the central room (Figure 21). Beginning with houses dating after A.D. 1100, the alcoves grew larger, and were often added to the corners of the central rooms. Early Koniag phase houses have square central rooms with rectangular alcoves on one or more corners, and occasionally also placed along the center of the rear and side walls of the house (Figure 22). Some early Koniag houses are surrounded with so many small side alcoves that they resemble a spoked wheel. Rectangular corner alcoves occasionally appear on late Koniag houses as a supplement to full fledged side rooms with their own entrance tunnels. Like Kachemak villages, the house in early Koniag settlements tend to be a clustered formation.

Early Koniag housefloors are thin, usually no more than 3 cm deep, although a stack of reflooring episodes can be expected to form deposits within a single house pit of 20 cm or more. The floors are defined by thin layers of gravel and sand. Hearths are quadrangular in shape and are larger than Kachemak, but smaller than the Koniag fire places which typically exceed a square meter in size. The clay lined pits seen in Kachemak houses

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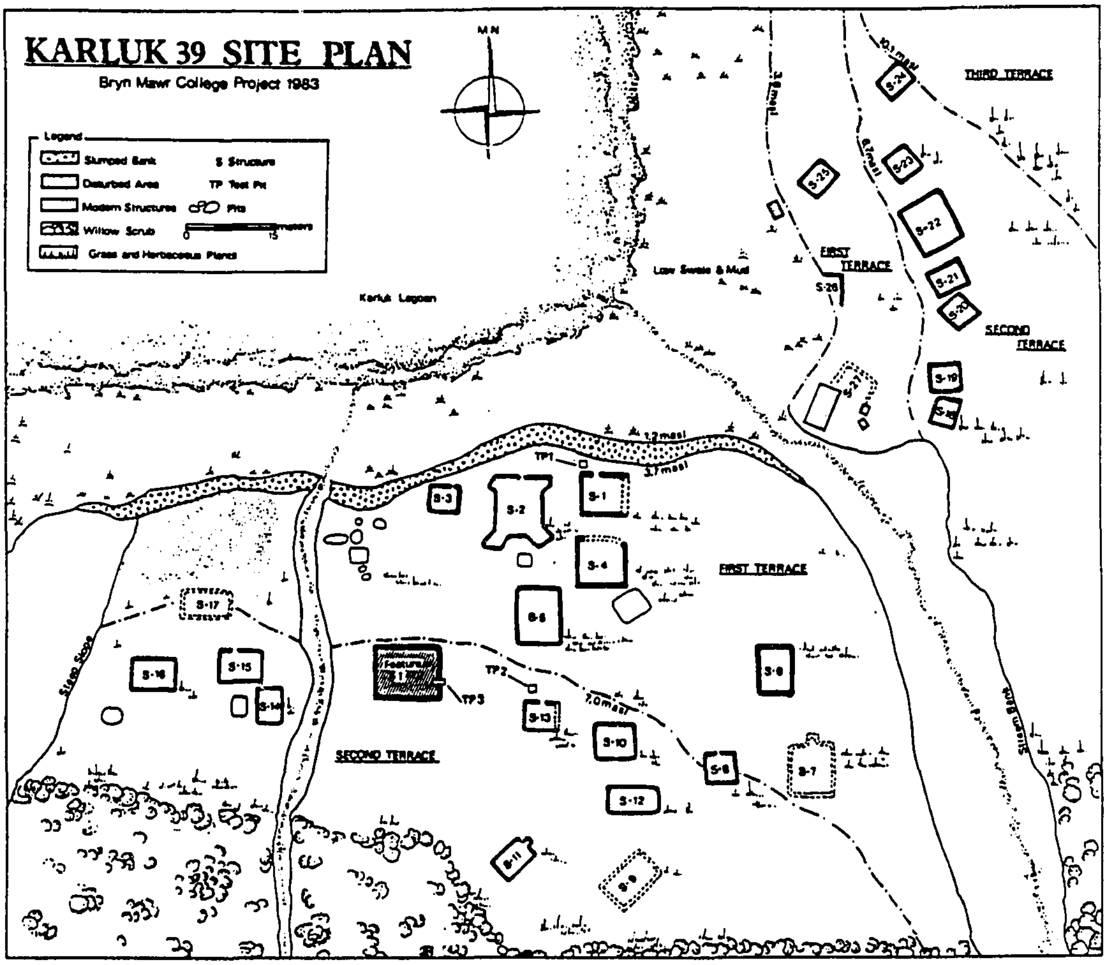

Figure 21: Kachemak village site on Karluk Lagoon

(From Jordan and Knecht 1988)

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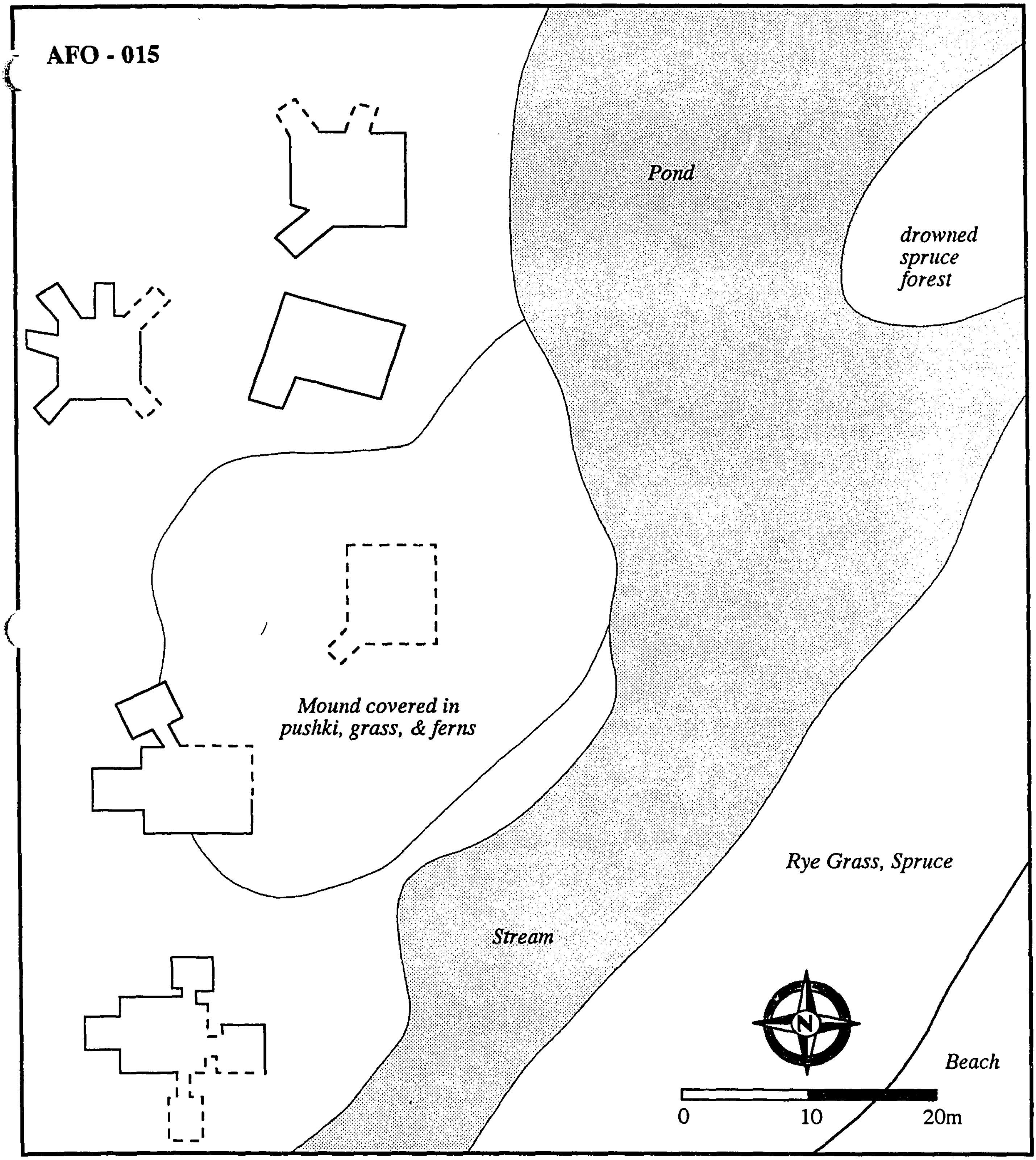

Figure 22: Sketch of AFG-15, Settlement Point, showing both early Koniag and late Koniag house pits

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are also seen in much larger forms in those in early Koniag times. Clay lined storage pits in early Koniag houses at the Settlement Point site (AFG-015) and at Malina Creek (AFG-5) measure from 40 to 180 cm in diameter. Subfloor storage pits, 40-60 in diameter, sometimes filled with the remains of marine inter tidal organisms: (clam and mussel shells, chitons, crushed sea urchin shells, and chitons) are also found in and near early Koniag housefloors, as they are in the Kachemak houses.

Early Koniag artifact assemblages are best known from the lower house floors, house floor 8, 9 and 10 and basal middens from the Karluk One site, representing about 130 cm of the site stratigraphy. Additional early Koniag material was found during the 1994 work at Settlement Point. The vast majority of early Koniag material culture shows strong continuity with both the preceding Kachemak phase and the succeeding late Koniag phase. Several artifact types however do not continue into late Koniag and have proven to be dependable horizon markers.

Lance points with pronounced medial ridges (Plate 35) have been found on Kachemak sites dating to around A.D. 1000 at KAR-31, Malina Creek, and at the Kukak Mound site on the Alaska Peninsula and were used at Karluk One into the early Koniag phase until A.D. 1400. These points have also been found in early Koniag houses at Settlement Point. The medial ridge on these points is high enough to create a diamond shaped cross section, which would have yielded substantially more lateral strength than in conventional flatter points. This point would also have been much harder to grind and its disappearance may be linked a what seems to be a general preference for more utilitarian, expedient forms of points with the onset of the late Koniag phase.

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Fish harpoon valves appear in the Kachemak phase, including a three piece form with a scarfed base in Kachemak sites such as the Uyak site (Heizer 1956) and in Kachemak Bay (Workman 1992). Shortly after A.D. 1400 the three piece fish harpoon point gives way to a two valve form where both components have a socketed base (Chart 2). This may also be part of a trend toward more utilitarian, easier to manufacture items as the late Koniag phase began.

Stemmed ulu blades are found early Koniag assemblages, although they exist along side straight backed ulu blades, which remain common throughout the Kachemak and Koniag periods. Kachemak phase ulu blades sometimes feature deep corner notches, which by early Koniag times have turned into a progressively shorter stem.

Another artifact characteristics early Koniag sites are incised pebbles (Chart 23), which are sometimes found in fairly large numbers. When organic preservation is present, as in the Karluk One site, the incised pebbles are found in vertical and horizontal association with tally sticks (Chart 22), which strongly suggests that incised pebbles were used in gaming. In addition incised pebbles seem to descend from flat, coin-shaped pieces of stone, also probably gaming pieces, seen in Kachemak sites at KAR-31, Malina Creek, and at Uyak.

Among the assemblage of wood and other organic artifacts at Karluk One the early Koniag levels have far more miniature bows. Snare pins are more common, as are one variety of wooden fish hook barb. Baleen basketry has so far been recovered only from Kachemak levels at KAR-31, and in the early Koniag levels at Karluk One, although the sample remains very small. The percentage of wood represented in the assemblage is somewhat greater, around 10-15%, in the early Koniag levels than in those of the late Koniag.

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Birch bark rolls and scraps also are far more abundant in early Koniag levels at Karluk One, for reasons that are not clear.

Table 10:1; Some Diagnostic Artifacts from the Early and Late Koniag Phase Levels at the Karluk One Site

Early Koniag Phase; 1200- 1400 A.D.	Late Koniag Phase; after 1400 A.D.
Fish harpoon valves 3pc., scarfed base	Fish harpoon valves 2 pc., socketed base
Lance points with pronounced medial ridge	Triangular endblades with faceted base
Incised pebbles	Gaming discs
Stemmed ulu blades	Perforated Ulu blades
	Chalcedony shatter
	Grooved splitting adzes

The Late Koniag Phase: A.D. 1400 -1780

A period of rapid climatic cooling affected much of the Northern Hemisphere between the years 1100 and 1850 A.D., known in the literature as the Little Ice Age. In Alaska this period witnessed the biggest Holocene advance of glaciers. Data from ice cores taken from glaciers in the southern Kenai Peninsula indicate large glacial advances beginning after A.D.1400, with the advances occurring between 1440 and 1460, and 1650 and 1710 (Wiles 1992, Mann 1993). Late summer snow lines during the Little Ice Age were probably 100 to 150 m below modern levels (Wiles 1992).

The climatic dynamics of Alaska are largely driven by the Pacific. It is unlikely that the temperature drops had a drastic effect on terrestrial resources utilized by the Alutiiq. Even minor temperature shifts, however, have important consequences for the location and abundance of marine species. Marine thermoclines affect the upwelling of nutrients. Nutrient mixing is also affected by prevailing wind direction and velocity. It is difficult, perhaps impossible to ascertain the which climatic changes most

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affected maritime subsistence patterns. In a complex system of this nature, change was probably inevitable.

During the same years as major glacial advances of the Little Ice Age were underway on the Kenai Peninsula, we see shifts in Koniag subsistence, house form, settlement pattern, and related forms of material culture.

Changes in house form and settlement pattern

After A.D. 1400 true multiple room barabaras appear on the Kodiak archipelago. The central room stays about the same size, but the hearth gets larger by about 20-30%. Adjoining the central room are entrance tunnels that lead to side rooms that can number from one to as many as eight (Figure 23). Unlike housepits from the preceding Kachemak and early Koniag phases, late Koniag houses vary greatly in both size and floor plan. This suggests that late Koniag society was less egalitarian in some respects (Chart 30, 31). The design of Koniag houses also indicates that groups of nuclear families, probably related to each other through biological or fictive lineages, shared the house. They also very likely all participated in a single household economy. The largest houses are located on 'prime real estate', facing a major salmon hole on a river, a weir, or dominant topographical feature, again suggesting differential access to resources based on the strength of a kin-based household.

A sudden and widespread shift also took place in settlement patterns after A.D. 1400, with villages of unprecedented size rising along every available well drained embankment of the Karluk and Ayakulik Rivers, the major salmon streams of the Kodiak Archipelago. Settlement patterns during the late Koniag phase tend to be more linear than clustered, within the limitations of local drainage and topography. At least 150 multiple room house pits exist on the Ayakulik drainage, the majority of which are seven miles upstream from the river mouth. More than 200 multiple room

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Figure 23: Segments of a very large late Koniag village on the Ayakulik River

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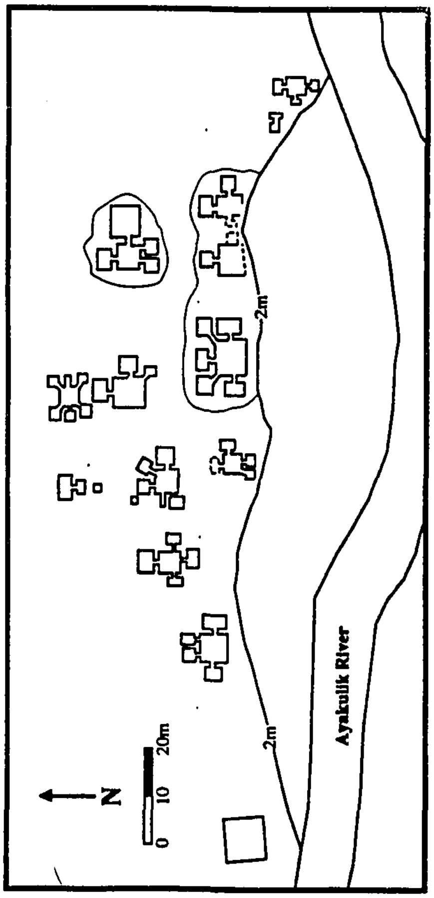

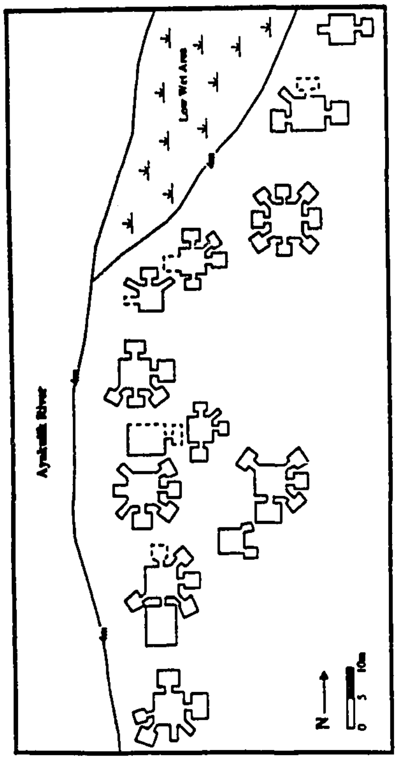

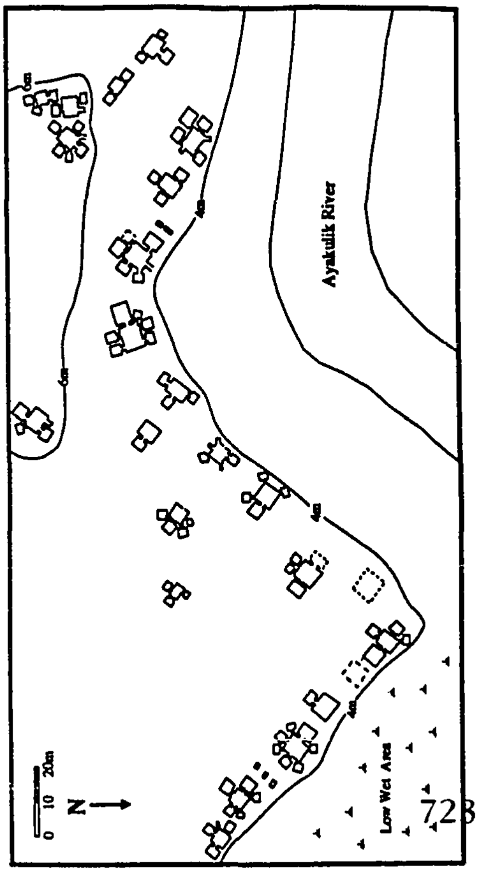

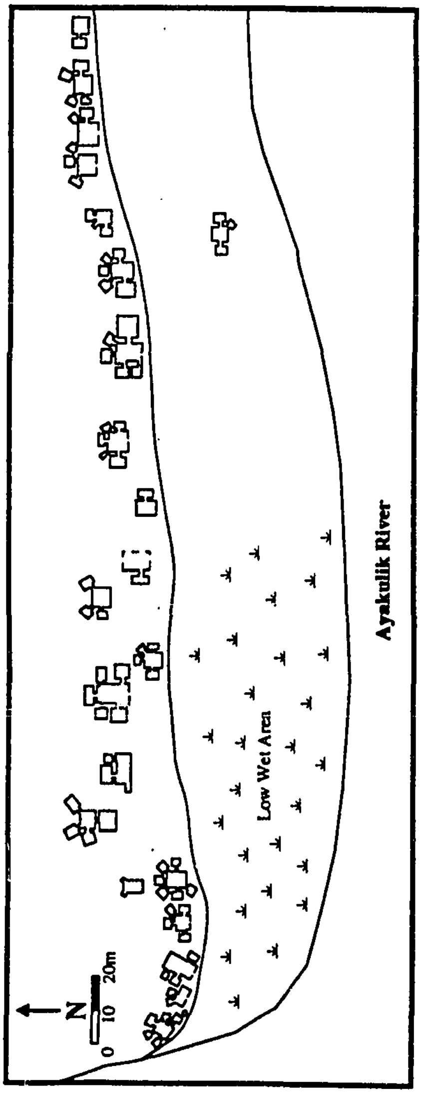

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Chart 30: Numbers and Sizes of Koniag House Pits on the Karluk River Drainage

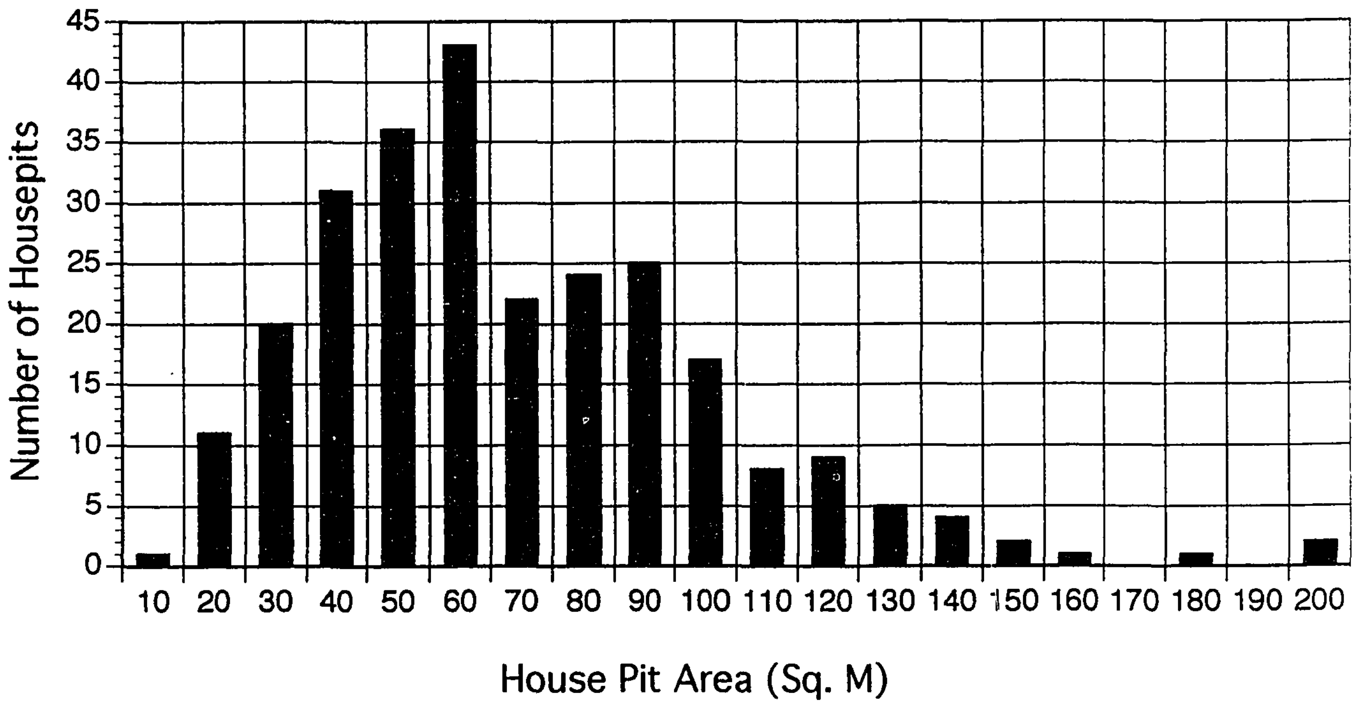

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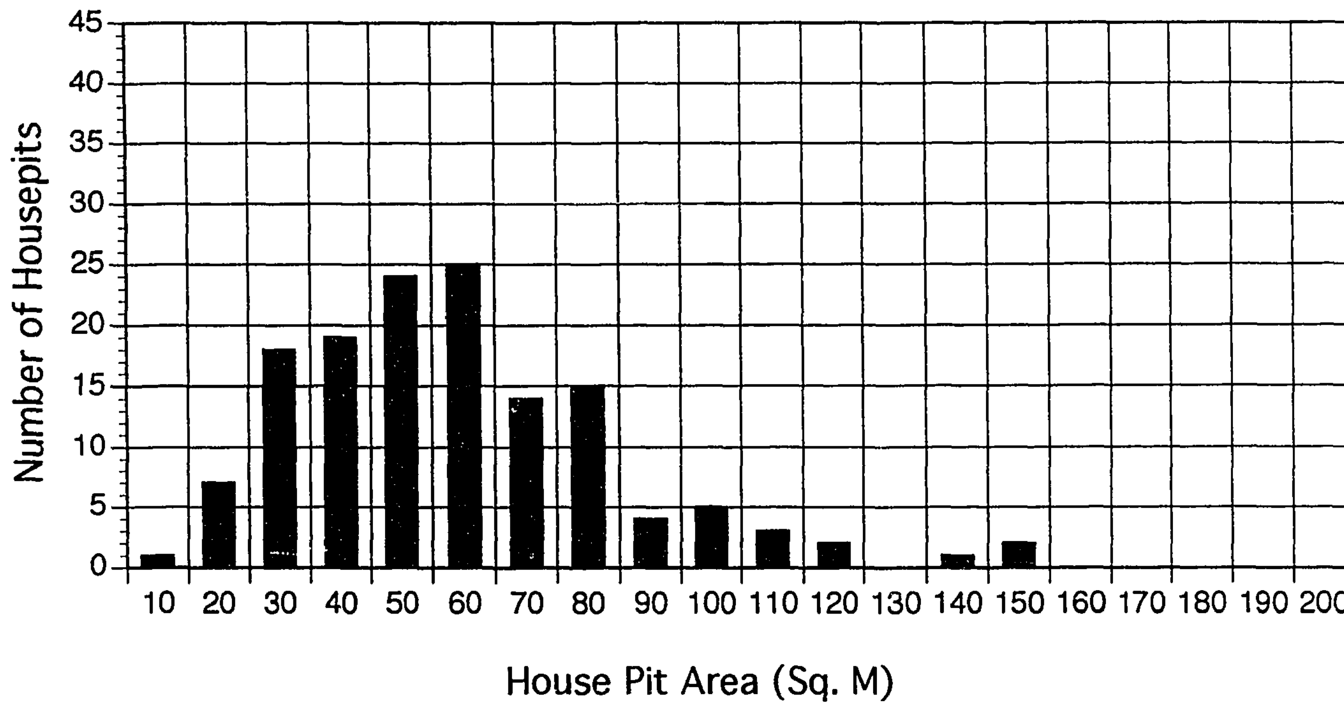
Chart 31: Numbers and Sizes of Koniag House Pits on the Ayakulik River Drainage



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barabaras line the banks of the Karluk River. No Kachemak or early Koniag settlements remotely approach that scale.

It is also significant that the Ayakulik, Karluk, and other large Koniag village sites are frequented by runs of silver salmon. Silver salmon spawn in the late summer and early fall, and are the last to run in Kodiak streams. Fairly fresh fish can be seen in streams well into the winter. Hungry eagles congregate in large numbers, sometimes by the hundred around the deep holes and stream bends where the dark shapes of silver salmon can be seen under the ice. Apparently the Koniag were following their example in locating settlements close to one of the few food sources of available in mid-winter.

Some earlier considerations of the Koniag period have assumed that this reflects both a rise in population and economic specialization as part of a continuing process of cultural evolution. At this point it is probably more realistic to view this as a focal settlement pattern, rather than an actual increase in numbers. Cultural evolution toward complexity definitely took place, but probably as a response to climatic adversity, not as a kind of Koniag renaissance.

The numbers of people represented by late Koniag house pits may be surmised from the earliest known written account of the Koniag which was left by Stephen Glottof, a Russian fur hunter and trader, who was in command of the vessel *Andrean and Natalia* (Coxe 1780:106). In September of 1763 Glottof anchored in an estuary on the south end of Kodiak Island, identified from his description as the present day Russian Harbor (Black: 1992). On the shore were " four large huts, so crowded with people that their number could scarcely be counted" (Coxe 1780: 108). According to Glottof, more than 100 persons fled from the village.

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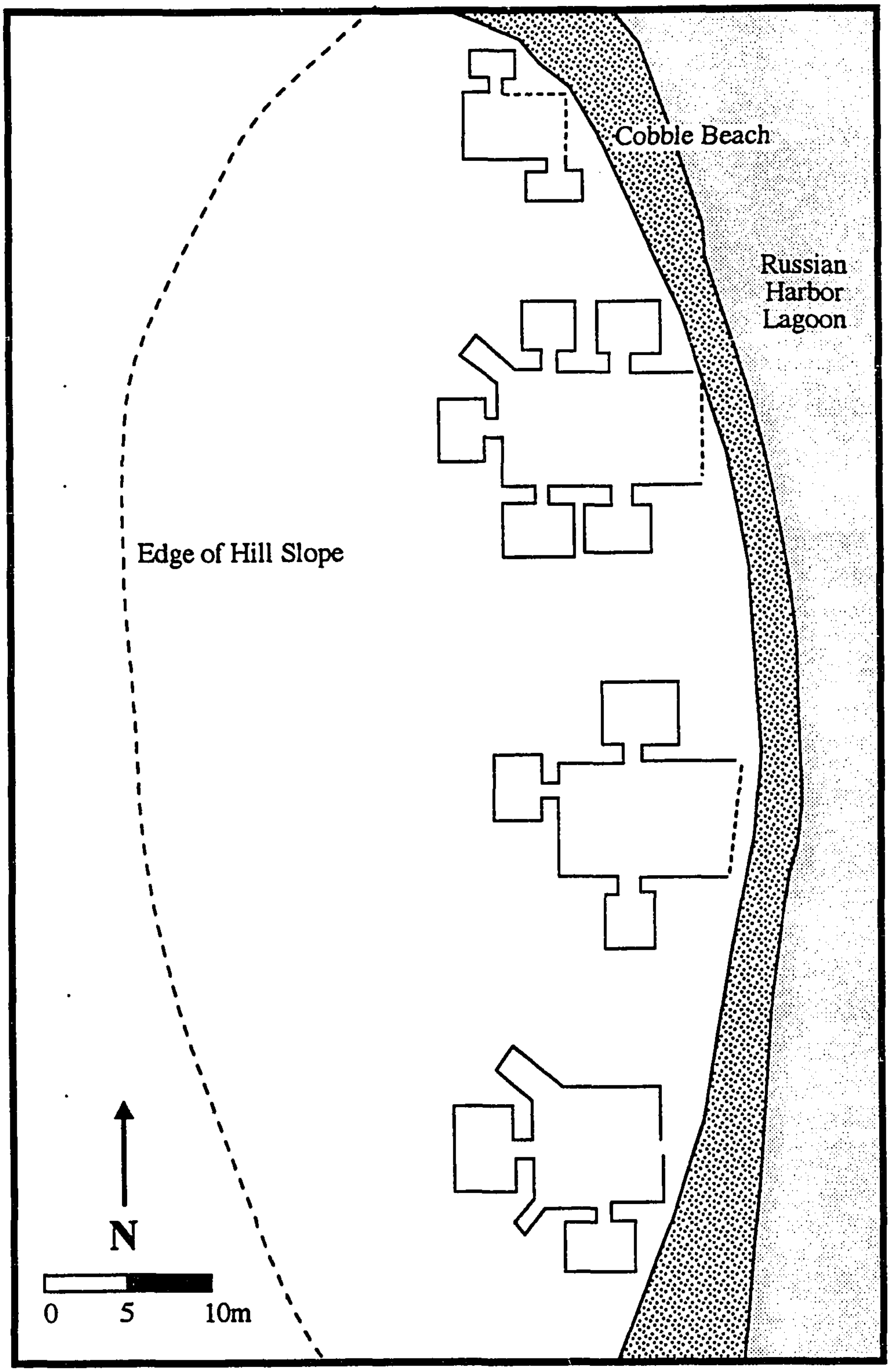
Figure 24: Plan of late Koniag house pits, remains of a village encountered by the Russian navigator Stephan Glotov in 1763



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Following a lead provided by a local fisherman, Glottof's maps and from Lydia Black (1992) I was able to locate the site of the 1763 landing during the course of a 1992 survey project in the Russian Harbor area. Here were four barabara pits, just as Glottof described (Figure 24), one of which yielded a spent musket ball from its roof sods. Other Russian sources indicate that on the average about 20 Koniags occupied a single barabara (Knecht and Jordan 1985).

Shifts in subsistence related technologies

The amount of sea mammal hunting gear; lance points, harpoon points, shaft fragments, throwing boards and accessories, in the Karluk One assemblage predating 1400 A.D. exceeds or is equivalent to the amount of artifacts associated with fishing (Chart 32). The shift in subsistence focus is most pronounced in the period for which the glacial advances on the Kenai Peninsula are recorded. Some recovery, that is a return to more sea mammal hunting, is evident by the mid-18th century.

Faunal remains from Karluk One also show a subsistence shift toward more fishing, less sea mammal hunting, and less use of shellfish during the years following 1400 A.D. (Chart 33). It is uncertain just how climatic changes associated with the Little Ice Age may have contributed to this, but this would seem to be the case. As we shall see later, the fact that this pattern has been observed in other sites at the same time is further evidence for factors, or a set of factors that led to increased reliance on salmon resources throughout a wide area of coastal Alaska. It may be that changes in the duration of the spring ice pack in the Bering Sea may have lessened the number of migrating sea mammals, or at least shifted their migration routes. It may have also been that marine upwellings of nutrients may have occurred further offshore, thus making it more difficult to take apex predators like whales.

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Chart 32: Changes in Relative Numbers of Artifacts Associated with Fishing and Sea Mammal Hunting at Karluk One.

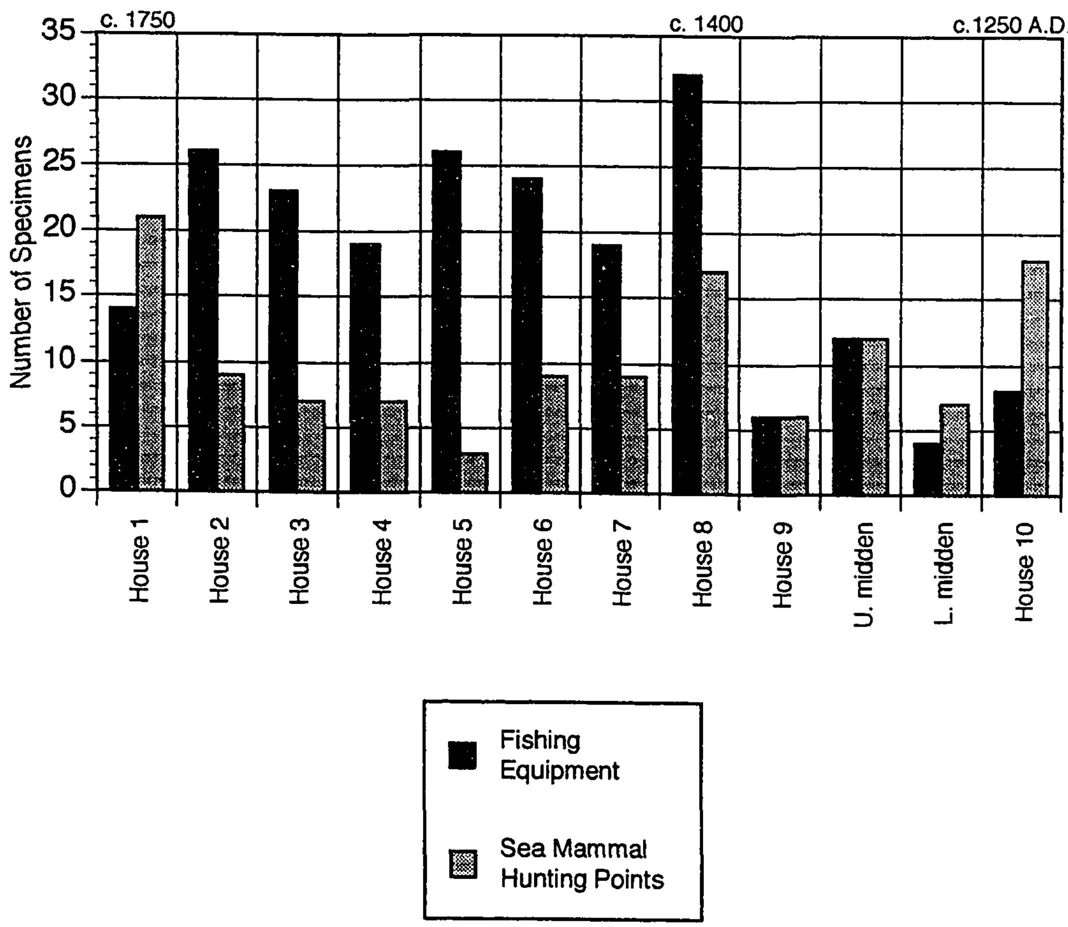

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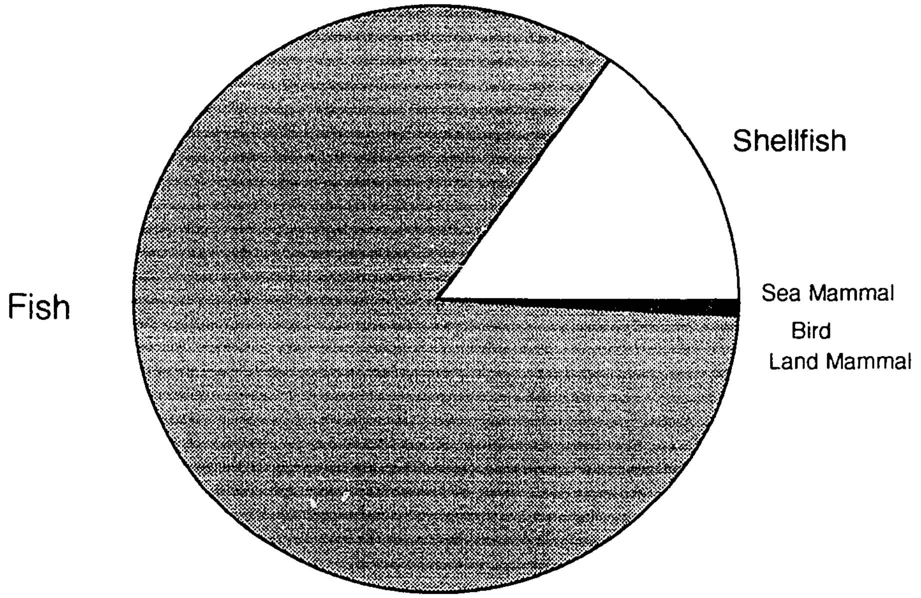
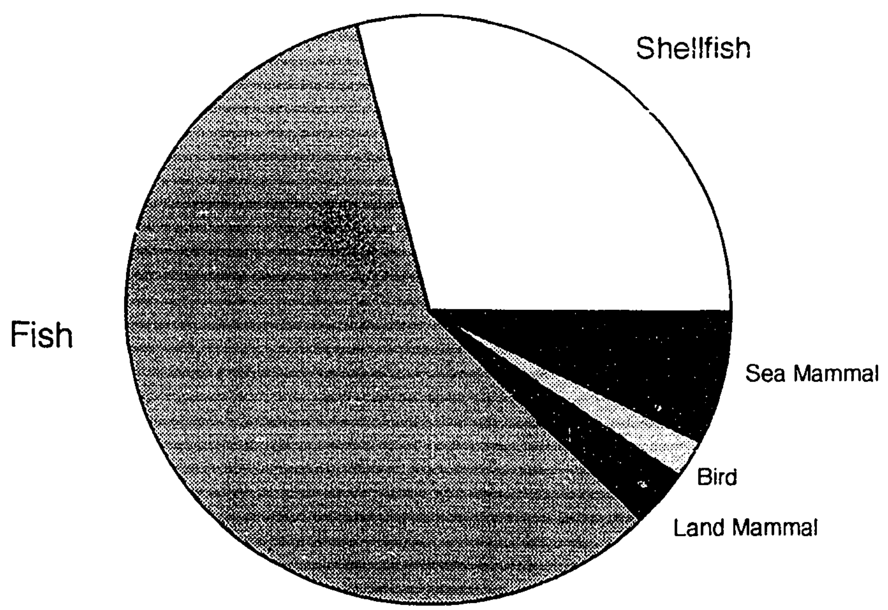
Chart 33: Changes in Proportions of Faunal Remains Recovered at Karluk One.



Karluk One 1400-1750 A.D.



Karluk One 1200-1400 A.D.

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Stormier weather patterns may have also played a role. Whatever the reason it remains the case that the Koniags found it necessary to focus more on harvesting salmon than they had at any time in the past or since.

Not surprisingly, a number of technological changes related to fishing are reflected in the late Koniag assemblage. Fish harpoon valves become more numerous and now are more simply made 2-piece socketed forms (Chart 2). Notched pebble sinkers also increase in late Koniag (Chart 1), and other items used in seines such as spacer-bar sinkers and cottonwood net floats are in evidence. Stunning clubs have also so far only been recovered in late Koniag contexts. Large V-shaped stone weirs can be seen adjacent to the late Koniag villages on the upper Karluk River, and spanning tidal inlets in the Akhiok area. Spearing salmon while they mill in large numbers behind an artificial obstruction may well have been the most efficient way to harvest large numbers of a fish too heavy for a hand made seine. Seines may have been used for small anadromous fish like Dolly Varden Trout.

Storage methods also change during the late Koniag period. Gone are the clay lined storage pits, in their place are rectangular plank lined storage boxes, held in place by upright logs pounded into the ground. We have encountered plank lined storage boxes inside dwellings at Karluk One, as well as outside at Malina Creek. When found intact, a plank lid has been found to be held down by a large cobble or small boulder or two. Baleen or rye grass has been found lining the base of the boxes, as in some of the large clay lined pits of the early Koniag.

A premium may have been placed on the ability to store food in the difficult periods during the Little Ice Age. The average size of bentwood vessels encountered at Karluk One rises in the years following 1400 A.D., and slowly declines as time goes on (Chart 9). Trapezoidal storage boxes also

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appear in late Koniag, as do large ceramics in the latest housefloors at Karluk One.

Other Technological Changes after 1400 A.D.

Other changes that define late Koniag may also be linked to the Little Ice Age. Sweat bath midden which first appears during the Kachemak phase, increases, as do the associated numbers of sweat bath or *banya* tools, such as rock tongs, rock scoops, and water dippers. The sheer volume of discarded burned rock from sweat bathing contributes the impressive size of late Koniag midden mounds into which the housepits are imbedded like so many bunkers in a row.

Not coincidental to this is the fact that wood splitting tools change, with the addition of the grooved splitting adze to late Koniag household inventories, although plain backed splitting adzes remain common in both early and late Koniag times. By 1500 A.D. the grooved splitting adze seems to have been adopted by cultures throughout Alaska, probably for similar reasons. The number and size range of wooden wedges also greatly increases. This may be due to an increase in fuel requirements, for the sweat bathing and simply to stay warm, as well as the need for split planks to line the larger barabaras.

Shattered debitage of white chalcedony, an import from the adjacent shores of the Alaska Peninsula occurs in late Koniag levels at Karluk One. There is also an increase in the use of local red chert, as well as a rise in the number of hammerstones in late Koniag, although I am not certain why this is so. By the late 18th century chert debitage is quite common in Koniag housefloors excavated at the KOD-450, the Awa'uq refuge rock site. Crystals of quartz and iron pyrite also appear in late Koniag house floors.

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Labrets, Social Stratification, and Conflict

A notable increase can be seen in the numbers, styles, and sizes of late Koniag labrets at Karluk One (Table 26, 27). By any measure, labret use peaks in the years following 1400 A.D., which may reflect an increasing concern for signaling social rank and/or affiliation as aggregates of people gathered to form the new larger settlements on the salmon rivers. The amount of organized labor to make these settlements possible is impressive. The largest village on the Ayakulik is two km long, lining both side of the river. Over 130 houses strong, it is located some seven miles from the coast, the nearest source of driftwood for construction. Even a sod walled barabara needs a substantial amount of wood for its frame and plank lined walls.

The salmon weirs are of such size that we didn't notice them until we were able to see them from the air. The weir near Akhiok is 100 m long and made from large boulders. Construction of the houses atop the refuge rocks is also stunning; timbers, stone slabs for storage boxes, and even entire whale skulls were somehow hoisted up a sheer 25 meter cliff at the Awa'uq Refuge Rock.

The role of labrets in social signaling during the onset of the later Koniag phase, when power struggles were likely prevalent, is supported by the association of labrets and the endblades used to tip arrows (Chart 34).

Ceremonialism, Gaming and Trade

Artifacts associated with ceremonialism and regalia; masks, mask bangles, miniature masks, and anthropomorphic figures all are important components of late Koniag assemblages at Karluk One (Jordan 1994, Donta

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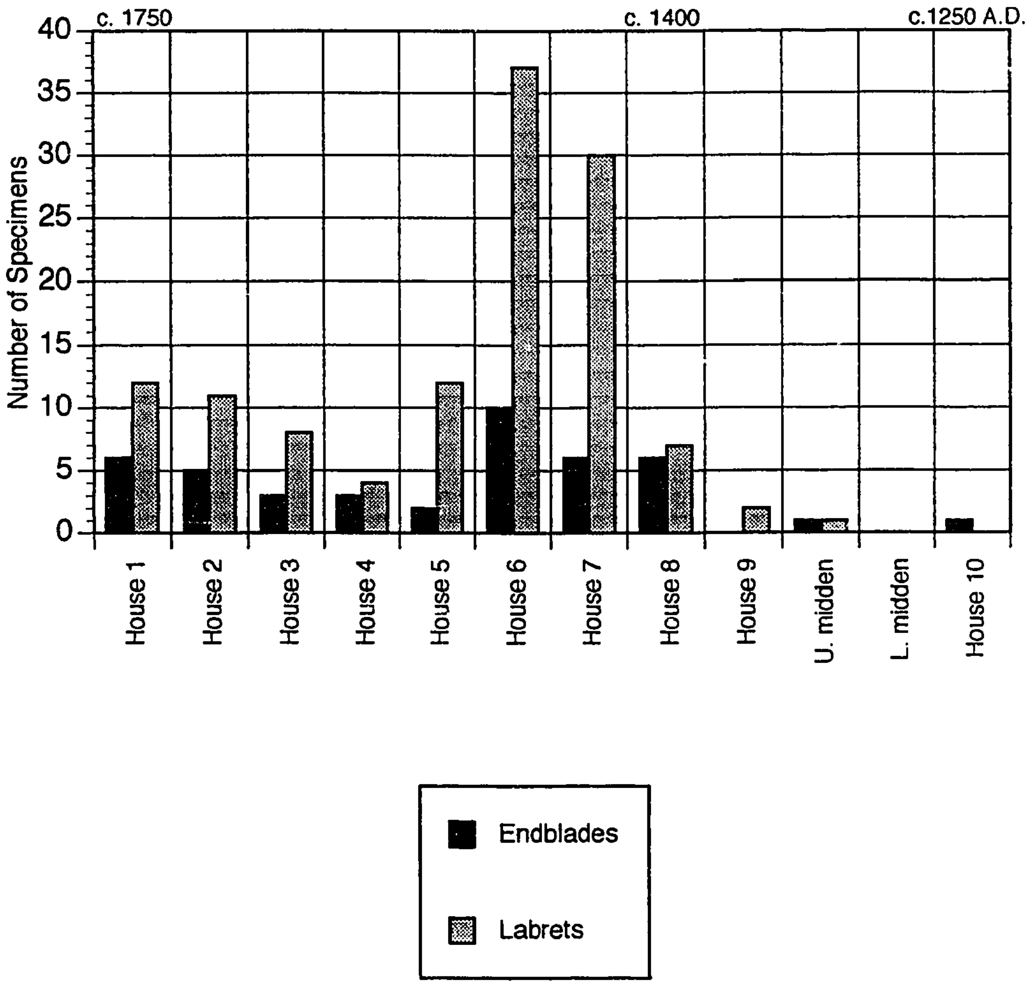
Chart 34: Warfare and Status: Arrow Endblades and Labrets at Karluk One



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1993). In ethnohistoric reconstructions of Koniag ceremonialism it is evident that ceremony, in conjunction with feasting and gaming, was an important means for achieving and ratifying political status. Ceremonial houses were owned by high ranking individuals (Jordan 1994:150). Several large square depressions, which lack side rooms and are located at one end of late Koniag villages have been observed, and may be the remains of the ceremonial house or *qasqi*.

Gambling was important in both the early and late Koniag phases, as evidenced by the quantities of gaming pieces and tally sticks in the Karluk One assemblage. The numbers of Uqshaq darts stays consistent throughout the Koniag phase, and as noted earlier, the game survives in Alutiiq villages today. Tossing games, perhaps the same game, apparently underwent a change from early to late Koniag as incised pebbles become replaced by Kaganak discs after 1400 A.D. (Table 23). Gaming balls, present in assemblages since Kachemak times, increase as the Koniag phase progresses (Chart 35). New variants of gaming balls also appear in the late Koniag phase, including balls of unfired clay, cottonwood bark, and wood. Ivory dice also appear in late Koniag and the game using them survived into the 20th century.

Warfare: Koniag Refuge Rocks

Faceted endblades, used to tip barbed bone arrow tips, are found to co-occur at Karluk One with labrets, as well as exotic raw materials such as jet, ivory, and limestone. This indicates that trading and raiding probably occurred during the same time period. These correlates of warfare, along with increased labret use, may reflect adjustments to life in the large villages which arose shortly after 1400 A.D. (Chart 36). After 1750 sea mammal hunting may be returning to former levels, and it is possible that long

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Chart 35: Changes in Koniag Gaming after 1400 A.D. at Karluk One

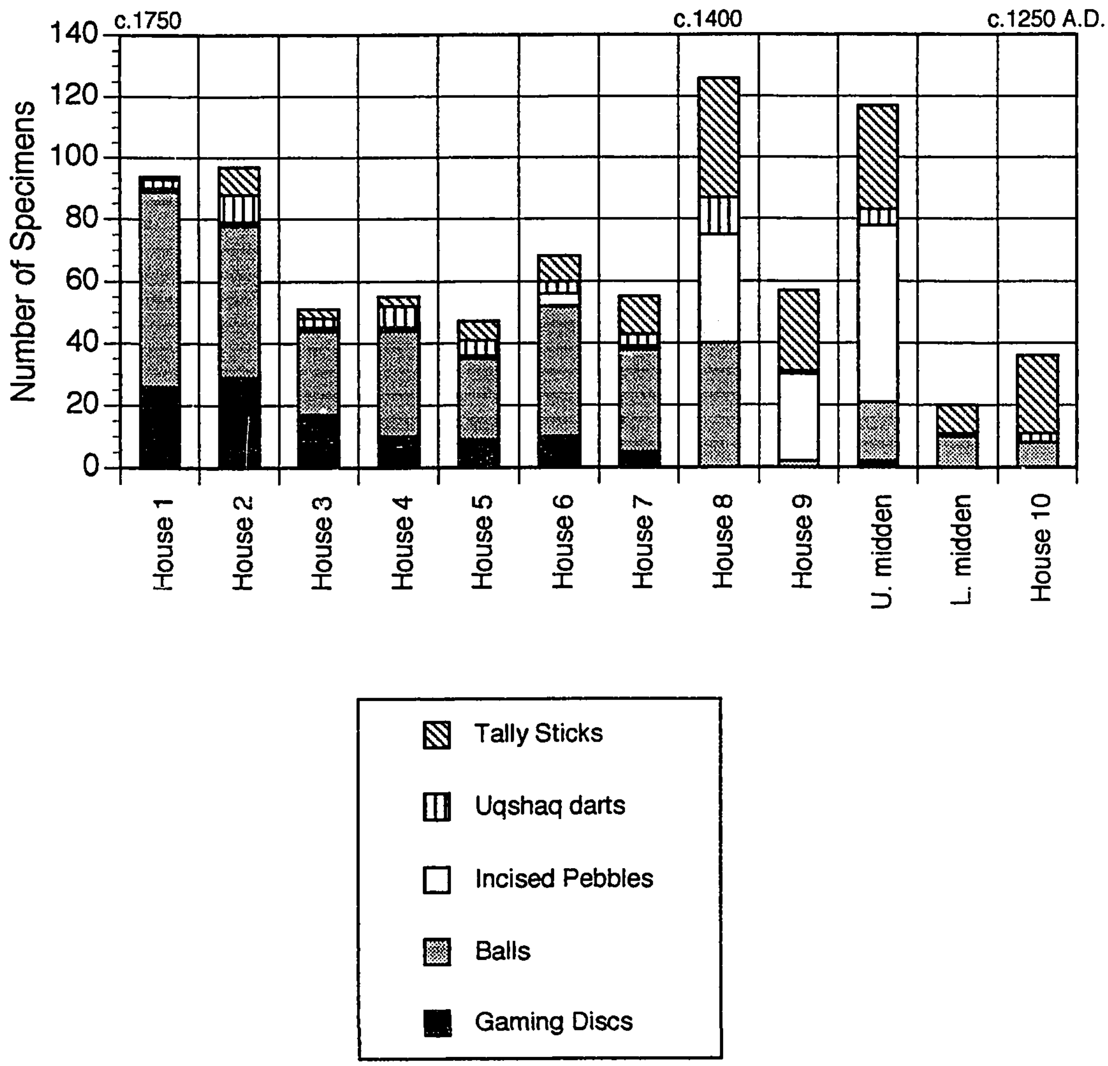

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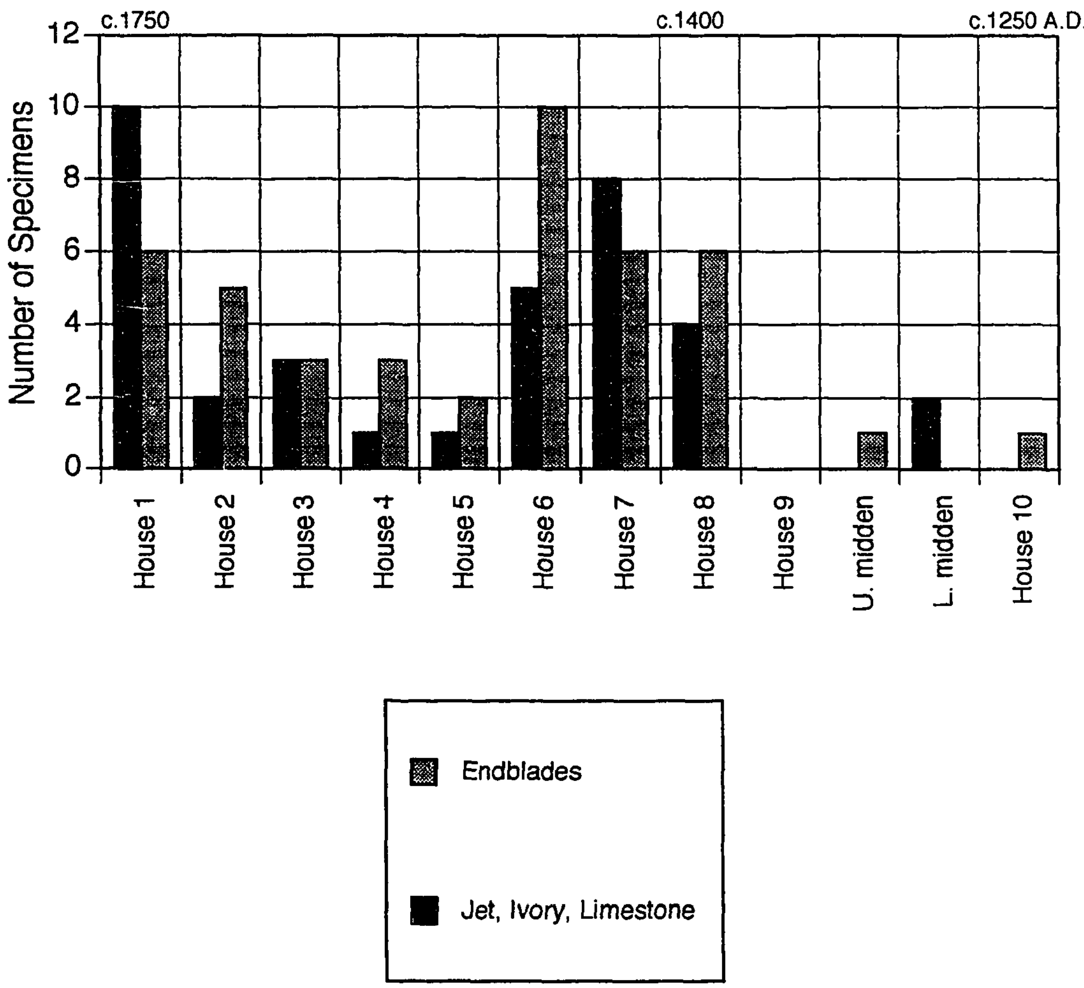
Chart 36: Exotic Materials and Warfare: Association of Slate Arrow Endblades with Jet, Ivory, and Limestone at Karluk One



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distance contacts also increased, perhaps with a break in the weather patterns. The largest village aggregates on the Karluk and Ayakulik may well have been abandoned by the time the Russians arrived in force in the 1780s. This may explain why there is no mention of them in ethnohistorical accounts.

One evidence of a rise in warfare late in prehistory is the refuge rocks, or fortified sea stacks which have been recorded in various locations around Kodiak and on the Alaska Peninsula. All of the refuge rocks so far investigated appear to be of late Koniag date. The best known of these is the Awa'uq refuge rock, located off of Sitkalidak Island near the modern Kodiak Island village of Old Harbor (Figure 25). This was discovered and excavated during the 1991 and 1992 field seasons (R. Knecht field notes).

At least 27 multiple room, late Koniag barabaras were located on top of the Awa'uq Refuge rock, which was the scene of an attack by Russian fur hunters in 1784. A single dwelling was completely excavated (Figure 26), revealing at least one reflooring episode from a previous use earlier in the 18th century. The historical record from this event provides other clues about the structure of late Koniag culture.

The End of Koniag Independence

The key to subjugation of Koniag society by the Russians was the taking of hostages from ruling families. Children of 'chiefs' were specifically sought, and at times several hundred hostages were held for such purposes at the Three Saints Bay settlement. The fact that the Koniag, so vastly superior in numbers to the Russians, could be held in check through the threat of harm to hostages perhaps is the strongest evidence of the political power possessed by influential families.

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Figure 25: Site plan of KOD-450, a late Koniag fortified sea stack attacked by Russian fur hunters in 1784

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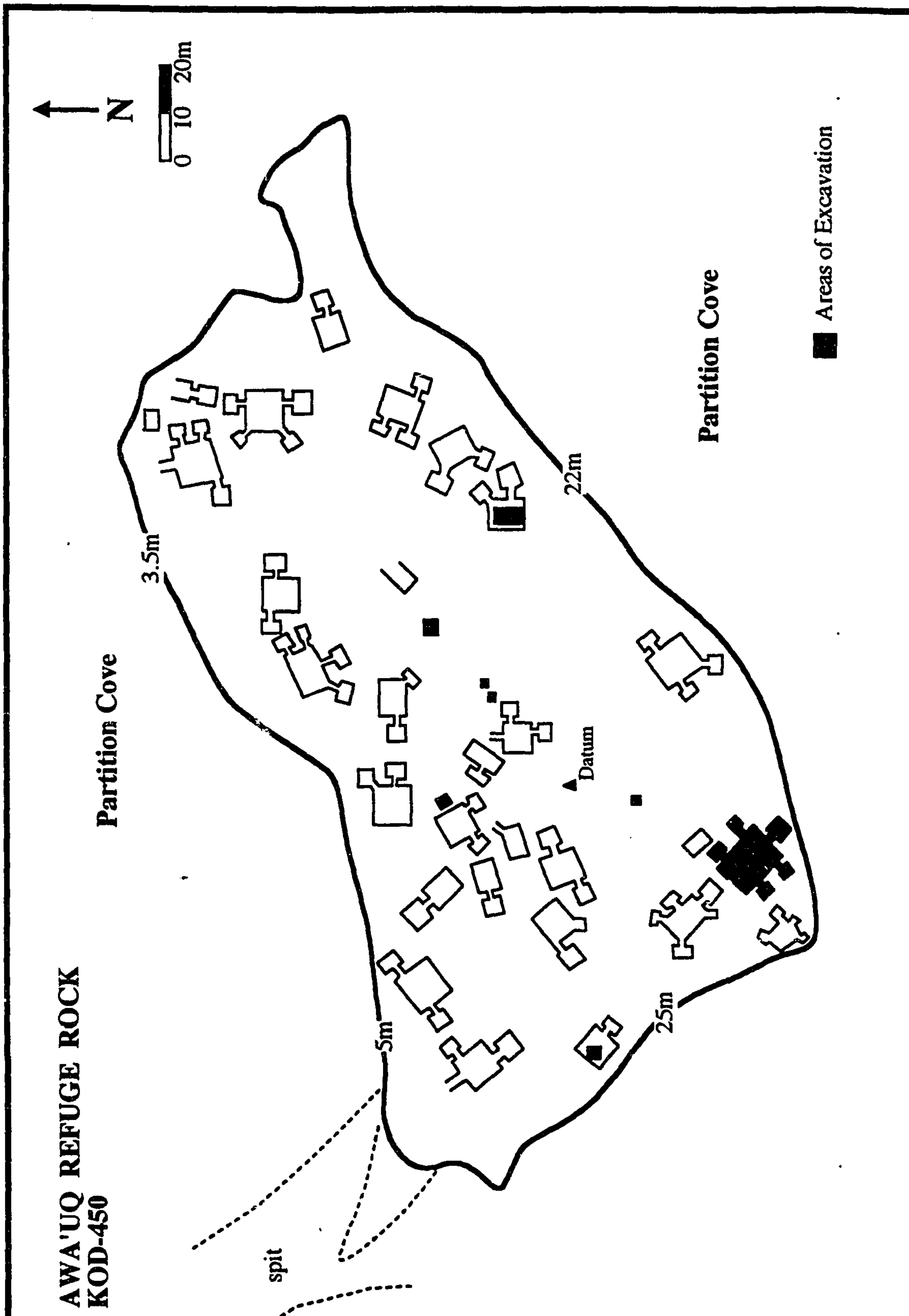

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Figure 26: Koniag dwelling excavated at KOD-450

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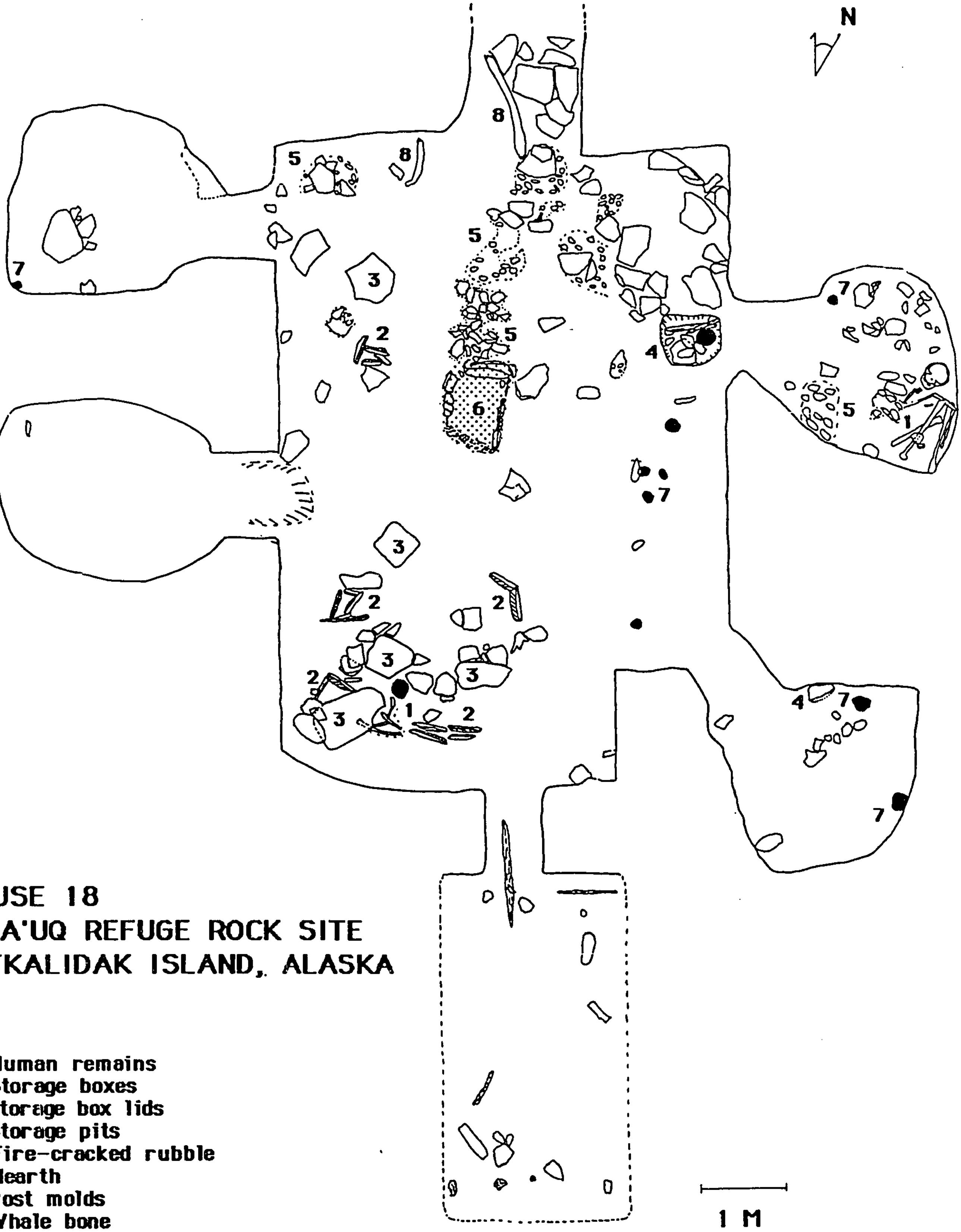

HOUSE 18
AWA'UQ REFUGE ROCK SITE
SITKALIDAK ISLAND, ALASKA

1. Human remains
2. Storage boxes
3. Storage box lids
4. Storage pits
5. Fire-cracked rubble
6. Hearth
7. Post molds
8. Whale bone

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Initial attempts at landings by Russian fur traders on Kodiak Island were foiled by Koniag military force. In 1761, the ship *Vladimir*, commanded by Pan'kov, landed at "Cape Agaekhtalik" [probably Cape Aiakhtalik, now called Cape Trinity] (Shelikhov 1981:41). The Koniags forced the Russians to stay within 5 km of their vessel, eventually forcing them to leave. Subsequent Russian attempts to establish a presence on Kodiak were also driven away by ferocious Koniag resistance in 1763, 1776, and 1780 (Shelikhov 1981:41). Twenty years would pass before the Russians would again attempt a permanent landing on Kodiak Island with Gregorii Shelikhov landing at Three Saints Bay in 1784. Forewarned by the experiences of earlier explorers, he was fully prepared with two ships, 130 armed men and five 2-pound cannons (Shelikhov 1981, Black 1992).

As in the case of earlier Russian landings, Shelikhov met armed resistance from the Koniags, who gathered on a refuge rock, actually a flat topped sea-stack, on the south side of Sitkalidak Island. Shelikhov claimed that 4,000 armed Koniags were gathered, awaiting still more reinforcements from other parts of the island in anticipation of attacking the Russians at Three Saints Bay. Other estimates place the number at 2,000 (Black 1992).

Oral accounts by elder Koniag survivors, recorded in the mid-19th century, indicate that all of the residents of the numerous Koniag villages on Sitkalidak Island had gathered on the refuge rock to oppose the Russians (Holmberg 1985:59). The fact that several Koniag settlements had formed an aggregate group to face the Russians on Sitkalidak also suggest a substantial degree of social cohesion, and probably some formalized political ties. According to an Aleut slave of the Koniags, who later reported to Shelekhov, the Sitkalidak group were expecting additional reinforcements from villages in

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what are now known as Killuda, Ugashik, Ugak, and Chiniak Bays, on the east and west coasts of Kodiak Island (Shelekhov 1981: 39).

Shelekhov and his men shelled the rock with cannon, and causing a stampede by its defenders killing between 300 and 500 Koniags. Shelekhov then rounded up prisoners, (accounts give numbers ranging from 300 to 1,000) and ordered the summary execution of at least 6 to 11 elder males, who presumably held leadership roles among the Koniag defenders.

The Little Ice Age and Alaskan Prehistory

Archaeologists working elsewhere in Alaska have also noted similar shifts in economy, house form and settlement pattern to that just outlined for the Kodiak Archipelago after 1400 A.D. It is difficult to find good comparative data; few areas of coastal Alaska have been excavated to the extent that the Kodiak region now has. Anderson (1983:74) noted subsistence changes evident in the Bering Sea area based on years research by himself and Lou Giddings:

> Around A.D. 1400 the large whaling settlements both along coastal Chukotka and Kotzebue sound disappeared...There continued to be larger settlements in the region but they were established with reference to fishing locations. Not only did whaling cease around Kotzebue Sound, but caribou hunting seems to have become less productive. For example at Cape Krusenstern land hunting equipment in the sites not only declined in absolute numbers, but also dropped from 45% of food getting equipment to about 17%. Fishing equipment increased from 22% to 41%.

In the Aleutian Islands house forms change from a smaller to much larger, multiple family dwellings about 500 years ago (McCartney 1984). On Nunivak Island new settlements focus on salmon streams 500 years B.P. and sealing clubs, large fishhooks and arrowheads enter the local artifact sequence

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for the first time (Nowak 1974, Lantis 1984). In the current emphasis on discovering social aspects of culture change, environmentally based explanations have been out of fashion in anthropology. It may be time to return some balance by including environmental changes in reconstructing the past of hunter-gatherers.

The new house form adopted by the Alutiiq during the Little Ice Age remained in use throughout the 19th century, and terms for its various features remain part of living memory today (Figure 27). By the 1890's, however barabara's began grew smaller, and often consisted of a single rectangular central room with one adjoining banya or storage alcove (Plate 153). Windows were sometimes added. Roof thatching was held down by logs, now nailed together as well as tied. Old fish seine was also frequently used to hold the rye grass roofing in place, which had to be changed yearly. The last barabaras were used as temporary camps by trappers and hunters into the 1950's. One original barabara still stands in the village of Akhiok.

Summary

The prehistory of the Kodiak Archipelago is characterized by long periods of relative stasis and very brief periods of rapid change in an overall pattern of punctuated equilibrium. At the Karluk One site excellent preservation and a stratified deposit of houses and midden four meters deep enabled us to examine one of these crucial times of substantial culture change with a high degree of resolution.

The equilibrium of Koniag culture was disturbed by the onset of the Little Ice Age, which apparently was felt most acutely shortly after 1400 A.D. The cultural response was one typical of other complex systems when confronted with a fluctuation in an equilibrium state; a rise in organizational complexity. Some items of material culture, by contrast became somewhat less

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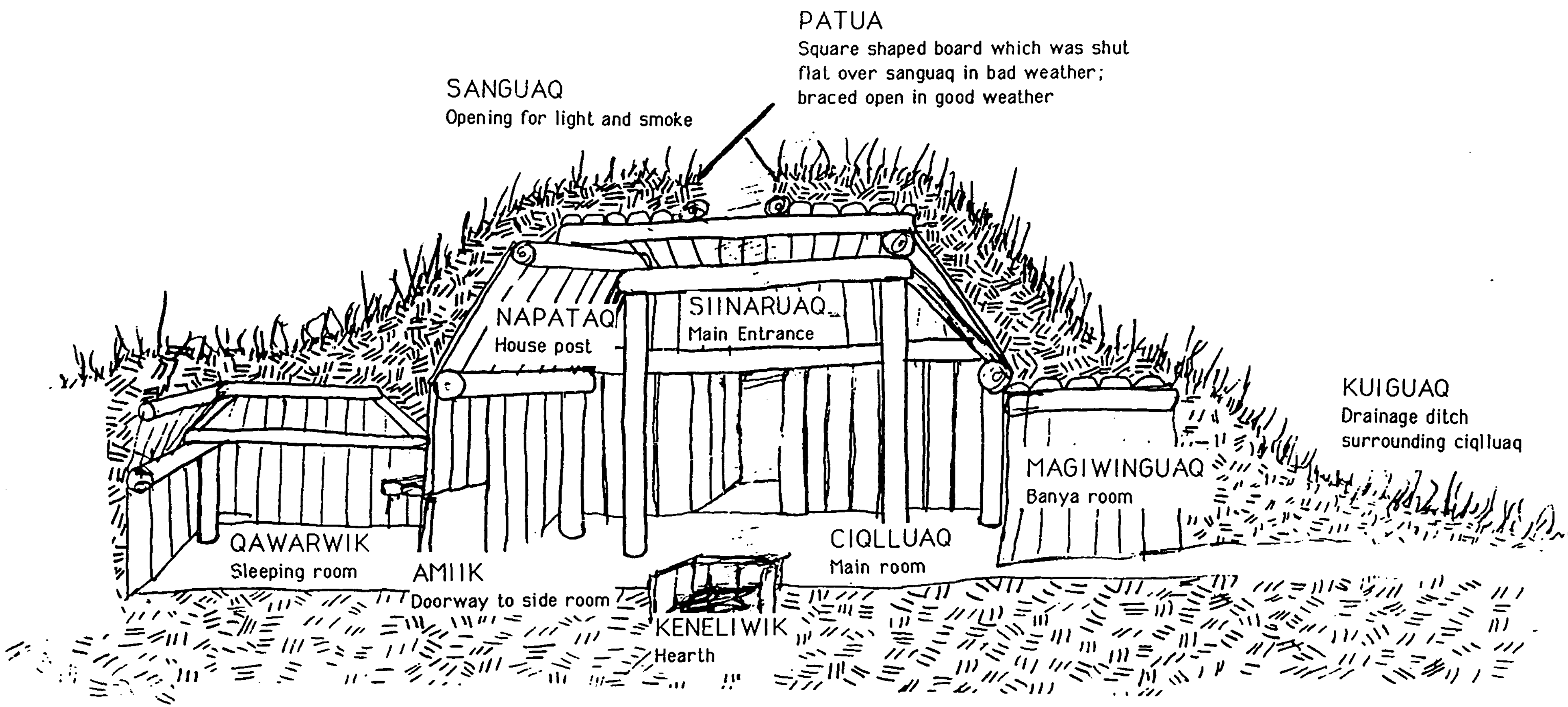

Figure 27: FEATURES OF AN ALUTIIQ BARABARA (CIQLLUAQ)
(Compiled by P. Knecht and E. Agnot 1988)

complex. Ulu hafting, fishing harpoon points, fish hook barbs, and ground slate projectile points all shifted toward easier to manufacture, more utilitarian forms after 1400. The total inventory of Koniag material culture, although perhaps more utilitarian in appearance, does seem in increase in size.

Settlement pattern changed when the Koniag economy became increasingly focused upon fishing and villages of unprecedented size grew along the banks of the Karluk, Ayakulik, and other salmon streams. The development of multiple room houses implies new levels of cooperation between family units sharing the house. The size of the villages suggests that new social aggregates formed, reflected by an increase in material culture associated with ceremonialism, feasting, and gambling. Social signaling through the use of labrets also peaks dramatically in the century following the onset of the Late Koniag period. Sweat bath midden and related artifacts vastly increase after 1400, along with greater numbers and variety in wood splitting technology. These adaptations, along with the newly adopted floor plan may have been a response to colder temperatures of the Little Ice Age.

The rise of Koniag culture has been demonstrated to be an *in situ* process, which occurred in a rapid, but systematic fashion just after 1400. This precludes earlier suggestions that the Koniag culture was the product of migrating peoples who reached the Kodiak Island area around A.D. 1,000. If we can now safely assume that Koniag culture is a rather late outgrowth from the preceding Kachemak period, then we are left with a continuous sequence of an Eskimo-Aleut culture for at least 3500 years into prehistory. This would place the Kodiak Archipelago as an important developmental center for Eskimo-Aleut culture, perhaps in concert with other centers such the Bering Sea Area.

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