

PREHISTORIC SEA MAMMAL HUNTERS AT KAFLIA, ALASKA

The research program in anthropology undertaken by the University of Alaska at Katmai National Monument under the auspices of a National Park Service contract was oriented toward rounding out a two season field study initiated during the previous year (1953) by the University of Oregon. The first year's program was archaeologically oriented and specifically designed to sample adequately the recorded sites in the Monument. Such a program was highly desirable and produced positive results under the field direction of Mr. W. A. Davis (1954). The plan of the second season's work was formulated by the writer, National Park Service advisors, and members of the Department of Anthropology at the University of Alaska, with the aid of the report from the previous season.

The author is grateful to the National Park Service personnel concerned for their full cooperation during the arrangement and tenure of the field study. The field logistics of the Katmai Project, of which this study was a part, were maintained in a most efficient manner by Robert Luntley. The writer is also grateful to Neal Hosley, Ivar Skarland, and James Van Stone, all of the University of Alaska, for their aid in working out the over-all and detailed plans of the field study. The writer appreciates the suggestions and comments made on sections of this study by E. H. Spicer, Terah Smiley, and E. W. Haury, of the University of Arizona; James Van Stone of the University of Alaska; J. L. Giddings, Jr., of the University of Pennsylvania; and T. N. V. Karlstrom, D. H. Hopkins, and T. L. Péwé of the United States Geological Survey. However, for the ideas expressed in this study the writer is alone responsible.

The general aim of the program was to define the sequence of prehistoric developments at a single site in the Katmai National Monument and to illuminate the prehistoric cultural stability and change. This was to be linked with an ethnographic study of the former inhabitants of the locality. A search for previously unrecorded coastal habitation areas led to the discovery and excavation of the Kafia site, the details of which constitute the body of the report to follow. To obtain ethnographic information on the residents of the area a trip was made to Perryville, a village where the people who left the Katmai area after the eruption in 1912 had settled. Unfortunately it was learned upon arrival at Perryville that all of the elderly people had died. The persons still alive who were in their teens when the Katmai area was abandoned were at sea fishing for the canneries at Chignik, but a trip to Chignik could not be arranged. At the village during the writer's stay were only three adult men, one of whom was not from Katmai; the others were relatively young and singularly uninterested in the past. Additionally Perryville is far from a "dry" village, which com-

plicated the situation further; however, some ethnographic data was obtained, and this has been incorporated into the body of the report.

METHODOLOGY

Interpreting the subject matter of any study necessitates an understanding of the methods of approach to the raw data. Thus a statement on method has been introduced in order to help clarify the aims and techniques embodied in this report as they were formulated during the Kafia study.

The general problem is conceived to be one of historical reconstruction and identification of cultural processes in the framework of prehistory. More specifically, it includes delimiting the prehistoric sequence in an unknown area of Alaska's north Pacific coast and relating the findings to previous archaeological and ethnographic studies in this locality, as well as defining the cultural processes which become apparent when the collection of artifacts is dealt with as an integrated segment of a cultural tradition.

With the focus on this specific field problem, it was hoped that a prehistoric village consisting mainly of an extensive midden deposit could be located in order to obtain the greatest possible occupational depth. The coastal area of the Katmai National Monument was selected and surveyed from the air, and a site of the type desired was chosen. An enumeration of the sites considered and the methods of location are presented in Appendix I. A small preliminary test pit was excavated in the selected site and the depth of the kitchen midden in one area of the deposit established. Following this a larger area, selected on the basis of an estimated depth of the cultural debris, was chosen and a grid pattern set up. The horizontal area intended for excavation measured 18 by 18 feet and was partitioned into 6 foot squares, which were divided into 6 inch vertical levels in order that the sequence of recovered items could be partially reconstructed later. The field notes taken during the course of the excavation included data on the digging techniques, conjectures regarding the cultural and non-cultural remains in the locality, and any other observations which were thought pertinent to reconstructing the cultural situation during the period of occupancy.

In the general classification of the midden debris from the Kafia site no rigid distinction was made between artifacts and non-artifacts since it was felt that both were significant in the totality. This recognizes that artifacts are only part of the site picture and that the associated bones and unworked stones, while not manufactured, still cannot be ignored in reconstructing culture.

Items recovered from Kafia and their depth in the midden debris are recorded in Table 1; an R indicates a random find from along the beach. Artifacts and seemingly significant non-artifacts have been arranged on the basis of material used and secondarily by manufacturing process if the item is an artifact. This scheme proposes that individual artifacts are reducible to a series of technological components

and that an understanding of the manufacturing technique aids in understanding the finished form.

Similarly, emphasis was placed upon the technology of artifact manufacture by Van Riet Lowe (1945) in his attempt to resolve some of the classification problems arising in tracing the evolution of Levalloisian tools from South Africa. Watson (1950) suggested that similar finished forms might be created by different techniques, such as by the adaptation of a new blade shape from an alien group without learning the alien industrial technology. However, Watson (1950, p. 151) and Movis (1953, p. 165) express the real difficulty in such reconstructions when they note that the archaeologist rarely has the skill to reproduce the tool experimentally. In the list of Kafia items presented by the writer steps in the manufacturing process are recognized and noted. These steps have been recreated partially by experimentation and partially by analysis of unfinished artifacts.

The headings in Table 1 show the gross material used, while the first sub-heading includes the present surface finish or finishes. The second sub-heading includes gross diagnostic features of the item, and from the next step, a, in descending order to the end of the scale more specific features are considered. No attempt was made to rigidly equate the categories, and each artifact was considered primarily in its class according to the material used and method of manufacture. An attempt was made to create categories which would be realities to most technicians. The alternatives of technique open to a manufacturer would be resolved culturally and by the physical availability of the resources (chipping or grinding, slate or flint, etc.). Thus individuals with a similar technology to draw upon and in a nearly similar geographical situation would have the same alternatives or reactions. By considering each artifact as embodying numerous individual steps in the manufacturing process and cross-comparing different forms created in a similar manner or similar forms created in a different manner, considerable insight may be gained into the processes of artifact manufacture. It was found in synthesizing the data of the item list that interpretations were most meaningful when related to those forms which were abundantly represented. It was assumed that the abundance of closely similar forms represented recurrent behavior responses which were of the cultural mode or most common prevailing form.

The physical descriptions of items from the Kafia site, along with a series of plates illustrating the range of types, should enable the reader to visualize the form of finds, and whenever possible subjective identifications with alternatives are given in parentheses at the end of the individual item descriptions. The raw data presented in the item list is interpreted in a section devoted to forms, which is intended to define the technological range of types. Following this is a section on time placement, and then interpretations of the synthesized data are introduced. Finally the entire collection is integrated into the local culture area.

THE SETTING

Kaflia Bay is located along the central coastal strip of the Katmai National Monument, and the bay proper is divisible into three distinct sections: the funnel-shaped outer bay, bordered on either side by low cliffs; the squared intermediate bay, bordered by rocky beaches and numerous small streams draining the surrounding low basins; and the oblong inner bay, again with rocky beaches and small streams, the largest of which drains a lake to the southwest (see the map in Figure 2). The prevailing ground-cover is grass, willows or alder thickets, with the latter dominating. There are no spruce growing along the shores of Kaflia Bay. A peninsula jutting from the south separates the intermediate and inner bays, and it is here that the site is located. The remains of semi-subterranean houses are visible from the air, which, along with the general setting, made it a choice for landing and further investigation. The site itself is approximately 100 yards long and from 20 to 30 yards wide. The visible surface house pits were of post-contact dwellings, with or without a tunnel; tunnel floors were at the same level as the floors of the small, square to rectangular dwelling rooms. These houses had sections of planks still visible, and round-headed nails were noted in some of the boards. It seems probable that persons from the village of Katmai were living in these houses while temporarily fishing in Kaflia Bay when Mt. Katmai erupted in A. D. 1912. A letter written by one of these fishermen is quoted below from Griggs (1922, p. 19).

Kaflia Bay, June 9, 1912

My dear Wife Tania:

First of all I will let you know of our unlucky voyage. I do not know whether we shall be either alive or well. We are awaiting death at any moment. Of course do not be alarmed. A mountain has burst near here, so that we are covered with ashes, in some places 10 feet and 6 feet deep. All this began on the 6th of June. Night and day we light lamps. We cannot see the daylight. In a word it is terrible, and we are expecting death at any moment, and we have no water. All the rivers are covered with ashes. Just ashes mixed with water. Here are darkness and hell, thunder and noise. I do not know whether it is day or night. Vanka will tell you all about it. So kissing and blessing you both, good-bye. Forgive me. Perhaps we shall see each other again. God is merciful. Pray for us.

Your husband
IVAN ORLOFF

The houses appear to have been abandoned soon after the eruption. On another section of the site are the burnt-out remains of a small house which belonged to the Bureau of Fisheries and served as a "stream watcher" station (to prevent commercial fishermen from poaching salmon from the bay). The midden debris is presently cutting out of the bank on the inland side of the site, but to seaward storms have driven beach pebbles onto the deposit.

This locality today seems ideal for year-round habitation; there are excellent high or low tide beaches quite suitable for landing small boats on the inland and coastal sides of the peninsula. There is a large accumulation of driftwood on the seaward side of the beach, and approximately 60 and 80 yards to the south are two small, clear fresh water

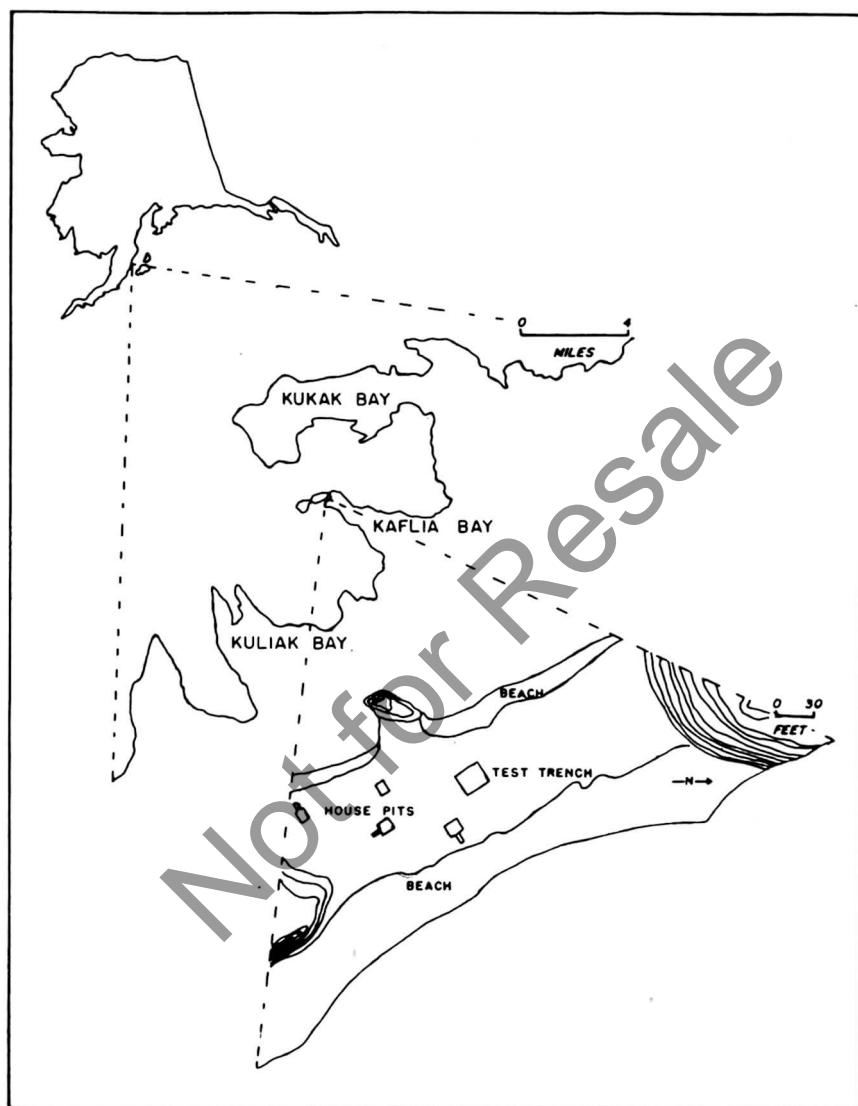


FIGURE 2. The Kaflia site and its geographical position in Alaska.
Only the site map is directionally oriented.

streams. The site proper is relatively low and yet sufficiently elevated to be above the highest tides in the area today. Rocky prominences to either side of the site make fine vantage points. At the present time seals abound in all sections of the bay, and periodically salmon and

smelt by the thousands migrate into the bay. Other forms of sea life include clams of many varieties and crabs. At the present time the only land mammal of any numerical significance is the Alaskan Brown Bear, which is quite common in the area of the site.

THE STRATIGRAPHY

Covering all of the site not disturbed in recent years by fishermen is a dense growth of tall grass. Beneath this uniform cover in the area of the test cut (see cross section in Figure 3) was a thick layer of white ash undoubtedly deposited during the eruption of Mount Katmai in A. D. 1912. Underlying the ash was a uniform, thin organic level interpreted as the sod layer at the time of the Katmai eruption. The next discernible layer contained a mixture of complete or crushed shells and fine silt particles, as well as a few scattered small rocks of the same form as that of the nearby outcroppings. This particular level was not uniform in thickness throughout the test trench and ranged from nearly 2½ to 4 feet in depth from the present ground surface. Entering from one side of the mixed shell, silt, and stone layer was a 6 inch lens of concentrated silt, and this type of soil was the dominant form of fill from the 3½ to the 3¾ foot depth. Within the latter deposit were many large stones from nearby outcroppings. Beneath this layer a narrow uniform lens of small beach pebbles covered the bulk of the deposit except for scattered areas on the seaward side. A layer of silt was then present along with the usual bedrock fragments, and intruding into this strata was a broken thin line of wood charcoal. Beneath the lower silt was the eroded bedrock surface marking the bottom of the cultural debris. The six inch levels were measured from the highest point at the rear of the test cut, and the depths of the recovered items are given in the Table 1 listings.

The meaning of the strata was clear in parts of the Kafliia test cut and obscure in others. There was no evidence of general human occupation in the section above the uppermost shell layer, an exception being one ceramic fragment of English Willow ware present in the sod layer. Nor was there any reason to surmise that this area of the site was occupied at the time of the Mt. Katmai eruption. It does appear, however, that the period of occupancy was continuous from the time of the first settlement. The over-all continuity of the strata is broken by the thin line of beach pebbles, but since there was no visible organic layer associated with it, it is interpreted as having been deposited quickly, such as during a severe storm which could have driven the gravel high into the deposit but not necessarily interrupted the occupancy. There is a break at approximately the 4½ foot level, beneath which there were no shells, but this may be correlated with a similar absence of any organic, artifacts, shells, or bones beneath this level, suggesting that the organic materials had decayed. This site is not perennially frozen, which in part accounts for the relatively poor preservation.



FIGURE 1. The Kafia site, Kafia Bay, Katmai National Monument.

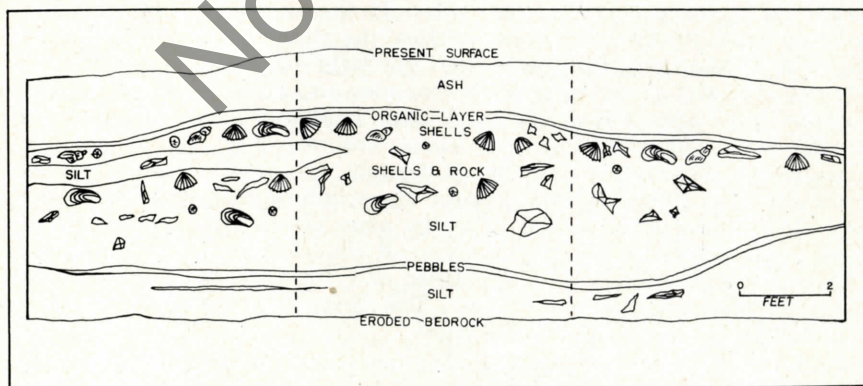


FIGURE 3. The strata at the rear of the Kafia test cut.
(The shells are not drawn to scale.)

To summarize, in the area of the large test cut the original inhabitants occupied a strata six feet lower than the present ground level, and the occupation was not broken until the final abandonment prior to the eruption of Katmai in A. D. 1912. While it is presumed that the site was continuously occupied, there is no reason to believe that the time period extended over more than a few hundred years. This conclusion was reached primarily by cross comparing the Kafkia artifacts with a longer and more detailed sequence from Kachemak Bay. The similarities will be more fully elaborated upon in the comparative study, as will the possibility that the site was deserted before the earliest historic contacts.

THE FINDS

If the interpretations made thus far are correct, we may assume that all the materials in the cultural debris above the bedrock except the wind-laid silt, some organic materials and the layer of beach pebbles were deposited by the former inhabitants. This would include fragments of local stone outcroppings, beach-worn stones, animal bones, and shells, as well as organic and inorganic artifacts; together these finds represent the virtual totality available for analysis.

Table I contains a physical description of each artifact under a number of sub-headings (see the statement on method), along with identifications, and these are to be correlated with the series of plates illustrating the range in forms. The broadest comparative grouping in the item list is the slate work. The total of recovered inorganic artifacts was 255, and of this number 128 were made from slate.

The following steps have been reconstructed as the most probable in the production sequence of a slate blade. The raw material was percussion chipped with a hammerstone striker into a gross outline of the potential implement if the implement was to have bilateral cutting edges with sharply converging sides. If the implement was to have cutting edges with nearly parallel sides, the slate was percussion flaked to form a relatively thin slab, then partially sawed with a stone saw on one face and sawed in a similar manner and position on the opposite surface until only a thin bridge of slate held the pieces together; this bridge was snapped to form two parts. The next step was to grind the parallel or converging sided blade against a coarse abrasive material as a grinding stone; in this process the grinding was often parallel to the blade in the form of lines. Finally, after wearing away the surfaces to a close representation of the over-all shape, the tang was probably chipped and ground into form; finer and finer grinding stones were used to obtain a finished surface. The final grinding was habitually at an acute angle to the cutting edge.

The first category of slate blades, those with finely ground surfaces, a piercing point and bilateral cutting edges, consists of either knife or lance blades, with two types represented. One has flattened or ovoid cross sections and a technologically unfinished appearance. This type in finished form has large and coarse abrasion scratches, and at least

one section of the completed surface usually shows fractures or saw marks produced in an earlier stage of manufacture. The second type, with the blade diamond-shaped in cross section and with uniformly well-ground surfaces, gives an impression of technological perfection for the medium and form involved. A further perfection of the surface grinding appears on the blades of the second type; this is the "hollow-ground" groove running at right angles to the length and cutting edge of the blade. It should be noted that the diamond cross sectional blades were recovered from the upper levels of the midden debris, while the technologically more unfinished form with a flat to ovoid cross section was scattered throughout the deposit. It is also seemingly significant that in this general category of slate blades with bilateral cutting edges and a piercing point, the blade is relatively constant in shape, but tangs have a considerable range of variation. The coarsely ground and chipped slate blades with bilateral cutting edges interpreted as uncompleted products all fall within the range of the same forms as those with finely ground surfaces.

A number of assumptions may be drawn from the analysis of ground slate blades. First, the slate was probably derived from a primary source, rarely from beach worn pebbles and never from recognizable reworked artifacts. After the broad outline of an artifact had been created, a considerable number of those with converging lateral edges were never finished, while the ones with nearly parallel lateral edges were almost always completed. From the fact that artifacts of this type were recovered in all stages of manufacture, along with hundreds of slate chips, it is inferred that they were shaped completely on the site rather than having been manufactured in a rough or completed form elsewhere and transported to the Kafia site for completion and/or use.

The slate blades with finely ground surfaces and a unilateral cutting edge probably went through the same manufacturing stages as those previously described. Perhaps an exception is the absence of the line striated step on the ulu blades and the complete absence of line striations on the adze blades. Another characteristic of the adze blades is that they were usually ground only along the cutting edge and chipped elsewhere.

The several ulu blade features which stand out above all others are the wide variety of tang forms, blade symmetry, thin cross sections, and the great range of blade size. The remarkable size range of the blades suggests a use specialization like that occurring in metal blades which was pointed out to the author by an Eskimo living along the Kuskokwim River near Aniak. Extremely large blades are preferred for cutting salmon, while the smaller ones are more useful for household tasks. Partially limiting the size of the Kuskokwim metal blades today is the size of the saw blades from which they are usually made, while it seems possible that at Kafia the difficulty in manufacturing a large thin blade from slate would be one factor limiting size; the unwieldiness of extremely large blades would be a factor in either case.

The narrow, symmetrical adze blades are usually coarsely chipped but have a well-polished blade. One of the items in this category is made from porous sandstone and may be a scraper. Incomplete adze and ulu blades both fall within the size range of their completed counterparts.

The next category includes flint objects, which number 32 in a total of 255 inorganic artifacts. Items made from flint (this designation includes all materials producing a concoidal fracture and being processed in a like manner) are not common in the collection, but the types represented are distinctive. It is probable that the forms recovered were shaped originally by coarse percussion techniques and then in a few cases pressure flaked for a more finished edge. There are indications that beach worn pebbles were used as raw material in the manufacture of at least some flint artifacts, but the paucity of rejected flint flakes suggests that manufacturing was not done on the site of the test trench. As with the slate blades, we cannot determine the possible sources of the raw material since the area is a virtual geological blank.

The flint blades with bilateral cutting edges tend as a group to have edges which converge considerably and cross sections that are most commonly either ovate or diamond-shaped. Tang styles vary widely in proportion to the number of samples recovered. Flint objects occur sporadically throughout the levels but seem to be concentrated in the lower levels of the cultural debris.

Exclusive of the scrapers made from rough flakes, chipped knives or scrapers with a unilateral cutting edge are not common (three items). The form with an asymmetrical blade is particularly note-worthy since it represents the only purposely shaped cutting implement with an asymmetrical cutting surface in the entire collection of blades.

An artifact type which probably should be equated with the knives is the relatively large flake with a well-defined cutting edge, which may be a substitution for the unilateral blades which are so few.

Choppers, the main form of artifact percussion flaked from beach worn cobbles, were recovered from most levels and are quite uniform in shape and appearance. All but one is unilaterally bladed. The next artifact type, the boulder chip, was, as the name implies, struck from the side of a small beach boulder with a single sharp blow. The range of individual variation in this type indicates that a variety of stone shapes and sizes were employed and considered adequate.

Pecking beach worn stones or raw sandstone is not a common technological feature of the Kafia material. The pecked items are from the uppermost levels or the random collection with the exception of one from the 54-inch level. The technique was probably known throughout the occupancy of the site, but tools processed in this manner were not numerous. Reconstruction of the manufacturing techniques of pecked stone objects indicates that oblong beach worn stones were used as hammer stones, and from the appearance of two such hammer stones it is obvious that one end was used for coarse pecking and the other

for finer work. It is also possible that the same or similar hammer stones were employed in chipping flint or slate.

Hammer stones must have played an important part in tool manufacture and in general utilitarian use; their uniformity in size and shape denotes careful selection. Surprisingly few broken specimens were recovered. It is likely that they were used for many diverse purposes, such as driving wedges, chipping flint or slate, pecking stone, and fracturing bones. The short oblong beach worn stones employed as hammer stones are uniform in general outline but not in the area of the stone used as a working surface. The ends were preferred as battering surfaces, but sides were sometimes used.

The artifacts identified as grinding stones fall into two types. The first, whetstones, are those presumably used to sharpen previously existing blade edges, while grinding stones in general are those artifacts employed in the abrasion process during tool manufacture. All items of the latter type were small and fragmentary and do not appear to have been used as they now stand, since the sharp, angular outer edges indicate fracture and breakage after the forms were completed.

The unworked beach pebbles constitute an intriguing category. These pebbles show no signs of human alteration, but their presence in the site would seem to indicate that they must have been handled by the people. It seems possible that the oblong unworked beach pebbles may have been a form of whetstone, whereas the round to oval ones were possibly used for juggling stones, much as the Bering Sea Eskimos employ them today. Similar stones were used in the Aleutians (Jochelson, 1925, Pl. 17, 27, 29) for a game in which a number of such stones were thrown into the air and an attempt was made to catch them all with one hand.

There is a diversity in the other inorganic materials recovered, but few were made into artifacts. The labret made from coal is one of the exceptions; this is an extremely well-made specimen in an unusual and brittle medium. The fragments of bedrock recovered among the debris in the site numbered into the thousands from every level beneath the ash layer. Why they were brought into the site is not known since they are of all shapes and sizes and were seemingly placed at random. Some of the larger rocks were arranged into groups of either oval clusters or lines, but these could not be identified with any form of structure. In the third level a thin flat stone nearly a foot across was found covered with a thick layer of wood ash, but no associations or implications could be derived from it. Not in the test cut proper but to the east central area of the site was a large pile of stones, and a like pile was found on the inland beach cutting into the bay. The latter cluster of stones contained 40 pieces, from one to three feet in diameter, arranged in an oblong pile three feet in length and nearly three feet high. No artifacts were found in direct association with either pile of stones, nor was it possible to draw any further inferences concerning them.

The organic artifacts number 27, and as previously noted they are from only the upper levels of the midden deposit. The antler items num-

ber 19 and compose the largest group. Antler artifacts in various stages of manufacture are conspicuously absent, but the few worked fragments present indicate the manufacturing techniques. Raw antler was cut lengthwise on opposite sides with an abrading tool, perhaps a stone the antler was split and adzed into the over-all desired shape, after saw or burin-like implement, neither of which was recovered. Then which it was shaped with a stone knife and finally ground, polished, or smoothed with a knife into finished form.

The antler products most abundantly represented are the various forms of weapon points, with the harpoon dart the most numerous. The antler weapon points are comparable in the quality of workmanship; none give the appearance of extremely careful or careless finished workmanship. All antler weapon points are unilaterally barbed, and there is little range in hafting methods. The harpoon dart heads have a limited range in their over-all size and outline along with a very apparent uniformity in hafting technique; tangs have either squared or rounded bases and drilled or sometimes gouged line holes.

Other artifacts made from antler, bone, or whalebone, while few in number, are significant in light of the relatively few organic materials recovered, but since it is difficult to determine the variability or range, they will be considered only in the comparative section.

An attempt was made at Kafia to record systematically the number of animal bones recovered from the excavation. The presence or absence of bones from a particular species is of course significant, but it is much more meaningful, especially where there is a hunting economy, to determine the abundance of the represented species. Rather than count every bone, only the long bones, scapula, pelvis, and mandibles were entered into the list. This avoids undue importance being attached to the occurrence of a complete set of bones such as seal ribs or vertebrae, which would greatly weight the importance of one animal in proportion to the others from which only a few bones remain.

The heavy reliance of the Kafia people on hair seal and clams as the basis for their economy is obvious. Other animals are virtually absent in the region today and consequently have no importance as a source of food. Not entered in Table 2 are dog, bear, walrus, bearded seal and porcupine bones, of which too few were found to be considered significant.

TIME PLACEMENT

To place the Kafia material in time several possible approaches have been considered—dating by historical association, by a relative archaeological chronology and by geochronological techniques.

The first recorded contact of the aborigines in this general area with Europeans was on Kodiak Island in A.D. 1761 (Hrdlicka, 1944, p. 9), but there is nothing to indicate whether or not the Kafia site was then occupied. This is significant in light of the absence in the test cut of European trade goods beneath the Mount Katmai ash layer at Kafia.

The difficulties of fitting the Kafia material into the existing archaeological framework are complex. The material can be related to the short sequence Davis has at Kukak Bay, a few miles to the north, but this site too covers a comparatively short time span and is as difficult to place as Kafia. Davis (1954, pp. 91-92) attempts to relate his material to the archaeological sequence on the Kobuk River in northern Alaska, which has been associated with dated wood, but to suggest as Davis has done that the dates for sites over 600 miles to the north can be applied to the Katmai area is tenuous. The areas compared are dissimilar ecologically, and we have little data concerning the nature and extent of the relationships between the Katmai and Kobuk regions; this is not to deny certain similarities in artifact form between the two localities. The only long archaeological sequence to which the Kafia material can be related is that of Kachemak Bay, and, as will be pointed out in the comparative section, the greatest similarities to this material are in de Laguna's Kachemak Bay Period II through the middle of Period III.

It was suggested by Davis (1954, p. 93) that using tree-ring methods of dating wood in this general locality is likely:

An increment core from a nine-inch spruce tree at the Fish and Wildlife station at Brooks Lake had a count of 92 rings. The stand of spruce at Hallo Bay contains many trees over 60 inches in diameter. Hence one would expect to obtain a chronological sequence of over 600 years.

This statement is not entirely consistent with our knowledge of tree-ring growth for Alaska. That a living tree with a six inch diameter contains 92 rings may or may not be significant for tree-ring dating, depending upon the quality of the rings, but to suppose that trees with sixty inch diameters would contain over 600 rings is inconsistent with present findings. Spruce sampled in northern Alaska over a period of eighteen years (Giddings, 1942, 1947) have yet to produce a living tree of the age proposed for those in the Hallo Bay stand (Giddings, 1942, pp. 14, 16; 1947, p. 26). However, assuming that living spruce were obtained with long ring sequences (one hundred rings or preferably more), this by no means assures tree-ring dating, since the tree must record one dominant climatic factor affording considerable annual variation in ring growth which may be plotted through time. Furthermore, the probability of wood suitable for dating being preserved in archaeological sites in the Kafia area is yet to be demonstrated. At the Kafia site only two spongy cottonwood planks and a fragment of spruce charcoal with six rings were recovered in the entire test trench; none had any ring-dating potential. The writer sampled living spruce with a Swedish increment borer in the general region of the Katmai National Monument, but a preliminary analysis of this collection indicates that the trees do not have the sensitivity required for successful and con-

sistent regional cross dating and none of the trees represented, including those at Hallo Bay, contain over 300 rings.

Geochronological dating techniques, aside from tree-rings which have already been considered, include the dating of a charcoal fragment by radio-carbon methods. One piece of wood from near the bottom of the midden deposit at Kaflia was saved, but analysis has not as yet been possible. It is fully anticipated that the charcoal sample would date in the Christian era, but even were it successfully processed, one date can contribute very little to any understanding of a chronological picture.

Another possible geochronological dating technique, a correlation between strand lines and site occupancy, was not attempted since the writer was unaware that geologically recent strands in Cook Inlet had been dated and that these dates could be projected to the Kaflia area strands. A difference in sea level exists at Kaflia between the present time and the time of original site occupation, but that this had local dating potential was not realized.

A RECONSTRUCTION OF KAFLIA CULTURE

The relative smallness of the artifact collection available necessarily limits the scope and probability of the conclusions which may be drawn. Nonetheless, with the aid of ethnographic data from the north Pacific region of Alaska, an attempt has been made toward a reconstruction.

The physical size of the site indicates that not more than a few families occupied it at any one time. At present there are surface remains of four aboriginal style houses on the site, and this would seem to be a reasonable number to postulate for the prehistoric period of occupancy. Ethnographic sources (Jochelson, 1925, p. 119; Hrdlicka, 1944, p. 20) suggest that in this general area the nuclear or extended family would reside in each dwelling.

That the site was inhabited only periodically is a supposition finding strength in the fact that no dwellings contemporaneous with the midden debris were discovered and that at the time of the Mount Katmai eruption the people residing there were only in temporary residence. However, were the earlier inhabitants of Kaflia semi-nomadic, a greater range of recovered artifact forms would be anticipated. A seasonal movement of the people would be motivated most likely by a search for additional or supplementary food, but the artifacts and bones at Kaflia do not support this assumption. There are only two arrowheads of the type used in land hunting, a single side spear prong for birds or fish, one reworked harpoon head and very few fish net sinkers, suggesting a limited utility of these implements. Judging from the number and identity of bones, the people were specialized seal hunters. There are hundreds of hair seal bones but few caribou, whale, or bear bones, which leaves little doubt of their primary food supply. The repeated occurrence of two items in the hunting complex is also important; the harpoon dart head and the large lance blade are both more plentiful than any other weapon types. From historic sources it is known that these weapons were important in killing seals. It is difficult to judge

how much the people relied upon clams for food, but it should be noted that the shells were extremely thick in small section of the test trench and scattered in most of the deposit where organic materials were preserved.

It is possible that when the site was occupied large whales, caribou and bears were not generally available in the locality and thus could not be utilized, but whether the people became specialized seal hunters out of necessity or preference or even whether it is possible to reduce the specialization suggested to such categories of casualty is not known. However, we do know that historic Eskimos and Aleuts utilized the products of their environment extensively, which suggests that the dominance of seal hunting at Kafilja was through necessity. Another factor favoring the hypothesis of specialization for survival is the geographical situation along this particular coastal region. The seashore is rugged, with few areas suitable for prehistoric villages. This contrasts conspicuously with the more favorable localities having tremendous midden deposits such as adjacent Kodiak Island, sections of Kachemak Bay, sections of the Alaska Peninsula, and the Aleutian Islands.

A few remarks may be made concerning the religious and ceremonial lives of the people as suggested by the archaeology and supplementary ethnography. It is probable that the seal had a significance beyond that of providing food, sinew, and skin. This is inferred from the conspicuous absence of seal skulls in the site, whereas most other bones of this animal were recovered in large numbers. It is known that along the Pacific Ocean and Bering Sea coasts of Alaska, people at the time of historic contact often used the nose, skull, bladder or bones of animals in propagation ceremonies (Weyer, 1932, pp. 367-370; Jochelson, 1925, p. 118); these items were often saved and then returned to the sea. In the same context it is considered more than accidental that very few seal penis bones were recovered. This, along with the occurrence of a phallic symbol, is taken to indicate a fertility complex which was most probably on the family level if our prior reconstructions are correct. The total inference is that the dominant subsistence item assumed a ceremonial significance in prehistoric times, a characteristic which has been suggested for a number of marginal societies.

Surprisingly enough, the people did not fish to any extent although the area teems with salmon today. In this general region of the north Pacific coast net sinkers are commonly the most plentiful items recovered from a site; very few were found at Kafilja, but fishing with nets was probably known to the people since sinkers of the form recovered have been found in much older sites both to the east and west. That the people did some fishing is evidenced, but the number of bones and sinkers recovered indicates that fishing was not very important.

TECHNOLOGICAL RECONSTRUCTION

With the recovered artifacts considered as an integrated segment of a technological tradition, an attempt has been made to postulate how well the tools actually served the users.

The knife and lance blade forms, including both flint and slate products, are comparatively constant, but there is a variety in the hafting methods employed. This is taken to mean that the general shape of the blade was well established and most probably quite successful for its purposes, while the hafting techniques varied at any one time as well as through time. If from variety we may assume instability in this artifact feature, it is probable that the various forms did not satisfactorily fulfill the purpose for which they were intended. Possibly there was a desire for variety seemingly for its sake alone, as Laughlin (1952, p. 32) has noted in the Aleutians, which would manifest itself in such a manner. There is a variation in ulu blade tangs, again interpreted as an unstable feature. Contrasting with the preceding variations is the similarity in shape of the large harpoon dart heads, particularly in the tang.

Collectively this seems to mean that the blade of the harpoon dart heads, lances and knives sufficiently met the needs of the individual users, while the tangs of the ulu, knife, and lance were unstable and perhaps inadequate. The latter is in contrast with the stable hafting methods of the harpoon dart heads.

Carrying the postulation of form utility forward in time to the period of early historic contact on adjacent Kodiak Island, we find that the forms of ulu hafting adopted there, to cite the clearest example, differed from the earlier types at Kafia. The type which prevailed had a tang which was a continuation of the blade body. There was a hole drilled through the blade, and a piece of lashing attached the blade to the handle (Birket-Smith, 1941, Fig. 31, a,b,j,k). This would seem to be superior to any of the previous ulu hafting techniques. The hafting method for the principal form of dart heads at Kafia survived unchanged into the historic period (Birket-Smith, 1941, Fig. 14, f), and it is common from the earliest finds in the Aleutian Islands (Laughlin, 1952, Pl. 2, e).

The standards for a finished slate blade changed at Kafia during the span of occupancy. Finished blades with coarse abrasion marks and fracture scars occur during the entire period, but in the latter part of the occupation a fine surface finish was in part vogue. This seems to have been accompanied by the diamond-shaped cross sectional blade, suggesting a new complex of ideas.

The dichotomy between flint and slate work is superficially great, but more careful evaluation makes apparent many similarities in finished forms. Blade outlines are essentially alike, and flattened and diamond cross sections occur in both as do the slightly shouldered or unshouldered tangs. The great divergence in form between these two blade traditions is attributable to a technological feature of slate manufacture. The parallel sided slate blades find no counterpart in flint; the blades were formed by sawing the lateral edges parallel, a technique not applied to flint.

The transference of a functional feature in one medium to a non-functioning role in another is observable in the Kafia collection. The


large whalebone lance head has broken but originally large bilateral barbs, while the large slate lance blades have similarly placed barbs in an extremely vestigial form. Since no multiple pairs of functional barbs in slate precede this form in the area, it is assumed that the transfer was from whalebone to slate.

SITE TO SITE COMPARISON

The site of Kafia is assumed to have been inhabited by an Eskimo-speaking group since there is little or no reason to believe that the boundaries in late prehistoric times, when the site was inhabited, were significantly different from the boundaries at historic contact. Davis (1954) has considered the tribal affinities of the Katmai area people, and there is little reason to restate the situation at this time.

The artifacts from Kafia have been compared to stylistically similar finds in the north Pacific region, and an attempt has been made to restrict the comparisons to materials from those sites which were occupied for a relatively long period and where the inhabitants had an economy similar to that of the people of Kafia. The main body of comparative material is from excavations at Kachemak Bay (de Laguna, 1934), in the Aleutians (Jochelson, 1925; Hrdlicka, 1945) and on Kodiak Island (Hrdlicka, 1944). The best comparative material is from Kachemak Bay, since the span of time represented there is relatively long and clear. In the Aleutians Jochelson's collection appears to be mainly from more recent sites, and Hrdlicka's collections are from both early and late sites. It is currently popular to scoff at the work of Hrdlicka in the Aleutians and on Kodiak Island. Certainly it is unfortunate that he did not conform to more orthodox archaeological methods of excavation and presentation; however, neither of his volumes has been supplemented as yet by any more definitive or better study. In addition, the diverse, generally unavailable ethnographic data which Hrdlicka has gathered together for these areas is a valuable compilation. In more recent years a considerable amount of archaeology has been done in the Aleutians by Helge Larsen, T. P. Bank and his associates, and William Laughlin and his associates. The many current ill-defined areas of Aleut prehistory will undoubtedly be clarified when their completed analyses are available. Laughlin's paper (Laughlin, 1952) "The Eskimo-Aleut Community" is the most stimulating and integrative approach to Aleut prehistory to date and is a good foundation for the more intensive analysis which should be forthcoming. Aleut prehistory in the present discussion has been considered as representative of a single time level since most of the comparative material is from Jochelson's excavation of recent sites. Comparisons with the artifacts recovered by Davis in 1953 are considered separately.

Slate grinding, which is so important at Kafia, assumes much the same significance at Kachemak Bay in Period III and is also recorded from both the Koniag and Pre-Koniag stages on Kodiak Island. Contrastingly apparent is the late and relatively unimportant position of ground slate in the Aleutians, where it was introduced in trade items

from Kodiak to Umnak (Bank, 1953, p. 43). The types most similar to the Kafia slate blades with bilateral cutting edges are from Kachemak Bay Period III (de Laguna, 1934, Pl. 31), and as at Kafia the Kachemak Bay specimens with diamond cross sections are later in sequence. At Kachemak Bay a pair of large distinct lateral barbs frequently occur near the base of the blade, but these are not found at Kafia. Ground slate blades with curved unilateral cutting edges, ulu blades, are also common from the later Kachemak Bay and Aleutian periods (de Laguna, 1934, Pl. 33; Jochelson, 1925, Pl. 16, 1-9, 12, 13). They are less variable than the Kafia specimens and do not combine the  shaped and shouldered tang types but otherwise are similar.

Chipped stone blades are dominant in the earliest period of Kachemak Bay, throughout the Aleut sequence and probably in the Pre-Koniag material. Large, oblong lance blades with bilateral cutting edges and tangs which are an unbroken continuation of the blade body are unusual at Kachemak Bay during any period; they are not specifically illustrated from the Kodiak Island sequence but are common in the Aleutian material (Jochelson, 1925, Pl. 15, 1-5, Fig. 10; Hrdlicka, 1945, Fig. 192). The arrow points from Kafia with slight shoulders and flattened cross sections compare with finds from Umnak Island (Jochelson, 1925, Fig. 14,29) and Kachemak Bay II (de Laguna, 1934, Pl. 30,4), but at no site in the region is this type common. The unshouldered arrowpoints with flattened cross sections and square bottomed tangs are comparable to some in the early Kachemak Bay periods (de Laguna, 1934, Pl. 30,3,20,21), while the shouldered diamond cross sectioned points are uncommon in the Aleutian Islands (Jochelson, 1925, Fig. 16,e) and are not found at Kachemak Bay. It is possible that the latter type came from the Bering Strait region, where it occurs sporadically during the recent prehistoric period. The Kafia chipped drill is similar to a Kachemak Bay III drill (de Laguna, 1934, Pl. 36,9); both vary from the reported Aleut type with a rectangular butt (Jochelson, 1925, Fig. 37).

Chipped semi-lunar blades are uncommon at Kafia but occur on Kodiak Island and in the Aleutians (Jochelson, 1925, Pl. 15,15, Fig. 10,11; Hrdlicka, 1944, Fig. 111; Hrdlicka, 1945, Fig. 186,187) as well as in the Kachemak Bay sequence (de Laguna, 1934, Pl. 35).

Asymmetrical chipped knife blades with a unilateral cutting edge occur frequently in the Aleutian series (Jochelson, 1925, Pl. 15,23,24,28, 31,36,37; Hrdlicka, 1945, Pl. 118 bottom), but they usually have a distinctive tang and were probably hafted at the end rather than opposite the blade, as has been postulated for the Kafia knives of this type. At Kachemak Bay this form is seemingly absent.

Purposefully formed chipped scrapers are not frequent at Kafia; the one oblong end scraper is like a combination of the Kachemak Bay scraper forms (de Laguna, 1934, Pl. 30,24,25).

All adze blades at Kafia seem to be of the same socketed variety, paralleling like finds from Kachemak Bay (de Laguna, 1934, Pl. 19, 9-12) and the Aleutians (Jochelson, 1925, Pl. 15,19,20,41).

Percussion chipped choppers, common at Kafilja, are recorded by de Laguna (1934, Pl.20,5,6) in the boulder chip category. It is possible that the "cleavers" noted by Hrdlicka (1944, pp. 333,344) for the Koniag levels on Kodiak Island are the same form. Boulder chips *per se* (de Laguna, 1934, pp. 60-61) are common at Kafilja and Kachemak Bay but are not specifically mentioned from the Aleutians or Kodiak.

Used flakes are cited from Kachemak Bay (de Laguna, 1934, Pl.30, 37) but rarely in the other areas although it seems probable that they were usually recovered.

The flat beach worn stones with opposite lateral notches identified variously as fish line or net sinkers are reported from the Koniag and Pre-Koniag levels on Kodiak Island (Hrdlicka, 1944, pp. 333,344), the Aleutians (Jochelson, 1925, Pl. 17,5,6,12), and Kachemak Bay (de Laguna, 1934, Pl. 16). At most well-sampled sites this form is plentiful. Many uses have been suggested for the grooved oblong stones. Among these are that they were club heads, line sinkers, or net sinkers, and the author has seen them used as the bottom weight for a funnel-shaped crab net in the Bering Sea. A stone fish line sinker with a medial groove is illustrated by Heizer (1952, Pl. 24) from a Kodiak Island ethnographic collection, and there is also a flat laterally notched sinker from a collection of Chugach Eskimo material culture (Birket-Smith, 1953, Fig. 17,a). One rock with a hole in the center, possibly a sinker, was recovered at Kafilja, and similar finds are recorded from the Aleutians (Jochelson, 1925, Fig. 36, Pl. 17,3,4) and Kachemak Bay II-III (de Laguna, 1934, p. 56).

Oblong beach stones used as hammers are common from all periods at Kachemak Bay (de Laguna, 1934, pp. 56-60). In the Aleutians Jochelson (1925, pp.68-69) comments on the common occurrence of the ball-shaped hammer stones, and his statements on workmanship indicate that the other type, the oblong form, was also recovered.

Grinding stones and whetstones occur almost universally in southwestern Alaska; the hexangular surfaced variety which was found at Kafilja is common in Kachemak Bay III (de Laguna, 1934, p.62), and the rectangular form is found on Kodiak Island (Hrdlicka, 1944, Fig. 141).

The oblong, round-bottomed, pecked stone lamps are one of the types from Kachemak Bay (de Laguna, 1934, pp.63-67) as well as from the Aleutians (Jochelson, 1925, Pl.20,5,9); at Kafilja they are the only form present.

A large slate labret almost identical to the coal labret at Kafilja is illustrated by Birket-Smith (1941, Fig. 11,b) from Kodiak Island. A lignite labret of roughly similar shape is also reported by Hrdlicka (1945, Fig. 205) from the Aleutians. A smaller labret from Kafilja is of the form designated by de Laguna (1934, pp. 109-112) as the broad base and low stud type which is mainly from Kachemak Bay III. The Kafilja specimens are somewhat smaller than two Aleutian labrets illustrated by Jochelson (1925, Figs. 85,87) of the same shape.

Round unworked gaming stones, which are plentiful at Kafia, are also recorded from Kachemak Bay III and the Aleutians (de Laguna, 1934, p. 104; Jochelson, 1925, Pl. 17,27,29).

Harpoon dart heads with a single barb, a line hole, and a squared to rounded tang are common throughout the Kachemak Bay sequence and plentiful in Kachemak Bay III (de Laguna, 1934, Pl. 39). Specimens with more than one unilateral barb, a line hole and a squared tange are also found throughout the same sequence but are less common, and the single dart head from Kafia with a unilateral bard, a gouged line socket on one side of the base and a lashing groove on the opposite side is virtually identical to one from the Kachemak Bay area (de Laguna, 1934, F'g. 2). Harpoon dart heads like those listed above are rare or absent in the Aleutians, where there is a tendency to have opposite barbed dart heads and any one of many tang or line attachment methods.

Leister prongs or bird spear side prongs, of which there is only one from Kafia, are absent from the Kachemak Bay series (de Laguna, 1934, p. 92) but common in the Aleutians (Jochelson, 1925, Pl. 24,1-6, 35,42) although none of the Aleut forms are closely similar to the one from Kafia.

The one reworked harpoon head from Kafia is so incomplete as to defy classification. Harpoon heads *per se* in the Aleutians are relatively uncommon since their function is fulfilled by a wide range of harpoon dart heads, but there are crude harpoon heads in the Kachemak Bay sequence (de Laguna, 1934, Pl.38).

The large bilaterally barbed whalebone lance blade from Kafia is similar in function and over-all shape to one from late Kachemak Bay but diverges from it in barb placement. The Aleut lance heads are elaborate (Jochelson, 1925, Pl. 23, 1-9; Figs. 54, b, 56; Hrdlicka, 1945, Fig. 200; Laughlin, 1952, Pl. 2, b), and none appear to be similar to the Kafia specimen.

The two large, unilaterally barbed arrow points, one of bone and the other of antler, are grossly similar to some from Kachemak Bay (de Laguna, 1934, Pl. 42, 10, 22). These two points from Kafia are like the hunting arrowheads from the late Bering Sea sites but have no close parallels in the illustrated Kodiak or Aleutian comparative material.

Awls with points at opposite ends are recorded from the Aleutians (Jochelson, 1925, Pl. 28, 15-20); these differ from the Kafia example in being made from bone rather than antler.

When the finds from Kafia are compared with those of Davis (1954) at Kukak, a site on the next bay to the north, it is apparent that there are many typological similarities in artifacts. Items recovered from both sites are as follow: barbed harpoon dart head; ground slate lance blade with flattened cross section, slight shoulders and a rectangular tang; harpoon blade; hollow ground slate work; ulu blade with tang that is a continuation of the blade body; socketed adze blade; grindstone; whetstone; oval lamp; arrow point with squared base and

flaring sides; chipped ulu blade; lance and knife blade; chopper; end scraper; and laterally notched flat pebbles.

The work of Davis indicates that the Kukak site was occupied for a shorter and, on the whole, later period than Kafilja. Supporting this is the presence at Kukak of certain forms considered technologically late, such as pottery, a drilled hole in a ground slate ulu blade, and the hollow grinding of slate. The latter appears at Kafilja but only in the upper levels of the deposit. While it is felt that the Kafilja site is older than Kukak, the upper layers at Kafilja may correspond with part of the period of occupancy at Kukak. The over-all differences in time which may exist between the two sites are probably relatively slight.

COMPARATIVE SUMMARY

The closest similarities to the Kafilja material as a whole are found in the Kachemak Bay sequence. There are more individual items of like character from Kachemak Bay sub III through middle III than from any other available collections. Certain forms appear at Kachemak Bay and Kafilja but not in the Aleutians, while fewer are found in the Aleutians and at Kafilja but not Kachemak Bay. Without more extensive excavations in the Kafilja area and the publication of more comprehensive reports on Aleutian and Kodiak prehistory, the nature and full extent of meaningful relationships must remain vague and tentative.

CONCLUSIONS

The Kafilja site was occupied by Eskimos for a few hundred years shortly before the first historical contact in this general area at A.D. 1761. The inhabitants of the site were few, and it is possible but not considered probable that they were seasonal occupants. The principal sources of food were the hair seal and clams; there are good indications that the most plentiful weapon forms from the site were used in seal hunting, and there is also reason to believe that the seal had ceremonial associations for the people. The priority of seal hunting over all other forms of food quest is indicated not only by the abundance of seal bones and seal hunting equipment but also by the absence of any significant number of weapons or bones from which it could be implied that other forms of game were important. This area of the coast is very inhospitable and contains no known large midden sites such as are found to the north and south and on adjacent Kodiak Island. It would seem that these people became almost exclusively seal hunters because of the general paucity of game in the area rather than from failure to utilize the available resources.

The tool types of Kafilja find their closest parallels in forms from the middle to late Kachemak Bay sequence, although some closely parallel Aleutian forms. An important over-all characteristic tying the Kafilja material to the Kachemak Bay developments is the importance

of ground slate work at Kafilua and Kachemak Bay as contrasted to the dominance of chipped implements and very late entry of ground slate in the Aleutians.

When ground slate and flint industries are viewed as a whole in southwestern Alaska, it appears that there has been a transformation from one medium to the other, most probably from flint to slate. This idea of transference and convergence agrees with the suggestion by Laughlin (1952) that the trends in Chaluka artifacts from the Aleutians manifest a seemingly uninterrupted and smoothly blending continuum. The writer would not agree that the development is as uniform and linear as Laughlin has suggested, but would consider it more probable that ideas introduced from without became rapidly integrated into the continuum, obscuring outside relationships in the process of assimilation, unless items were introduced too recently for integration to have fully taken place.

Table 1. ITEMS FROM THE KAFILUA SITE

		Six-inch levels from the middle surface										R	
		1	2	3	4	5	6	7	8	9	10		
SLATE													
A. finely ground surfaces													
I. piercing point and bilateral cutting surfaces													
a. symmetrical and slightly converging lateral edges													
1. ovoid to flattened cross section (c.s.) (lance blade) Plate 1, No. 1													
a. tang absent.....		—	—	—	2	3	4	2	7	3	1		2
b. tang, sharp shoulders, rect. outline (knife or lance blade) Pl. 1, No. 4.....		—	—	1	—	—	—	—	1	1	—	—	
c. tang, faint sloping shoulders, rect. outline (lance blade) Pl. 1, No. 6, 7.....		—	—	—	—	—	1	—	1	—	—	—	
d. tang, sharp shouldered with medial basal groove and rect. outline (knife or lance blade) Pl. 1, No. 8.....		—	—	—	—	—	—	—	—	1	—	—	
e. tang, sharp shouldered, rect. outline, vestigial barbs (lance blade) PL. 1, No. 2, 3.....		—	—	1	1	—	—	—	—	—	—	—	
2. flattened c.s with single longitudinally medial apex on each face (knife or lance blade) Pl. 1, No. 9													
a. tang absent.....		—	1	—	—	1	—	1	1	—	—	—	
b. tang, unshouldered, incomplete.....		—	—	—	—	1	—	—	—	—	—	—	
3. flattened c.s with single longitudinally medial apex on one face only													
a. tang absent.....		—	1	—	—	—	—	—	2	1	—	3	
b. tang, sharp shouldered, rect. outline.....		—	—	—	—	1	—	—	—	—	—	—	
4. flattened c.s with single longitudinally medial apex on each face													

Prehistoric Sea Mammal Hunters at Kafia, Alaska

	1	2	3	4	5	6	7	8	9	10	R
dividing proximally into two low lateral ridges (harpoon blade) Pl. 1, No. 5											
a. tang absent	—	—	—	—	1	—	—	—	—	—	—
5. diamond-shaped c.s., and "hollow ground" with paired lateral barbs											
a. tang absent	—	—	—	—	—	—	—	—	—	—	—
b. tang, rect. outline (lance blade) Pl. 1, No. 10.	1	1	—	—	—	—	—	—	—	—	—
6. diamond-shaped c.s and paired lateral barbs											
a. tang absent	—	—	—	—	—	—	—	—	—	—	—
b. tang, rect. outline and unshouldered	—	—	—	1	—	1	—	—	—	—	—
II. tang, rect. outline, and unshouldered	—	1	—	—	—	—	—	1	—	—	2
III. irregular frag. non-diagnostic shape (rejected frag.)	x	x	x	x	x	x	x	x	x	x	x
IV. unilateral cutting surface (ulu or woman's knife blade)											
a. rect. outline with slightly convex cutting surface											
1. flattened c.s (frag.)											
a. tang absent	4	5	1	1	—	1	—	3	—	—	3
b. tang, flattened rect. with lateral shoulders, Pl. 1, No. 12, 13.	2	2	1	—	—	—	—	—	—	—	—
c. tang, with lateral shoulders and an inverted V-shaped medial stem Pl. 2, No. 2	—	—	—	—	1	—	—	—	—	—	—
d. tang, with an inverted V-shaped medial stem	—	—	—	—	—	—	—	—	—	—	—
e. tang, rect. without a shoulder, Pl. 2, No. 1	1	—	1	1	1	—	—	—	—	—	—
B. coarsely ground surfaces (unfinished blade)											
I. piercing point and bilateral cutting edges											
a. symmetrical and usually converging lateral edges											
1. flattened c.s. (lance or knife blade)											
a. tang absent	—	—	—	—	—	—	1	2	3	—	1
b. tang, shouldered and rect. outline	—	—	—	—	—	—	—	1	—	—	—
C. chipped and ground surfaces											
I. piercing point and bilateral cutting surfaces											
a. convex cutting edge and converging symmetrical lateral edges											
1. flattened c.s. (lance blade blank) Pl. 2, No. 3											
a. tang absent	1	—	—	1	2	—	—	—	1	—	1
II. narrow, unilateral cutting edge											
a. rect. outline and slightly convex cutting edge											
1. nearly square c.s. (adze blade) Pl. 3, No. 8	1	3	—	—	1	—	—	—	—	—	—
D. chipped surfaces											
I. unilateral cutting surface											
a. rect. with slightly convex cutting edge											
1. broad V-shaped c.s.											
a. tang absent	—	—	—	—	—	—	—	—	—	—	—

	1	2	3	4	5	6	7	8	9	10	R
b. tang, unshouldered continuation of blade body (ulu or woman's knife blade blank)	—	—	—	—	2	—	—	—	—	—	—
II. narrow, unilateral cutting surface											
a. rect. with slightly convex cutting edge											
1. flattened c.s. (adze blade blank)	—	—	—	—	—	—	—	1	1	1	—
III. piercing point and bilateral cutting surfaces											
a. symmetrical and converging lateral edges											
1. flattened c.s.											
a. tang absent	—	—	—	—	—	—	—	—	—	—	—
b. tang, unshouldered continuation of blade body (unfinished knife or lance blade sections)	—	1	—	—	2	1	—	—	—	1	—
IV. irregular shapes (possibly rejected frag.)	x	x	x	x	x	x	x	x	x	x	x
E. sawed and fractured											
I. bilateral sawed surfaces											
a. symmetrical with parallel sides											
1. flattened c.s. (incomplete lance or knife blade) Pl. 1, No. 11											
a. tang absent	—	1	—	—	—	—	—	7	7	1	—
II. irregular non-diagnostic shapes (probably rejected frag.)	x	x	x	x	x	x	x	x	x	x	x
FLINT											
A. surfaces pressure and percussion flaked or percussion flaked alone											
I. piercing point and bilateral cutting surfaces											
a. symmetrical with converging lateral edges											
1. ovate c.s. (lance or knife blade frag.)											
a. tang absent	—	—	—	—	—	—	—	1	—	—	—
b. tang, unshouldered continuation of blade body (lance blade) Pl. 2, Nos. 4, 5	—	—	—	—	2	—	—	1	1	—	1
c. tang, unshouldered with a squared base and flaring body (arrow point) Pl. 2, Nos. 7, 8	—	—	—	—	2	—	—	—	—	—	—
d. tang, moderately shouldered, long and rect. (arrow or lance point) Pl. 2, No. 6	—	—	—	—	—	—	—	1	—	—	—
2. diamond-shaped c.s.											
a. tang absent	—	—	—	—	—	—	—	—	—	—	—
b. tang, faintly shouldered with basal flattening (arrow point) Pl. 2, No. 9	—	—	—	—	—	—	—	1	—	—	—
c. tang, sharp shouldered and diamond shaped (arrow point) Pl. 2, No. 10	—	—	—	—	—	—	—	1	—	—	—
3. flat ventrally and with a dorsal medial ridge											
a. tang absent	—	—	—	—	—	—	—	—	—	—	—
b. tang, oval (hand drill) Pl. 2, No. 11	—	—	—	—	—	—	—	1	—	—	—
b. asymmetrical lateral edges, irregular											
1. irregular c.s. (side scraper) Pl. 2, Nos. 12, 13	—	—	—	—	—	—	—	—	—	—	—

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	1	2	3	4	5	6	7	8	9	10	R
c. symmetrical with converging lateral edges											
1. ovate c.s. (blade blank)	—	—	—	—	2	—	—	—	—	—	2
II. unilateral cutting surface and roughly rect. outline											
a. roughly semi-lunar cutting edge											
1. flattened c.s. (ulu or woman's knife blade) Pl. 3, No. 1											
a. tang absent	—	—	—	—	—	—	—	—	—	—	1
b. tang, unshouldered continuation blade body	—	—	—	—	—	—	—	—	—	—	1
b. symmetrical convex cutting edge											
1. flattened c.s. man's knife blade) Pl. 3, No. 2, 4											
a. tang absent	—	—	—	—	—	—	—	—	—	—	1
b. tang, unshouldered continuation of blade body	—	—	—	—	1	—	—	1	—	—	—
c. semi-lunar cutting edge	—	—	—	—	—	—	—	—	—	—	1
2. irregular c.s.											
a. trianguloid outline (end scraper) Pl. 3, No. 5											1
b. rect. outline (snub nose scraper) Pl. 3, No. 3	1	—	—	—	—	—	—	—	—	—	—
B. percussion flaked and use retouch											
I. bilateral cutting surfaces											
a. irregular cutting surfaces											
1. irregular, flat c.s. (used flake) Pl. 3, No. 6	—	—	3	—	—	—	—	3	—	—	—
II. unilateral cutting surface											
a. irregular shaped cutting edges											
1. Irregular c.s. (used flake) Pl. 3, No. 7	—	—	—	—	—	—	—	1	—	—	—
b. semi-lunar cutting edge											
1. irregular c.s. (used flake)	—	—	—	—	2	—	—	—	—	—	—
III. no recognized cutting surfaces											
a. irregular edges											
1. irregular c.s. (flake)	—	—	2	1	6	6	5	9	2	3	1
BEACH WORN STONE											
A. percussion chipped											
I. rect. outline with unilateral cutting surface											
a. slightly convex cutting surface											
1. flattened c.s. (chopper) Pl. 3, No. 9, Pl. 4, Nos. 1, 2	—	—	2	3	—	2	1	1	—	—	—
II. ovoid outline and bilateral cutting surfaces											
a. slightly convex cutting edge											
1. flattened c.s. (double edged chopper) Pl. 4, No. 3	—	—	—	—	—	—	—	1	—	—	—
III. oval to round outline, cutting edge continuous around lateral edge											
a. continuous outer working edge											
1. flattened c.s. boulder chip scraper) Pl. 4, Nos. 4, 6	—	1	1	1	6	1	—	1	3	2	—
IV. oblong stone											
a. opposite lateral notches											
1. flattened c.s. (fish line or net sinker) Pl. 4, Nos. 5, 7	—	—	—	1	—	—	2	—	—	—	—
b. with a hole in the center an inch across, six-inch diameter											

	1	2	3	4	5	6	7	8	9	10	R
1. flattened c.s. (unidentified)	—	—	—	—	—	—	—	—	—	—	1
B. pecked											
I. oblong beach stone											
a. encircling medial groove around short axis											
1. oval c.s. (maul head, fish line sinker or net sinker) Pl 5, No. 1	—	—	1	—	—	—	—	—	—	—	—
II. round beach stone											
a. encircling medial groove around long axis (maul head, fish line or net sinker) Pl. 5, No. 2	—	—	—	—	—	—	—	—	1	—	1
III. curved oblong stone											
a. groove across narrow end											
1. oval c.s. (phallic symbol) Pl. 6, No. 5	—	—	—	—	—	—	—	—	—	—	1
IV. oblong stone, incomplete											
a. two small pits on one side and one on the opposite near the proximal end											
1. oval c.s. (hammerstone with finger (?) holds) Pl. 5, No. 4	—	—	—	—	—	—	—	—	—	—	1
C. natural surfaces											
I. oblong and ranging in length from two to twelve inches, flattened battering surfaces (hammerstone)											
a. battered at one end from repeated blows											
1. oval c.s., Pl. 6, No. 7	—	—	—	—	2	—	—	—	—	—	—
b. battered at one end and one side											
1. oval c.s., Pl. 6, No. 6	—	—	1	—	1	—	—	—	—	—	—
c. battered at one side											
1. oval c.s.	—	—	—	2	—	—	1	—	—	—	1
d. battered at opposite ends											
1. flattened c.s.	—	—	—	—	—	—	—	—	—	—	—
2. oval c.s.											
a. red stains on one surface (hammerstone and/or palette)	—	—	—	—	—	—	—	—	—	1	—
3. oval c.s.	—	2	—	1	—	—	—	—	—	1	—
e. battered at opposite ends and one side											
1. flattened c.s.	1	1	1	—	—	—	—	—	—	—	1
2. squared c.s.	—	—	—	1	—	—	—	—	—	—	—
3. oval c.s.											
a. finger holds (?) on two faces	—	—	—	—	—	—	—	1	—	—	—
II. irregular size, frag., flattened battering surfaces											
a. battered on one or more surfaces											
1. oval to flat c.s. (hammerstone frag.)	—	—	2	—	2	3	2	1	—	1	2

SANDSTONE

A. pecked											
I. oblong outline											
a. pecked central basin area											
1. rounded base continuing into the sides (lamp) Pl. 5, No. 5	—	—	—	—	—	—	—	—	—	—	1
2. small flattened area at the base and convex sides											
a. pecked line encircling the outside of the rim (lamp) Pl. 5, No. 3	—	—	—	—	—	—	—	—	—	—	1
B. finely ground surfaces											
I. rect. or irregular edges											

Prehistoric Sea Mammal Hunters at Kafilia, Alaska

	1	2	3	4	5	6	7	8	9	10	R
a. one grinding surface											
1. thin, flat c.s. (grinding or whetstone, Pl. 6, Nos. 1, 2)	1	—	1	—	—	2	1	2	1	1	1
b. opposite grinding surfaces											
1. thin, flat c.s. (whetstone)	—	1	—	—	1	—	1	2	—	—	—
c. four grinding surfaces, two narrow, two wide											
1. flat rect. c.s. (whetstone) Pl. 6, No. 3	—	—	1	—	—	—	—	—	—	—	—
d. hexangular grinding surfaces											
1. hexagon (whetstone) Pl. 6, No. 4	—	—	1	—	—	—	—	—	—	—	—
e. one grinding surface											
1. raised and lowered grinding area, irregular c.s. (centerhump grinding stone(?))	—	—	—	—	—	—	—	1	—	—	—
BEACH PEBBLE											
A. natural surfaces											
I. small oblong stone											
a. no signs visible of human use											
1. oval c.s. (use unknown) Pl. 6, Nos. 8, 9	—	1	2	3	7	6	8	6	1	—	1
II. small, nearly round stone											
a. no signs visible of human use											
1. round c.s. (game stone) Pl. 6, Nos. 10, 11	—	—	—	5	—	5	2	5	—	4	—
QUARTZ CRYSTAL											
A. natural surfaces											
I. irregular shape, small											
a. no visible signs of human use											
1. irregular c.s.	—	—	—	—	—	—	—	—	—	—	1
COAL											
A. natural surfaces											
irregular shape, small frag.											
a. no visible signs of human use	—	—	—	—	—	—	2	—	—	—	—
B. finely ground surfaces											
I. rect. shape, small											
a. rect. c.s. (ground frag.)	—	—	—	—	—	—	2	—	—	—	—
II. oval outline and medial groove											
a. ventral surface fractured and broken											
1. flat c.s. (labret) Pl. 7, No. 1	—	—	—	—	—	—	—	—	—	—	1
PUMICE											
A. natural (?) surfaces											
I. oblong shape											
a. no visible signs of human use											
1. irregular c.s. (abrading (?) stone)	—	—	2	—	—	—	—	—	—	—	—
CHINA											
A. glazed											
I. English Willow Ware											in sod layer
WHALEBONE											
A. surfaces natural, adzed and/or ground											
I. irregular shapes (rejected frag.)	—	1	4	4	5	2	3	—	—	—	—
II. parallel sides and working surface at right angles to the straight lateral edges, three to six inches long											
a. end opposite working surface battered											
1. half-circle c.s. (wedge)	—	—	2	1	—	—	—	1	—	—	—
III. piercing point and bilateral cutting surfaces as well as two unilateral barbs											
a. converging lateral edges											

	1	2	3	4	5	6	7	8	9	10	R
1. triangular c.s. (arrowhead) Pl. 7, No. 6.....	—	—	1	—	—	—	—	—	—	—	—
IV. piercing point, bilateral cutting surfaces and four sets of irregularly paired barbs											
a. parallel lateral edges											
1. ovoid c.s. with medial ridge on each face											
a. tang, laterally notched and rect. (lance head) Pl. 7, No. 7.....	—	—	—	1	—	—	—	—	—	—	—
V. rect. section of bone with short lateral projections at one side											
a. curving parallel edges											
1. dome-shaped c.s. (labret) Pl. 7, No. 8.....	—	1	—	—	—	—	—	—	—	—	—
ANTLER											
A. unworked frag.	—	—	—	—	1	—	1	—	—	—	—
B. sawed, adzed, and/or ground or natural sur- faces, frag.	1	8	7	4	5	2	1	1	—	—	—
C. sawed, adzed, natural, and/or ground surfaces											
I. slightly converging sides and working surface at approximately right angles to the straight lateral edges, three to five inches long											
a. end opposite working surface battered											
1. flat c.s. (wedge).....	1	—	—	1	—	—	—	—	—	—	—
II. piercing point, bilateral edges smooth and a single unilateral barb											
a. roughly parallel lateral edges											
1. oval c.s.											
(a) gouged line hole											
(1) tang, wedge shaped with rounded butt (harpoon dart head) Pl. 7, No. 2.....	—	—	—	—	—	1	—	—	—	—	—
(b) drilled line hole											
(1) tang, rect. with squared butt (harpoon dart head) Pl. 7, No. 3.....	—	—	—	—	—	—	1	1	—	—	—
III. piercing point, bilateral cutting edges, and two unilateral barbs											
a. converging lateral edges											
1. roughly diamond-shaped c.s.											
(a) drilled line hole											
(1) tang, rect. with square butt (harpoon dart head) Pl. 7, Nos. 4, 5.....	1	1	—	—	—	—	—	—	—	—	—
(2) tang, converging lateral edges with rounded base (harpoon dart head) Pl. 7, No. 9.....	—	—	1	—	—	—	—	—	—	—	—
IV. piercing point, bilateral surfaces smooth, and four unilateral barbs											
a. nearly parallel lateral edges											
1. oval c.s.											
(a) drilled line hole											
(1) tang, rect. (harpoon dart head) Pl. 7, No. 10.....	1	—	—	—	—	—	—	—	—	—	—
V. piercing point, bilateral surfaces smooth, and a single unilateral barb											
a. nearly parallel lateral edges											

Prehistoric Sea Mammal Hunters at Kafilja, Alaska

	1	2	3	4	5	6	7	8	9	10	R
1. oval c.s.											
(a) lashing slot on one side and a ridged groove on the opposite											
(1) tang, squared (harpoon dart head) Pl. 7, No. 11.....	—	—	—	—	1	—	—	—	—	—	—
VI. piercing point, bilateral edges smooth, and two unilateral barbs											
a. slightly converging lateral edges											
1. round c.s.											
(a) proximal end incomplete (incomplete harpoon dart head)	—	—	—	1	—	—	—	—	—	—	—
VII. reworked blunted piercing point, bilater- al edges smooth, and four unilateral barbs											
a. slightly converging lateral edges											
1. rounded c.s.											
(a) lashing groove near butt											
(1) tang, conical (side prong) Pl. 7, No. 12.....	1	—	—	—	—	—	—	—	—	—	—
VIII. piercing point, bilateral edges weathered and a single unilateral barb											
a. probably parallel lateral edges											
1. round c.s.											
(a) tang, approximately conical but incomplete (leister prong).....	—	—	1	—	—	—	—	—	—	—	—
IX. thin rounded working point and con- ing lateral edges also thin											
a. incomplete but converging lateral edges											
1. dome-shaped c.s. (barking tool point?) Pl. 7, No. 13.....	—	—	1	—	—	—	—	—	—	—	—
X. piercing points at opposite ends and rounded lateral edges											
a. roughly parallel lateral edges											
1. broad dome-shaped c.s. (double- endedawl) Pl. 7, No. 14.....	—	—	—	—	1	—	—	—	—	—	—
XI. rect. section of antler with an appended oval shaft											
a. roughly parallel lateral edges											
1. oval c.s. of shaft and rect. c.s. of the shaft body (fish hook shank?) Pl. 7, No. 16.....	—	—	—	—	—	—	—	—	—	—	1
XII. rect. section of antler with a blunted conical point at one end and a split end at the opposite end											
a. irregular lateral edges											
1. flat c.s.											
(a) medial drilled hole (reworked harpoon head) Pl. 7, No. 15.....	—	—	—	—	1	—	—	—	—	—	—
XIII. split section of antler											
a. slightly converging lateral edges											
1. dome-shaped c.s.											
(a) burnt drill holes at irregular in- tervals (drill bearing).....	—	—	—	—	—	—	—	—	—	—	1
XIV. round, flat section of antler											
a. with ventral rect. projection at right angles to the body and a drilled hole through the projection											
1. flat c.s.											

	1	2	3	4	5	6	7	8	9	10	R
(a) compass drawn circles on dorsal surface (button?) Pl. 7, No. 17.....	—	—	—	—	1	—	—	—	—	—	—

BONE

A. ground and natural surfaces

I. piercing point and bilateral edges sharpened

a. converging lateral surfaces

1. irregular dome-shaped c.s.

(a) tang, conical with a slight knob on one side (arrowhead)

Pl. 7, No. 18.....	—	—	—	—	1	—	—	—	—	—	—
--------------------	---	---	---	---	---	---	---	---	---	---	---

Table 2. SELECTED BONE COUNT

	Six inch levels from the midden surfaces											
	1	2	3	4	5	6	7	8	9	10	R	
Seal long bones (humerus, radius, ulna, femur, tibia, fibula)	33	70	79	26	32	7	—	—	—	—	—	—
Seal scapula	6	—	14	7	10	2	3	—	—	—	—	—
Seal pelvis	28	6	24	9	11	3	—	—	—	—	—	—
Seal jaw	—	2	6	—	3	2	1	—	—	—	—	—
Whale bone fragments	—	—	1	—	1	—	1	—	—	—	—	—
Caribou long bone	1	—	—	—	2	—	—	—	—	—	—	—
Clam shells	X	X	X	X	X	X	—	—	—	—	—	—

Table 3. ARTIFACT TOTALS EXCLUSIVE OF FLAKES AND FRAGMENTS

INORGANIC MATERIAL

Slate

A. finely ground.....	83
B. coarsely ground.....	8
C. chipped and ground.....	11
D. chipped.....	10
E. sawed and then fractured.....	16

Flint

A. pressure and/or percussion flaked.....	23
B. percussion flaked and use retouch.....	9

Beach worn stone

A. percussion chipped.....	30
B. pecked.....	5
C. natural surfaces.....	32

Sandstone

A. pecked.....	2
B. finely ground surface.....	18

Quartz, coal, pumice

A. ground.....	3
B. natural surfaces.....	5

ORGANIC MATERIAL

Whalebone

A. sawed, adzed, ground and natural surfaces.....	7
---	---

Antler

A. Sawed, adzed, ground and/or natural surfaces.....	19
--	----

Bone

A. ground and natural surfaces.....	1
-------------------------------------	---

APPENDIX I

Fortunately it was possible to make an aerial survey of the entire coastal region of the Monument from Cape Douglas west to Cape Kubugakli during almost ideal flying weather. Each cove and bay was carefully observed, but water conditions sometimes made it impossible to land. Locating unreported sites from the air necessitates considering a number of factors. These include the presence of a gentle beach to permit the landing of small boats even in rough water, shelter from high waters and strong winds, an accessible supply of nearby fresh water, and a supply of driftwood in the vicinity.

Beginning at Cape Douglas and working westward the sites observed and the general coastal conditions with reference to habitations will be enumerated.

Near the northeastern tip of Cape Douglas where a clear stream enters a small cove on the sea artifacts were found just behind the beach and cutting out of a caving bank. The artifacts include a chipped knife blade, a scraper and numerous flakes but no organic materials. These specimens appeared to have been from a thin organic soil layer just beneath the present ground surfaces. The site was not extensive; there were no indications of dwellings nor was there anything to suggest more than a brief occupation.

South of Cape Douglas to Swikshak Bay all the streams are glacier-fed, and no point or river mouth area was noted which seemed suitable for habitation. The next locality investigated was approximately four miles south of Swikshak Bay at the mouth of a clear river. A site had been reported in this general area, but none was found either by aerial survey or by walking along the most promising sections of beaches.

Along the next bay, which is unnamed, were low cliffs abruptly fronting the sea at the upper end and a long barren sandspit to the west, neither of which appeared suitable for settlement. Just to the south is the abandoned historic village of Kaguyak. This was inspected from the ground, but no more was noted than had previously been reported by Davis (1954, pp. 45-56). In the area of Hallo Bay north of Ninagiak Island a single house pit was observed, and a number of cleared areas appeared to have been occupied; however, water conditions did not permit landing to investigate.

The next site observed was that of Kuliak, which was partially excavated by Davis. The site is extensive, perhaps the most extensive along the coastal area of the Monument. A few miles to the west of the Kukak site a number (five) of house pits were observed, and a probable pit was noted at the mouth of a small stream entering the bay. The next site located was that of Kafilja, the description of which appears in the text. An attempt was made to locate further sites in this area, but none were found nor were any spots that seemed adequate for habitation. South of Cape Gull a small site was observed at the mouth of a stream entering the bay from the west, but no suitable locations were observed in Kuliak, Missiak, or Kinak bays, probably because steep cliffs front the sea along most of this area. The site on Takli Island

reported by Hrdlicka (1944, pp. 131-133) was flown over, but again landing was prohibited by poor sea conditions.

The low cliffs of Dakavak Bay and Amalik Bay again make these areas uninhabitable. The abandoned Katmai Village is described by Davis, and no effort was made to locate it. The only other possible site located was in a clearing at the innermost point of Kashvik Bay near an old log cabin.

In summary, it seems probable that the Monument coastline was inhabited by relatively few people at any one time, and it seems likely that the sites of Kukak, Kafliia, and possibly Takli are the most significant along the entire coast.

Bibliography

- Bank, T. P.
1953. "Cultural Succession in the Aleutians." *American Antiquity*. Vol. 19, pp. 40-49. Salt Lake City.
- Birket-Smith, Kaj
1941. "Early Collections From the Pacific Eskimo." *Ethnographical Studies*. pp. 121-163. Copenhagen.
1953. *The Chugach Eskimo*. Nationalmuseet, Copenhagen.
- Davis, W. A.
1954. *Archaeological Investigations of Inland and Coastal Sites of the Katmai National Monument, Alaska*. Mimeographed.
- Giddings, J. L., Jr.
1942. *Dendrochronology in Northern Alaska*. University of Alaska Publ. Vol. IV. Tucson.
1947. "Mackenzie River Delta Chronology." *Tree-Ring Bulletin*. Vol. 13, pp. 26-29. Tucson.
- Griggs, R. F.
1922. *The Valley of Ten Thousand Smokes*. National Geographic Soc., Washington.
- Heizer, Robert
1952. "Notes on Koniag Material Culture". *Anthropological Papers of the University of Alaska*. Vol. 1, No. 1, pp. 11-24. College.
- Hrdlicka, Alex
1944. *The Anthropology of Kodiak Island*. The Wistar Institute of Anatomy and Biology. Philadelphia.
1945. *The Aleutian and Commander Islands and their Inhabitants*. The Wistar Institute of Anatomy and Biology. Philadelphia.
- Jochelson, Valdimar
1925. *Archaeological Investigations in the Aleutian Islands*. *Carnegie Institute of Washington*. Publ. No. 367. Baltimore.
- de Laguna, Frederica
1934. *The Archaeology of Cook Inlet, Alaska*. *University of Pennsylvania Press*. Philadelphia.
- Laughlin, William
1952. "The Eskimo-Aleut Community". *Anthropological Papers of the University of Alaska*. Vol. 1, No. 1, pp. 25-46. College.
- Watson, W.
1950. Review of: *The Lower Palaeolithic Cultures of Southern and Eastern Asia*. in *Man*. Vol. L, pp. 151-152. London.
- Van Riet Lowe, C.
1945. "The Evolution of the Levallois Technique in South Africa." *Man*. Vol. XLV, pp. 49-59. London.
- Weyer, E. M., Jr.
1932. *The Eskimos*. Yale University Press. New Haven.



PLATE 1

- | | |
|------------------------|------------------------------------|
| 1 lance blade | 8 knife or lance blade |
| 2 lance blade | 9 knife or lance blade |
| 3 lance blade | 10 lance blade |
| 4 knife or lance blade | 11 incomplete knife or lance blade |
| 5 harpoon blade | 12 ulu knife blade |
| 6 lance blade | 13 ulu knife blade |
| 7 lance blade | |



PLATE 2

- 1 ulu knife blade
- 2 ulu knife blade
- 3 lance blade blank
- 4 lance blade
- 5 lance blade
- 6 arrow or lance point
- 7 arrow point

- 8 arrow point
- 9 arrow point
- 10 arrow point
- 11 hand drill
- 12 side scraper
- 13 side scraper

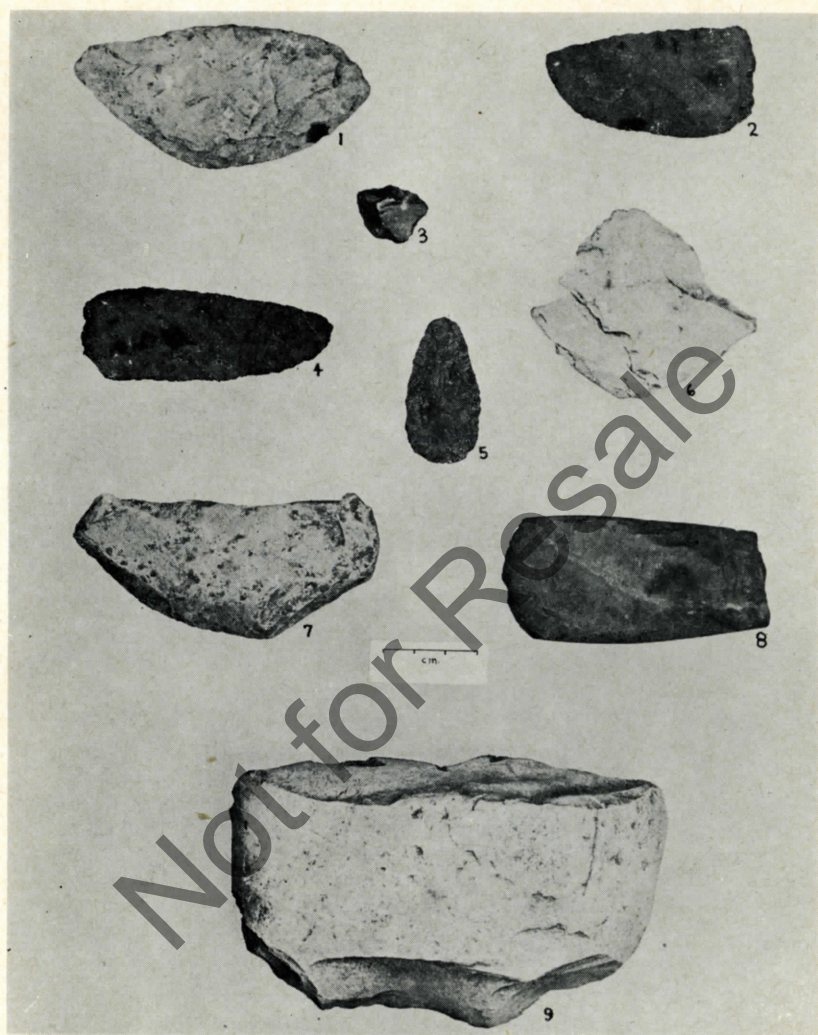


PLATE 3

- 1 ulu knife blade
- 2 man's knife blade
- 3 snub nose scraper
- 4 man's knife blade
- 5 end scraper

- 6 used flake
- 7 used flake
- 8 adze blade
- 9 chopper

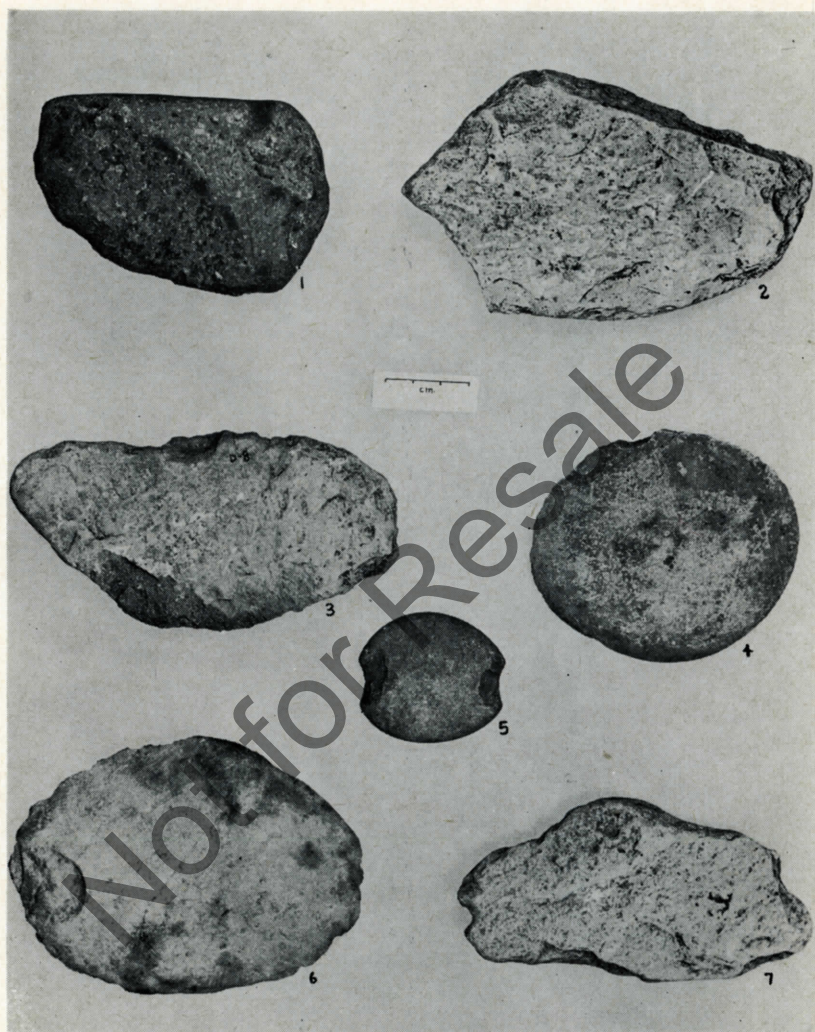


PLATE 4

- | | | | |
|---|----------------------|---|-------------------------|
| 1 | chopper | 5 | fish line or net sinker |
| 2 | chopper | 6 | boulder chip scraper |
| 3 | double edged chopper | 7 | fish line or net sinker |
| 4 | boulder chip scraper | | |

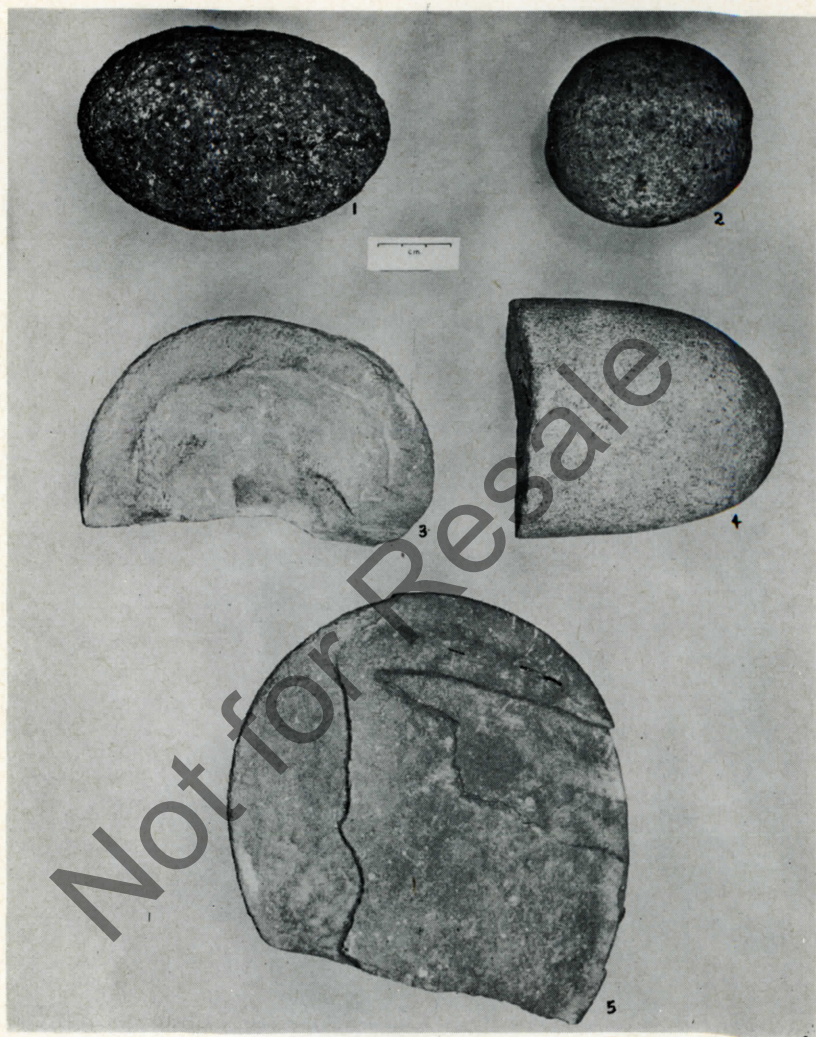


PLATE 5

- | | |
|--|---------------|
| 1 maul head, fish line sinker or net
sinker | 3 lamp |
| 2 maul head, fish line sinker or net
sinker | 4 hammerstone |
| | 5 lamp |

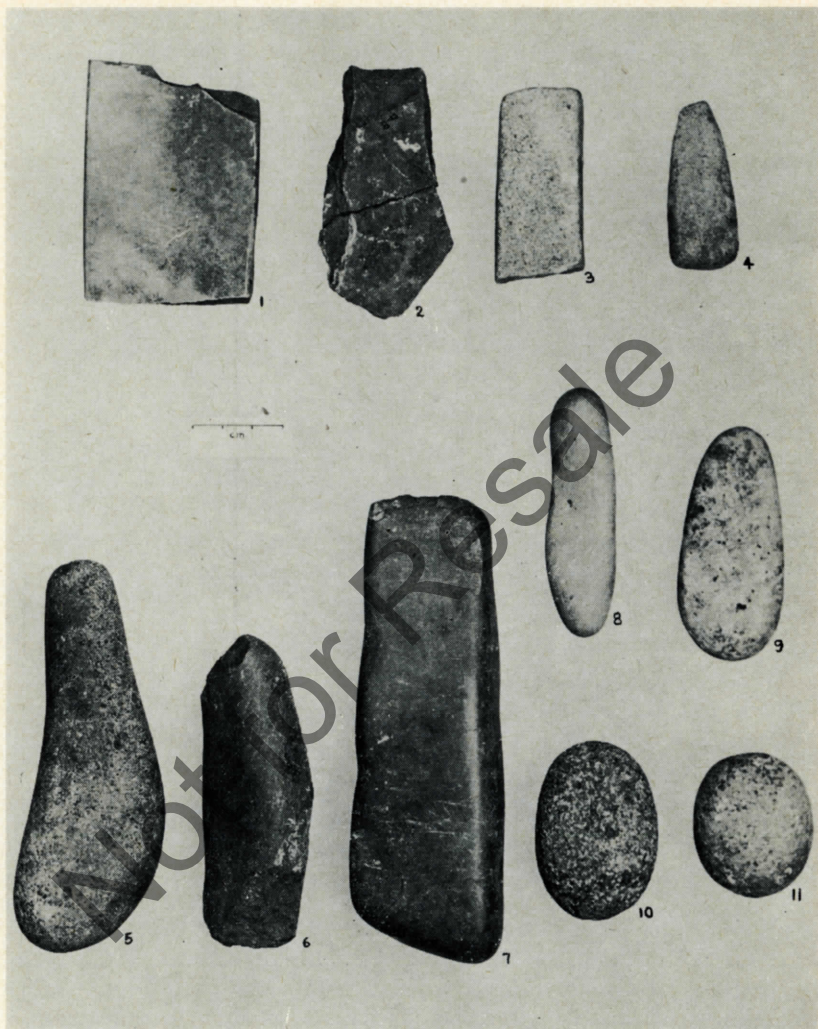


PLATE 6

- 1 grinding or whetstone
- 2 grinding or whetstone
- 3 whetstone
- 4 whetstone
- 5 phallic symbol
- 6 hammerstone

- 7 hammerstone
- 8 oblong stone, use unknown
- 8 oblong stone, use unknown
- 10 oblong stone, use unknown
- 11 oblong stone, use unknown

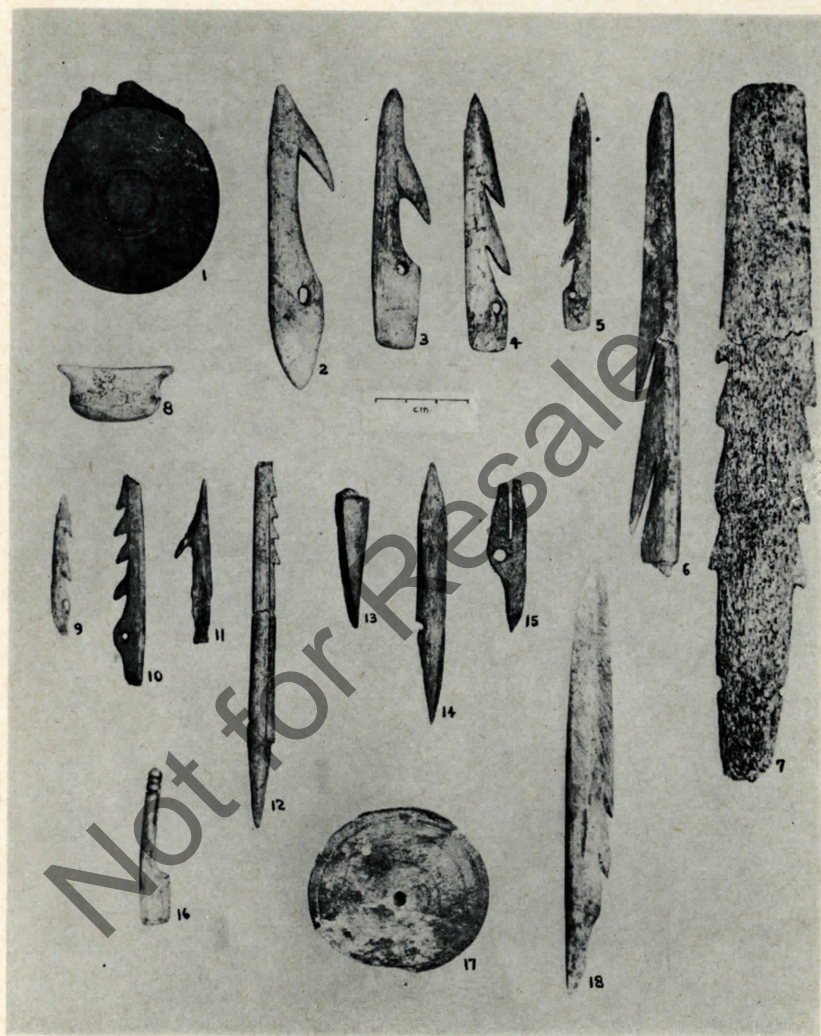


PLATE 7

- | | |
|---------------------|--------------------------|
| 1 labret | 10 harpoon dart head |
| 2 harpoon dart head | 11 harpoon dart head |
| 3 harpoon dart head | 12 side prong |
| 4 harpoon dart head | 13 barking tool point |
| 5 harpoon dart head | 14 double ended awl |
| 6 arrowhead | 15 reworked harpoon head |
| 7 lance head | 16 fish hook shank |
| 8 labret | 17 button |
| 9 harpoon dart head | 18 arrowhead |