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AKULIVIKCHUK:
A NINETEENTH CENTURY ESKIMO VILLAGE ON THE NUSHAGAK RIVER, ALASKA

JAMES W. VANSTONE

OCTOBER 16, 1970

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Frontispiece: Akulivikchuk in 1967.

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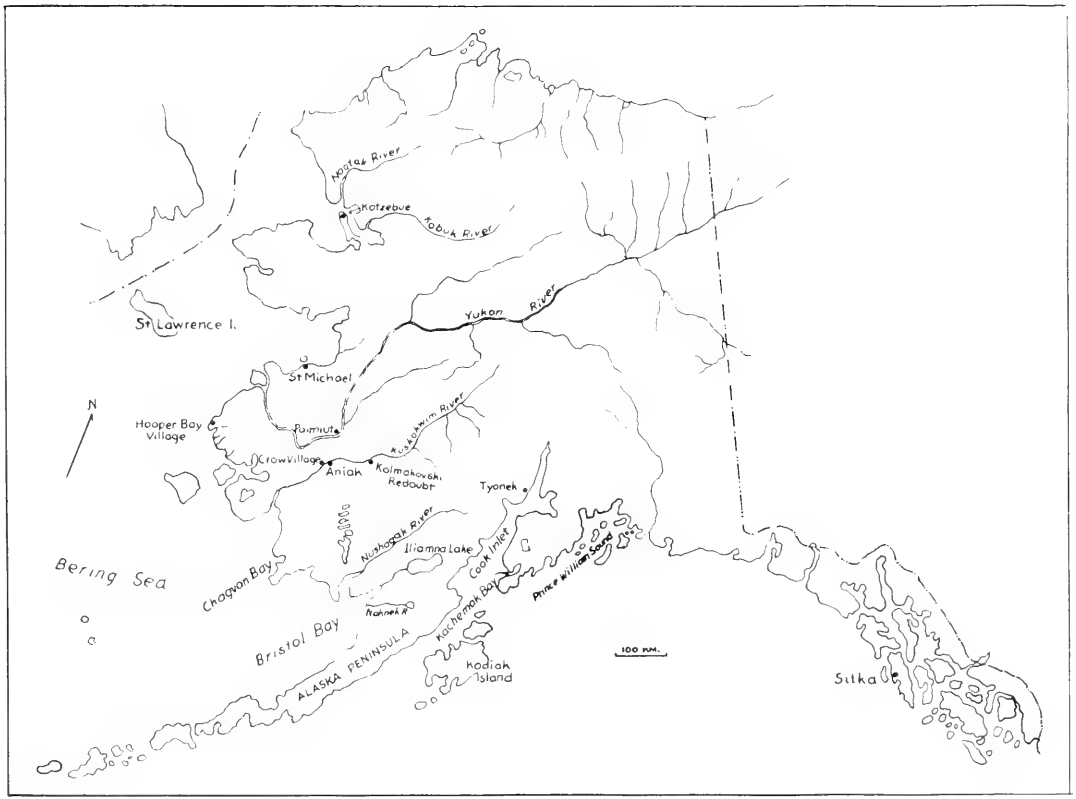
Noatak River
Kotzebue
Kobuk River
St Lawrence I.
Yukon River
St Michael
N
Hooper Bay Village
Russian Mission
Crow Village
Aniak
Kuskokwim River
Kolmakovski Redoubt
Tyonek
Nushagak River
Iliamna Lake
Cook Inlet
Bering Sea
Chagvan Bay
Prince William Sound
Naknek R.
Bristol Bay
Kachemak Bay
ALASKA PENINSULA
Kodiak Island
100 NM.
Sitka

Preface

The present study is one of a continuing series of publications dealing with the culture of the Nushagak River region in southwestern Alaska during the historic period (Fig. 1). Earlier publications in the series are a monograph on the ethnohistory of the region (VanStone, 1967), an annotated ethnohistorical bibliography (Van Stone, 1968a), and an archaeological report dealing with excavations at Tikchik, a nineteenth century settlement near the mouth of the Tikchik River (VanStone, 1968b).

Field work was begun in the summer of 1964 with an archaeological survey of the Nushagak River and three of its major tributaries, the Wood, Nuyakuk, and lower Mulchatna rivers (Fig. 2). Forty-five sites belonging to the period of historic contact were located and many of them mapped. The survey was continued during the following three summers and at the present time there is information on a total of 58 historic sites in the area. Eventually a detailed report on nineteenth and early twentieth century settlement patterns throughout the river system will be prepared, but this requires an additional season of field work.

The first summer of the survey suggested that throughout the period of historic contact there were centers of population along the upper and middle river. For purposes of the survey, the upper Nushagak included Tikchik Lake, the Nuyakuk River, and the Nushagak between the mouths of the Nuyakuk and the Mulchatna, including the lower reaches of the latter. The Nushagak above the mouth of the Nuyakuk has not been included in any phase of this project because of the virtual absence of reported historic settlements in that region. The middle river, a somewhat more populous center, was defined as encompassing that part of the Nushagak between the mouths of the Mulchatna and Kokwok Rivers. The river below this point, together with Nushagak Bay, may be regarded as constituting a third population center.

FIG. 1. Map of Alaska.

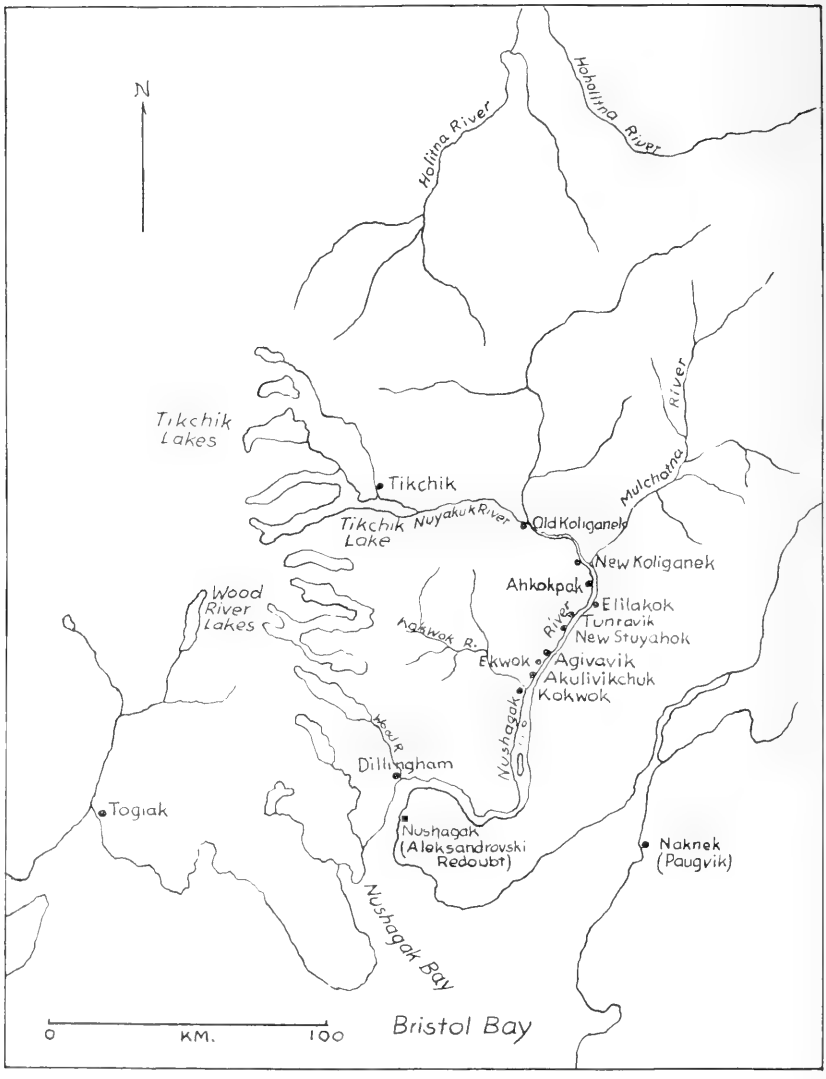

FIG. 2. Map of the Nushagak River region.

Archaeological research was planned in each of these centers and initiated with excavation of the Tikchik site during the summer of 1965. The selection of a site in the middle river region proved more difficult. At least three localities were considered potentially suitable, and there was also the possibility of working in several smaller settlements. Akulivikchuk, although not mentioned as frequently

in the historical sources as Kokwok and Agivavik, the other two large sites in the immediate area, had the advantage of having been abandoned early enough so that a twentieth century occupation would not confuse the excavation picture. Agivavik also qualified in this regard, but appears to have had a prehistoric component. In addition, much of this site, which is somewhat larger than Akulivikchuk, is covered with a heavy growth of spruce and willow trees. This would have made sufficiently extensive excavation virtually impossible with the crew and time available. In short, Akulivikchuk appeared a logical choice, and the most rewarding location for an archaeological approach to the nineteenth century in the middle river region.

Excavations at Akulivikchuk were begun on June 15, 1967 and completed on August 19. In retrospect it must frankly be admitted that the site hardly lived up to expectations. The artifact collection is not extensive and the number of trade goods recovered was disappointingly small. The main value, perhaps, of the information contained in this study is that it provides important data for comparison with recovered materials from the growing number of excavated historical sites in southwestern Alaska. Also, of course, it broadens considerably our perspective of Nushagak Eskimo culture in the nineteenth century and allows us to make at least a few generalizations concerning culture change in the area during the early contact period.

In the interests of consistency and to facilitate comparisons, the organization of the text follows as closely as possible other reports of historic site excavations in southwestern Alaska in which the author has participated. These include the above-mentioned Tikchik study, an account of excavations at Crow Village in the middle Kuskokwim River region (Oswalt and VanStone, 1967), and a monograph on the nineteenth century Tanaina Indian village of Kijik on Lake Clark to the north and east of Iliamna Lake (VanStone and Townsend, 1970).

The Historical Setting

Informants who were questioned concerning the meaning of the name Akulivikchuk generally agreed that it was simply a place name. One person, however, suggested that the word may have been derived from *agoonli* which means "in between," a reference to the small creek which formerly divided the site into two nearly equal parts.

Throughout its recorded history, the settlement was occupied by Yupik speakers of the Western Eskimo language stock. This dialect was spoken in all the villages along the Alaskan coast from the vicinity of Nome southward to Bristol Bay and the western end of Iliamna Lake. The inland range of Yupik speakers was to the village of Paimiut on the Yukon River and the vicinity of Aniak on the Kuskokwim River. The Eskimos of the Nushagak River region have the ethnic name of Kiatagmiut. This sub-group of Yupik speakers occupied, at the time of historic contact, the entire Nushagak River, excluding Nushagak Bay, and the area to the west as far as and including the Wood River Lakes and Tikchik Lakes (Oswalt, 1967, p. 6; VanStone, 1967, pp. 110–111).

The cultural center of Yupik-speaking peoples was along the central Bering Sea coast. In this area the people were oriented toward a maritime economy in which the seal was the most important food animal. On the adjacent tundra, caribou were hunted and fishing for salmon was significant at the mouths of rivers and in certain bays. The Yupik penetration of the Nushagak River system took place at some unknown time during the prehistoric period when the people presumably moved inland from the Bering Sea coast. Since, at that time, they already possessed a well-developed salmon fishing technology, these Eskimos were able to exploit effectively an inland environment like that along the Nushagak River and its tributaries where these fish are abundant.

The first well-documented contact between Yupik-speaking peoples and Europeans took place in 1818 when a party of Russian–American Company employees was dispatched from Kodiak Island to explore the territory north of Bristol Bay. During these explora-

tions a trading post, Aleksandrovski Redoubt, was established at the mouth of the Nushagak River as the first Company post north of the Alaska Peninsula. Using the redoubt as a base of operations Ivan Filipovich Vasiliev explored the Nushagak River for the Company in 1829 and 1830. In the latter year he crossed over into the Kuskokwim drainage and descended that river to the coast. As a result of these explorations, a series of trading stations were built at various points along the middle Kuskokwim culminating, in 1841, with the construction of Kolmakovski Redoubt opposite the mouth of the Kwik River about 16 km. above Aniak. This station remained an important trading center until abandoned by the Russian–American Company in 1866.

The exploration of Bristol Bay and the Nushagak River, together with the founding of Aleksandrovski Redoubt, later to be called Nushagak by Anglo-Americans, played a vital role in opening up the interior regions of southwestern Alaska to the fur trade. Kolmakovski Redoubt continued to be supplied from Aleksandrovski until 1845 and the route up the Nushagak River to its headwaters, across the divide and down the Holitna or Hoholitna to the Kuskokwim became a heavily traveled route with supplies going upriver into the Kuskokwim region and furs proceeding in the opposite direction.[1]

Since Akulivikchuk was almost certainly one of the larger and more important settlements along the Nushagak River throughout all or most of its occupation, and since it was located on the direct route of these regular journeys between the Kuskokwim and Aleksandrovski Redoubt, the village could not fail to have been drawn increasingly into the flourishing fur trade that was rapidly developing throughout southwestern Alaska. And yet there are no specific references to the village in any of the published or archival sources which I have examined dealing with exploration and trade during the Russian period.

In 1841 the first Russian Orthodox church north of the Alaska Peninsula was established at Aleksandrovski Redoubt and missionaries began to penetrate the Nushagak River country. Although very little is known concerning the exact nature of their contacts with the Eskimos of the interior regions, the earliest known reference to Akulivikchuk occurs in the vital statistics of the church at the redoubt. In 1843 a man from the village, presumably a visitor to

[1] For a detailed account of explorations and trading activities in the Nushagak River region, see VanStone, 1967, chapters I, III.

the mission at Aleksandrovski, is listed as having been baptized. Residents of the settlement continue to be listed more or less regularly in the statistics until 1899, although as we will note presently, the village may have been abandoned somewhat earlier (Alaska Russian Church Archives, vital statistics, Nushagak, 1842–1931).

These listings of Akulivikchuk residents in the church statistics are the only references to the village during the Russian period that have come to light. Because of this paucity of information, the significance of Russian trading and mission activity in the lives of the inhabitants of Akulivikchuk may be determined only within the general framework of Russian expansion into interior Alaska. For this information, the reader is referred to the author's earlier publications on the Nushagak River, its history and inhabitants (Van Stone, 1967; 1968a, b). It can be emphasized here, however, that as far as commercial relations were concerned, the number of Russians and creoles occupied in trading activities was probably always small but they maintained control over desirable products, and the Eskimos could obtain these only through the exchange of fur. This simple fact explains more than anything else the amazing rapidity with which the Eskimos of southwestern Alaska were exposed to the fur trade. Between 1818 and 1840 the entire region was opened up and trading contacts were established throughout the heavily populated Yukon and Kuskokwim River systems as well as along the Nushagak and its tributaries.

With reference to mission influence, it should be noted that although Akulivikchuk residents are mentioned frequently in the vital statistics of the Nushagak church, it seems virtually certain that missionaries did not visit the settlement regularly in spite of its relatively accessible location. Throughout the 1850's and 1860's, for example, the missionaries at Aleksandrovski were seldom able to visit the villages along the Nushagak more than twice a year. Thus, it is likely that only those settlements nearest the redoubt were strongly influenced by Christian teaching. Residents of Nushagak River villages were, at best, but marginal participants in the newly introduced faith, a situation that probably persisted as long as Akulivikchuk was occupied.

For a long time after the transfer of Alaska from Russia to the United States in 1867, no attempt was made to explore the Nushagak region. At the end of the nineteenth century the inland area north of Bristol Bay still remained comparatively unknown although it continued to be penetrated by missionaries, occasional trappers,

and traders. The assets of the Russian–American Company were purchased by Hutchinson, Kohl & Company of San Francisco. This firm was soon reorganized to form the Alaska Commercial Company which dominated trade in southwestern Alaska throughout the rest of the nineteenth century and well into the twentieth. The Russian Orthodox Church continued to send priests into the interior and was the major religious influence in the area as it is at the present time. The Moravian church established a mission near Nushagak in 1884 but it is unlikely that it exerted any influence on the residents of Akulivikchuk at this late date.[2]

Unfortunately, there is only one definite reference to Akulivikchuk in the known late nineteenth century reports of missionaries, government officials or travellers. This is somewhat surprising considering the settlement's accessible location. Most of the villages on the Nushagak River were enumerated in the federal census of 1880 (Petroff, 1884) or 1890 (Porter, 1893). Akulivikchuk is correctly located on Petroff's map and a population listing of 72 is given in the text (1884, p. 17, map 1). This number seems reasonable in light of the appearance of the site today.

In the federal census of 1890 reference is made to a village named "Akgulurigiglak" in the Nushagak district, but it is not shown on the accompanying map. This settlement is listed as having a population of 61 including 16 families living in five houses (Porter, 1893, p. 164). These figures again seem reasonable if the settlement in question is indeed Akulivikchuk. If not, the absence of the village from the 1890 census suggests that it had been abandoned by that time. When questioned on the subject, informants could only say that the settlement was abandoned sometime around the turn of the century. Reference to the village in the vital statistics of the Russian Orthodox mission at Nushagak as late as 1899 could be misleading since it is not always clear whether the statistics refer to the place of a parishioner's birth or to his residence at the time his name appears.

The cause of the community's abandonment cannot be determined with certainty. Several informants mentioned that during one winter when many of the village children were playing in front of the settlement on the river ice, it suddenly gave way and a large number were drowned. It was said to be after this unfortunate acci-

[2] For a detailed account of Moravian activities in the Nushagak River region, see VanStone, 1967, chapter II.

dent that Akulivikchuk was abandoned. Certainly, it is within the norm of Eskimo behavior to abandon a place of residence after it has been visited by serious illness or some other unhappy event. As we will note later, however, the emergence of other villages in the general area may also have played a role in the decision to abandon Akulivikchuk.

In the summer of 1931 Aleš Hrdlička ascended the Nushagak River as far as Old Koliganek. The primary purpose of his trip was to collect skeletal material for the United States National Museum, but he also located and described a large number of archaeological sites, among which was Akulivikchuk. On his way up the river, Hrdlička (1944, p. 357) notes that Akulivikchuk is "a very large old site on right bank, largest yet." On the return trip he was even more impressed and described the site as follows:

> Reach another large old site two miles below Hurley's [Ekwok]. Extends on both sides of a now dry small stream and then along a large flowing creek. Much larger than the site above Hurley's but there is evidently an older part and a later. Scores of square pits of igloos some large, many small. Collectively extend along main river and creek for at least half a mile, igloos several deep. (p. 374)

It is difficult to recognize the Akulivikchuk site from this description and it is clear that Hrdlička greatly overestimated its size. This is understandable since the site is characterized by a cleared area that is large in relation to the actual number of house pits. The extremely tall grass growing on the site might also give the impression, to the casual visitor, that many structures are hidden. In addition, the high bank of the river at this point creates a false impression of considerable depth and makes the site look something like the large coastal middens with which Hrdlička was familiar. Akulivikchuk is indeed one of the larger sites along the Nushagak River and its tributaries, but there is nothing to suggest that there are, or ever were, "scores of square pits of igloos."

Excavations

The Akulivikchuk site is located on the west bank of the Nushagak River approximately 5 km. below the village of Ekwok (59° 22′ N, 157°30′ W). Just above Akulivikchuk the river makes a big bend to the east and at this point there are several small islands which formerly were separated from the river bank by sloughs which connected with the main channel above and below the bend. At the present time, however, one of these sloughs is the main channel and the big bend in the river is in the process of becoming an oxbow lake. It will be a long time, though, before this process is complete and the bend is still the main route for barges and larger boats.

The west bank of the Nushagak River just below Ekwok is low but rises again south of Akulivikchuk and is ten to twelve meters high at the site itself. The formerly occupied area appears as a large, cleared, relatively flat expanse of ground approximately 150 m. long and 75 m. deep. This area is covered with tall grass and divided about equally into two halves by a deep ravine that at one time contained a running stream (see frontispiece). At the peripheries of the site is a thick growth of small spruce and cottonwoods with the latter being more common near the river bank to the north and south, while the former predominate along the back of the site to the west; a few willows are also growing in the ravine. Trees are not encroaching on the site to any great extent and the cleared area of former occupation must be very nearly the same size today as it was when the settlement was abandoned.

The cleared area to the south of the ravine is somewhat smaller than that to the north, and only a single house together with a number of pits are located on this side. All the other houses, the single *kashgee*, and a large number of pits of varying sizes are on the northern side. The fact that the only good view down the river is from the north side may account for this distribution. This appears to have been a major factor in the orientation as well as the location of the structures since all those excavated on the northern side of the ravine face downriver with one exception (H-1) which opens toward the river.

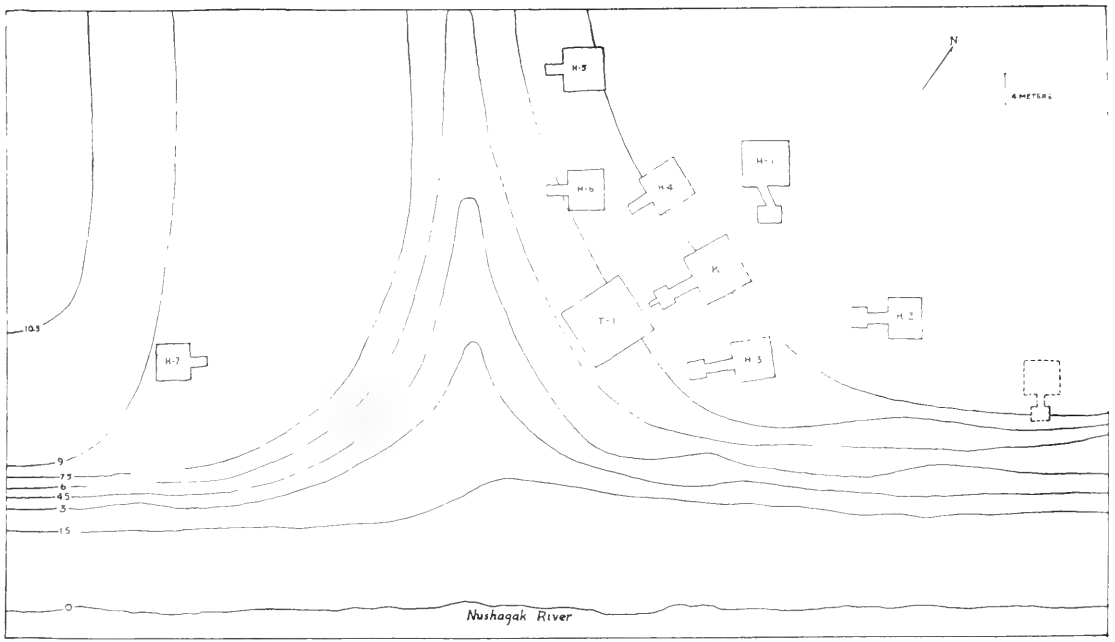

FIG. 3. Map of the Akulivikchuk site. Key: H-1–7=houses 1–7, K=*kashgee*, T=midden, dotted lines indicate unexcavated house.

A series of approximately 15 pits were located at the upriver end of the site behind the excavated structures. These are presumed to have been primarily for the storage of fish or meat, but their exact purpose is unknown. There are also nine pits of the same general type at the southern end of the site. All pits on both sides measure approximately three meters by two meters and are one meter deep.

Directly in front of Akulivikchuk the river is narrow. In fact, this point is one of the narrowest places along its course where the entire river is contained in one channel. The water is shallow along the shore in front of the site, but according to Ekwok informants, the silting is recent and not too long ago the river was deep close to shore and this was a very good place to set salmon nets. Even today a number of Ekwok families place their nets in the vicinity of Akulivikchuk throughout the entire summer. Across the river from the site, the bank is low and covered with willows. Moose are said to appear frequently in this area and prefer to cross the river here because it is relatively narrow.

The slope leading up to the site from the river is quite steep, but the ravine that divides the cleared area is wide at the point where it meets the water's edge and an easy ascent can be made by following the slope at this point. In fact, this was very likely the main trail leading to the houses at the time the site was occupied.

In considering the natural advantages of Akulivikchuk as a place to live, we can mention the high ground, the presence of fresh water running in the ravine, a good hunting and fishing location, and a favorable downriver view of as much as three to five kilometers. Another factor that may have been taken into consideration by the residents was the availability of large timber for building, although there is little of that left in the area today.

The purpose of the 1967 field season was to excavate the Akulivikchuk site as fully as possible. The first step involved stripping the sod layer from seven house pits and the single *kashgee*. An eighth house, located at the extreme northeast end of the site facing the river, was not excavated because of time limitations and the fact that several large cottonwood trees were growing in it. This house is indicated on the site map (Fig. 3) with dotted lines. A small but obvious midden deposit was found in front of the *kashgee* and here the sod was stripped from an area measuring eight meters in width and nine meters in length. There did not appear to be midden deposits in front of any of the houses, although no actual testing was

attempted. It seems likely that much of the garbage and other debris disposed of by the villagers was simply thrown over the bank into the river.

HOUSES

Excavation of the houses at Akulivikchuk proved to be relatively easy once the difficult task of sod removal was completed. At the time work was begun on June 18 the sod was almost completely thawed and only occasionally was frost encountered in any of the house pits. Drainage from the excavations was always good, even after prolonged periods of wet weather. This was due at least in part to the fine-grained sand which underlies the occupational debris over the entire site.

A number of generalizations about the seven houses excavated at Akulivikchuk are appropriate before discussing the details of each one in particular. First of all, it cannot be said with certainty that all houses were occupied simultaneously. This is a question that must be dealt with, but it certainly cannot be resolved, or even adequately considered, until after the distribution of artifacts has been studied. Therefore, we will leave consideration of this problem for a later chapter. For the present it is sufficient to note that since the total period of occupancy at Akulivikchuk was almost certainly less than a century and since the dwellings are all structurally similar, we can consider them as a cluster of contemporary residences. Whatever changes may have been going on in the culture of the Akulivikchuk Eskimos throughout the period of occupation, they do not seem to be reflected to any great extent in the construction of the dwellings in which the villagers lived.

In each instance the house builders at Akulivikchuk made an excavation in the ground slightly larger than the proposed structure. Thus all the houses were semi-subterranean dwellings. The species of wood employed in construction was, as far as can be determined, spruce. It is possible that some cottonwood logs may have been used, although spruce would generally have been much preferred because it does not rot as quickly.

Entrance tunnels are perhaps the most consistent feature of Eskimo dwellings everywhere and therefore it is not surprising that they were found attached to all the Akulivikchuk houses. The tunnel of only one excavated house (H-1) opens directly toward the river bank, while five (H-2, H-3, H-4, H-5, H-6) face downstream and one

(H-7) upstream. The floors of the tunnels of all houses are lower than the house floors, although in three cases (H-1, H-2, H-6) the difference is not great and no cold trap was formed. With one exception (H-2), tunnels project into the main living area, although the degree of projection varies considerably. At the inner ends of the tunnels there are usually split logs or planks which serve to shore up the end and also form an entrance. In five houses (H-3, H-4, H-5, H-6, H-7) this takes the form of a row of horizontal planks, while one structure (H-1) has a semi-circular wooden sill at the inner end. Horizontal planks also form the outer ends of tunnels in six houses (H-1, H-2, H-3, H-5, H-6, H-7); vertical planks in this location are characteristic of one structure (H-4).

Tunnel wall construction in four houses (H-1, H-5, H-6, H-7) consists of a series of parallel horizontal logs supported by short vertical ones, while in three (H-2, H-3, H-4) there are vertical wall planks. In each case these appear to have been held in place at the upper end by a long horizontal log. There are clear indications in two houses (H-1, H-4) that short, split logs were placed on top and at right angles to the tunnel wall logs to form the roof. In the same two structures there is evidence that sheets of birch bark had been placed over the tunnel roof logs before they were covered with sod or dirt. In general, it can be said that log preservation was much better in the tunnels than in the main rooms of the Akulivikchuk houses. However, all tunnel walls were, to some extent, compressed by pressure from the earth.

Three of the Akulivikchuk houses (H-1, H-2, H-3) have entryrooms or storm sheds at the outer end of the tunnels. Only one (H-1), however, contains a sufficient number of preserved logs to reveal features of construction. In all three houses the outer end of the tunnel extends into the entryroom and terminates in a pronounced step up. Another consistent feature of the three entryrooms is irregular floors that seem simply to be well-trodden, natural ground surfaces rather than actual prepared floors. It seems clear that entryrooms were not as well constructed as the rest of the houses.

In over-all plan, five houses (H-1, H-3, H-4, H-5, H-7) are virtually square, while two (H-2, H-6) are rectangular with the longer sides at right angles to the tunnel. Horizontal wall logs, presumably always held in place by vertical posts, are a consistent feature of all the houses, although one (H-6) has vertical wall planks along one side. A cribbed corner occurs in one structure (H-7), the cribbing logs being supported by two narrow, vertical posts. The floors of

TABLE 1.—House Construction Features

Feature	House H-1	H-2	H-3	H-4	H-5	H-6	H-7
Excavated foundation	X	X	X	X	X	X	X
Spruce wall logs	X	X	X	X	X	X	X
Tunnel							
shallow floor, no cold trap	X	X	0	0	0	X	0
deep floor, cold trap	0	0	X	X	X	0	X
horizontal wall logs	X	0	0	0	X	X	X
vertical wall planks	0	X	X	X	0	0	0
short, split roof logs	X	?	?	X	?	?	?
birch bark sheets at roof level	X	0	0	X	0	0	0
horizontal planks at inner end of tunnel	0	0	X	X	X	X	X
horizontal planks at outer end of tunnel	X	X	X	0	X	X	X
semi-circular wood sill at inner end of tunnel	X	0	0	0	0	0	0
vertical planks at outer end of tunnel	0	0	0	X	0	0	0
Tunnel entryrooms	X	X	X	0	0	0	0
House							
dimensions square	X	0	X	X	X	0	X
dimensions rectangular	0	X	0	0	0	X	0
horizontal wall logs	X	X	X	X	X	X	X
vertical wall planks along one side	0	0	0	0	0	X	0
cribbed corners	0	0	0	0	0	0	X
central hearth	X	X	X	X	X	X	X
pits in floor lined with birch bark	0	X	0	0	0	0	0
Benches							
back bench only	0	0	X	X	0	X	0
grass-covered bench	0	0	0	0	0	X	0
dried grass on floor along side walls	X	0	0	0	0	0	0
Roof							
four-post-center	?	X	X	?	X	X	?
birch bark sheets at roof level	0	X	0	0	0	0	0
skins used in roof construction	0	?	0	0	0	0	0

all the houses consist of a hard-packed, scaly, dark layer from which overlying material separated easily. Near the center of each house is a hearth characterized by discolored earth and a wood ash concentration. In four houses (H-1, H-3, H-4, H-6) one or more fire-darkened rocks found in or near the fireplace suggest that at one time those hearths may have been clearly delineated by stone borders. Several structures have pits of varying depths in the floors, and one such pit (H-2) is lined with birch bark.

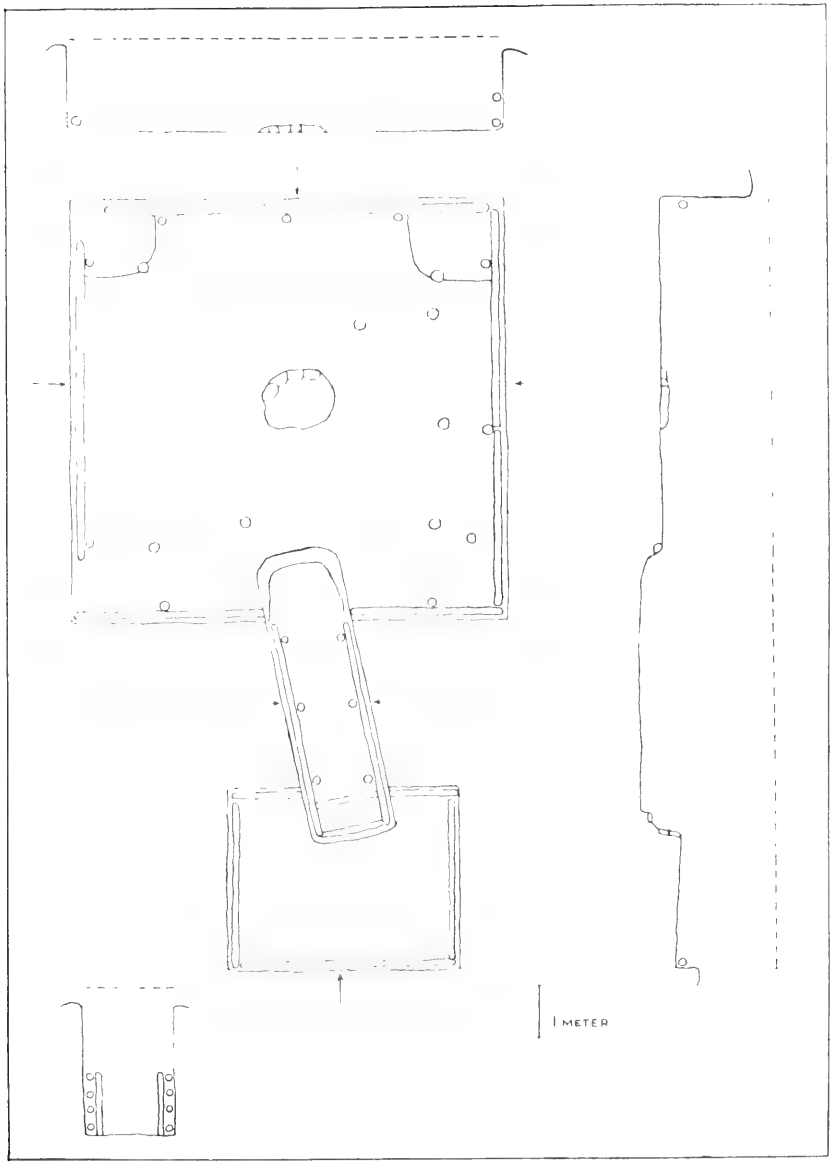

FIG. 4. House 1.

Surprisingly, wall benches are not a characteristic feature of Akulivikchuk houses. Three dwellings (H-3, H-4, H-6) have back benches only and in one of these (H-6) the bench was covered with dried grass. In house 1 there are no actual benches, but dried grass was found on the floor along the side walls.

The manner in which roofs were supported is a rather consistent feature of the houses. Four structures (H-2, H-3, H-5, H-6) have the remains of vertical posts almost equidistant from the side walls. These posts presumably supported four horizontal beams with short roofing posts or planks stretching from these beams to the uppermost wall log on all four sides. This four-post-center type of roof construction may also have been present in the other three dwellings (H-1, H-4, H-7), but the presence of additional post fragments makes it possible that some other form of roofing, perhaps six-post-center, was used. At the level of the roof in one house (H-2) badly decayed sheets of birch bark were recovered suggesting that this material was placed between the roof logs and overlying sod as a waterproof protective cover. At the roof level in the same structure were sizeable deposits of maggot cases indicating that caribou skins or moose hides may have been similarly used.

House 1 (Fig. 4)

The main room of this structure, the largest dwelling on the site, is virtually square with horizontal wall logs held in place by vertical supports. There appear to have been at least three and probably four wall logs along each wall, but no more than two were found. In the back corners are small piles of sterile sand which may have been intended for spreading on the floor when it became dirty. The floor itself is a hard-packed, scaly, dark layer, thick and distinct over the entire surface. A centrally-located fireplace appears to have had stone retainers. The manner in which the roof of this house was supported must remain conjectural, although four-post-center construction is a possibility. However, there are additional posts, the structural significance of which is not clear. There are no benches in this house, although a covering of dried grass was found on the floor along the side walls in the area where benches might have been expected to occur.

The tunnel is deeply excavated but its floor is not far below that of the main chamber. At the inner end of the tunnel is a semicircular wooden sill, but the step up here into the living area is less than 20 cm. Tunnel wall construction consists of five horizontal logs

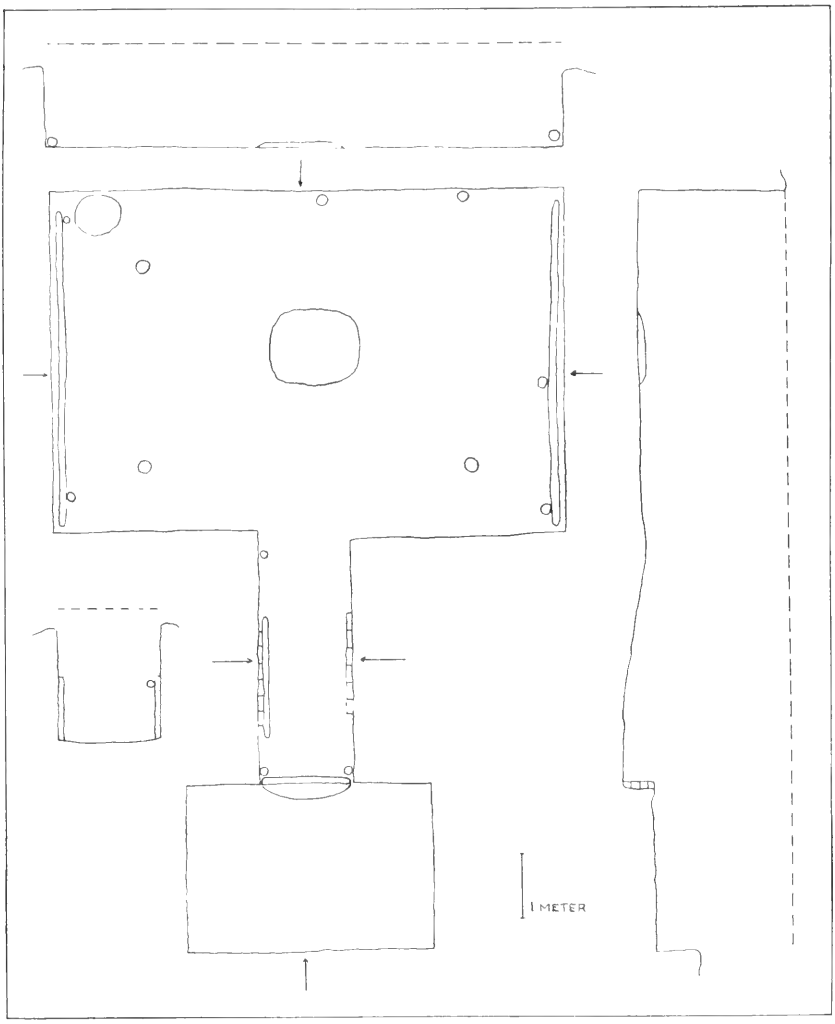

FIG. 5. House 2.

on each side held in place by opposite sets of three vertical supports. At the outer end of the tunnel is a steep step up into the entryroom, the floor of which is well above the floor of the main chamber. There are three short retainer logs at this end, the lowest of which is in the form of a narrow step. The tunnel floor is a hard-packed, dark layer but less thick than the floor in the living area. This structure was

one of two where tunnel roof construction could be determined with some degree of certainty. Short, split logs were placed horizontally with the flat side down. These appear to have been covered with strips of birch bark before a sod covering was added. The entryroom into which the tunnel extended is well defined by horizontal wall logs on the four sides, but the floor of this area is indistinct and somewhat lower in the center than on the sides.

House 2 (Fig. 5)

Wood preservation in this structure, although the poorest in any on the site, was sufficient to indicate the main features of construction. Wall logs are located along the sides only and there is just one on each side. Nevertheless, it is clear that these walls were constructed of horizontal logs held in place by vertical supports. The back and front walls had to be located by following the floor to its outer limits. It appears that the roof was supported by four center posts. During excavation many large strips of birch bark were encountered at the roof level and these may have covered the roof logs under the sod. In places there were large deposits of maggot cases indicating that hides may also have been utilized in roof construction. The floor of the main chamber is a hard-packed, scaly, dark surface and there appeared to be several floor layers but these could not be separated consistently over the entire living area. Therefore, no attempt was made to separate artifacts from the various floors. Excavation of the floor was complicated considerably by the existence of numerous pits, only one of which is shown in the house plan. This pit, approximately 40 cm. in diameter and 40 cm. deep, is circular and lined with strips of birch bark. It contained bones and a few artifacts, mostly beads. A large, thick, central fireplace consists of discolored earth and charcoal fragments.

The tunnel of this house is notable for its depth and the fact that there is no real cold trap. The floor of the main chamber slopes up slightly near the tunnel while the tunnel floor itself slopes gently downward and then rises slightly just before the step up into the entryroom. The tunnel floor is simply a continuation of the hard-packed floor in the main room. Log preservation is poor, but enough remains to indicate that the tunnel walls were lined with split vertical planks held in place by one or more horizontal logs. There was probably one such log running along the top of the planks and another one in a similar position at the bottom. At the step up into the entryroom are four horizontal planks held in place on each side by a

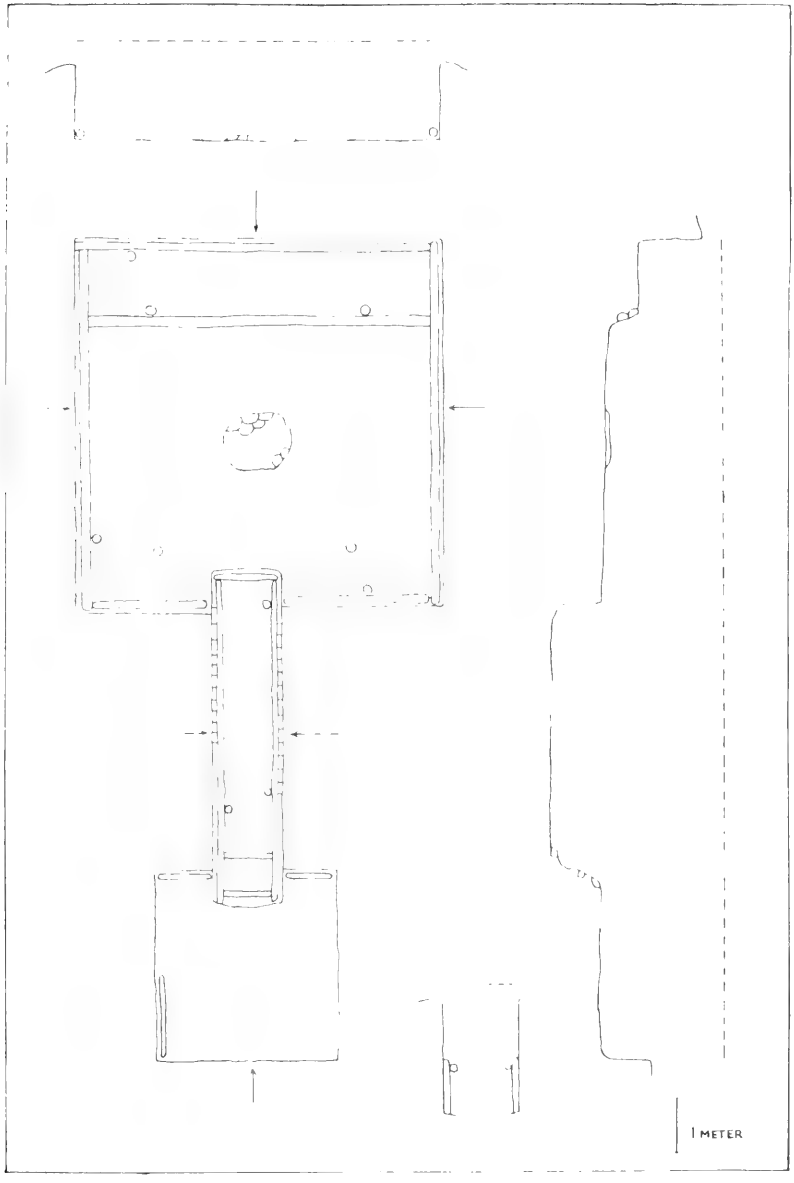

FIG. 6. House 3.

vertical support. The entryroom itself contains no structural features of any kind and has a poorly defined, darkened floor that is low in the center and slopes up along the sides. Just at the tunnel entrance is a slight, semi-circular depression.

House 3 (Fig. 6)

This generally well-preserved structure has a main room with the usual horizontal wall logs held in place by vertical supports. There were probably at least three logs on all four sides, but only a single one remains along each wall. The most striking feature of this house is a high bench which extends along the back wall. This bench is faced with two horizontal retaining logs which pass in front of the back two supports of the four which supported the roof. Floor in this structure is the usual hard-packed, dark layer and there are a number of deep pockets of occupation debris along the side walls. The central fireplace contains a number of fire-cracked rocks as well as ash deposits and discolored earth.

The tunnel of this house, which is quite deep and long, is characterized by extremely good wood preservation. The floor is a well-defined dark layer and the walls consist of vertically-placed split log planks supported by a single long log on each side at the top of the planks. These horizontal retainers are in turn supported by upright logs. The inner end of the tunnel extends a short way into the main chamber where there is a step up with two short retaining logs. At the opposite end the tunnel extends into the entryroom and in this area there are two steps, each one with a horizontal retaining log along the outer face. There is also a similar log at the top almost level with the floor of the entryroom.

House 4 (Fig. 7)

This is another well-preserved structure and its main living area, like those of other houses on the site, is characterized by horizontal wall logs held in place with vertical supports. There were probably four such horizontally-placed logs along each wall, but no more than three are preserved on any one wall. As in house 3, there is a high bench along the back wall which is faced with two large horizontal logs. This facing is retained by four posts, two or more of which may have been associated with roof support. Four- or six-post-center roof construction is possible for this house, but because of those posts along the bench and the seemingly indiscriminate location of others, no clear pattern emerges. There is a central fireplace containing a

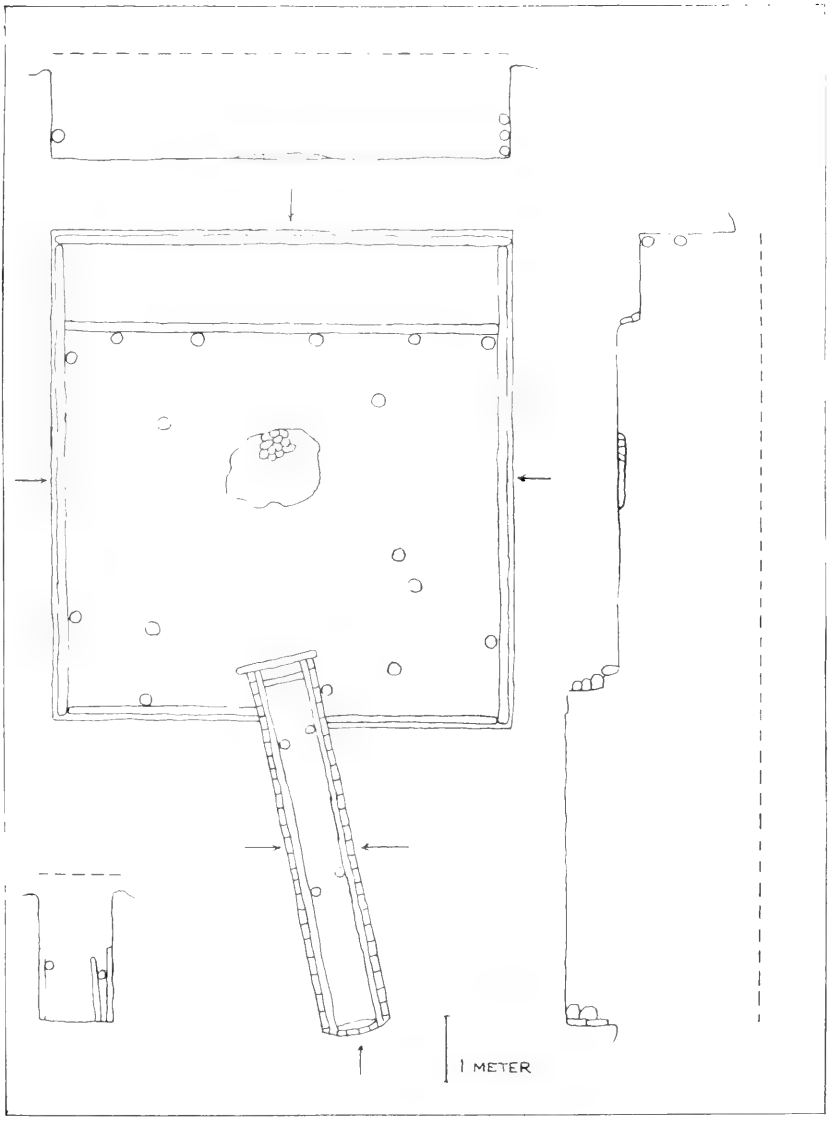

FIG. 7. House 4.

large number of small fire-cracked rocks. The floor of the main chamber is a relatively even layer of the familiar hard-packed, scaly, black material.

The long tunnel extends into the main living area and then goes off at a slight angle. Wall construction consists of vertical planks held in place by a single horizontal log along each side at the top. These in turn are held in place by vertical supports. This tunnel is quite deep and has a hard-packed, dark floor. At the inner end is a wooden sill that sits flush with the floor and in front of which are three short horizontal retaining logs that form a single narrow step. At the outer end of the tunnel are four vertical planks. In front of these are two short horizontal logs which also form a narrow step. In this structure there is clear evidence for the type of tunnel roof construction previously noted for house 1 and probably characteristic of all the structures.

House 5 (Fig. 8)

This is a square house, the main chamber of which is characterized by the usual horizontal wall log construction. There were apparently four logs along each wall, although this number was preserved on only two sides of the main room. The roof was probably supported by four posts, although one of these appears to be considerably out of line. A central fireplace contains much charcoal and discolored earth, while the floor itself is no different from that described for the other structures. It should be noted, however, that the excavation for this house is shallower than that for any of the others, and the overburden less thick.

The tunnel, which is short, extends well into the main chamber and is very well preserved. There are four horizontal logs along each wall held in place by vertical supports at the inner end. As retainers at the step up into the main chamber, there are three short horizontal logs. One is flush with the house floor and extends outward on either side of the tunnel. The second below it protrudes slightly and the third enough to form a step. At the outer end of the tunnel are four horizontal split logs forming a retaining wall. The floor is a well-defined dark layer, lowest in the center but sloping up slightly at either end.

House 6 (Fig. 9)

This house, cut deeply into the bank of the draw, is also the most deeply excavated of all the structures. There was a great deal of

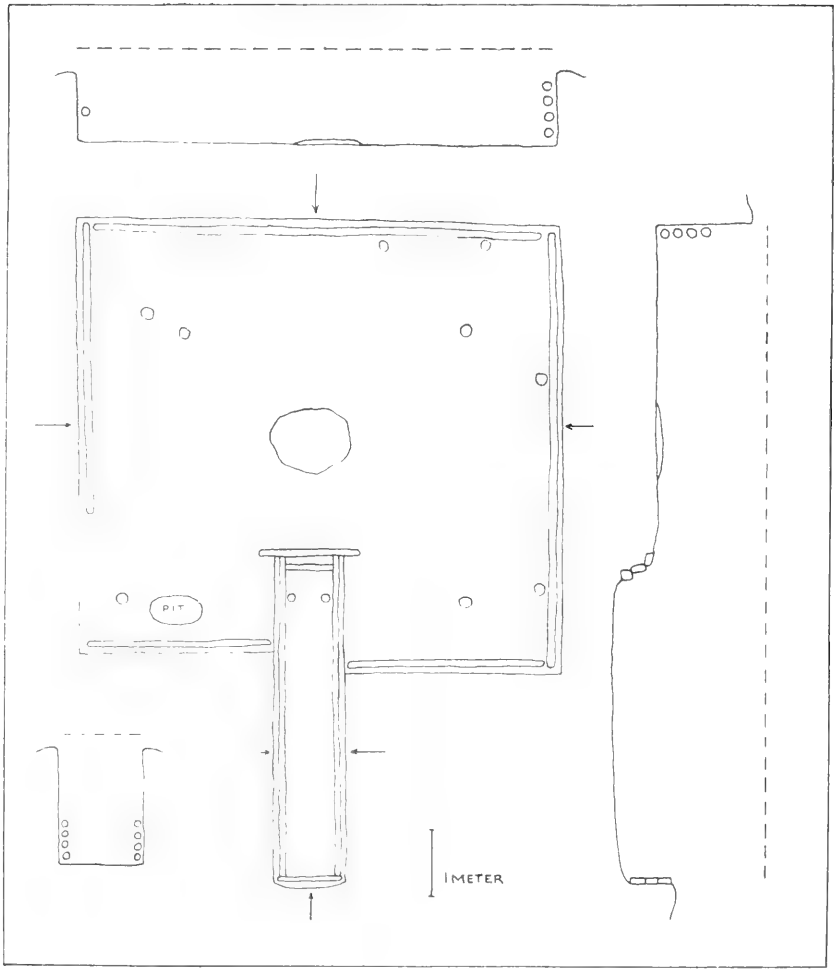

FIG. 8. House 5.

overburden to be removed before features of construction were revealed. Horizontal wall logs, held in place by vertical supports, are present along three walls of the main chamber. Only three logs were used along the back wall, while there were apparently four along each side. The front wall on both sides of the tunnel consists of vertical split logs dug into the floor at the bottom and supported by a horizontal log at the top. The split logs are badly decayed but they appear to be approximately 15 cm. wide and set in place with the flat side facing inward. The central fireplace in this structure con-

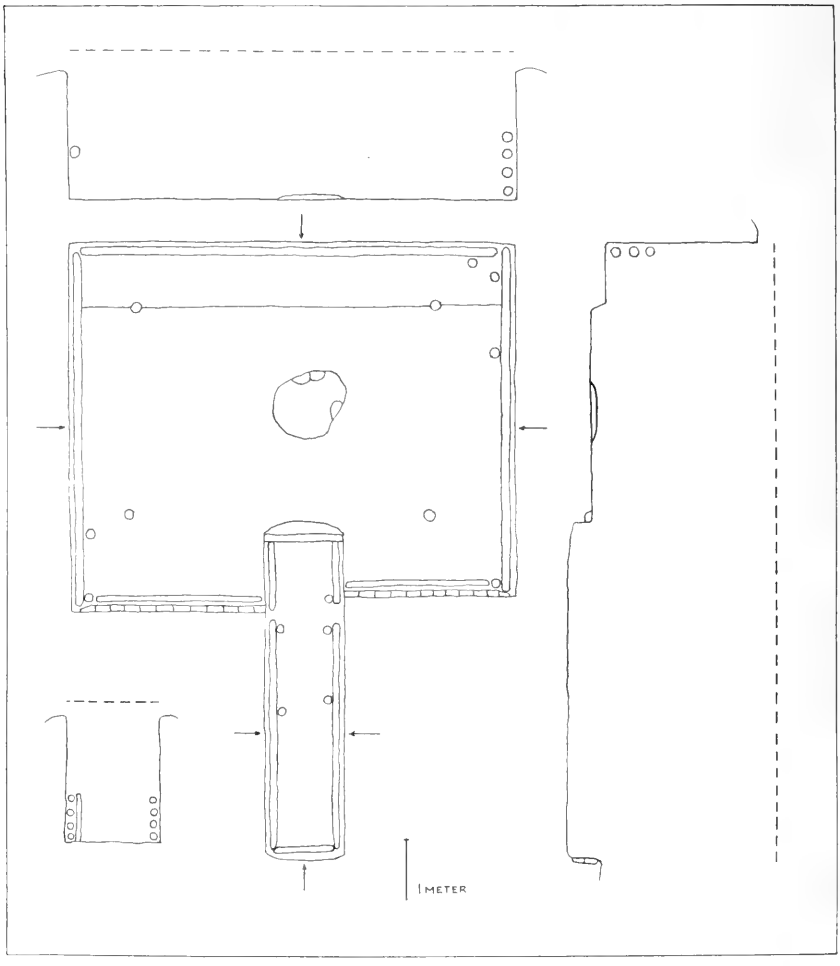

FIG. 9. House 6.

tains the usual charcoal, discolored earth and a few fire-cracked rocks. Along the rear wall is a low, narrow bench rising no more than 15 cm. above the floor. It appears to have extended out as far as the back two posts of the four that supported the roof. The floor is the usual hard-packed, scaly, black layer and this surface also occurs on the bench along with indications that dried grass may have been laid over it. In places the floor surface extends into deep pockets, particularly along the sides near the wall logs.

The tunnel of this house, like that of most of the others, extends well into the main chamber. On either side there are horizontal logs

supported by vertical ones, and separate short logs form that part of the tunnel inside the living areas. This tunnel extends no more than 25 cm. below the house floor level and, therefore, hardly can be said to form a cold trap. There is a single log retainer at the inner end, while at the outer end there is a similar arrangement involving two short logs. The tunnel floor is the same hard-packed, dark layer as the house floor.

House 7 (Fig. 10)

Like the structure just described, this house is also cut well back into the bank. However, wood preservation is very poor and wall logs are located along one wall only. These indicate horizontal log wall construction with the logs being held in place by vertical supports. One corner apparently was cribbed, perhaps for the purpose of utilizing shorter wall logs. The cribbing was supported by small, vertically-placed stakes. The floor is a hard-packed, grey to black layer which in places is thick and scaly but elsewhere exceedingly thin and difficult to follow. It is also very uneven. The manner of roof construction is virtually impossible to determine because of the large number of posts and their seemingly random placement. A central fireplace consists of burned earth and charcoal fragments.

Log preservation in the tunnel of this dwelling is much better than elsewhere. There are four horizontal logs on either side held in place by vertical supports. The tunnel is quite deep and extends into the main chamber where there are three short horizontal retaining logs. At the outer end, two such retainers are still in place and there may have been a third. When this structure was excavated, the tunnel logs were found to be pushed well toward the center and the drawing restores them to their original position. The floor is the same well-defined, hard-packed, dark layer that was characteristic of much of the floor in the main chamber.

KASHGEE

As might be expected, by far the most imposing structure in the village is the centrally located *kashgee* (K), or ceremonial house (Fig. 11). It is impressive not only because of its size, but also its depth. Unlike *kashgee* 1 at Tikchik (VanStone, 1968b, pp. 253–255), the excavation is directly down into the ground rather than cut into a steep hillside. Wood preservation in the Akulivikchuk *kashgee* was remarkably good and nearly all features of construction can be deter-

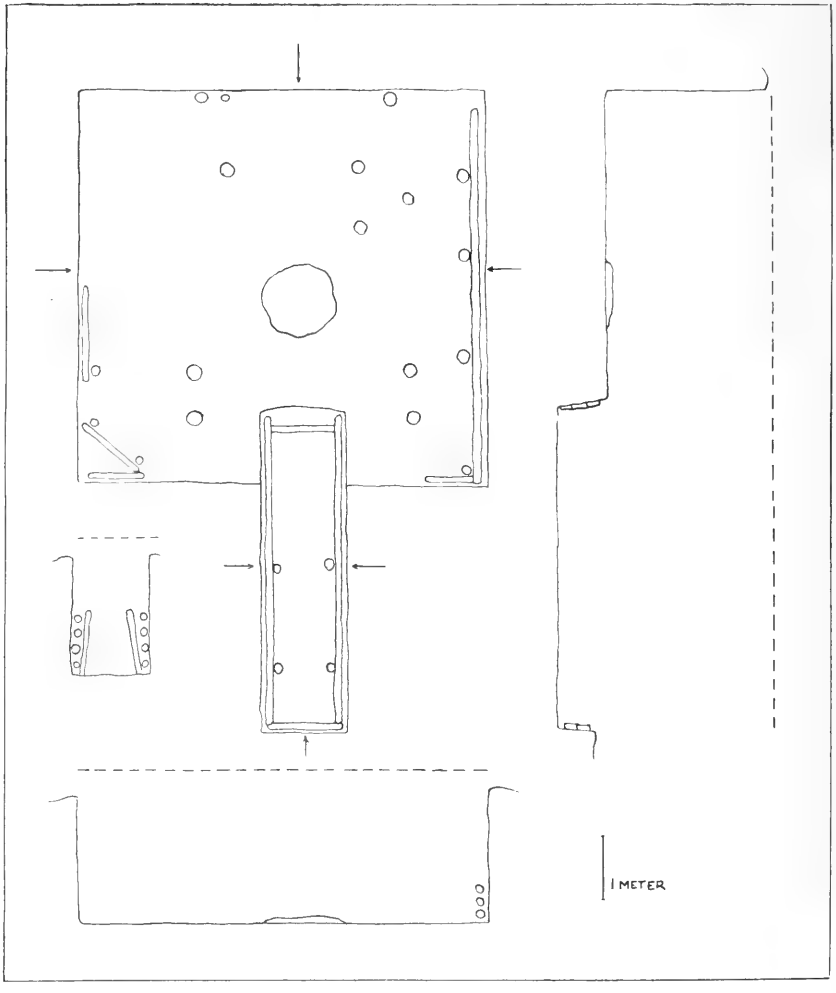

FIG. 10. House 7.

mined with some degree of certainty. The main chamber is characterized by horizontal wall logs, probably held in place by vertical supports although only two of the latter were encountered (Fig. 12). Three of the four corners are cribbed, but the actual number of wall logs along each side of the main chamber cannot be determined definitely. There were apparently at least four since this number was preserved along one wall. Single, long wall logs appear to have been used almost exclusively, although the condition and preservation of the remaining logs is such as not to exclude the possibility that two

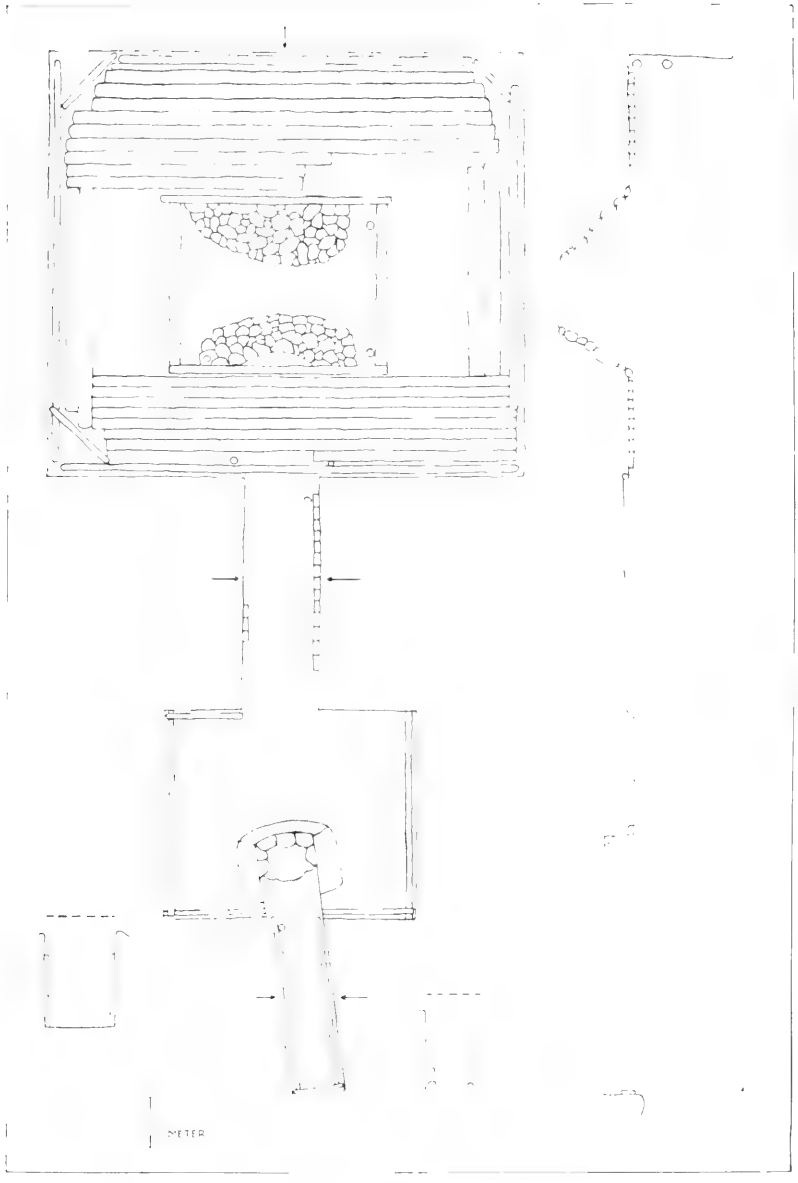

FIG. 11. *Kashgee.*

were joined at some point along a wall. There are wide bench areas on all four sides and all seem to have been covered with wooden planks, the only example of this kind of bench covering at the site. The two side benches have only a pair of very wide planks near the walls, while the front and back benches are covered with a number of horizontally placed planks.

The deep center of the main chamber has a log framework that runs all around it, probably four horizontal logs on the two short sides and just one each on the long sides where a large number of sizeable rocks appear to be a structural feature. These rocks, which may also have been used during sweat baths in the *kashgee*, seem to have served as fill to help support the front and back benches. The center area between the piles of large rocks is filled with a thick, sterile layer of charcoal and ash, and the retaining logs are badly charred. In fact, some of the wall logs are blackened too, suggesting that the structure was used extensively as a bathhouse.

The *kashgee* tunnel enters the main chamber at the level of the front bench. Wood preservation in this area is poor, but it appears that there were vertical planks along the walls. These may have been held in place by horizontal supports as in some of the house tunnels. On the other hand, they may have been placed in such a manner as to be self-supporting. The tunnel enters the entryroom at floor level which is approximately the same as bench level in the main chamber.

The entryroom presents something of a puzzle. Its walls consist of horizontal logs, probably three on a side and presumably supported in position by vertical posts. The floor of the entryroom tunnel runs into the center of the room and is framed at the inner end by a log at floor level on the end and two wide planks in the same position on either side. At this inner end of the tunnel are a number of large, fire-darkened rocks and a small hearth. One possible explanation for this arrangement is that the entryroom might itself have been used on occasion as a bathhouse. At the outer end of the tunnel is a single horizontal retainer. Floor in the entryroom is a dark grey layer, but in the entryroom tunnel it is distinct, hard-packed and dark. In the regular tunnel the floor is also hard-packed and dark. In fact, even on the plank-covered benches of the main chamber a certain amount of scaly black layer was found over and in between the planks. The entryroom tunnel extends out at an angle and has horizontal wall logs.

It is difficult to determine the manner in which the main chamber of the *kashgee* was roofed, but it is virtually certain that center posts

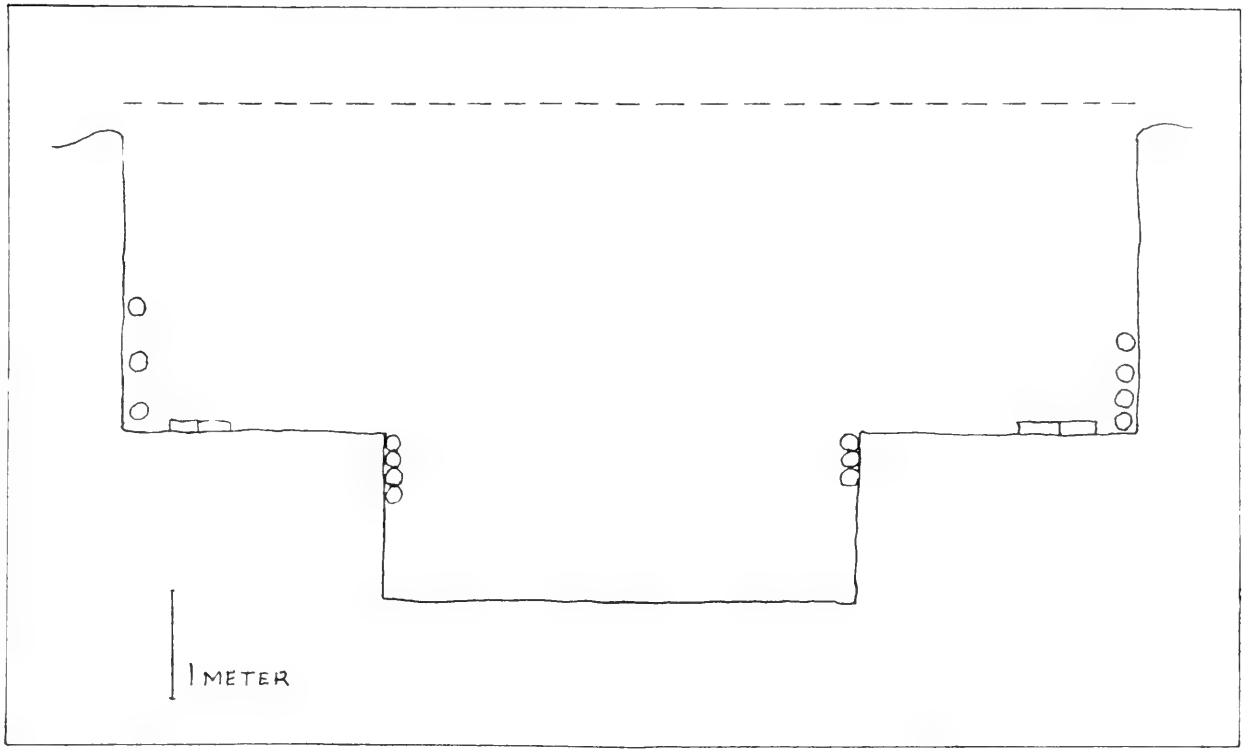

FIG. 12. Main chamber of *kashgee* in cross-section.

were not involved. Concentrations of collapsed short logs in two corners suggests cribbing, a method of roof construction for ceremonial houses that has been reported elsewhere in southwestern Alaska (Nelson, 1899, p. 250; Lantis, 1946, fig. 5). It will be recalled that cribbed wall logs occurred in three corners and this may be an indication of cribbing that extended upward as part of the roof structure. Both tunnels were apparently roofed with short, horizontally arranged split logs placed with the flat side down.

MIDDEN

A careful examination of the Akulivikchuk site at the beginning of the field season revealed a single obvious midden deposit directly in front of the *kashgee* (T-1). Prior to excavation it appeared as a rectangular, grass-covered hump. Sod was stripped from an area 8 m. wide and 9 m. long and excavation was begun in arbitrary 15 cm. levels in hopes of distinguishing significant differences in the nature of artifacts and artifact distribution at various levels. After the entire cleared area was excavated to a depth of 15 cm. below the sod level, it became clear that approximately half of it, that half closest to the *kashgee* entryroom, was not midden debris at all. People using the *kashgee* had apparently walked forward and tossed their rubbish over a small, natural bank. Therefore, actual midden material occurred only in the lower half of the cleared section and further excavations were confined to this smaller area. Here the midden was deepest in the center where excavations were extended to a depth of slightly more than 1 m., and thinned out at the sides where the sterile underlying sand was encountered at approximately 40 cm.

As expected, the midden consisted almost exclusively of bone and antler fragments along with considerable charcoal and pieces of wood. Most of this material was doubtless the by-product of baths and the various manufactures that took place in the *kashgee*. The artifact collection is not extensive and it proved impossible to distinguish significant artifact differences by level. Therefore, the small collection of midden artifacts has been considered as a single unit with materials from the structures on the site.

In conclusion it should be noted that there were apparently no residential middens at Akulivikchuk and although extensive testing was not attempted, it is most unlikely that cultural debris exceeds 60 cm. in depth anywhere on the site except in front of the *kashgee*. Even here, where the accumulation was clearly visible before excavation, the extent of the deposit is modest indeed. It seems likely,

as we have noted, that the residents of the village threw most of their debris either over the riverbank or into the ravine where it was eventually washed into the river. What little did accumulate around the houses would perhaps have been dispersed by dogs and by the people themselves. The total span of occupation at Akulivikchuk was not sufficient for the accumulation of any significant amount of midden debris around the houses. This has also been found to be true for other nineteenth century village sites in southwestern Alaska (Oswalt and VanStone, 1967, pp. 23–24; VanStone, 1968b, p. 260). The *kashgee* would be an exception because of its use as a workshop by the men of the village.

Collections

In this chapter the artifacts recovered from the Akulivikchuk site will be described under two headings: locally manufactured goods and imported manufactured goods. Within these two broad categories, further subdivisions will be made on the basis of the material from which the various artifacts were made. Although no exhaustive comparative treatment will be attempted, some comparative data derived from those published and unpublished reports dealing with sites which are closest, both spatially and temporally, to Akulivikchuk will be included with the descriptions when considered relevant. Comparative generalizations and conclusions derived from them will be reserved for a later chapter.

LOCALLY MANUFACTURED GOODS

Under this heading are included those artifacts presumably manufactured at the settlement, or at nearby settlements, by Eskimos. This would also include, of course, any objects made by Eskimos and traded to the people of Akulivikchuk, although it should be stated at the outset that proof of such trade is lacking. The artifacts to be described here, then, are what we might call traditional Eskimo forms and they are made from materials readily available in the local environment such as stone, bone and antler, birch bark, etc. Both the forms and the materials were, of course, known to pre-contact Eskimos of the Nushagak River region and therefore we can say that the artifacts about to be described represent a continuity of material culture stretching back into the prehistoric period. But there are two other categories of artifacts to be dealt with here. The first includes forms made locally from exotic materials introduced into the area by Europeans and may be characterized as an attempt to perpetuate traditional forms in new materials. The second represents forms that were direct products of the contact situation but have been manufactured from traditional, locally available materials.

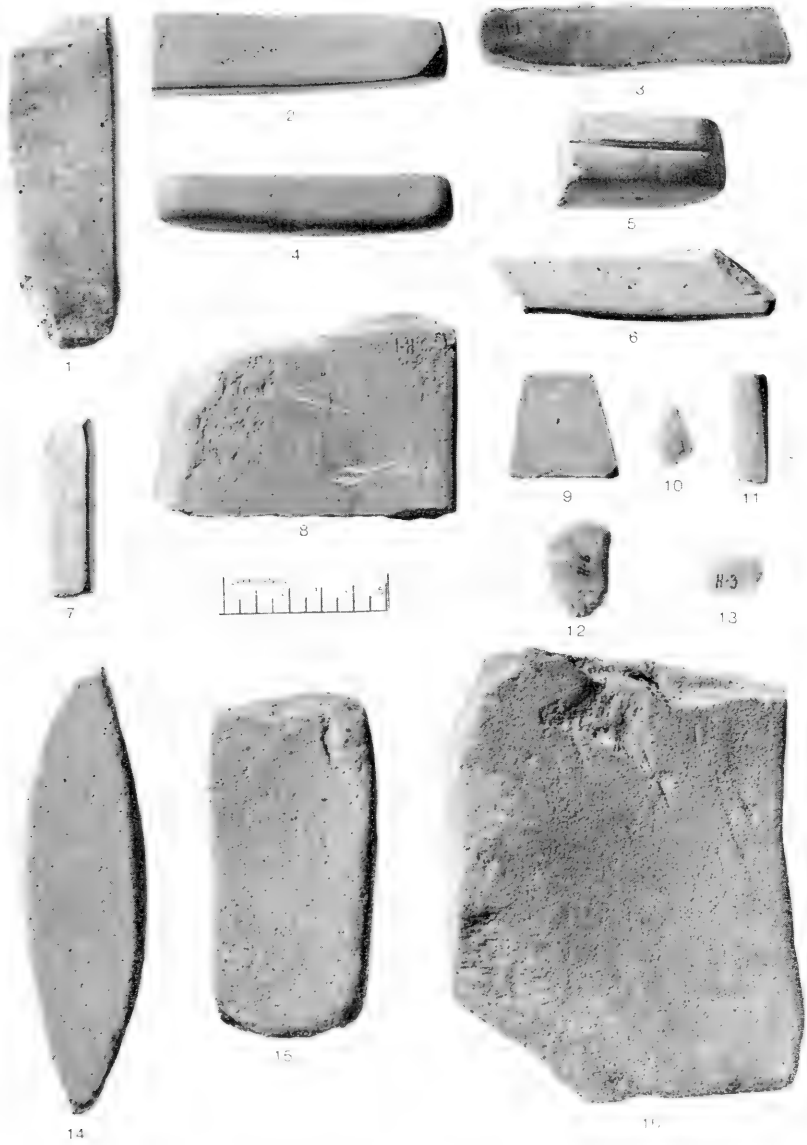

PLATE 1. Stone Artifacts. 1–9. Whetstones (pp. 42–43); 10. Projectile point (p. 42); 11. Whetstone (p. 43); 12. End scraper blade (p. 42); 13. Snub-nosed scraper (p. 42); 14–16. Whetstones (p. 43).

Chipped and Ground Stone

These two methods of working stone are considered together partly because there are virtually no true chipped stone implements in the collection, but also because many stone artifacts show that both chipping and grinding techniques were utilized in their manufacture.

Evidence for the chipping of flinty materials at Akulivikchuk is extremely limited. There is one large nodule of blue chert, approximately 7.5 cm. long and 5 cm. wide, from which a number of flakes have been removed, and eight flakes of the same material, two of which show some retouching. In addition, four flakes of opaque chalcedony were recovered. There are only three finished flint artifacts: a fragment of opaque chalcedony with a steep, carefully prepared working edge that may have been hafted as a *snub-nosed scraper* (Pl. 1, 13); a blue chert flake retouched along one edge, perhaps as a hafted *end scraper blade* (Pl. 1, 12), and the tip of a small *projectile point* of blue chert (Pl. 1, 10). Although chipped flint artifacts are characteristically early in Alaska, they are also widely distributed in late sites including two nineteenth century Eskimo settlements in southwestern Alaska (Oswalt and VanStone, 1967, pp. 26–27, pl. 1, e–f, h–i; VanStone, 1968b, pl. 1, 1–7). There seems little reason to doubt, therefore, that the small number of flint artifacts and chips from Akulivikchuk are indigenous and contemporary with the rest of the collection.

A single *hammerstone* is simply a large water-worn pebble of basaltic material which has had a number of rough flakes removed through use. It is 15 cm. long and 8 cm. wide near the distal end.

There are 40 *whetstones* in the Akulivikchuk collection and for descriptive purposes these have been divided into three types based on the nature of the stone from which they are made. Those specimens belonging to type 1, of which there are two, are made of very fine-grained filite (Pl. 1, 4). Both are rectangular, water-worn pebbles that have simply been picked up and used as whetstones and they show wear on one surface only. The smallest of the two implements is illustrated; the larger is of a similar shape and is 15 cm. long.

The seven whetstones of type 2 have been shaped of very fine-grained siltstone (Pl. 1, 2–3). Three specimens show wear on all surfaces and tend to be worked to a rectangular form. The illustrated specimens are typical in size, although one broken whetstone of this

type was obviously much larger, the fragment measuring 14 cm. in length and 4.5 cm. in width.

By far the majority of whetstones, 31 in number, belong to type 3. They are made of fine- to medium-grained sandstone and a variety of sizes and shapes is represented. The very fine-grained specimens, of which there are 14, tend to be small, light colored and show wear on all surfaces. Of these, all are fragmentary and the illustrated specimens (Pl. 1, 1, 5–7, 11) show the range of shapes and sizes. The fine- to medium-grained sandstone specimens belonging to type 3 show a much greater variety of size and shape. All but two are fragmentary and as a group they tend to be broad, flat and worked on two or more surfaces. The range in length of these fragments is from 4 to 17 cm. and in width from 2 to 10 cm. The illustrated specimens are typical and include the two complete whetstones of this type (Pl. 1, 8–9, 14–16; Pl. 2, 12). Three specimens belonging to type 3 have narrow V-shaped grooves in them which indicate cutting with a stone saw (Pl. 1, 5). Although no such saws have been identified in the collection, it is likely that this implement was used for the initial shaping of some whetstones and doubtless for many other stone working purposes as well. A single type 3 whetstone (Pl. 1, 16) has reddish colored marks on one side indicating that it was used as a surface on which to grind red ochre.

All the whetstones described were held in the hand and presumably used for shaping and sharpening small stone, bone and metal objects. In addition to these artifacts, the collection also includes 11 large, flat *grinding slabs* of medium-grained sandstone which have been roughly shaped in a rectangular form and show wear on one surface only. The largest of these is 33 cm. in length and 14 cm. wide at its widest point. Most specimens, however, are approximately 20 by 15 cm. It is probable that some of these flat slabs were used for the grinding, polishing and sharpening of large adz and knife blades. Informants indicated, however, that the more fine-grained specimens were simply stones which women used to sharpen their ulus when splitting fish. Such stones are used in a similar manner in the Nushagak River villages today, the women whetting their knives occasionally as they work.

Ten fragmentary slate *end blades* all exhibit finely ground surfaces and bilateral cutting edges. Of this number, four large tip fragments represent more than half of the complete blades and are characterized by a hollow-ground groove running parallel to the en-

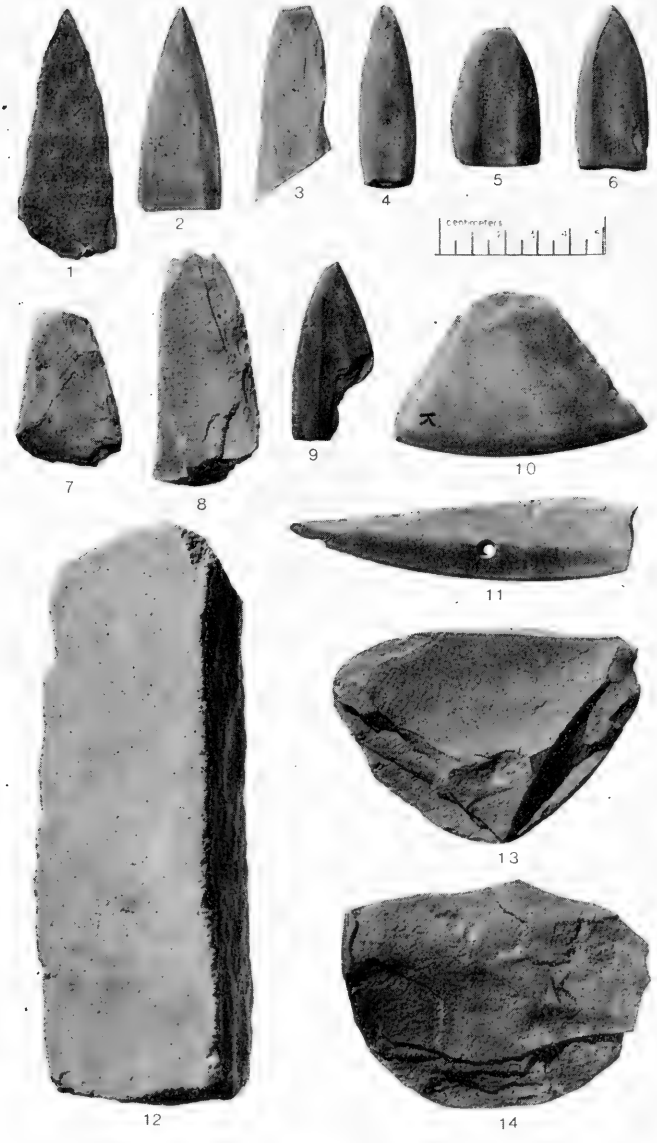

PLATE 2. Stone Artifacts. 1. End blade blank (p. 45); 2. End blade (p. 45); 3. End blade blank (p. 45); 4–6. End blades (p. 45); 7–8. End blade blanks (p. 45); 9. End blade (p. 45); 10–11. Ulu blades (p. 45); 12. Whetstone (p. 43); 13–14. Ulu blade blanks (p. 45).

tire length of the blade (Pl. 2, 2, 5–6, 9). Of the remaining six fragments, four show the hollow-ground groove. In addition, there is a single blade that appears to be complete except for final polishing (Pl. 2, 4). It has a flat base where primary chipping is visible and the hollow-ground grooving, presumably the final step in the manufacturing process, had just begun. This specimen, as well as all the fragments just described, are of a size to suggest their use as arrow or lance blades.

The 15 slate *end blade blanks* vary in length from 3 to 7.5 cm.; some are probably fragmentary but it seems certain that all would have been finished as arrow points (Pl. 2, 1, 3, 7–8). The nature of the workmanship exhibited by these blanks suggests that a piece of slate was chipped to roughly the desired size and shape, and then finished by grinding first the flat surfaces and then the working edges and base.

Ground slate end blades with hollow-ground grooves are reported from a number of sites in southwestern Alaska including Tikchik (VanStone, 1968b, pp. 267–268, 270), Crow Village (Oswalt and VanStone, 1967, p. 29, pl. 2, g–h), Togiak at the mouth of the river of that name (Kowta, nd.) and along the Yukon River (deLaguna, 1947, p. 151, pl. XXVI, 36–41). This form is probably related to blades with a very thin and sharply cut triangular mid-section such as have been found at the Pavik (Paugvik) site at the mouth of the Naknek River (Larsen, 1950, p. 178, fig. 55, A 14, 15) and on Kodiak Island (Clark, 1966, fig. 9, p). Another related form which is triangular and hollow-ground occurs at the Uyak site on Kodiak Island (Heizer, 1956, pl. 46, n).

None of the eight slate *ulu blade* fragments in the collection is complete enough to suggest the shape of the entire blade or to indicate the manner of hafting. All have convex cutting edges, there being some degree of variability in this convexity. The two largest fragments are illustrated (Pl. 2, 10–11), one of which has a beveled cutting edge and a drilled hole, possibly as an aid to hafting. The five slate *ulu blade blanks* are all complete or nearly so. They are roughly flaked and the final form of the blade is clearly suggested. In addition to being finished with a convex cutting edge, it is likely that none of these blades would have been tanged, but would rather have had flat or convex proximal surfaces for insertion into the handle (Pl. 2, 13–14).

By far the largest category of stone implements is that of *scraper or planing adz blades* of which there are 53. For convenience of description, these have been divided into four types on the basis of the nature of the stone from which they were made. The largest number of complete and fragmentary specimens belong to type 1 and are made of medium- to fine-grained sandstone. Of the 34, 16 are complete or nearly so, and 18 fragmentary. The type 1 blades are crudely fashioned except for the working edges which are finely ground and V-shaped in cross-section; 12 are slightly concave on one surface. Of the complete or nearly complete specimens, all but two taper toward the proximal end for insertion into an antler or wooden handle (Pl. 3, 1–3, 5–7, 9–10, 13–14); the other two have straight sides (Pl. 3, 11, 12). Nine of the fragmentary blades also show this taper while the remainder are not complete enough to indicate their shape. Complete blades of type 1 vary in length from 5 to 13 cm., while the fragments are from 3 to 8 cm. long.

Scraper or planing adz blades belonging to type 2 are, for the most part, similar in form to those just described but they are made from a slightly metamorphosed sedimentary rock like a schist that has a pronounced metallic sheen and a tendency to exfoliate in horizontal layers. There are 13 specimens of this type, nine of which are complete or nearly so. All are roughly worked except for the cutting or scraping edge and taper toward the proximal end (Pl. 3, 4, 8). Three of the fragmentary blades also show this taper. All the type 2 blades have working edges that are roughly V-shaped in cross-section, five being slightly convex on one side. A single specimen has a pronounced beveled edge on both sides. The complete blades range in length from 6.5 to 11 cm.

The four blades belonging to type 3 are all complete and made from a very fine-grained siltstone (Pl. 4, 1, 3–4, 8). They are somewhat more carefully finished than those of types 1 and 2 and all have V-shaped working edges. Three specimens taper toward the proximal end and one of these is much flatter than the others (Pl. 4, 4). The fourth blade is unique in the collection being carefully worked and polished over its entire surface and with a working edge at each end (Pl. 4, 8). Such a blade might have been hafted without an antler head so that either working end could be used, or the two working edges could have been used successively, the blade being turned in the head as necessity required.

Type 4 blades, two in number, are of basalt and taper toward the proximal end. One specimen shows a minimum of workmanship and

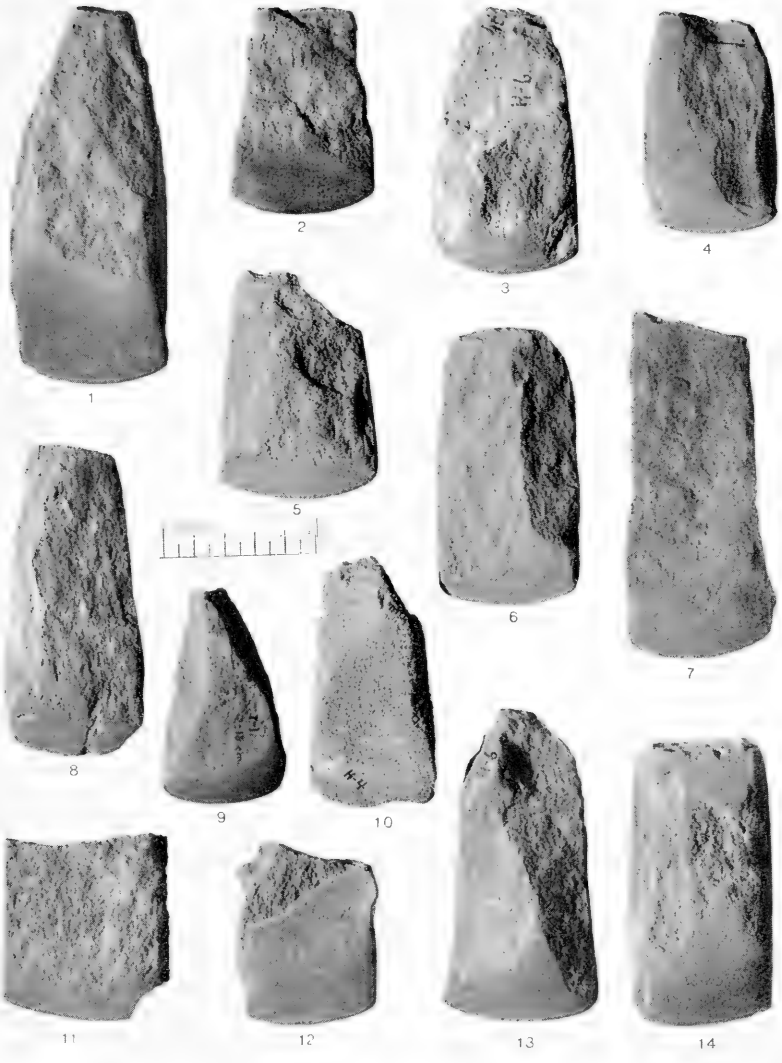

PLATE 3. Stone Artifacts. 1–14. Scraper or planing adz blades (p. 46).

is essentially just a basaltic chip with a thin, ground, V-shaped working edge (Pl. 4, 9). The other is a fragment that appears to have been only roughly worked over most of its surface. It has a polished and steeply beveled, V-shaped working edge (Pl. 4, 5). This blade is convex along one side and flat on the other except where the bevel occurs.

Scraper or planing adz blades similar to those from Akulivikchuk have been described from a large number of archaeological sites in southwestern Alaska and are also present in ethnographic collections. In the past a number of writers, myself included, have attempted to differentiate between skin scraping blades and planing adz blades on the basis of the material from which they were made. Those made of a hard material could be either scraper or adz blades, but adz blades were never made of soft stone (deLaguna, 1947, p. 186; Oswalt, 1952, pp. 57–58, 61; VanStone, 1968b, pp. 270–271). While there is doubtless some validity to this distinction, it has been decided in the present context not to distinguish between the two forms on this basis, particularly since it is virtually impossible to draw a dividing line between "hard" and "soft" stone. Any attempt to do so would be meaningless. Apart from any distinction based on material, it would seem that the majority of the blades described above were used in small adzes as wood working tools. Of the total of 53 specimens, 30 were found either in the *kashgee* or in the midden (T-1) directly in front of it. Wood working adzes would have been used by men, most likely in the *kashgee*, while a skin scraper was a woman's tool. Those blades most likely to have been used as scraper blades may be the beveled specimens and possibly those that are broad and flat.

The *scraper or planing adz blade blanks* in the collection can be described on the basis of the same four types as the complete specimens. Of the 17 blanks belonging to type 1, all but two are complete enough to show that the completed implement would have tapered toward the proximal end. Most of the blanks have been worked sufficiently so that little remained to be done except grind and polish the working edges. A variety of sizes is illustrated (Pl. 4, 2, 7, 11, 13). A single specimen was apparently used secondarily as a grinding slab for some bluish substance, traces of which can be seen on the surface near the distal end (Pl. 4, 11). Three of the five type 2 blanks are unbroken and do not differ substantially in shape from type 1 (Pl. 4, 10). The two type 3 specimens appear to be finished except for grinding the distal ends (Pl. 4, 6, 12), while the single type 4 basalt blank

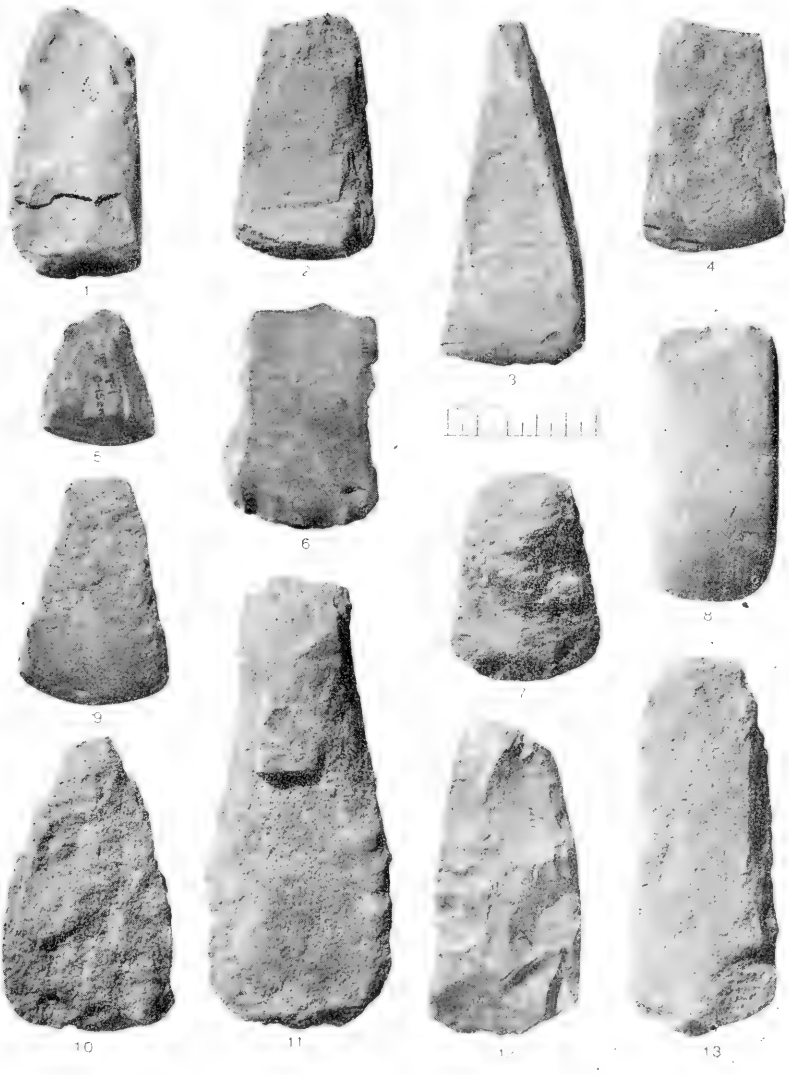

PLATE 4. Stone Artifacts. 1. Scraper or planing adz blade (p. 46); 2. Scraper or planing adz blade blank (p. 48); 3–5. Scraper or planing adz blades (pp. 46–48); 6–7. Scraper or planing adz blade blanks (p. 48); 8–9. Scraper or planing adz blades (pp. 46, 48); 10–13. Scraper or planing adz blade blanks (p. 48).

is little more than a roughly-flaked nodule, the identification of which should be considered tentative (Pl. 5, 6). It will be noted from the trait list that the majority of the blanks, like the complete blades, were recovered from the *kashgee* or its midden.

The *double-grooved splitting adz head* is represented in the Akulivikchuk collection by three fragments and one unfinished specimen, all made from basalt. Two of the fragments are large and appear to have had their distal ends broken through use. Both are relatively unworked except where the lashing grooves have been pecked out in such a manner as to leave a pronounced unworked ridge between them. One specimen has a rather large flake removed from the proximal end suggesting that a blow was struck at this point (Pl. 5, 7). The third fragment is very small and can be identified as part of a splitting adz only because part of one groove is visible. The unfinished specimen would apparently have been worked over most of its surface. Shallow grooves are visible and the working edge has been roughly shaped (Pl. 5, 9). The double-grooved splitting adz has a fairly wide distribution in late sites in southwestern Alaska, being found at Crow Village (Oswalt and VanStone, 1967, p. 29, pl. 2, k), Nanvak Bay (Ackerman, 1964, p. 32, fig. 15, 2), Kachemak Bay (deLaguna, 1934, pp. 56–57, pl. 18, 2), along the Yukon River (de Laguna, 1947, pp. 121, 150, pl. X, pl. XXV, 22, 25; Nelson, 1899, pl. XXXIX, 3), Prince William Sound (deLaguna, 1956, pp. 110–117, pls. 10–11), and on Kodiak Island (Heizer, 1956, p. 44, fig. 26).

A curious object similar in size to the splitting adz heads and also of basalt is what appears to be a form of *wedge* (Pl. 5, 8). The implement has been worked rather carefully on one side in such a manner that it tapers to a wedge-shaped tip at the distal end. The opposite end is completely unworked.

Another unusual and fairly abundant category of artifacts in the collection has been identified as *paint mortars or palletes*, or possibly *pigment or tobacco grinders*. Actually, most of these are not artifacts at all in the accepted sense, but rather natural forms that were used, or were collected for the purpose of being used, for the above-mentioned purposes. Three of these are large, irregularly shaped boulders of fine-grained sedimentary rock from which large flakes or spalls have been removed, probably as a result of frost action or heat, to leave depressions or flattened areas. On two specimens this flattened area is darkened from use and a third clearly shows the remains of red ochre (Pl. 6, 5). The two larger specimens, not illustrated, measure 20 by 24 cm. and 20 by 10 cm., respectively.

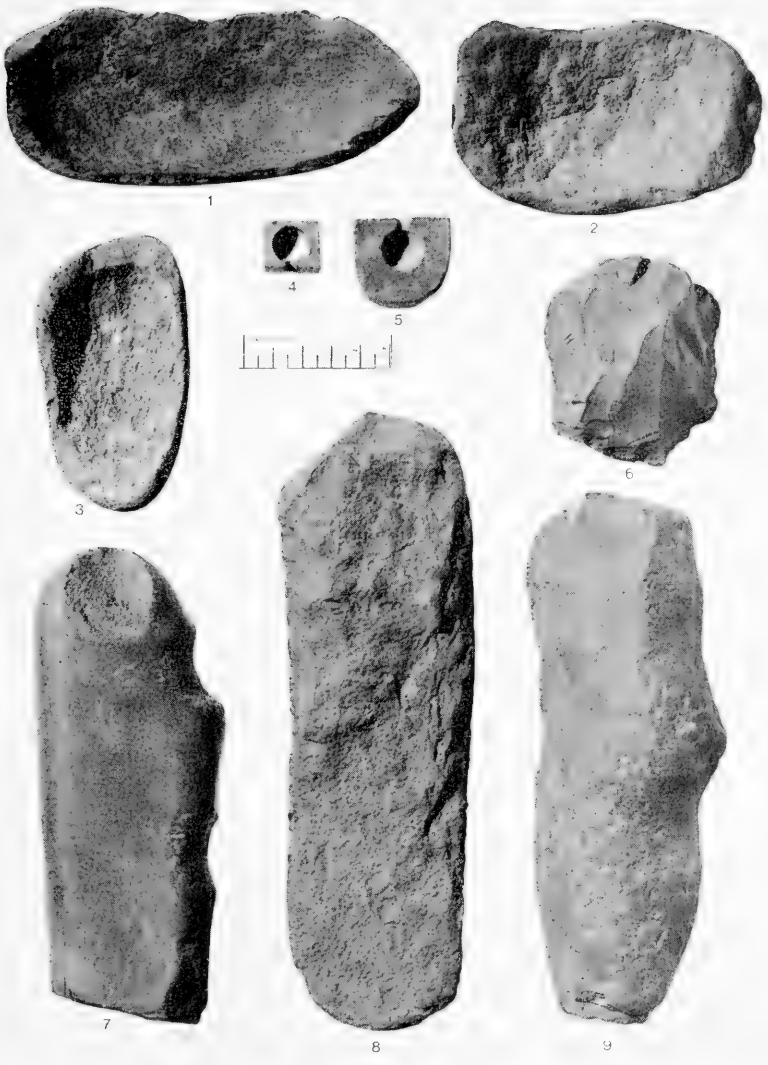

PLATE 5. Stone Artifacts. 1–3. Mortars, grinders or palletes (p. 52); 4–5. Bullet molds (p. 56); 6. Scraper or planing adz blade blank (p. 50); 7. Splitting adz head (p. 50); 8. Wedge (?) (p. 50); 9. Splitting adz head (p. 50).

The above-mentioned spalls have also been utilized for similar purposes. Most of these are probably the result of fire action and are perhaps from rocks that formed house fireplaces. Often these spalls are extremely deep with steep sides and make excellent containers. There are eight objects of this type, most made of sedimentary material but at least one of igneous rock. The three illustrated specimens are typical, one showing a considerable deposit of red ochre (Pl. 5, 1–3). These specimens range in length from 4.5 to 14 cm.

Four of these mortars or grinders are small pieces of sedimentary conglomerate out of which an inclusion has weathered. None show indications of use, but all were almost certainly collected with the idea of use in mind (Pl. 6, 3). Two small sandstone pebbles with recessed surfaces (Pl. 6, 6) and another fragment of fine-grained sandstone with circular recessed surface are also included in this group. The latter shows a thick deposit of red ochre (Pl. 6, 2).

The only specimens in this category which appear to have been worked by man are a small, rectangular pebble with a circular depression ground into one surface (Pl. 6, 4), a much larger, irregularly shaped metamorphic boulder with a large, deeply ground cavity to the sides of which adhere particles of an unknown substance (Pl. 6, 7) and a more carefully worked oblong slab with a ground flat surface and traces of red ochre (Pl. 6, 1).

In addition to being used as paint palletes or pigment grinders for red ochre and similar substances, it is possible that objects similar to these might also be used for grinding birch fungus for adding to tobacco. Eskimos in the area today frequently mix their tobacco in this manner. Similar grinders or mortars occur in other sites in southwestern Alaska, notably on the Yukon (deLaguna, 1947, p. 221, pl. XXI, 2, 4), at Crow Village (Oswalt and VanStone, 1967, p. 20), Tikchik (VanStone, 1968b, p. 271, pl. 3, 2), and in Prince William Sound (deLaguna, 1956, pp. 141–143, pls. 22, 3; 23, 6). Specimens from other sites probably have been described as lamps.

A flat, roughly worked, oval object of a coarse-grained metamorphic rock has been tentatively identified as a *platter*, although it may also have served as a grinder. It is slightly discolored on one surface but otherwise shows no signs of use. The specimen is 25 cm. long and 18 cm. wide.

Two *stone lamps* were recovered, one of which is complete and the other a large fragment representing about three-quarters of an entire lamp. The complete specimen, made of medium-grained sand-

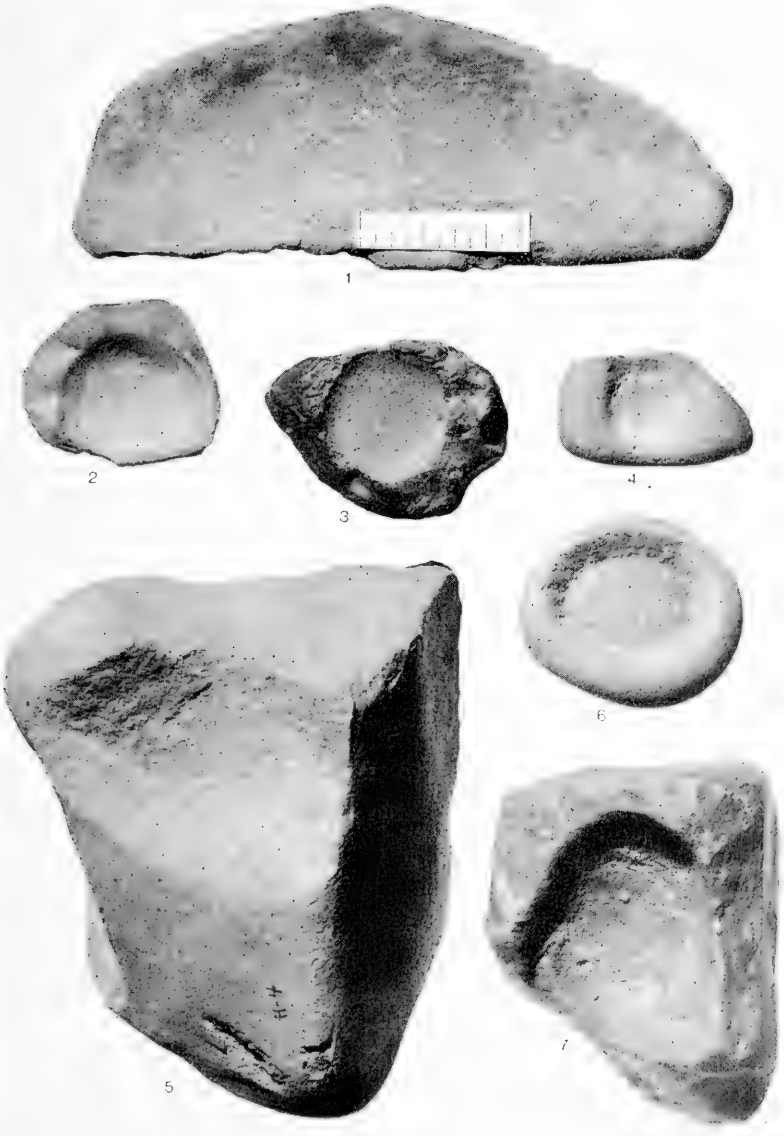

PLATE 6. Stone Artifacts. 1–7. Mortars, grinders or palletes (pp. 50, 52).

stone, is characterized by a wide and flat rim, a relatively shallow bowl, evenly rounded exterior and wide, concentric wick channel cut out of the flat rim (Pl. 7, 2). This type of lamp, as pointed out by Hough (1898, p. 1054, pl. 20) is typical of Kodiak Island. Heizer also notes that Hrdlička collected two lamps of this type from living Koniag and the form occurs exclusively in the upper level of the Uyak site (Heizer, 1956, p. 33, pl. 26, c). Similar lamps are illustrated by deLaguna (1934, pl. 24, 1; 1956, pl. 24, 4) from Kachemak Bay and Prince William Sound; a fragment of a lamp of this type occurs in the collection from Crow Village (Oswalt and VanStone, 1967, pp. 30–31, pl. 2, o).

The fragmentary lamp is a large, ovoid specimen characterized by a narrow, beveled rim, broad, flat bottom, and a longitudinal groove in the center of the bowl (Pl. 7, 1). The three fragments of this lamp were found in two different houses but in the trait list the specimen is recorded as coming from house 4. This Akulivikchuk specimen somewhat resembles the Type IB2 form from the Uyak site where it occurs in the lower level (Heizer, 1956, pp. 34–35) and lamps with longitudinal grooves also occur in Kachemak Bay where deLaguna (1934, p. 65) has noted that its purpose was probably to direct the flow of oil to the wick.

Since pottery lamps were well established throughout the Nushagak and Kuskokwim river regions in the late prehistoric and early historic periods, the finding of stone specimens at Crow Village was explained by suggesting that they were not indigenous to the site, but had been traded into the area, perhaps from Kodiak Island or other stone lamp areas to the south (Oswalt and VanStone, 1967, p. 31). Since the Crow Village report was written, however, oval stone lamps with flat rims have also been found at Kolmakovski Redoubt (Oswalt, personal communication), at Tikchik (VanStone, 1968b, p. 272, pl. 3, 1), and at the mouth of the Togiak River (Kowta, nd). In addition, the author has recently discovered that Gordon (1906, pl. 26, fig. 6) refers to lamps similar to the complete specimen described above as being in use as far north as Norton Sound at the beginning of the twentieth century. Also recently noted is the fact that Zagoskin (1967, p. 223) refers to the use of stone lamps by the peoples of interior southwestern Alaska at the time of his explorations in 1842–1844. It would seem, therefore, that stone lamps probably spread north into the pottery lamp area in the late prehistoric period from their center in the Kachemak Bay–Kodiak Island region. The author knows of no stone lamps reported

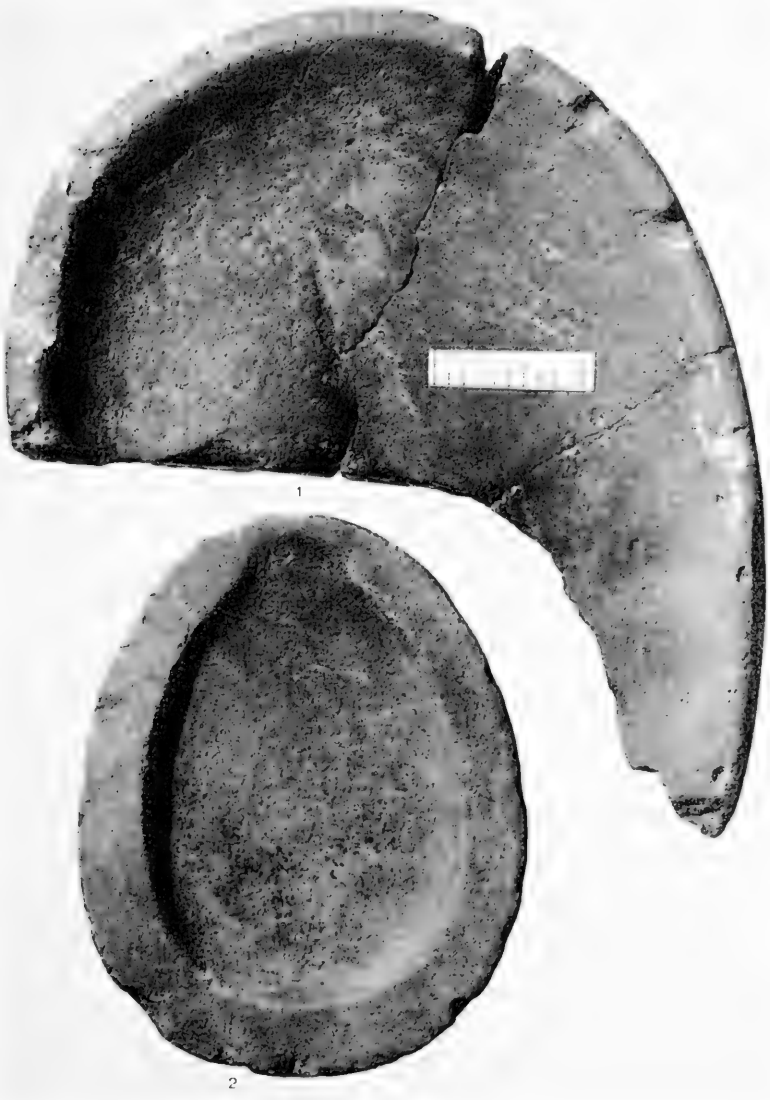

PLATE 7. Stone Artifacts. 1. Stone lamp fragment (p. 54); 2. Stone lamp (p. 54).

from the Kuskokwim–Nushagak area that do not resemble types illustrated either by Heizer (1956) or deLaguna (1934, 1956).

The collection also contains three halves of *bullet molds* made from medium- to fine-grained sandstone. These bullet mold sections each consist of a prepared flat surface into which has been ground a circular depression. One specimen is very fragmentary but the other two are complete and their depressions are 1.4 cm. and 1.6 cm. in diameter, respectively. At one end of the depressions are grooves which, when the identical other halves of the molds were fitted to these, would permit the lead to be poured in (Pl. 5, 4–5). The two halves of each of these molds would, of course, be lashed together before molten lead was poured and then after the metal had hardened, the halves could be separated and the completed balls removed. The point where the two halves of the mold joined would leave a raised burr around the circumference of the lead balls and these burrs are actually visible, to a greater or lesser degree, on lead balls recovered from the site. It is possible that these stone molds were originally fitted into wooden or antler handles resembling those in ethnographic collections (see particularly Nelson, 1899, pl. LXIII, 8). Locally made bullet molds similar to these stone specimens from Akulivikchuk are likely to be found in increasing numbers in southwestern Alaska and elsewhere as more sites belonging to the historic period are excavated. They have already been recovered from Crow Village (Oswalt and VanStone, 1967, p. 31, pl. 2, n) and the Tanaina Indian settlement of Kijik on Lake Clark (VanStone and Townsend, 1970, p. 62, pl. 11, 2).

Bone and Antler

Artifacts of bone and antler are common in the Akulivikchuk collection, there being 145 identifiable implements made from these materials along with two unidentified objects and a large number of worked fragments.

Of the 14 complete and fragmentary *net weights*, 13 are made of antler and one of bone. All are roughly rectangular in outline with laterally drilled holes at each end for attachment to the net. With one exception, the antler weights are made from split sections of the material (Pl. 8, 15). The single exception is more carefully shaped than the others, having a rounded, triangular form in cross-section, narrow at the top and thick at the bottom (Pl. 8, 14). An unfinished specimen appears to be complete except that the line holes have not been drilled. The complete antler weights range in length from

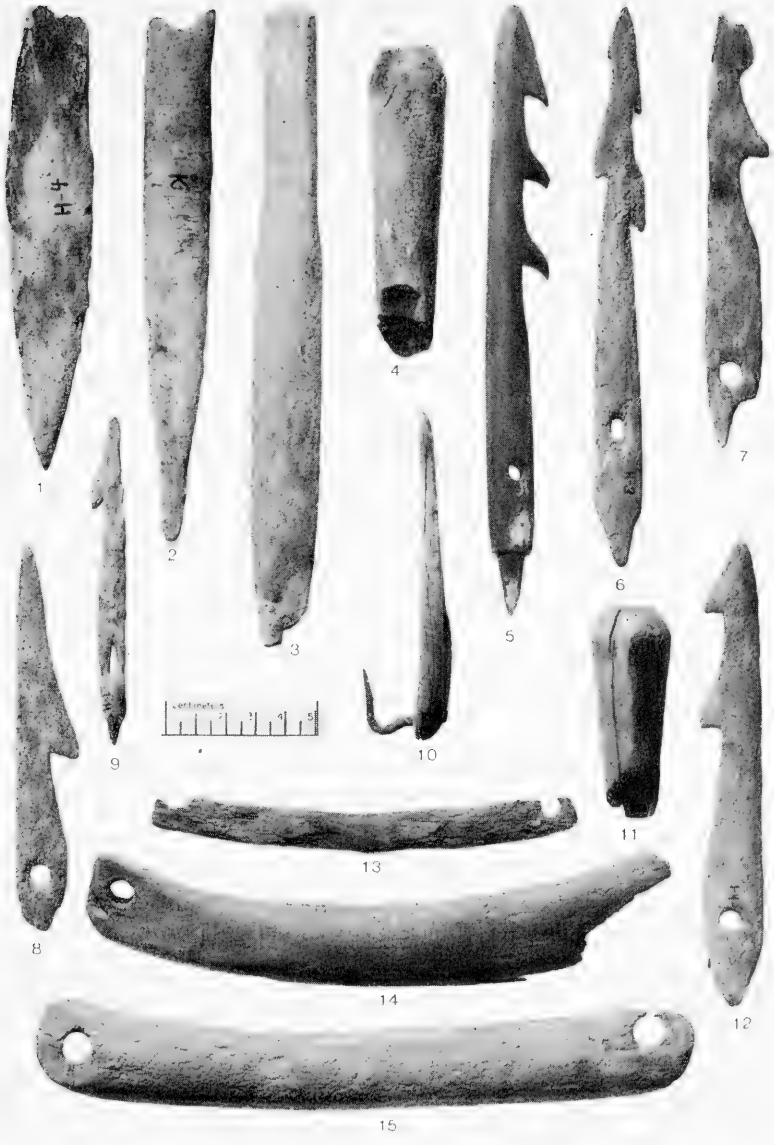

PLATE 8. Bone and Antler Artifacts. 1–3. Fishing ice picks (p. 58); 4. Salmon harpoon socket piece (p. 58); 5–9. Salmon harpoon dart heads (p. 58); 10. Lure-hook (p. 58); 11. Salmon harpoon socket piece (p. 58); 12. Salmon harpoon dart head (p. 58); 13–15. Net weights (pp. 56, 58).

14.5 to 23 cm. The bone specimen has been fashioned from a section of moose or caribou rib. The line holes are broken out (Pl. 8, 13).

The single *lure-hook* is complete and consists of an antler shank in a stylized fish shape with a bent nail in the distal end as a barb. The proximal end has a small, drilled suspension hole that runs parallel to the barb (Pl. 8, 10).

Three bone *salmon harpoon socket pieces* (Pl. 8, 4, 11) are all broken at the proximal end but a socketed tang is suggested for one specimen (Pl. 8, 11). Each is drilled at the distal end to receive the dart head and two had small wooden insets in this hole which presumably served to wedge the tang of the dart head in place.

Six pointed sections of antler are identified as *fishing ice picks*, although this identification should be considered tentative for at least some of these specimens. Five are simple split sections of antler worked to a point at one end (Pl. 8, 1, 2). One is scored along the outer surface near the proximal end, presumably as an aid to hafting to a wooden shaft (Pl. 8, 2). The sixth is more carefully shaped, being worked to a roughly rectangular shape at the proximal end (Pl. 8, 3). It may have been intended for use as a knife.

The 15 antler *salmon harpoon dart heads* have been divided into three types on the basis of the shape of the line hole and the positioning of the barbs. Nine specimens belong to type 1 and are characterized by a round, centrally located line hole and asymmetrically placed barbs ranging in number from one to three. Three have sharp shoulders and plain conical tangs (Pl. 8, 5), while the others have sloping shoulders and wedge-shaped tangs (Pl. 8, 8, 12). On one of these the tang is irregularly shaped and forms a pointed spur (Pl. 8, 7). The five type 2 dart heads also are asymmetrically barbed with the number of barbs ranging from one to three, but they have rectangular, centrally located line holes. Two specimens have sharp shoulders and plain, conical tangs (Pl. 8, 9). One of these has a deeply incised line running upward toward the tip from the line hole. A very fragmentary specimen has a sloping shoulder and plain, conical tang, while another fragment is shoulderless. A third fragment is broken at the proximal end. There is only one specimen in type 3. It has two barbs on each side near the tip, rounded, oblong line hole, and a sloping shoulder with conical tang (Pl. 8, 6).

Two badly weathered antler objects are tentatively identified as *side prongs for fish spears*. One is a simple leister prong, asymmetrically barbed with a pointed tang. The other, probably unfinished as it is barbless, has an irregularly shaped tang designed to fit into a

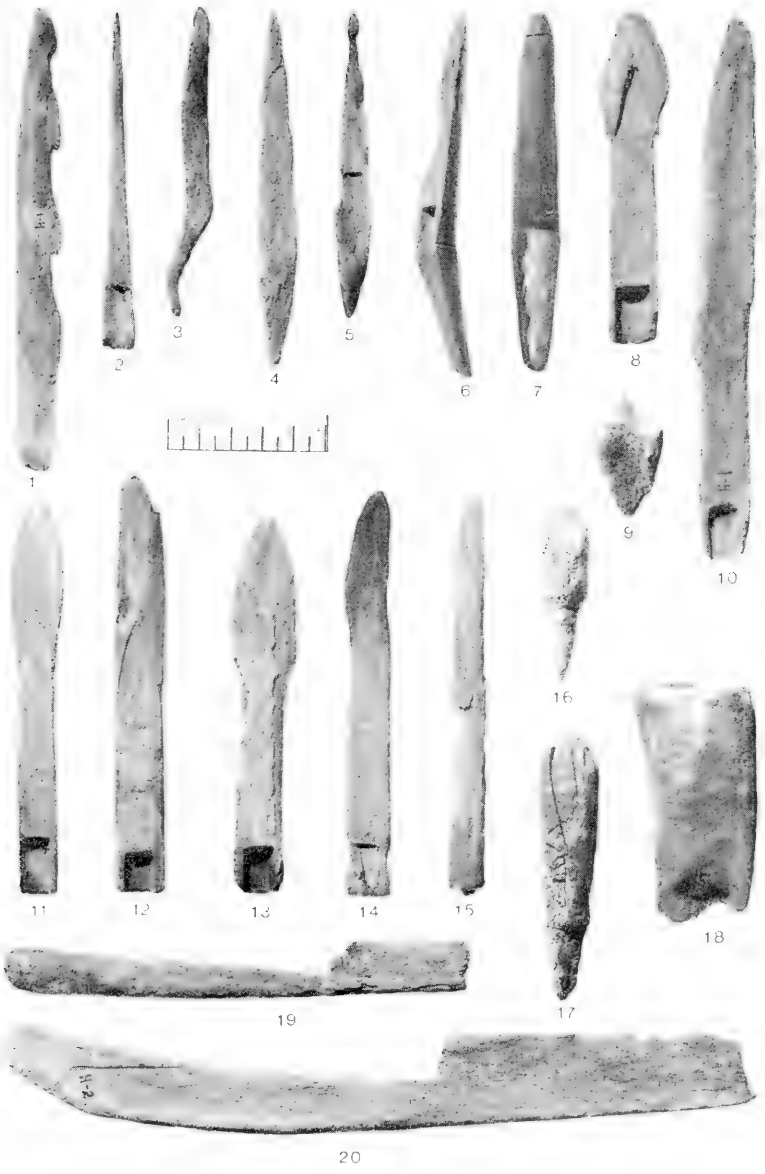

PLATE 9. Bone and Antler Artifacts. 1. Fish spear point (p. 60); 2. Center prong for fish spear (p. 60); 3. Side prong for fish spear (p. 58); 4. Center prong for fish spear (p. 60); 5–7. Composite harpoon heads (pp. 60–61); 8. Unbarbed, socketed projectile point (p. 61); 9. Blunt arrowhead (p. 62); 10–14. Unbarbed, socketed projectile points (p. 61); 15. Arrowhead (p. 61); 16–17. Blunt arrowheads (p. 62); 18. Splitting wedge (p. 62); 19–20. Mesh gauges (p. 61).

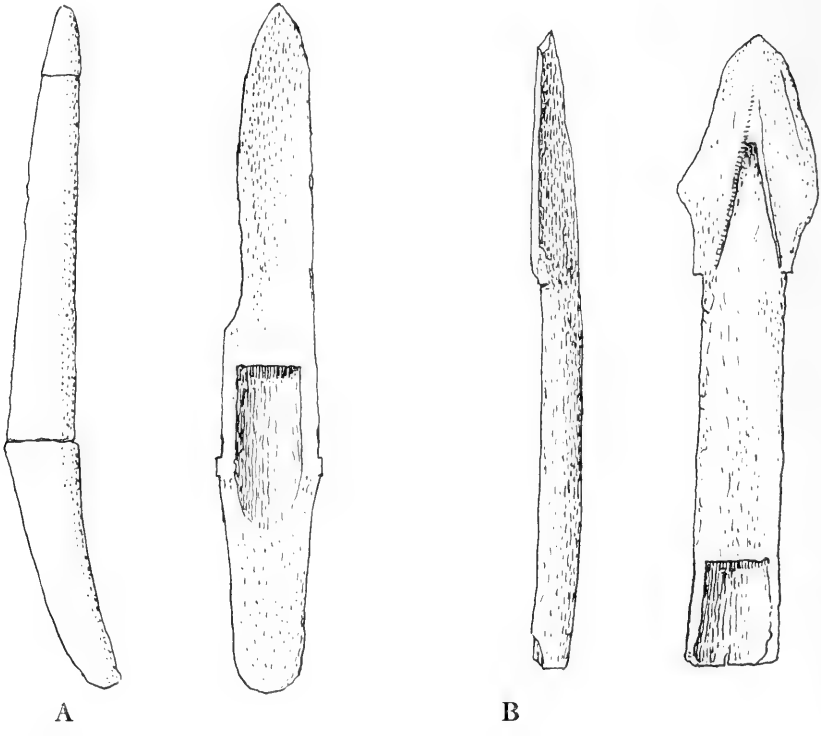

FIG. 13. a. Composite harpoon head. b. Unbarbed, socketed projectile point.

slot near the proximal end of a wooden shaft (Pl. 9, 3). Two barbless prongs of antler may be *center prongs* for the two- or three-pronged fish spear. One is shoulderless and slopes to a pointed proximal end (Pl. 9, 4). The other is more rounded and has a slot at the proximal end to facilitate hafting (Pl. 9, 2). The identification of this latter specimen should be considered particularly tentative. A *fish spear point* of antler has three barbs along one side and is tangless (Pl. 9, 1); the specimen may be broken at the proximal end. A similar point was recovered from the Tikchik site (VanStone, 1968b, p. 275, pl. 4, 13). Both would presumably have been hafted to a long shaft; a spear of this type is illustrated by Nelson (1899, Pl. LXVII, 4).

What have been referred to in the archaeological literature as *composite harpoon heads* are represented in the Akulivikchuk collection by four finished and two unfinished halves. The term appears

first to have been used by Drucker (1943, p. 39, fig. 4) who found these two-piece spurred points along the northern Northwest Coast. Heizer (1956, p. 64, fig. 40) also reports such points as occurring in the lower levels of the Uyak site. The complete halves have short sockets and broad lashing grooves that encompass virtually the entire head except for the spur and the tip (Pl. 9, 6–7; fig. 13a). It seems likely that these heads were used with a very thin, narrow metal blade inserted between the halves, or perhaps with no blade at all. On the Northwest Coast and Kodiak Island, these harpoon heads were associated with sea mammal hunting and it may be that the implement was used by the residents of Akulivikchuk for a similar purpose during their trips to Nushagak Bay. The larger specimens do not seem to be adapted for fishing, but there is a small one that might have been so used (Pl. 9, 5). This form has not hitherto been reported from sites in southwestern Alaska.

Except for the previously described net weights, the only objects in the collection associated with netting are two complete and one fragmentary *mesh gauges* of antler. The two complete specimens have gauging distances of 9.3 cm. and 4.4 cm., respectively (Pl. 9, 19–20). It is likely that the larger gauge was used in the manufacture of gill nets for salmon fishing, while the smaller may have been used in making seins or dip nets.

There are four antler artifacts which have been identified as *arrowheads* but unfortunately they are all so fragmentary and poorly preserved that it is difficult to note their characteristics. One fragment seems to have had a single barb, sharp shoulder and conical tang (Pl. 9, 15), while another apparently had a number of small barbs along one side, a sloping shoulder, and conical tang. The remaining specimens are so fragmentary that nothing definite can be said about them and their identification as arrowhead fragments should be considered very tentative.

A very distinctive form is an *unbarbed, socketed projectile point* which has been described by Heizer (1956, pp. 64–65, figs.41–42) as typical of Kodiak Island and considered by him to be a local specialization. There are six of these, all of antler, in the Akulivikchuk collection and they can be divided into two types. Three belong to type 1 and are characterized by a simple sharpened tip and a square-cut base with a short, wide, open socket (Pl. 9, 10, 13–14). The type 2 projectile points are in every way similar to type 1 except that they have a recessed lashing slot along one side (Pl. 9, 8, 11–12, fig. 13b).

A socketed projectile point similar to these was discovered at the Tikchik site (VanStone, 1968b, p. 275, pl. 4, 12) where it was erroneously identified as a fish spear point. Aside from this lone occurrence, the form has not previously been reported from anywhere in Alaska except Kodiak Island.

Like the arrowheads described above, the five antler artifacts that have been identified as *blunt arrowheads* are also unfinished and poorly preserved. Two specimens have sharp shoulders and relatively conical tangs (Pl. 9, 16–17), while a third is faceted and broken at the proximal end (Pl. 9, 9). Of the remaining two, both very fragmentary, one appears to be wedge-shaped at the distal end with a shouldered, conical tang, while the other is shoulderless and slopes to a blunted point at the proximal end.

The 25 complete antler *splitting wedges* vary in length from 7 to 18.5 cm. and average about 12 cm. With one exception, all are sections of antler blunt at one end and tapering to a wedge-shaped tip at the other (Pl. 9, 18; Pl. 10, 11, 15). None shows signs of extensive use. The single exception is made from a piece of split antler and has apparently been used as a beaming tool as it has a concave, worn edge along one side (Pl. 10, 12). There are also five antler wedge tip fragments.

The single fragmentary *skin scraper* has been made from a caribou metatarsal cut longitudinally to form a sharp scraping edge which shows signs of use (Pl. 10, 16).

The first type of *awl*, represented by three specimens, is made from slivers of antler, blunt or irregular at one end and sharpened to a point at the other (Pl. 10, 10). The three awls of the second type are made of bone. Two specimens are fragments of caribou ribs worked to a point at one end (Pl. 10, 4), while the other is a leg bone of some small animal with a narrow, flat distal end (Pl. 10, 5).

The two *crooked knife handles* are formed from slightly curved pieces of bone. One specimen has the metal blade still in place (Pl. 10, 7). A curious feature of this handle is that the blade slit is 10.5 cm. long or 3.5 cm. longer than the blade. Perhaps the blade was pushed forward as it wore away at the distal end. The second handle, with a blade slit 7 cm. in length, also has another slit through the body of the handle parallel to and nearly directly opposite the blade slit (Pl. 10, 6). Extending from this slit toward the distal end of the implement are two engraved lines which may have been intended as decoration. The function of this second slit, which passes through the handle, is unknown.

PLATE 10. Bone and Antler Artifacts. 1. Storyknife (p. 64); 2. Pendant (p. 65); 3. Unidentified (p. 65); 4–5. Awls (p. 62); 6–7. Crooked knife handles (p. 62); 8. Engraving tool handle (p. 64); 9. Spoon (p. 64); 10. Awl (p. 62); 11–12. Splitting wedges (p. 62); 13. Adz head (p. 64); 14. Spoon (p. 64); 15. Splitting wedge (p. 62); 16. Skin scraper (p. 62).

A tentatively identified artifact is an antler *engraving tool handle*. The specimen, which is badly weathered, does not appear to be complete as no slot is visible at the distal end for an animal tooth or metal blade. There are, however, a series of four raised bands running around the implement toward the distal end, a type of decoration that is characteristic of Alaskan Eskimo engraving tools (Pl. 10, 8).

Although many stone adz blades have been described, the only evidence for the manner in which these blades were hafted is the presence of a single, unfinished antler *adz head*. This is the characteristic form found in Eskimo sites throughout Alaska and in ethnographic collections. It is a section of antler with a blade slit at one end and pronounced lashing knob at the other. The inner side is flat to receive a wood or antler handle which would be lashed to the head (Pl. 10, 13). The blade slit in this particular specimen is very narrow and shallow suggesting that the head was intended to receive a small metal blade.

There is one complete antler *spoon* which has a long, narrow bowl and a short, straight handle (Pl. 10, 14). Another specimen is incomplete but apparently had a shorter, narrower bowl and a longer handle which narrows toward the center and flares at the proximal end (Pl. 10, 9). A third spoon is represented by a fragment of a deep, oblong bowl.

Two *storyknives* are made of curved, flat sections of antler which widen at the distal end to form a knife-like blade. Both are virtually the same length, but one is much better preserved than the other. The lower half of this specimen is decorated with two parallel lines running along one side. Inside these lines, an inverted chevron design occurs at irregular intervals (Pl. 10, 1). It is curious that a storyknife with an almost identical decorative motif was recovered from the Tikchik site (VanStone, 1968b, p. 279). Ethnographically, the telling of stories illustrated by means of a storyknife appears to be confined to Eskimo girls living in southwestern Alaska. The northern distributional limit is in the vicinity of St. Michael, while to the south such knives are absent on Kodiak Island (Oswalt, 1964, p. 310). Archaeologically, storyknives have been recovered from Crow Village (Oswalt and VanStone, 1967, p. 40, pl. 7, j–l) and Hooper Bay Village (Oswalt, 1952, pp. 69–70, 80) as well as Tikchik.

An abundant artifact type in the Akulivikchuk collection is *sled shoe sections*, of which there are nine of antler and 16 of bone. The

antler sections are all drilled with holes for pegging to the runner (Pl. 11, 6–7). These holes vary from 5 mm. to 1.3 cm. in diameter and are irregularly spaced. The bone specimens are also characterized by irregularly spaced pegging holes drilled 6 mm. to 1.3 cm. in diameter, but one section shows, in addition to a pegging hole, two pairs of parallel holes joined by a groove for lashing the shoe to the sled runner (Pl. 11, 1). The width of the unbroken sled shoe sections of both materials varies from 2.3 to 5.5 cm. and many are thin, indicating considerable wear. The antler sections tend to be shorter, narrower, and thinner in cross-section than those made of bone.

A single antler *kayak shoe section* was recovered. Such shoes were attached to the bow and stern of a kayak so that the cover would not tear as the boat was drawn up on the beach. This specimen has three drilled holes for pegging to the kayak frame (Pl. 11, 8).

A bear tooth has a drilled hole at the proximal end indicating its use as a *pendant* or as part of a necklace (Pl. 10, 2).

There are two seemingly complete antler artifacts that cannot be identified. One is a curved section of antler of uniform width that is concave on one surface and convex on the other (Pl. 11, 9), while the other is a ring with a pointed projection rising from one side (Pl. 10, 3).

In addition to the identified and unidentified artifacts described above, a total of 288 sections of cut antler and 1,073 pieces of cut bone without any articular surface present were counted and discarded in the field.

Clay

In other historic Eskimo sites in southwestern Alaska excavated in recent years, it has been noted that the tradition of pottery making was seen in its final stages (Oswalt and VanStone, 1967, p. 74; VanStone, 1968b, p. 312). This is even more the case at Akulivikchuk where only two potsherds and 12 lamp fragments were recovered. In connection with the Crow Village and Tikchik sites, it has been suggested that the acceptance of metal and crockery containers by the Eskimo rendered clay cooking and storage vessels obsolete, but that lamps may have continued in use for a longer period of time due to the difficulties involved in obtaining a regular supply of coal oil. In any event, it seems clear that in the Nushagak River region, as well as along the Kuskokwim River to the north, pottery making had virtually ceased by the end of the nineteenth century.

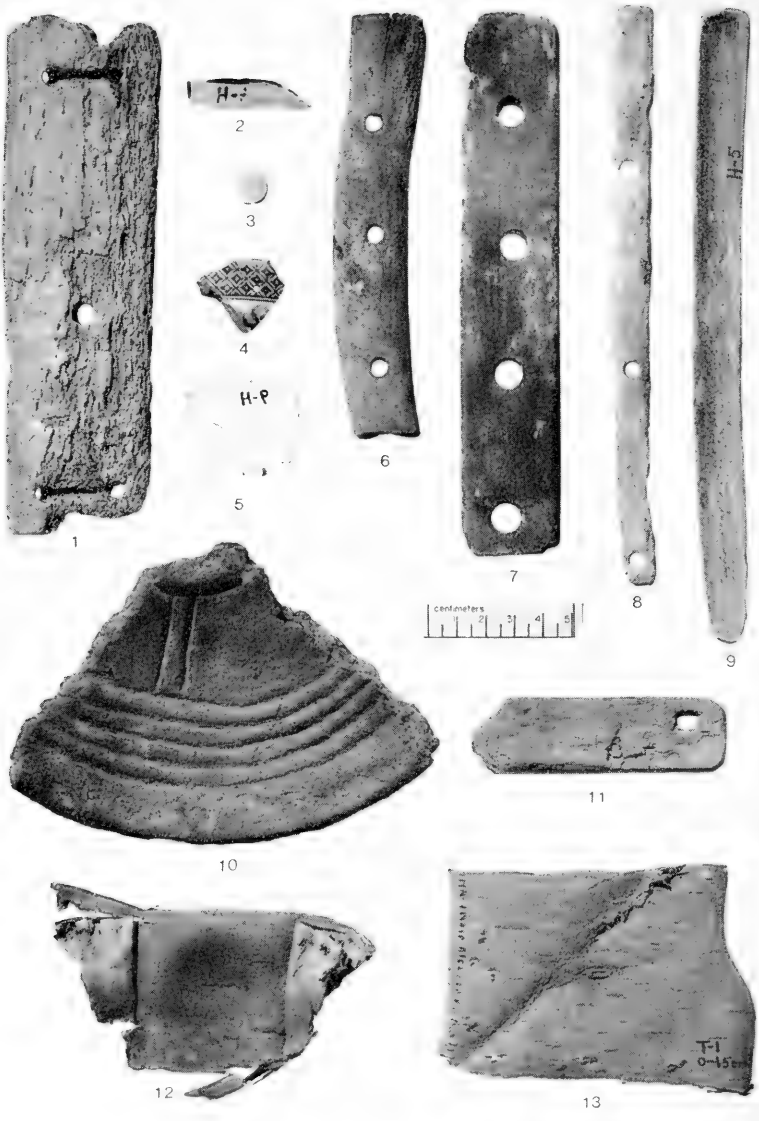

PLATE 11. Artifacts of Bone, Antler and Miscellaneous Materials. 1. Sled shoe section (p. 65); 2. Scraper (p. 68); 3. Labret (p. 68); 4. Drilled fragment of non-Eskimo pottery (p. 68); 5. Scraper (p. 68); 6–7. Sled shoe sections (p. 65); 8. Kayak shoe section (p. 65); 9. Unidentified (p. 65); 10. Pottery lamp fragment (p. 67); 11. Net float (p. 68); 12–13. Basket fragments (p. 67).

Neither of the two recovered potsherds from Akulivikchuk is a lip fragment and it is impossible to learn anything concerning vessel size or shape from them. One is plain and the other shows the Yukon Line-Dot form of decoration (Oswalt, 1955, p. 37). This form of surface treatment occurs at both Crow Village and Tikchik where it is associated with the so-called situla shape. Vessels of this shape are widely spread in Alaska from Hotham Inlet south to Kodiak Island. Both Akulivikchuk sherds are tempered with a coarse inorganic material and are 7 mm. thick.

Lamps in the collection are represented by one large fragment and 11 small ones including three rim sherds. The large fragment, which represents about one-quarter of a complete, saucer-shaped lamp, has an encircling line outside the rim, five lines just inside the bowl, and a spoke-like design of two lines each which, presumably, divided the center of the bowl into quarters (Pl. 11, 10). There is also a single, or possibly a double, circular engraved line at the very center of the vessel.

The saucer-shaped lamp with encircling lines near the rim and a cross motif toward the center is widespread in southwestern Alaska and seems to have made its appearance in the region no earlier than 1830 (Oswalt, 1953, p. 22). Of the remaining lamp sherds, all but three rim sherds show two encircling lines outside the rim and the others, one. All the fragments are tempered with gravel.

Bark

Containers of birch bark are commonly associated with interior Eskimo settlements in southwestern Alaska and since preservation was generally poor at the Akulivikchuk site, the few basket fragments recovered undoubtedly give an unrealistic impression of the extent to which the material was actually used. Only three fragments clearly suggest one manner in which such baskets were constructed. These represent containers which were made from a single piece of bark folded at two ends to form the basket and then stitched, probably with spruce root (Pl. 11, 12). The remaining fragments were probably also parts of baskets, but this cannot be determined with any degree of certainty. All of them have a row of sizeable, widely-spaced holes along one edge for sewing with spruce root. However, one fragment has very closely-spaced, small sewing holes suggesting that a finer material, perhaps finely-braided grass, was used (Pl. 11, 13).

The only other bark artifacts in the collections are two fragmentary *net floats* made of cottonwood bark. Both are roughly rectangular in outline with laterally-gouged, square holes at each end for attachment to the net (Pl. 11, 11). In cross-section, these floats have a rounded triangular form, narrow at the top and thick at the bottom. Like the birch bark baskets mentioned above, these floats are doubtless a form that was used extensively at Akulivikchuk but is virtually absent from the collection because of poor preservation at the site.

Glass

Two pieces of dark green bottle glass and a single fragment of a clear bottle have been extensively retouched for use as *scrapers* (Pl. 11, 2, 5). All are between 6 and 8 mm. in thickness. Chipped glass scrapers of this type have been reported from several historic sites in Alaska and the form is also common elsewhere in North America. A fragment of window glass 2 mm. thick and 2.7 cm. in diameter has been chipped to a round shape for an unknown purpose.

Wood

The only two wooden artifacts in the collection were recovered from the midden directly in front of the *kashgee*. Both are illustrated because it has been impossible to identify them (Pl. 12, 1–2). The narrow, flat object rounded at one end and with a flattened, rounded tip at the other may be a *peg*, or possibly a *trap or snare part*.

Non-Eskimo Pottery

A single rim sherd of ironstone china showing the familiar "willow" transfer print has a small hole drilled through it (Pl. 11, 4). An undecorated fragment of ironstone china has been worked into a round shape for use as a *labret* (Pl. 11, 3). It has been grooved in such a way that each surface forms a lip to hold the labret in place. A similar pottery labret was recovered from the Crow Village site (Oswalt and VanStone, 1967, p. 51, pl. 12,m).

Metal

In identifying locally manufactured metal artifacts from other historical sites in southwestern Alaska, it has been noted that the indigenous nature of such artifacts is sometimes difficult to determine because heavily rusted metal objects may look very similar whether they were made in the village by Eskimos or imported as

finished trade goods (Oswalt and VanStone, 1967, pp. 48–49; Van Stone, 1968b, pp. 284–285). The situation at Akulivikchuk, however, is somewhat clearer in this regard and the author is reasonably certain that all those specimens described below were, indeed, made in the village and, as at Crow Village and Tikchik, they clearly illustrate the Eskimo reaction to the availability of a new raw material. This new and exotic material was apparently most readily available in the form of tinned steel plate normally used in the manufacture of tin cans. Wrought and cast iron as well as small amounts of brass were apparently also available.

In the past when describing indigenously manufactured metal artifacts, it has been assumed that metal, particularly can metal, could be cut and worked more easily than stone and other indigenous materials (Oswalt and VanStone, 1967, p. 49; VanStone, 1968b, p. 285). One reason for this assumption was that such metal artifacts greatly outnumbered those of stone at both Crow Village and Tikchik. This is not the case at Akulivikchuk, however, and it will be noted that of the few comparable forms, only metal ulu blades outnumber their stone counterparts. Of course, this may be due directly to the variety or abundance of metal at the various sites, but it would also seem that the two materials were not generally considered interchangeable. That is, it was considered possible to substitute metal for stone for some forms, but this substitution was rarely, if ever, attempted with others. More often, probably, metal lent itself to use for new forms or as a substitute for other materials such as bark and wood, or for decorative purposes.

One of the most typical artifact types found in sites belonging to the historic period in Alaska are *blunt arrowheads* which have been constructed by fitting spent rifle cartridges over the ends of thin, wooden shafts. A small section of shaft protrudes from the two Akulivikchuk specimens (Pl. 12, 5). Both cartridge cases are of the 44 caliber rimfire type and show the double firing pin marks of the Henry Repeating Rifle, invented in 1860, or of the Model 1866 Winchester, manufactured until 1898. One case has a plain base while the other is headstamped with a raised letter "H." The raised "H," as opposed to a sunken one, dates this particular cartridge, which was made into the 1930's, as pre-1900 (Logan, 1959, p. 68; Barnes, 1965, p. 280; Smith, 1955, p. 8; Williamson, 1952, p. 460).

Two lead *musket balls* are virtually the same size, being approximately 1.5 cm. in diameter (Pl. 12, 11). Both have raised burrs run-

ning medially around them indicating the division of the two halves of the mold in which they were made. In addition to these complete balls, there is also a single fragment of melted lead in the collection.

Four complete and one unfinished *end bladed knife blades* we recovered at the site, three of which are 14.8, 15.5, and 8.8 cm. in length, respectively. The complete specimens appear to have been made from narrow, rectangular sections of metal which perhaps were originally sections of barrel hoops. The only workmanship evident is a V-shaped cut at one end and the longitudinal sharpening of one side (Pl. 12, 3, 10). A fourth has a more carefully shaped blade with the remnants of an antler handle attached (Pl. 12, 7). The unfinished specimen, 22.3 cm. long, is made of a somewhat heavier material and has been roughly cut on one side along about half its length.

There are four *ulu blades*, flat across the top with semi-lunar edges and all cut from the sides, tops or bottoms of cans. Three are similar in size to the largest illustrated specimen and one of these has a very narrow, rectangular antler handle in place (Pl. 12, 14). This handle has a narrow groove running along each side parallel to the cutting edge of the blade. The fourth blade is similar to the others but much smaller (Pl. 12, 6).

Six *crooked knife blades* are similar in shape and do not vary much in size from the illustrated examples. With one exception, all curve up at the distal end, narrow slightly at the proximal end, and tend to be made of somewhat heavier metal than the previously described end bladed knife blades and ulu blades. The exception resembles the others except that it is wider at the proximal than at the distal end and has a hole through it which doubtless aided in hafting the blade (Pl. 12, 8–9).

Two artifacts that have been tentatively identified as *adz or skin scraper blades* are quite different in appearance. One has a convex scraping edge and tapers toward the proximal end. The sides have been folded over, presumably to strengthen the blade (Pl. 12, 17). The other resembles a small ulu blade except that it is broader in proportion to its length (Pl. 12, 18).

A fragment of heavy, narrow, rectangular metal has been worked to a point at one end and may have been used as an *awl* (Pl. 12, 4).

An interesting indigenously constructed metal artifact that has been reported from both the Crow Village and Tikchik sites (Oswalt and VanStone, 1967, p. 50, pl. 12, i; VanStone, 1968b, p. 287, pl. 7, l) is a crude *dish* or small container made from pieces of can

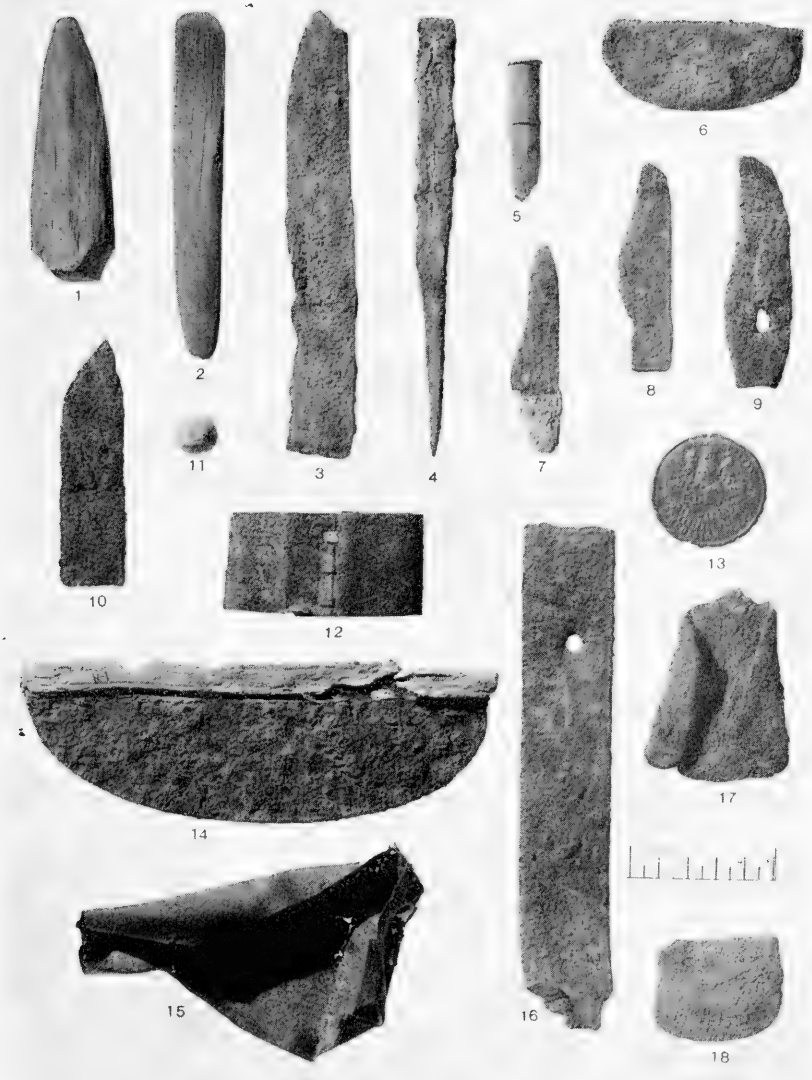

PLATE 12. Wood and Metal Artifacts. 1–2. Unidentified (p. 68); 3. End bladed knife blade (p. 70); 4. Awl (p. 70); 5. Blunt arrowhead (p. 69); 6. Ulu blade (p. 70); 7. End bladed knife blade (p. 70); 8–9. Crooked knife blades (p. 70); 10. End bladed knife blade (p. 70); 11. Musket ball (p. 69); 12. Reinforcement piece (p. 73); 13. Pendant (p. 73); 14. Ulu (p. 70); 15. Scoop (p. 72); 16. Sled shoe section (?) (p. 72); 17–18. Adz or skin scraper blades (p. 70).

siding which have been folded at the corners to form a shallow, roughly rectangular container. There are three of these in the Akulivikchuk collection and they are all badly corroded and very fragmentary.

Closely related to these dishes are two *scoops*, also made of can metal which has been bent in such a manner as to form a round hole at the proximal end into which a short, wooden handle might have been fitted. The other end is crimped and folded to form a shallow bowl (Pl. 12, 15). The largest specimen, not illustrated, is 21 cm. long. Such scoops, which were also recovered from the Tikchik site (VanStone, 1968b, p. 287, pl. 7, 9), might have been used for flour or sugar.

An iron rod, rectangular in cross-section and 47 cm. in length, has been bent so as to form a circular hook at one end and a small eye at the other. Such an implement was probably used as a *pothook*.

A rectangular strip of metal with a single hole centrally located near one end has been identified as a *sled shoe section* (Pl. 12, 16). A shoe of this type would probably be attached to the runner with short, flat-headed nails, in the same manner as the previously described bone and antler shoes. There are also four sections of rectangular metal approximately the same width as the illustrated specimen but slightly longer. These may have been cut for finishing as sled shoe sections, but they are just as likely to have been prepared for manufacture into other types of artifacts.

A type of *necklace*, parts of which are represented in the collection, was made from beads and spent rifle cartridges, each with a small hole drilled through the head. Three are 44 Henry rimfire cartridges, two with plain bases and one with a raised letter "H" in the center of the head. All these show double firing pin marks like those 44 caliber cartridge cases previously described. The fourth cartridge case is a 38 long rimfire with plain base, a cartridge that was very popular for a period of 50 or 60 years following the close of the Civil War. It was chambered to many different makes of weapons, usually inexpensive rifles, and some revolvers (Barnes, 1965, p. 278; Datig, 1958, vol. II, p. 150). Necklaces with bead separators made from spent cartridge cases would appear to be common in historic sites in southwestern Alaska as they have been reported at Crow Village (Oswalt and VanStone, 1967, p. 51), Tikchik (VanStone, 1968b, p. 287, pl. 7, 13), and the Kijik site on Lake Clark (VanStone and Townsend, 1970, p. 71, pl. 14, 10).

The center panel has been cut from the lid of a can for percussion caps and three small, closely spaced holes drilled along the edge, presumably so that the object could be worn as a *pendant* (Pl. 12, 13). On the lid is a stamped heraldic design. Above this design and running around the edge is the following two-word inscription, one of which is only partly legible: "———MILLS / LONDON." The three drilled holes are directly over these words. Below the design is the single word "ELEY'S" and below that in three successive lines are the words "DOUBLE WATERPROOF / CENTRAL FIRE PERCUSSION CAPS." Eley Brothers is a British firm which manufactured percussion caps in the nineteenth century and is still in business (Russell, 1962, p. 243). An Eley cap box with a somewhat different inscription and of a smaller size was recovered at the Crow Village site (Oswalt and VanStone, 1967, p. 64).

Four cut can fragments have a number of holes around the sides and may have been used as *reinforcement pieces*. These fragments vary in length from 4 to 10 cm. and in width from 2.5 to 8 cm. Such metal reinforcement pieces are often used in the Nushagak River region today to strengthen the cracked shaft of an oar, or to repair wooden artifacts of various kinds. A slightly different kind of reinforcement piece, if indeed that is a correct identification, consists of two narrow rectangular sections of can metal that have been cleverly joined together by means of three parallel thin metal strips which extend through both sections, the ends of which overlap (Pl. 12, 12).

The lower part of an elliptically shaped can 10.3 cm. long and 4 cm. wide in the center has been cut off and the bottom pierced with a large number of very small holes as if for use as some kind of *sieve*.

In addition to the metal artifacts described above, 51 cut can fragments were recovered from the site, most of which were counted and discarded in the field. Of this number, 20 were found in the *kashgee* midden (T-1) but only one occurred below the 0–15 cm. level. Eighteen pieces of heavy metal were also recovered along with nine fragments of metal rods ranging from 10 to 25 cm. in length and 1 to 6 mm. in width, and five fragments of cut brass. All this material was also discarded in the field.

IMPORTED MANUFACTURED GOODS

This section contains descriptions of trade goods in the Akulivikchuk collection. In contrast to the artifacts already described, these implements were not manufactured by Eskimos in the village, but

were made by non-Eskimos and traded to the residents of Akulivikchuk. Similar trade goods have been, or are being, described for a number of nineteenth century archaeological sites in southwestern Alaska. Thus, these artifacts from Akulivikchuk will be compared, when such comparisons are relevant, with similar recovered materials from the Crow Village site (Oswalt and VanStone, 1967), Tikchik (VanStone, 1968b), Kolmakovski Redoubt (Oswalt, personal communication), Kijik (VanStone and Townsend, 1970), and sites in the Glacier Bay area of southeastern Alaska (Ackerman, 1965). For a detailed statement of various types of trade goods in a nineteenth century site in southwestern Alaska the reader is particularly referred to Oswalt and VanStone (1967).

Non-Eskimo Pottery

Excavations at the Akulivichuk site resulted in the recovery of 329 fragments of non-Eskimo pottery including a large number of identifiable cup and saucer fragments and a few sherds that are parts of broad-rimmed soup plates. All the collected sherds from Akulivikchuk, like those from other sites in southwestern Alaska, are fragments of ironstone china, a utilitarian stoneware variant that was extremely popular during the nineteenth century, particularly in frontier areas, because of its strength and durability.

The sherds of non-Eskimo pottery to be considered here can be discussed most satisfactorily according to the five types of surface treatment that are present: undecorated white ware, transfer-printed ware, hand-painted ware, a group of sherds showing both hand-painted and stamped decoration, and a ware characterized by stamped designs alone. There are 119 undecorated white sherds, but it should be kept in mind that many of these may represent undecorated areas of vessels characterized by either a transfer-printed or hand-painted and stamped design. The plain, white sherds are remarkably uniform although there is some variation in thickness, firing and smoothness of the glaze.

The decorated sherds have been grouped into a typology that is based entirely on decorative motifs and conceived of simply as an ordering device which makes description of the sherd collection easier and more detailed. Of the types listed below, some are homogeneous and some heterogeneous. In order to be classified as a homogeneous type, four sherds with the same design are required. The heterogeneous types are labeled a, b, c, etc. These refer to decorative motifs represented on three sherds or fewer.

Transfer-printed ware, with the print occurring under the glaze, is represented by a total of 29 sherds, all of which are extremely small making it difficult to ascertain the designs with any degree of certainty.

TYPE 1 (Pl. 13, 1). Brown and blue "willow" ware. This is the most common transfer-print, there being 12 sherds of blue "willow" and a single brown "willow" fragment. Actually, of course, there was no single "willow" pattern since almost every potter in Great Britain took it up after the pattern was first engraved about 1780. There are, therefore, many versions of the same theme having certain features in common, but often arranging them differently and adding or omitting certain details. At least one noted authority on nineteenth century pottery believes that to assign any unmarked piece to any particular pottery or even to attempt rough dating on the basis of design is a very uncertain business (Collard, 1967, p. 122). Both European and American potteries copied the English "willow" pattern extensively and the design is, of course, still being used.

TYPE 2 (Pl. 13, 2). Flow blue. This type, represented by four sherds, has floral designs in light and dark shading with the whole surface covered with a diffuse blue color.

TYPE 3A (Pl. 13, 3). Blue and white geometric band. Two sherds.

TYPE 3B–D (Pl. 13, 4–5, 8). Brown and green floral. Only three sherds represent this heterogeneous type and their extremely small size makes it impossible to be more specific with regard to the decoration.

TYPE 3E (Pl. 13, 11). Black pictorial. There is only this one sherd with a representational design in the entire collection.

TYPE 3F (Pl. 13, 7). Blue floral. Four sherds have this decorative motif of blue roses with a geometric border of the same color.

TYPE 3G (Pl. 13, 18). Blue floral, stylized type. There is only a single sherd in this category and it seems to be characterized by white stylized leaves in a blue geometric background. There is some possibility that this subtype and type 3a represent the same design.

In general, the transfer-printed ware tends to be somewhat thinner than the undecorated white ware. This characteristic has also been noted for the ironstone china from other historic sites in southwestern Alaska.

Hand-painted ware is by far the most common at Akulivikchuk, there being 116 sherds.

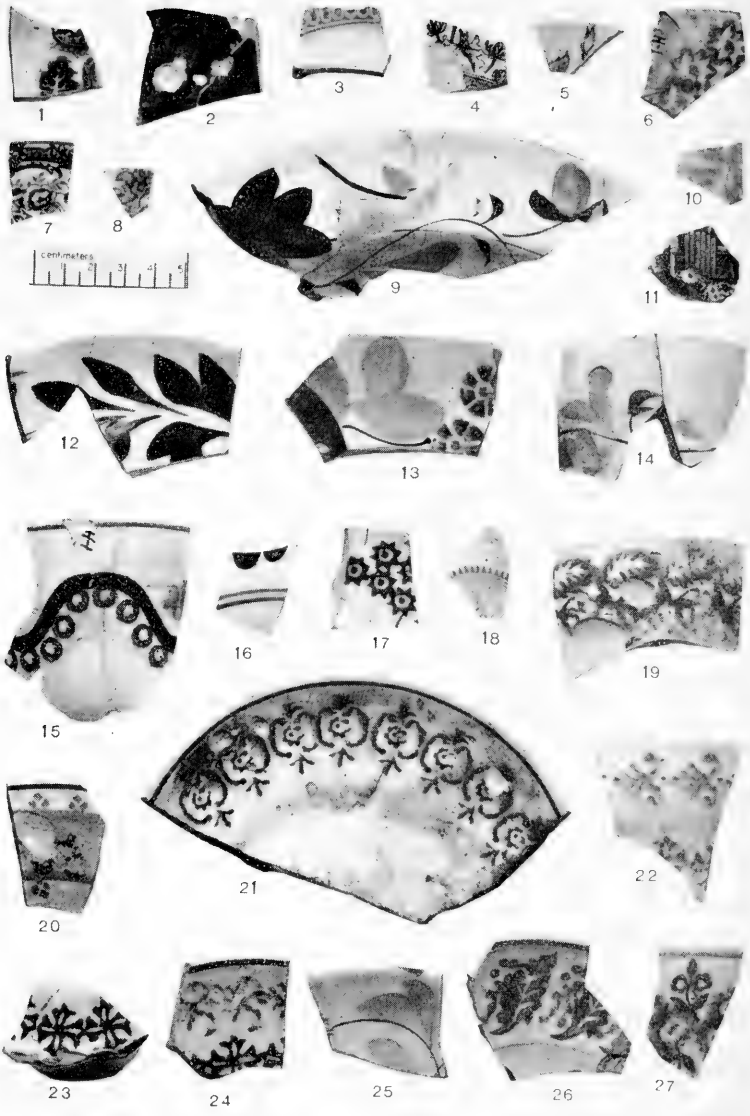

PLATE 13. Non-Eskimo Pottery. 1–5. Transfer printed ware (p. 75); 6. Hand-painted and stamped ware (p. 77); 7–8. Transfer printed ware (p. 75); 9. Hand-painted ware (p. 77); 10. Stamped ware (p. 78); 11. Transfer printed ware (p. 75); 12. Hand-painted ware (p. 77); 13. Hand-painted and stamped ware (p. 77); 14. Hand-painted ware (p. 77); 15. Hand-painted and stamped ware (p. 77); 16. Hand-painted ware (p. 77); 17. Stamped ware (p. 78); 18. Transfer printed ware (p. 75); 19. Stamped ware (p. 78); 20. Hand-painted and stamped ware (p. 77); 21–24. Stamped ware (p. 78); 25. Hand-painted ware (p. 77); 26–27. Stamped ware (p. 78).

TYPE 4A–D (Pl. 13, 9, 12, 14, 25). Floral designs in red, green, blue, and purple. All but one of the hand-painted sherds are characterized by stylized or naturalistic floral patterns in the colors listed. Also characteristic are painted lines around the rims and outer edges of the vessels, or around the base. Typical examples of this type are illustrated.

TYPE 4E (Pl. 13, 16). Purple lines, brown flower (?). This very poorly defined design is represented by a single sherd.

Hand-painted and stamped ware included sherds which have design elements painted on by hand in combination with those that have obviously been applied by means of a small stamp. It should be emphasized that because of the small size of the sherds from Akulivikchuk, many of those described above as being simply hand-painted, may actually be parts of vessels which also had stamped designs. This again emphasizes the importance of stressing that the classification system being used here is significant for descriptive purposes only. There are nine of these hand-painted and stamped sherds in the collection.

TYPE 5 (Pl. 13, 15). Blue undulating line and purple circles. There are four sherds of this type. The small purple circles have been applied with a stamp.

TYPE 6A (Pl. 13, 13). Blue and green leaves, purple flowers. Although there are only two sherds of this heterogeneous type, it represents a characteristic combination of hand painting and stamping in collections of pottery from other sites in southwestern Alaska. The leaves, stems and other elements are painted, while the flowers are stamped (see Oswalt and VanStone, 1967, pl. 13,b; VanStone, 1968b, pl. 8, 7, 8).

TYPE 6B (Pl. 13, 6). Green leaves, red flowers. Since there are only two of these sherds, the type might well have been combined with 6a. As with the above type, the flowers are the stamped element here.

TYPE 6C (Pl. 13, 20). Broad blue band, red flowers. The band is painted and the stylized flowers stamped. Although there is only a single sherd of this type, it may eventually be of importance because of its occurrence in other sites. There appears to have been some form of black design on the blue band that does not show very well on this example.

The 47 sherds bearing stamped designs only will now be described. Again, it should be kept in mind that painted elements may

have occurred with the stampings and that it may simply be an accident of breakage that relegates some of these designs to this particular category.

TYPE 7 (Pl. 13, 21). Green flowers. Thirteen sherds bear this stylized, dark green floral design which would appear to occur without any painted elements.

TYPE 8 (Pl. 13, 26). Green and red leaves. There are four sherds which have this design of overlapping stamps.

TYPE 9 (Pl. 13, 22–24). Red fleur-de-lis with red, brown or green crosses. Three of the eight sherds with this type of decoration are illustrated to show the range of combinations.

TYPE 10 (Pl. 13, 17). Blue flowers. There are four sherds of this type which, if larger fragments were available, might show a combination of hand painting and stamping.

TYPE 11 (Pl. 13, 27). Purple flowers and green ovals. Another double stamp combination, this one represented on five sherds.

TYPE 12A (Pl. 13, 19). Red leaves. Three sherds show this outline leaf design.

TYPE 12B (Pl. 13, 10). Green leaves. Although represented at Akulivikchuk by only a single small sherd, this is a type that appears likely to have comparative value with pottery collections from other sites in southwestern Alaska.

In addition to the decorated sherds which have been described here, there are nine pottery fragments which, although having some trace of decoration, are too small for typing.

The most accurate means of identifying crockery, of course, is by means of the maker's marks which occur on the bottoms of vessels. Unfortunately, only two very fragmentary marks occur on the sherds from Akulivikchuk. Nevertheless, it is possible to suggest tentative identifications of these marks. One sherd has part of an impressed mark showing the letters "COPE———." This is very likely to be a mark of W. T. Copeland (& Sons, Ltd.), Spode Works, Stoke, one of the Staffordshire potteries. The firm was established in 1847 and is still in existence. An impressed mark using the name, either alone or with other devices, was used between 1847 and 1867, thus making it possible to date this particular sherd, which is associated with type 2 decoration, within fairly narrow limits (Godden, 1964, p. 171). The fact that pottery with this particular mark ceased to be made in 1867 does not, of course, mean that it necessarily was traded into

the Nushagak River region by the Russians, although this is at least a possibility. There is certain to have been a significant time gap between the date of manufacture of any European or American pottery and its use in the Alaskan trade.

The second marked sherd, which is undecorated, shows the upraised tips of a bird's wings. On the basis of the position of the wings, it is possible to suggest that they are part of a mark of the Baltimore firm of Edwin Bennett which, under this name, manufactured utilitarian and other wares between 1856 and 1890. Edwin Bennett, incidentally, was a brother of James Bennett, the first potter in East Liverpool, Ohio, one of the great nineteenth century midwestern pottery centers (Thorn, 1947, p. 118; Cox, 1944, p. 1007).

A fragmentary, printed English registration mark occurs on the single type 3g sherd. Such marks, showing the date of manufacture, were placed on English ceramics from 1842 to 1883. By means of a series of code numbers and letters, the month, day of month, and year of manufacture are indicated (see Godden, 1964, pp. 526–527; Thorn, 1947, p. 82). Unfortunately, the code letter indicating the year is missing from this mark, but because of a change in the code system that took place in 1867, it is at least possible to say with certainty that the vessel of which this sherd is a fragment was manufactured sometime between 1842 and 1867.

Although non-Eskimo pottery of both British and American manufacture has been recovered in considerable amounts from a number of historic sites in southwestern Alaska, it has not as yet been possible to date its occurrence with reference to specific sites and structures. This is simply one problem that has resulted from the fact that no meaningful stratigraphic sequence could be determined at Crow Village, Tikchik or Kijik. And yet, the general similarity of the decorated wares at all these sites has lent some encouragement to the idea that a dated sequence based on decoration might eventually be worked out if pottery could be excavated with good stratigraphic control. This ideal situation has not as yet occurred, unfortunately, but Oswalt's excavations at Kolmakovski Redoubt in 1966 and 1967 have led to the establishment of a stratigraphy with reference to pottery that has some significance for the Akulivikchuk sherds just described.

The stratigraphy at Kolmakovski, which, along with the collections from this site, is still in the preliminary stages of study, is based on a combination of structures dated by means of historical records and a stratigraphic sequence based on determined floor levels

within these structures. Oswalt has tentatively defined an early level dating from 1841 to ca. 1867, a middle level from ca. 1868 to ca. 1900, and a late level from ca. 1900 to ca. 1918 (Oswalt, personal communication). Using this sequence and those decorative pottery designs which the two sites have in common, it is possible to make some tentative statements about the time range of the Akulivikchuk sherds. It should be emphasized, however, that simply because a particular design occurs stratigraphically "early" at Kolmakovski is not definite proof that it is also early at Akulivikchuk. Nevertheless, the comparisons are intriguing and it seems worthwhile to at least discuss the pottery from one site in terms of the other.

To begin with the comparable transfer-printed wares from Akulivikchuk, it can be noted that types 1 and 2 run clear through the sequence at Kolmakovski, thus seeming to indicate that the "willow" ware and flow blue types may not lend themselves to accurate dating unless maker's or registration marks are present. Type 3a is early at Kolmakovski and types 3e and 3f tend in that direction, while type 3c is late. Of particular interest is the definite early occurrence of type 3g at Kolmakovski. The single sherd of this type at Akulivikchuk is also definitely early since it has a registration mark that dates it between 1842 and 1867.

Turning to comparable hand-painted and stamped wares, we can note that types 4a–d, 5, 6a–c, and 9 all run through the Kolmakovski sequence, while types 7 and 12b tend to be early. It would seem, therefore, that perhaps hand-painted and stamped wares in Alaskan sites may not be as diagnostic as those with transfer prints. It is also true that hand-painted and stamped designs similar to those described in this report have been widely reported throughout the former frontier areas of the American west, particularly in the southwest where they are generally considered to date no earlier than the 1880's (Bernard L. Fontana, personal communication). The significance of the approximately dated Akulivikchuk sherds for the age and sequence of occupation for particular structures at the site will be discussed in a later chapter.

On the basis of Oswalt's stratigraphic sequence at Kolmakovski, it will probably be worthwhile to re-examine the already published pottery collections from Crow Village and Tikchik, and such a study is now in progress. It would seem, however, that resemblances to both Akulivikchuk and Kolmakovski pottery, although impressive

in bulk, are confined to designs that are not particularly diagnostic. Thus "willow" ware is plentiful and although the hand-painted stamped combination was not recognized at the time the artifact descriptions from these sites were written, it is obvious that floral designs reproduced by these methods are also common.

One further point might be made with reference to the dating of European pottery in Alaskan sites. The extent to which wares of both British and American manufacture occur in such sites in southwestern Alaska has been noted in some detail in the archaeological reports that have been mentioned frequently in these pages. It is clear that a goodly percentage of all such pottery was manufactured in one of the Staffordshire potteries, and yet in the sizeable collections of sherds from Crow Village, Tikchik, Kijik, Akulivikchuk, and Kolmakovski Redoubt, the only pre-1883 registration mark to be found is the one described above. Therefore, it seems virtually certain that although some European pottery was included in trading inventories throughout southwestern Alaska during the Russian period, the bulk of it probably dates no earlier than 1880. It therefore can safely be assumed that the bulk of this particular trade item was available to the residents of Akulivikchuk only during the closing years of the settlement's occupation.

Glass

Objects of glass, with the exception of beads, are relatively uncommon in the Akulivikchuk collection. The material, particularly in the form of containers, was apparently not available to the villagers in any great quantity. A similar situation appears to have existed at Tikchik, but bottles in particular were much more abundant at Crow Village and Kijik.

Seven milk glass *buttons*, all of the four-hole shirt variety, occur in the collection. They are molded in a bi-convex shape with a slight depression in one face and with diameters ranging from 1.1 to 1.8 cm. Five are white (Pl. 14, 14–15), one is white with a dark red rim (Pl. 14, 12), and the other white with a gray rim. Two of the plain white specimens have a series of parallel lines radiating out from the center (Pl. 14, 15). Four-hole shirt buttons like these were first made in France and introduced to the United States about 1860 (Fontana and Greenleaf, 1962, p. 98). The small number of such buttons recovered at Akulivikchuk, as well as at Crow Village and Tikchik, suggests, of course, that western clothing may not have been used

to any great extent by the interior Eskimos of southwestern Alaska even at the end of the nineteenth century.

It has been possible to identify seven small pieces of glass as *window glass* fragments. The thickness of these fragments varies from 2 to 3 mm. with the narrower measurement being more common. The four thinnest fragments are clear, while the thicker ones are of a slightly greenish color. It has sometimes been considered that thin, colorless window glass, when recovered from historic sites in the midwest and western United States, is earlier than the thicker, slightly greenish glass which was first manufactured during the latter part of the nineteenth century (Miller, 1960, p. 67). The number of recovered fragments from Akulivikchuk is, of course, much too small to provide meaningful information along this line. We know, however, that window glass was highly prized by the Eskimos of southwestern Alaska at least as early as 1842 (Zagoskin, 1967, p. 255). It would seem, nevertheless, that such glass could not have been available to the inhabitants of Akulivikchuk except in the very smallest quantities.

The number of *bottle* glass fragments recovered is not great, there being altogether 57, three of which were retouched as scrapers and have been described previously. Of the remaining 54, four are recognizable as being associated with bottles of the patent medicine type, tall with a rectangular body, round neck and "panels" on which the trade name was sometimes impressed. No such names occur on these fragments.

The other bottle fragments are all very small and not particularly revealing as far as size and shape are concerned. Twenty-four are of a thick, dark green glass frequently associated with liquor bottles and one of these is the deeply-recessed base of such a bottle that measures 7.8 cm. in diameter. Two fragments are apparently from colorless bottles with a varied corrugated design on the neck, while two others are from flat-bottomed, hexagonal containers of undetermined size. It is interesting to note that recovered bottle fragments at Akulivikchuk are fewer and less revealing than those from either Crow Village, the Glacier Bay sites (Ackerman, 1965), or Kijik, but somewhat more numerous than at Tikchik.

In addition to buttons, window glass, and bottle fragments, there are two small pieces of what appear to be round, flat-bottomed *drinking glasses.*

A comparatively small number of glass *trade beads* of various shapes, sizes, and colors were found in all the structures and the test trench. These will be analyzed typologically and then minimal comparative statements will be made with reference to bead collections from other historic archaeological sites in southwestern Alaska. It can be stated at the outset, however, that the value of trade beads as dating aids is limited, and that in spite of the relatively large amount of comparative material, it will be possible to draw only the most general conclusions about the chronological position of the beads from Akulivikchuk.

A total of 537 beads and bead fragments were recovered from the site. For study purposes these were first separated into groups based on color alone. The colors are given as they appear to the author and not through comparison with a standard color chart. Variation in the basic colors listed is often considerable and some beads appear to be discolored as a result of exposure or chemical action of the soil. An attempt will be made to indicate the range of variation within each color category.

The collection contains 360 white beads, 145 blue, 16 black, 4 green, 4 brown-lined red, 2 white-lined red, 2 polychrome, 1 blue faceted, 1 clear, 1 red, and 1 white painted bead. Next the beads were separated according to shape within each color category, there being five different shapes represented (Fig. 14). With reference to size, there are 76 of the "seed" form, those beads less than 2 mm. in diameter. All belong to the type a shape, and all are very light blue in color with the exception of one white-lined red specimen. These "seed" beads are identical to those sold in tubes in stores throughout rural Alaska today for sewing into bead work designs on cloth or skin garments.

Of the 360 white beads, all but one are complete enough to indicate shape with 190 belonging to type a, 142 to type b, and 28 to

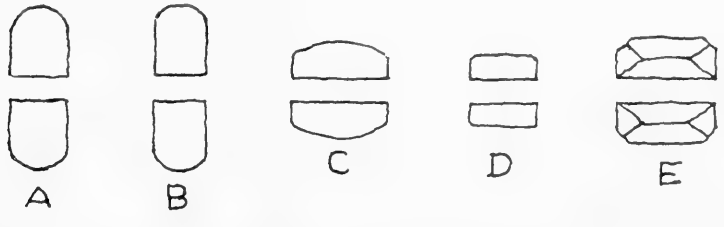

FIG. 14. Bead types according to shapes, showing cross-sections of each.

type d. The color is relatively uniform, but a large number of those beads belonging to type a and b shapes exhibit a variation between exterior and interior color. Both are opaque, but the interior is whiter than the exterior. The white beads are also fairly uniform in size, only eight specimens exceeding 5 mm. in diameter.

Blue beads are represented in only two shapes, there being 123 of type a, including 75 of the "seed" category; the remaining 22 belong to the type b shape. The color range of the blue beads is great; from very light blue to a deep marine color. Size range is also considerable, particularly among the beads belonging to type a. There are eight light blue specimens with diameters in excess of 8 mm. and another fragmentary specimen of the same type which has a diameter of more than 1.2 cm. Three sizeable translucent beads, two complete and one fragmentary, are of a deep marine blue color. The largest of these is illustrated (Pl. 14, 13). A sizeable blue faceted bead (type e) is also translucent and of a similar shade, although not quite so dark.

Of the 16 black beads, all but one belong to type a, the single exception being of the type b shape. These and the four green beads, all belonging to type a, are uniformly of small size, being no more than 4 mm. in diameter, and are opaque. A single red bead is a translucent wine color and belongs to type a. There is also one colorless bead of the type b shape.

The two polychrome beads are basically white, of type a, and with the same variation of exterior and interior colors noted for the white beads. On the outside of these beads are alternate red and green lines, two of each, running parallel to the stringing hole. Both specimens are approximately 3 mm. in diameter.

The single bead belonging to type c is translucent white with a wavy pink band running around the middle at right angles to the threading hole. This bead is large, being 7 mm. in diameter at each end and 1.7 cm. long.

Two forms of the well-known "Cornaline d'Aleppo" bead were recovered. Four specimens have a dull reddish exterior and a translucent, dark brown interior. Three of these belong to type a and one to type b. Two additional beads have bright red semi-translucent exteriors and opaque white cores; both are the type a shape, one being a seed bead. The "Cornaline d'Aleppo" bead derives its name from the fact that it was associated in the Italian export business with the city of Aleppo in Syria. This type of bead was widely dis-

tributed among Indians of North America in the nineteenth century and has been recovered from all historic sites so far excavated in southwestern Alaska.

None of the beads described above is unique for the Akulivikchuk site and if there is one thing notable about this bead assemblage as a whole, it is the small number recovered. As noted elsewhere (VanStone and Townsend, 1970, pp. 96–97), only the "Cornaline d'Aleppo" and deep marine blue faceted beads have any diagnostic value at all, the latter being frequently referred to in the literature as "Russian" beads. It has not been possible, however, to isolate this type as belonging exclusively to the Russian period at Crow Village, Tikchik, Kolmakovski (Oswalt, personal communication) or Kijik. Unfortunately, therefore, it is not possible to say anything more definite about the Akulivikchuk beads than was said about a much larger and more varied assemblage from Kijik; namely, that they presumably represent "a nineteenth century assemblage of European and Syrian made trade beads which . . . were used extensively in the Plains and in other parts of North America prior to being introduced into Alaska where, for some uses, they have persisted down to the present time" (VanStone and Townsend, 1970, p. 97).

Metal

Objects of metal are not numerous in the Akulivikchuk collection, particularly when compared with the large number of such artifacts recovered from other historic sites in the general area. The small number of actual types represented is especially noteworthy.

Of the five *nails* in the collection, four have their heads missing and are so badly corroded that nothing definite can be said regarding their size or shape. The single complete specimen is a 12d common, square-cut nail (Pl. 14, 9). There are also four *cut spikes*, all incomplete and, with one exception, badly corroded (Pl. 14, 1).

Metal tools in the collection include a single, well-made *planing adz blade* constructed from a rectangular iron bar. It is flat across the proximal end and tapers slightly near the working edge (Pl. 14, 16). Two additional specimens are much shorter, being only 7 cm. in length, of approximately the same width, and badly corroded. An adz blade fragment consists of approximately 3 cm. of the distal end of a specimen like that just described.

A small *file* is triangular in cross-section and broken at the proximal end (Pl. 14, 3). It is machine made as were all files manufac-

tured in the United States after 1850 (Fitch, 1883, p. 724). There are also two very fragmentary and badly corroded fine-tooth *saw blades*, presumably of the type used in cross-cut saws. A tentatively identified *drill bit* (Pl. 14, 8) completes the inventory of true metal tools from the site. A single *iron ring* is flat along one side and almost certainly was attached to a strap of some kind, perhaps a dog harness (Pl. 14, 7).

The only object in the collection that can definitely be associated with trapping is a fragment of an iron *trap jaw* (Pl. 14, 10). There is also a single copper or brass *pendant* or *earring*. It is small and light and tapers sharply at one end to which is attached a small wire eyelet (Pl. 14, 6).

Among household articles of metal are fragments of six cast iron *kettles*, four of which include sections of the rim. One of these fragments is from a kettle with a constricted neck, slightly everted rim, a diameter of approximately 19 cm., and a cast loop handle (Pl. 14, 17). The other three are from vessels with simple everted rims. Two are from kettles whose diameters were slightly in excess of 36 cm., while the third is from a much smaller kettle with a diameter of about 9 cm. No handles or lugs are indicated on these fragments, but one does have part of a raised design in the form of a shield with crossed swords in the center. Across the top of this shield and inside it is some illegible lettering (Pl. 15, 14). A kettle fragment of this latter type was also recovered from the Tikchik site (VanStone, 1968b, p. 298, pl. 9, 5).

The four *lugs for kettle handles* are of the type that were riveted to the kettle rim on opposite sides just below the lip (Pl. 14, 2, 4–5). All would appear to have come from large sheet iron kettles, none of which were recovered. There is also a fragmentary copper or brass *kettle handle*, but since both ends of this specimen are missing, the identification should be considered tentative (Pl. 14, 11).

Cutlery from the site includes one complete *tablespoon* (Pl. 15, 12) and tablespoon bowl, as well as a complete *teaspoon* (Pl. 15, 13). A single fragmentary *kitchen knife* (Pl. 15, 11) had a handle with wooden fittings which were held in place with brass pins. A medium-sized pair of *scissors* (Pl. 15, 7) were recovered along with a fragment from a much larger pair.

A significant feature of the Akulivikchuk collection of imported goods is the virtual absence of artifacts associated with the use of firearms. Only five spent *cartridge cases* were recovered, four of which

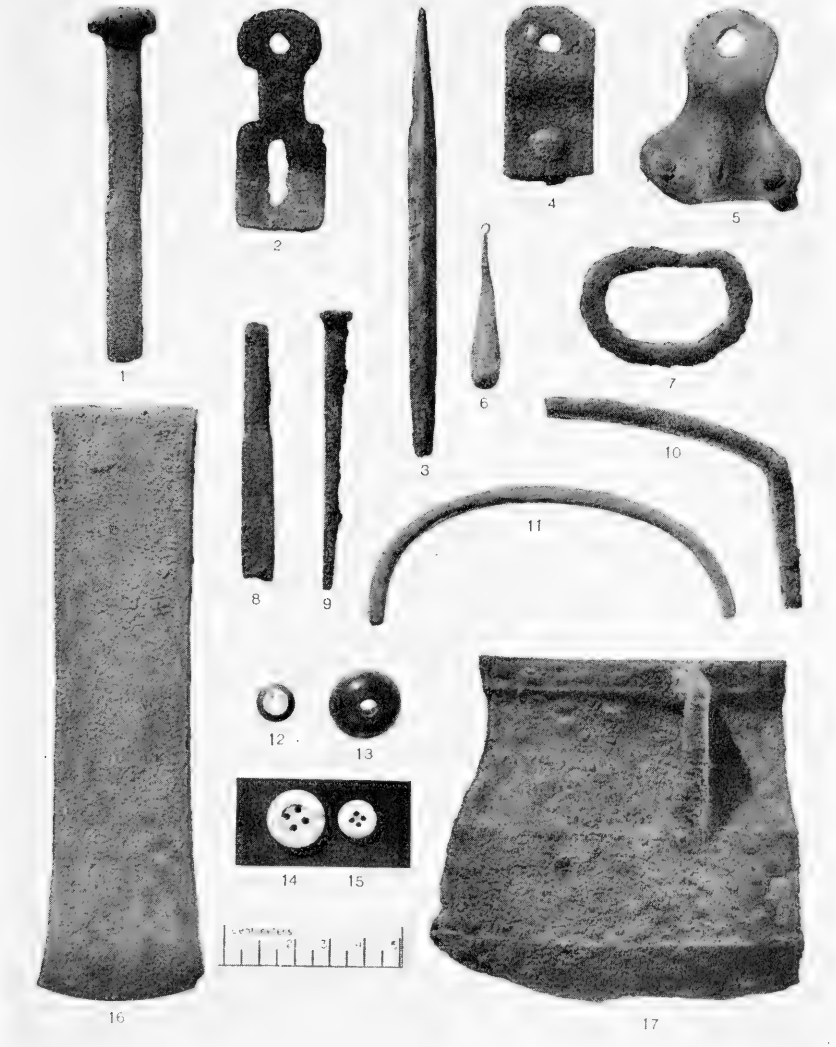

PLATE 14. Artifacts of Metal and Glass. 1. Cut spike (p. 85); 2. Lug for kettle handle (p. 86); 3. File (p. 85); 4–5. Lugs for kettle handles (p. 86); 6. Pendant or earring (p. 85); 7. Iron ring (p. 86); 8. Drill bit (?) (p. 86); 9. Nail (p. 85); 10. Trap jaw (p. 86); 11. Kettle handle (?) (p. 86); 12. Button (p. 81); 13. Bead (p. 84); 14–15. Buttons (p. 81); 16. Planing adz blade (p. 85); 17. Kettle fragment (p. 86).

had been drilled at the proximal end for stringing as bead separators and have already been described. The fifth, like three of the others, is a 44 Henry rimfire cartridge and is similar to the others except for a raised letter "P" in the center of the head. This indicates that the cartridge was manufactured by the Phoenix Cartridge Company of South Coventry, Connecticut around 1880 (Smith, 1955 p. 8). Also associated with firearms are two copper *percussion caps* which have narrow phlanges around their lower ends and were used with rifles or muskets. A small fragment of a rectangular *bar of lead* (Pl. 15, 1), 3.5 cm. in length, represents the form in which this material was received by the Eskimos for manufacturing into bullets, either for muzzle-loading weapons or for the capping of re-loaded cartridges. This fragment has one recessed surface on which are the letters "———ER'S." Apparently trade names commonly occurred on bar lead. A complete bar from the Tikchik site contains an illegible name in the same position (VanStone, 1968b, p. 304, pl. 10, 14). Bars of trade lead, one of which is marked "new soft lead warranted," are on exhibit in the Museum of the Fur Trade, Chadron, Nebraska. They are referred to as dating "c. 1840."

One of the most interesting artifacts in the entire collection is a small cast brass *crucifix* with a ring at the top for attachment to a string or chain (Pl. 15, 8). This cross has no lettering, although there is a design in low relief. It is quite different in size and design from those worn today in the area by members of the Russian Orthodox Church. Such crosses were given to infants when they were baptized and were worn around the neck all through life. This one represents the only indication in the collection that any of the residents of Akulivikchuk were Christians.

The number of identifiable *cans* in the collection is surprisingly small, particularly when compared with the large number from other historic sites in southwestern Alaska. Only one or possibly two specimens can be identified as food containers. It should be remembered that can metal was used in the manufacture of artifacts, but the small number of artifacts of this material would seem also to indicate that canned goods of any kind were not plentiful during the occupation of the settlement.

Four types of cans and can fragments can be identified as to shape with some degree of certainty:

Type 1. The only nearly complete can in the collection is an oval-shaped, single-seamed specimen approximately 12.8 cm. high

PLATE 15. Artifacts of Metal and Miscellaneous Materials. 1. Fragment of lead bar (p. 88); 2. Gun flint (p. 91); 3. Heel of man's shoe (p. 91); 4. Leather strap fragment (p. 91); 5. Type 4 can (p. 90); 6. Type 1 can (p. 90); 7. Scissors (p. 86); 8. Crucifix (p. 88); 9. Fragment of braided leather (p. 91); 10. Heel of woman's or child's shoe (p. 91); 11. Kitchen knife blade (p. 86); 12. Tablespoon (p. 86); 13. Teaspoon (p. 86); 14. Kettle fragment (p. 86).

and 10 cm. wide. In the center of one end, presumably the top, is a round hole. There are also 11 tops and bottoms that would appear to be associated with type 1 cans. Cans similar to these have been recovered at Tikchik (VanStone, 1968b, pp. 297–298, pl. 9, 1). Crow Village (Oswalt and VanStone, 1967, p. 64), and Kijik (VanStone and Townsend, 1970, p. 118, pl. 21, 10–11). In the Crow Village report they were tentatively identified as having contained tobacco. This identification now seems doubtful in the light of informants' statements and a single recovered top for such a can which resembles the others but has a short threaded neck of lead which fits into the hole (Pl. 15, 6). There are, in addition, three lead screw caps which appear to fit this neck. The tops of two of these caps are decorated with a series of concentric circles, but the third has the letters "C.P.W. / S.F. CAL." in the center (Pl. 15, 6). The latter part of this inscription is clear enough and obviously indicates the place of manufacture — San Francisco, California. The first part of the inscription presumably indicates a company name. A similar cap with the inscription "HAZZARD'S POWDER" on the top was recovered from the Tikchik site (VanStone, 1968b, p. 305, pl. 10, 7). The author now feels that these cans contained gunpowder and that the inscription on the Tikchik cap as well as that on the Akulivikchuk specimen just described, refer to a powder company. Inconclusive information from a few elderly informants in the area adds some confirmation to this point of view.

Type 2. The rectangular lid or base of a meat can that most likely contained bacon or corned beef.

Type 3. A fragment of a single seam, straight-sided can of undetermined size, probably with a flat bottom. It had small lugs riveted to the rim for a wire handle. This pail-like can may have contained lard.

Type 4. Two sizes of flat, round can were recovered each with a tight-fitting lid. The smaller is 4.2 cm. (Pl. 15, 5) and the larger 6 cm. in diameter. Unfortunately, all specimens are very badly corroded and any inscriptions, if present, have been completely obliterated. It may be that the smaller can contained percussion caps, as its diameter is the same as that of a previously-described cap can lid cut and perforated for use as a pendant. The larger cans are similar in size to present-day snuff cans and may have contained that substance.

In addition to the metal artifacts just described, there are seven unidentified fragments, six of which appear to be of iron and one of

brass. One of the iron specimens is a rectangular bar 20.5 cm. long and 3 cm. wide with three regularly spaced, square holes along its length. There are also 41 unworked can fragments too small or badly corroded to be useful in reconstructing can types. They were recovered from all structures except house 2, the *kashgee*, and the single test trench.

Miscellaneous Materials

All the leather fragments from the Akulivikchuk site derive from commercially prepared cowhide. These include six fragments of knotted *leather strap* (Pl. 15, 4) and a small section of braided leather (Pl. 15, 9). Footwear is represented by the *heel of a man's shoe* (Pl. 15, 3) and two heel fragments of *women's or children's shoes* (Pl. 15, 10). The man's heel was fastened to the sole by means of a series of headless nails approximately 2.5 cm. in length which passed through the several sections of the heel into the sole.

The single textile fragment in the collection is of mill manufacture but is too small for positive identification with any particular type of garment. It is a heavy fragment of low quality broadcloth, napped on both sides, and may be part of a man's *overcoat*.

A badly decayed fragment of wood may be part of a *gun stock*. If so, it is from that part of the stock which runs along the underside of the barrel. In the center on one surface of the fragment and running its entire length is a narrow groove, possibly, if the identification is correct, for a ramrod.

A single *gun flint*, gray in color and measuring 25 by 22 mm., is of English manufacture (Pl. 15, 2). It is very badly worn and was presumably used in a trade gun with a large lock.

Continuity and Innovation

Akulivikchuk is the third nineteenth century Eskimo settlement in southwestern Alaska to have been excavated in the past seven years and the recovered traditional Eskimo artifacts from this site, along with those from Crow Village and Tikchik, are similar and well within the tradition of coastal Yuk culture. There are only five traditional artifact types in the Akulivikchuk collection (fishing ice pick, skin scraper made from a caribou metatarsal, composite harpoon head, flat grinding slab, stone "platter") that cannot be duplicated in collections from the other two sites; none of these is particularly diagnostic. Therefore, it is clear that when the inhabitants of Akulivikchuk and other Nushagak River settlements moved inland from the coast, they, like their counterparts on the Kuskokwim River to the north, drew upon the varied cultural inventory of the Bering Sea coast and simply emphasized those subsistence techniques compatible with an inland environment where fishing and land hunting were the primary means of livelihood (see VanStone, 1968b, p. 306).

Since the material culture of the Bering Sea coast has been well documented (see Kowta, n.d.; Nelson, 1899; Oswalt, 1952), no exhaustive comparative analysis of the Akulivikchuk traditional artifacts will be attempted here. Nevertheless, it is worth emphasizing that one of the more interesting things about the Akulivikchuk occupation is that in spite of its late date, there is considerable specific evidence of continuity with the past.

Recent interest in the historic period in southwestern Alaska has resulted in the excavation, to date, of 22 living structures (Crow Village—5, Tikchik—10, Akulivikchuk—7), a number sufficiently large to allow for some generalizations with reference to house construction in the late prehistoric and historic periods. The major characteristics and most consistent features of these houses are horizontal wall logs, roofs supported by four central posts, a central fireplace, and lateral sleeping benches. This type of house is widely distributed in both time and space throughout Alaska (see Giddings, 1952; pp. 11–19; 1961, p. 166; Simpson, 1875, p. 255; Collins, 1937, pp. 258–264; Lantis, 1946, p. 157). Other features that occur at all three of the

sites in the Kuskokwim–Nushagak region are tunnel floors that vary from a depth approximately the same as the house floor to lower than the floor, horizontal and vertical tunnel wall logs, entryrooms at the outer ends of the tunnels, and sheets of birch bark at the roof level.

It is interesting to note that in spite of this basic uniformity of house construction, a certain amount of variation nevertheless exists, perhaps reflecting construction materials available as well as the preferences of individual builders. For example, only half the 22 houses have entryrooms, and variation can also be noted in the location of benches and the type of wall construction in the tunnels. Akulivikchuk seems to show a greater variety of house forms than the other two sites, a fact that is clearly shown in the table of house construction features. This variation, however, occurs within very definite limits and it would seem that there was a consistent pattern to house construction throughout the entire period of Eskimo occupation in interior southwestern Alaska during the nineteenth and early twentieth centuries. In the Nushagak River region, such houses were in use until well into the 1920's.

The excavation of a *kashgee* at Akulivikchuk makes it desirable to say something of a preliminary nature concerning the construction of this type of structure in southwestern Alaska during the historic period. The total number excavated, however, is only three and they are sufficiently different to prevent all but the most tentative generalizations. Significant features which are shared by all three (see VanStone, 1968b, pp. 252–258) are benches on all four sides, a deep, fire-darkened center area, an entryroom, and perhaps cribbed roof construction. Other structural aspects exhibit considerable variation and it may be that the manner in which a *kashgee* was constructed depended to a large extent on the size its builders wished to make it and on its location. *Kashgee* 2 at Tikchik (VanStone, 1968b, fig. 18, pp. 255–258) appears to resemble the type most frequently described in the literature (see Zagoskin, 1967, p. 115; Swineford, 1898, pp. 164–166), although none of the descriptions by eye witnesses of ceremonies in *kashgees* is detailed with reference to structural features.

Turning to a consideration of the artifacts, continuity with the past displayed by traditional Eskimo stone working is perhaps one of the most notable characteristics of the collection from Akulivikchuk. Virtually absent, however, are examples of the chipping of flinty materials, a technique of implement manufacture reasonably

well represented in the Tikchik collection (VanStone, 1968b, pp. 265–266, pl. 1, 1–7). Polished stone implements for working wood and skin are particularly abundant, suggesting that metal equivalents were scarce even in a community located along the main trade route into the interior of southwestern Alaska.

The collection of bone and antler artifacts, also showing strong continuity with the past, is noteworthy primarily for the presence of two forms virtually unreported from other sites in the area. As noted earlier, composite harpoons of antler have not previously been reported from sites north of the Aleutian Islands. Unbarbed socketed projectile points, a typical Kodiak Island form, have, in addition to the Akulivikchuk examples, been found only at Tikchik where a single specimen was recovered. When the small number of excavated sites in interior southwestern Alaska is taken into consideration, it is perhaps surprising that more previously unreported forms were not recovered from the Crow Village, Tikchik, and Akulivikchuk sites. Indeed, one might expect in particular a strong influence from the more heavily populated regions to the south and east. Stone lamps, in addition to the socketed projectile points and composite harpoon heads, represent an impetus from this direction and it seems likely that additional forms from these areas will be reported as more sites are excavated.

It is possible to speculate that the influence of Kodiak Island and the Aleutians on coastal Yuk culture may have grown stronger during the late prehistoric and early historic periods. Such influences would then have spread rapidly up the rivers to the interior. The possibility of direct contact with Aleuts and Koniags with consequent borrowing cannot be ruled out either. Aleuts and creoles were frequently sent to the trading posts of southwestern Alaska by the Russian–American Company and they also accompanied explorers and traders on their trips to the interior. This would have given them an opportunity to transmit ideas and even actual artifacts to the villages where they visited and traded.

With reference to the unmodified bones recovered from the Akulivikchuk site, it must be admitted that the accompanying table of bone occurrences (Table 2) is not particularly revealing, either from a cultural standpoint or in terms of the animals utilized by the inhabitants. In retrospect, it appears to have been a mistake to fail to retain for study in the laboratory all bones that were recovered. Only those with at least one articular surface intact were collected.

TABLE 2.—Animal Bones Recovered from the Akulivikchuk Site.

	H-1	H-2	H-3	H-4	H-5	H-6	H-7	K	T-1
Beaver (*Castor canadensis*)									
cranium	2					1	1		
mandible	2	7		2		2	2	1	2
incisor		2	1	1	1	2			1
humerus	2	2			2			1	3
ulna	2	1							1
rib								1	4
pelvic bone	3	2			2	1			1
femur	1	1	1	1	2			4	2
tibia	1	2		3	1	2			5
Caribou (*Rangifer arcticus*)									
skull fragment							1		
mandible		1				1	5		
scapula	2	16	1	1		5	1		1
humerus	3	11		1	1	4		1	1
radius		4				2	1		
ulna		3	1		2	3	4		
carpal	2	3		2	5				
vertebra	5	8	1		1	4			
rib	1	4	1	2	3	13	1	1	2
pelvic bone		1							
femur	2	10	1	1	4	4			
tibia	9	23		1	5	4	3		1
tarsal	4	15		3	8	4	1	1	
metatarsal	1	9	1	2			2		
phalange		6	2		1	2	1		
Moose (*Alces alces*)									
mandible						3	1		
scapula	1	2							
humerus		1					1		
radius		1					1		
ulna		2							
femur	3	1							
tibia			1		1				
metatarsal						1			
Bear (*Ursus americanus*)									
scapula		1							
ulna	1					1			
Red fox (*Vulpes vulpes*)									
mandible		2				2	1		
Dog (*Canis familiaris*)									
mandible	1	5			1	4			
scapula	1								
humerus		4		1		3			
radius	1	2				2			
ulna	1	3				2			1
vertebra		2		1	1	9			
rib					2				
femur		1				2			
tibia	1	1		1		3			

Failure to save other bone fragments as well makes it difficult to interpret the material in culturally meaningful ways. Nevertheless, a few comments can be made.

As might be expected, caribou bones occur with greater frequency than those of any other animal and, in fact, make up the bulk of the unmodified bones collected. This is not surprising since, according to informants at Ekwok, caribou were plentiful in the area, more so 30 or 40 years ago than they are today. Moose, on the other hand, occur much more frequently in the Nushagak River region today than in the past and their number has been increasing steadily. Thus, only a small number of moose bones were recovered from the site. An interesting feature of those caribou bones of the upper and lower leg that were examined is that they appear to have been broken twice; at either end near the articular surface. The sharp edges of these breaks suggest that a hatchet or axe was used. Since other caribou bones are usually complete, it seems likely that the leg bones were split open to extract the marrow.

The bone list almost certainly does not give an accurate impression of the fur-bearing animals taken by the residents of Akulivikchuk. Only beaver bones are represented in significant numbers. We know from an examination of the records of the Russian–American Company and other sources that many other fur bearers were economically important to the Eskimos of the Nushagak River region during the nineteenth century (see VanStone, 1968b, p. 309). It is doubtful whether, in very many cases, the carcasses of trapped animals were brought to the village for skinning. A more convenient practice would have been to do the skinning in a trapping camp, bringing only the raw skins back to the settlement. The presence of beaver bones in relative abundance may indicate that this animal was trapped near the village, perhaps along the Kokwok River south of Akulivikchuk where trapping is good at the present time. In any case, it is certainly true that evidence of any kind for trapping by the residents of Akulivikchuk is negligible. This was also true of Tikchik and Crow Village. It has been noted that traditional trapping methods were preferred by the Eskimos of southwestern Alaska even after metal traps were available to them (Zagoskin, 1967, p. 221). Locally made snares, nets, and deadfalls would leave no trace in the archaeological record, at least at a site like Akulivikchuk where the preservation was poor. So we must assume that the residents of the settlement were as fully involved in the fur trade as

those of any other community in the general region even though specific evidence for this involvement is lacking.

In addition to the recovered bones shown in Table 2, four fragments of salt water clam shells (*Saxidomus muttalli giganteus*) were found in house 6.

Having noted those aspects of Eskimo culture at Akulivikchuk which demonstrate continuity with the past, we can now turn to a consideration of those indicating change induced by the contact situation. In previous studies dealing with nineteenth century archaeological sites in southwestern Alaska (see VanStone, 1968b, pp. 320–323; VanStone and Townsend, 1970, pp. 140–146) it has seemed advisable to follow the organization of a similar section in the report on Crow Village (Oswalt and VanStone, 1967, pp. 74–75). There it was pointed out that "in situations where innovations occur as a result of contact we would expect things new to arise from: (1) exotic objects introduced, accepted, and added to the cultural inventory without formal changes; (2) the availability of new materials permitting a change of existing forms; and (3) the construction of new forms based on new models. A very similar set of categories for considering artifacts that reflect processes of cultural change was developed by George I. Quimby with reference to the historic period in the western Great Lakes region (Quimby, 1966, pp. 9–11). Quimby includes additional categories in his scheme and they will be considered when relevant to the present discussion.

Concerning the first source of innovation, the artifact descriptions and trait list indicate the extent to which trade goods were acquired by the residents of Akulivikchuk and accepted into the cultural inventory without change. It is evident that the collection of trade goods from the site is not particularly impressive, either with reference to cultural categories or the number of specimens within these categories. In connection with a very similar assemblage of trade goods from Tikchik (VanStone, 1968b, pp. 320–321), the suggestion was made that it might not be representative of the number of trade items that were actually available to the people. At Crow Village (Oswalt and VanStone, 1967, p. 75), on the other hand, we believed that relatively few items were probably available, particularly during the Russian period.

In light of a comparison of all three sites, it now seems likely that the statement with reference to Crow Village is closer to the truth. Trait lists for the three sites show that approximately 35 separate

categories of unmodified trade goods were recovered at Akulivikchuk, 38 at Tikchik, and only 44 at Crow Village, in spite of the fact that preservation was far better there. Thus the similar traditional culture at all three sites would appear to have been subject to outside influence to about the same degree. This is noteworthy when it is realized that both Crow Village and Akulivikchuk are located along well-traveled, major waterways, while Tikchik must have been nearly as isolated as any settlement in interior southwestern Alaska. On the other hand, at the nearby Tanaina Indian settlement of Kijik on Lake Clark, more than 130 categories of trade goods were recovered. An explanation for this vast difference may be, as suggested elsewhere, that the Eskimos of the Nushagak and Kuskokwim river systems were strongly conservative when compared with the neighboring Tanaina who, already partially acculturated, may have moved into the Lake Clark area from Cook Inlet directly in response to the fur trade (VanStone and Townsend, 1970, pp. 145, 147, 176–191).

Although detailed inventories of trade goods for the Nushagak area are lacking for both the Russian and early American periods, we do know that at least by the turn of the century and probably somewhat earlier, a surprisingly large number of such goods of all kinds were available to Indians living within the sphere of influence of the Alaska Commercial Company post at Tyonek on Cook Inlet (see VanStone, 1968b, pp. 320–321; VanStone and Townsend, 1970, p. 141). There is no reason to believe that the Nushagak and Kuskokwim posts were not similarly stocked at that time. Be that as it may, the various posts almost certainly did not carry as great a variety of trade goods during the Russian period. In fact, it is quite likely that one of the outstanding features of the change-over from Russian to American control in Alaska was the much larger number of trade goods shipped to the Alaska posts by the San Francisco-based Alaska Commercial Company.

Some indication of the kinds of trade goods available and preferred at the very beginning of the American period is to be found in a list published in the *Alaska Herald* on February 1, 1869 (Vol. 1, no. 26). This list is said to comprise those

> articles most in demand by the inhabitants of Alaska and other places in the Arctic Ocean: Window Panes, Calico Stockings, Ladies' Shoes, Caps, Men's Hats, Bonnets, Woollen Scarfs, Muslin Ducking, Patent Leather Belts, Needles, Yarn for Stockings, Coato's Cotton, Confectionery, Russian Tobacco Leaves, Sea Biscuits, Pickled Cucumbers, Sauer Krout, Black California Caviar, Mustard, Ground Pepper, Common Buttons of all kinds, Loaf Sugar, finest quality of Black Tea, Rye Flour, Buckwheat

> Flour, Buckwheat Groots, and a small quantity of Wheat Flour, large quantity of Salt, Hickory Skirts, Dried Apples, Cutlery, Common Cotton, Red Handkerchiefs, Candles of Tallow, Blankets, Crockery, Ribbons of all kinds, Combs, Overalls, Cheese, Boots, Nails, Clocks, Stoves, Grates, Iron Hoops for Barrels.

This is an impressive inventory, but it should be noted that only a few of the objects mentioned would occur in an archaeological context.

In the inventories of the Tyonek post on Cook Inlet, canned goods do not make their appearance until 1879 and it is at about this time that a wide variety of hardware is also stocked (Alaska Commercial Company. Iliamna and Tyonek post trading and fur inventories. University of Alaska Archives.) By this time, however, Akulivikchuk may have been close to abandonment and although Crow Village and possibly Tikchik were occupied somewhat longer, it is likely that they had passed their peak of population and were in decline. In any case, the relative scarcity of trade goods in three nineteenth century sites in southwestern Alaska must surely indicate that throughout most of the period of occupation, the variety of objects offered to the Eskimos in trade was small.

One further point remains to be made with reference to our first category of innovation. Namely, that all the trade goods recovered at Akulivikchuk, with the exception of beads, were types that were made to be used by both white men and Eskimos. This is in contrast to many areas of North America where certain artifacts were made specifically for trade with Indians. It would appear that relatively few of this latter type of trade goods were used in the Alaska trade. Aside from beads, only the trade gun, an example of which was recovered at Tikchik (VanStone, 1968b, pp. 300–302), comes to mind. This does not mean, however, that there were not many items, particularly types of firearms, that were obsolete elsewhere but highly suitable for trade with the native peoples of Alaska.

The second category of innovation is of particular interest to us, involving as it does the introduction of new raw materials and their effect on the manufacture of traditional artifact types. Examples of this type of innovation are discussed below.

1. Scrapers made from bottle glass resemble those of flinty materials (Pl. 11, 2, 5). This use for an imported material was common throughout Alaska (Ackerman, 1965, p. 46; Oswalt and VanStone, 1967, p. 75; VanStone, 1968b, p. 284; VanStone and Townsend, 1970, p. 74).

2. The top of a can for percussion caps has been cut and pierced to be worn as a pendant (Pl. 12, 13). This is an understandable innovation when it is recalled that such metal would have been bright and shiny when first acquired and thus very attractive from the standpoint of personal adornment. Pendants made from imported metal have also been reported from the Tikchik and Kijik sites (Van Stone, 1968b, p. 287; VanStone and Townsend, 1970, pp. 71–72, p. 14, 2).

3. A metal sled shoe section is a counterpart of the traditional type made of whale bone or antler (Pl. 12, 16). Metal runners are used on Eskimo sleds in all parts of Alaska at the present time. The material has the advantage of being available in longer sections than antler or bone and such runners are much easier to construct.

4. Can metal folded into shallow, dish-like containers has proved to be extremely common in historic sites throughout southwestern Alaska (Oswalt and VanStone, 1967, p. 50; VanStone, 1968b, p. 287; VanStone and Townsend, 1970, p. 70, pl. 14, 16). The resemblance to folded birch bark baskets is readily apparent and it is clear that such baskets were used by the Akulivikchuk Eskimos (Pl. 11, 12).

5. Also widely reported are fragments of flattened can metal with holes around the edges. These have been identified as reinforcement pieces, possibly used to strengthen a cracked shaft or to repair wooden artifacts in a variety of ways (Oswalt and VanStone, 1967, p. 50; VanStone, 1968b, p. 288). Metal reinforcement pieces of this kind doubtless replaced strips of caribou or moose hide used in a similar manner. The added strength of the metal would seem to make this innovation extremely attractive.

6. A fragment of heavy metal worked to a point at one end has been identified as an awl (Pl. 12, 4). Such an implement clearly resembles in size and shape traditional awls made of bone or antler.

7. An unidentified fragment of ironstone china has been worked into a round shape for use as a labret (Pl. 11, 3). A pottery labret was also recovered at Crow Village (Oswalt and VanStone, 1967, p. 51) and the material might be expected to recommend itself as it is both light and relatively easy to work. It is perhaps noteworthy that no labrets of traditional materials have been recovered from any of the excavated sites in interior southwestern Alaska.

8. Rimfire cartridge cases were perforated at the proximal end and strung as bead separators. This innovation, which is reported at Crow Village, Tikchik, and Kijik (Oswalt and VanStone, 1967, p. 76; VanStone, 1968b, p. 287; VanStone and Townsend, 1970, p. 71,

pl. 14, 10) will doubtless prove to be widespread in Alaskan historical sites.

9. A lure-hook with an antler shank in a stylized fish shape has a bent nail in the distal end as a barb (Pl. 8, 10). Such a nail-barb has an obvious advantage over the antler or bone barbs that were presumably characteristic of such artifacts during the prehistoric period. Similar combinations involving antler shanks and nail-barbs occur in the Tikchik site (VanStone, 1968b, p. 274).

10. The use of a spent cartridge case to form the end of a blunt arrowhead represents only a slight modification of a traditional artifact (Pl. 12, 5). This form appears to be extremely common in historic sites throughout Alaska and has been recovered in historic levels at Hooper Bay Village (Oswalt, 1952, p. 53), from Crow Village (Oswalt and VanStone, 1967, p. 76), Tikchik (VanStone, 1968b, p. 285) and in the Tanaina Indian settlement of Kijik (VanStone and Townsend, 1970, pp. 68, 70, pl. 13, 6).

11. Ulu and end bladed knife blades cut from can metal (Pl. 12, 3, 6–7, 10, 14) are another form that has been widely reported in historic sites in southwestern Alaska (Oswalt and VanStone, 1967, p. 75; VanStone, 1968b, p. 285; VanStone and Townsend, 1970, p. 70, pl. 13, 1, 2, 7, 9, 11).

It is worth mentioning that numbers 8 through 11 would be included in a separate category by Quimby because they are made partly of local materials and partly from materials imported through trade (Quimby, 1966, p. 10). In the case of these Akulivikchuk specimens, the local materials are bone and antler handles, or, in the case of the blunt arrowheads, wooden shafts.

In a special but related category of innovation are side-bladed knife handles, the familiar Eskimo crooked knife with an antler or bone handle and metal blade (Pl. 12, 8, 9). This implement may not have appeared in Eskimo culture until the people had access to trade iron from Siberia to use for the characteristic form of curved blade. Such knives, which, of course, go back much further in Eskimo prehistory than any of the other artifacts discussed here, appear on St. Lawrence Island as early as the Punuk period (Collins, 1937, Pl. 78, 1–3). They are generally well distributed along the Alaska coast from Barter Island to Bristol Bay (Mathiassen, 1930, Pl. 5, 10; Murdoch, 1892, Fig. 118; Nelson, 1899, Pl. XXXVIII, Oswalt, 1952, p. 57; Larsen, 1950, Fig. 55, 5). The type also occurs in the Kobuk River region at Ambler Island, Kotzebue (1550 A.D.), and Ekseavik (Giddings, 1952, pp. 66, 68, 71; VanStone, 1955, p. 106).

12. The sides of an adz or skin scraper blade of metal have been folded over, presumably to strengthen the blade (Pl. 12, 17). A similar artifact was recovered at Crow Village (Oswalt and VanStone, 1967, p. 50). Quimby places such artifacts in a separate category of change because they are not only modified by the substitution of an imported material (metal instead of the traditional stone in this case), but involve "a different technological principle to achieve a similar end product" (Quimby, 1966, p. 11).

Turning to the third category of innovation mentioned above, that of new forms based on new models, there is only one example of an attempt by the Eskimos at Akulivikchuk to produce a non-Eskimo artifact locally. These are sandstone bullet molds, a type that has also been recovered from the Crow Village and Kijik sites (Oswalt and VanStone, 1967, p. 76; VanStone and Townsend, 1970, p. 62, pl. 11, 2). This is another of the forms that is likely to be very common in sites of the historic period throughout Alaska.

The specifics of innovation that we have been discussing in this chapter are interesting because they indicate the response of Akulivikchuk Eskimos to the items of material culture that were introduced as a result of European contact. It has been noted elsewhere that the people living at the Tikchik site exhibited a cautious approach to things new. This also seems to have been true of the residents of Akulivikchuk, but it is rather more surprising here because the latter settlement was not only much closer to the trading post at the mouth of the Nushagak River, but was on a major and direct trade route into the interior of southwestern Alaska. Like Tikchik and Crow Village, the collection of artifacts from Akulivikchuk indicates more than anything else, a basic continuity with emphasis on the retention of traditional forms. The fact that the village was less than 100 miles from the most important center of contact intensity in all southwestern Alaska, appears to have mattered very little indeed.

Interpretations and Conclusions

Occupation of the Akulivikchuk site apparently encompassed most of the nineteenth century. Since trade goods were found in all structures and the test trench, it can be assumed that there was at least indirect historic contact during the earliest stages of occupation. We have noted that historical source materials referring directly to Akulivikchuk are scanty and it should be clear from the preceding chapters that not a great deal has been learned concerning the specifics of Russian and American influence on the settlement through a study of the collected artifacts. These regrettable gaps put severe restrictions on our interpretation of the occupation at Akulivikchuk and force us to fall back on rather broad generalizations concerning life in the middle Nushagak River region in the nineteenth century.

Specific historical information concerning Akulivikchuk has been summarized in an earlier chapter and detailed treatment of the history of the general area under discussion will be found elsewhere (see VanStone, 1967, chapters I–III; 1968b, pp. 324–340). Here we need only repeat that although the residents of Akulivikchuk must have had contact with the Russians from virtually the very beginning of the latter's penetration into southwestern Alaska, it has been impossible to isolate tangible manifestations of the Russian presence in the collection from the site. As at Crow Village, Tikchik, and Kijik, there was no recognizable stratigraphic division between the Russian and American periods of influence at Akulivikchuk.

Aside from the fact that it may be unreasonable to expect meaningful stratigraphy in sites where the occupation is so short, it is also possible that by the time of the expansion of their influence into interior southwestern Alaska, the Russians were obtaining a large proportion of their trade goods from non-Russian sources. When Baron F. P. von Wrangell became General Manager of the Company in 1830, he immediately set about trying to lower prices on the goods that were traded to the Indians and Eskimos of Alaska. Wrangell found means of purchasing many goods in European countries thus bring-

ing down the price on items that had previously been shipped from Russia around the world to Sitka (Tikhmenev, 1939–40, chapter XX, footnote 52).

Although it has been possible to make only a few explicit statements concerning the changing material culture of Akulivikchuk Eskimos, we can say something about shifting settlement patterns in the immediate vicinity of the village. This information, based partly on historical sources and partly on my surveys, indicates that throughout the period under discussion, there was a definite center of population in the middle Nushagak River region (see VanStone, 1967, pp. 114–115).

Between 1800 and 1860, for example, there were probably only three settlements along the entire Nushagak River south of the mouth of the Nuyakuk. All three were in the central river sector; Agivavik south of the present community of New Stuyahok, Kokwok at the mouth of the river of that name, and Akulivikchuk. All are located on the high, western bank of the river (see Fig. 2). No population figures are available for any of these villages during this period, but on the evidence of the sites alone, a reasonable estimate might be 300 people for all three. This would not be inconsistent with Vasiliev's estimate of 400 for the entire river exclusive of Nushagak Bay in 1829 (quoted in Zagoskin, 1967, p. 308).

Between 1860 and 1890 new settlements appeared, but the continuity of the middle river population was not altered. There were three small villages north of Akulivikchuk. One of these, Akokpak, had a population of nine in 1890 (Porter, 1893, p. 164) but for the other two, Elilakok and Tunravik, there are no references in the sources. It is unlikely, however, that more than 100 people ever occupied these three villages. In the Kokwok–Akulivikchuk area there were important shifts in population during this period. Agivavik had a population of 47 in 1879 (Bailey, 1880, pp. 26–27) and 30 in 1890 (Porter, 1893, pp. 5, 164). It probably was abandoned sometime during the first decade of the present century, perhaps at the time of the influenza and measles epidemic of 1899–1900 which spelled the end of so many Eskimo villages in southwestern Alaska. As previously mentioned, Akulivikchuk had a population of 72 in 1880 (Petroff, 1884, p. 17), and there is some question as to whether the village is listed in the eleventh federal census of 1890. At any rate, we have noted that the last residents are said to have moved downriver to Kokwok, which at this time was also in a decided decline. During our period of interest, Kokwok had a population of

83 in 1879 (Bailey, 1880, pp. 26–27), 104 in 1880 (Petroff, 1884, p. 17), 145 in 1881 (DRHA, vol. 2, p. 144), 46 in 1890 (Porter, 1893, pp. 5, 164), and 106 in 1898 (Elliott, 1900, p. 740). The marked variation in these figures almost certainly reflects seasonal movements of people and the fact that census figures were not collected at the same time of the year in each case. Toward the close of the century, Ekwok, with a population of 79 in 1898 (Elliott, 1900, p. 740), began to emerge as the most important settlement along the middle river. On the basis of these population estimates, it is conceivable that there were as many as 250 people living in the middle river region during this period.

It will be noted that Akulivikchuk was one of a group of settlements in close proximity to one another. Probably at no time was it the largest village in the area and it may not have been the oldest either. Agivavik is the only settlement along the middle river that seems to have had a prehistoric component. It is perhaps possible to discern a pattern of population movement in the area with Agivavik declining at the expense of Akulivikchuk and Kokwok. The latter eventually gave way to Ekwok which then became the only settlement along the middle river until the much later establishment of New Stuyahok. Although a number of factors may have been responsible for these shifts, it is difficult not to attribute the major cause of population coalescence to a succession of large and small epidemics with their attendant periods of starvation. Although we have noted that possibly as many as 250 people occupied the middle river settlements between 1860 and 1890, it is virtually certain that the number had declined to not more than 100 by 1910.

In a previous publication (VanStone, 1967, chapter VII) I have described the settlement pattern of the Nushagak River region in some detail. Although not specifically stated there, this pattern is obviously of the Central-Based Wandering type, a configuration involving communities which spend part of each year wandering and the rest at settlements to which they may return consistently in future years (Beardsley et al., 1956, p. 138). The nineteenth century Nushagak River Eskimos spent the winter months in their permanent villages along the river and in spring moved to temporary camps along streams in the mountainous country of the interior. There they engaged in hunting and trapping, returning to the river in early summer to fish for salmon. In the latter part of the summer when the fish runs were nearly over the men alone moved to the inte-

rior leaving the women to watch over the full fish caches. Interior hunting and trapping would continue until the first snowfall in October at which time the men would return once more to the winter villages.

There is some indication that this pattern was modified to some extent at villages deep in the interior like Tikchik. Informants have suggested that in this settlement the hunters and trappers left their families at the village all or most of the time and returned frequently. Such a pattern was said to have been possible because good hunting and trapping areas existed within a short distance of the settlement (VanStone, 1968b, p. 337).

The above-mentioned Central-Based Wandering type of settlement pattern for the Nushagak River need not, of course, reflect the situation in strictly aboriginal times. Trapping was added to the subsistence cycle at the time of earliest contact and this doubtless resulted in considerable modifications in the seasonal activities of the inhabitants. At the present time it is impossible to reconstruct life in the area during the pre-contact period, but one suspects that along the middle river at least, the effect of a trapping-trading economy on the settlement pattern may have been minimal. It seems probable that the aboriginal inhabitants had to be fairly mobile in order to hunt effectively in their area. On the other hand, the existence of a stable and predictable supply of fish removed a good deal of the uncertainty from subsistence and must have allowed for permanent villages along the river then as it did at a later time. And yet there are few indications today that such villages existed in the prehistoric period. As noted in the preface, I conducted extensive surveys along the Nushagak and its tributaries during the summers of 1964 through 1967 and located 58 sites. It is probable that fewer than five of these have a prehistoric component and only one clearly prehistoric site was found. It should be emphasized, however, that the nature of the vegetation in this region is not conducive to the discovery of very old sites. Tree growth and ground cover is heavy along the riverbanks and on the basis of the appearance of known historic sites, I have estimated that they could become completely overgrown in no more than 200 years after abandonment. In any case, it is difficult to imagine a settlement pattern in the pre-contact period, at any rate in recent prehistoric times, that was radically different from the one in the early nineteenth century.

The advent of a trapping-trading economy in the Nushagak River region may have had a minimal effect on the settlement pattern of

the area, at least when compared with the effect of the later commercial fishing industry. However, it certainly would have brought about changes in the seasonal movements of people. This would have been particularly true during the early summer when the Eskimos of Akulivikchuk and other river communities visited Aleksandrovski Redoubt to trade their furs and obtain supplies. Some may have also remained in the bay area for a period of time to fish and to trade products of the interior with coastal peoples for such things as seal oil and walrus ivory. The residents of Akulivikchuk, living fairly close to the mouth of the river, may very well have made such trips at more frequent intervals throughout the year. On the other hand, it is also likely that representatives of the trading post visited the village from time to time to trade for furs. However, these trips may have been relatively infrequent once the trade was well established. The Russian–American Company, and later the Alaska Commercial Company, enjoyed a monopoly in the area and would not have had to be concerned about the necessity of reaching the villages before the agents of other trading companies.

It is probably true that after the advent of commercial salmon fishing in Bristol Bay in the last decade of the nineteenth century, the Eskimos of the Nushagak River villages spent more time at the coast in the hope of obtaining employment in or largesse from the canneries. It was the introduction of this economic activity that had the most drastic effect on settlement patterns throughout the area and resulted in the coalescence of population and abandonment of some of the smaller communities. However, by this time Akulivikchuk was already completely abandoned or nearly so.

If the settlement pattern in the middle Nushagak region can be characterized as Central-Based Wandering, then the size of the permanent base will depend to some extent on the mobility of the inhabitants. In other words, the greater the area that is exploited by the residents of a community like Akulivikchuk, the greater the number of people who can make their homes in the permanent settlement. We have already noted that there were, in addition to Akulivikchuk, two other sizeable settlements in the middle river region throughout most of the nineteenth century. Although there is no reason to believe that the hunting and trapping areas utilized by these three communities did not overlap, the fact remains that the proximity of these villages must have had some bearing on their size. As we have noted earlier, Akulivikchuk was not a large village. The only certain population figure for the community is the 72 inhabitants men-

tioned in the tenth federal census (Petroff, 1884, p. 17). If all the houses were occupied at the time the census data were collected, this would be an average of approximately ten persons per house which, considering the size of the structures, seems reasonable.

One might normally presume that even in a settlement where people lived for less than 100 years, not all the structures would have been occupied simultaneously. Yet, on the basis of the collections, virtually nothing can be determined with reference to the chronological relationship of the seven house pits to each other. There are only six trade items in the entire collection that can be dated with any degree of certainty. These include three fragments of pottery with maker's marks and three metallic cartridge cases. Each one of these items was recovered from a different structure. As noted earlier, it was possible to assign very approximate dates to six Akulivikchuk pottery types on the basis of their occurrence in Oswalt's stratigraphic sequence at Kolmakovski. It is unfortunate, however, that only 22 sherds are involved and these are spread evenly throughout the structures and midden.

The percentage of trade goods to aboriginal artifacts in the individual houses is not particularly revealing either. By far the greatest number of trade items are beads and crockery fragments. In fact, excluding these materials, there are only 138 additional trade objects in the entire collection. It is clear that a much larger collection of datable artifacts of European manufacture is needed before such a collection can be helpful in answering chronological questions with reference to the occupation of specific structures. Size of the collection is not sufficient (see VanStone and Townsend, 1970, p. 162) and the manner in which the objects are distributed throughout the various structures is very important, too. In other words, it is likely that only under the most ideal circumstances will a collection of dated artifacts be useful for determining the chronological relationship of individual structures on a site. Such an ideal collection, which has yet to be recovered from any Eskimo or Indian site in southwestern Alaska, is most likely to be obtained through excavation of a European trading settlement in the area.

In previous publications dealing with historic Eskimo settlements in the general area under discussion, attempts have been made to consider the sites in terms of Louis Giddings' Arctic Woodland Culture (Giddings, 1952; see Oswalt and VanStone, 1967; VanStone, 1968b). This has seemed essential not only because of the various environmental parallels between the two areas (see Giddings, 1952,

p. 115), but because it appeared unwise to ignore the only other compendium of information available on the subject of riverine Eskimo archaeology.

Tikchik, Crow Village, and Akulivikchuk exhibit all the characteristics of a riverine Eskimo configuration. One might expect that of the three, Akulivikchuk would show stronger ties with the coast, but this is not the case. We can be certain that the presence of the Nushagak post drew the residents of Akulivikchuk to Nushagak Bay at least once a year and that while they were there, they traded for coastal products. And yet, as at Crow Village and Tikchik, coastal subsistence techniques are not reflected in the recovered material culture from the site. This would seem to indicate that, unlike the Kobuk River Eskimos, those of the interior Nushagak villages did not actually take part to any great extent, aside perhaps from fishing, in the various coastal subsistence activities. They only traded with their coastal neighbors for the products of such activities.

Another significant factor here may be that coastal sea mammal hunting was not well developed even among those residents in the settlements around the shores of Nushagak Bay. Like those of the river villages, these people were also strongly inland oriented even though they exploited to a limited extent the more varied environment of their area. Thus, inhabitants of the Nushagak River region and, to a lesser extent perhaps, the Kuskokwim, were more truly an inland people than those of the Kobuk and Noatak drainages. At the very least it can be said with certainty that settlements along the middle Nushagak like Akulivikchuk apparently had no closer coastal ties than upriver villages like Tikchik.

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Appendix

APPENDIX.—Akulivikchuk trait list with items in the sequence of the text descriptions.

Item	Location								
	H-1	H-2	H-3	H-4	H-5	H-6	H-7	K	T-1
LOCALLY MANUFACTURED									
CHIPPED AND GROUND STONE									
Chert nodule		1							
Chert flake		2	1	1		1			3
Chalcedony flake				1		2			1
Snub-nosed scraper, chalcedony (Pl. 1, 13)			1						
End scraper blade, chert (Pl. 1, 12)						1			
Projectile point tip, chert (Pl. 1, 10)		1							
Hammerstone, basalt		1							
Whetstone									
Type 1 (Pl. 1, 4)	1				1				
Type 2 (Pl. 1, 2–3)	1	1		1		2			2
Type 3 (Pl. 1, 1, 5–9, 11, 14–16; Pl. 2, 12)	5	7	2	2	1	4	4		6
Grinding slab, sandstone		1		1	1	2	2	1	3
End blade, slate									
Fragment, tip, hollow-ground groove (Pl. 2, 2, 5–6, 9)	2								2
Fragment, tip, flat				1			1		2
Fragment, center section, hollow-ground groove								2	
Complete, unfinished (Pl. 2, 4)									1
End blade blank, slate (Pl. 2, 1, 3, 7–8)	2					4	2		7
Ulu blade fragment, slate (Pl. 2, 10–11)		1				2		1	4
Ulu blade blank, slate (Pl. 2, 13–14)						1		3	1
Scraper or planing adz blade									
Type 1 (Pl. 3, 1–3, 5–7, 9–12, 13–14)	2	3		3	1	5		6	14
Type 2 (Pl. 3, 4, 8)				1	2	1		2	7

APPENDIX.—Akulivikchuk trait list with items in the sequence of the text descriptions.—*Continued*

Item	Location								
	H-1	H-2	H-3	H-4	H-5	H-6	H-7	K	T-1
Type 3 (Pl. 4, 1, 3–4, 8)		1			1	2			
Type 4 (Pl. 4, 5, 9)			1						1
Scraper or adz blade blank									
Type 1 (Pl. 4, 2, 7, 11, 13)	2	2	2	1	2	1		5	2
Type 2 (Pl. 4, 10)									5
Type 3 (Pl. 4, 6, 12)								1	1
Type 4 (Pl. 5, 6)		1							
Splitting adz head, fragment, basalt (Pl. 5, 7)		2							1
Unfinished (Pl. 5, 9)		1							
Wedge (?), basalt (Pl. 5, 8)							1		
Mortar, grinder, or palette (Pl. 5, 1–3; Pl. 6, 1–7)	2	8	3	4	1	2	1		
Platter (?)	1								
Lamp									
Complete, sandstone (Pl. 7, 2)			1						
Fragment, metamorphic rock (Pl. 7, 1)				1					
Bullet mold (Pl. 5, 4–5)	1					1			1
BONE AND ANTLER									
Net weights									
Complete, antler (Pl. 8, 15)	3				3	2		1	
Complete, bone (Pl. 8, 13)						1			
Fragmentary, antler (Pl. 8, 14)									3
Unfinished, antler			1						
Lure-hook, antler (Pl. 8, 10)			1						
Salmon harpoon socket piece, bone (Pl. 8, 4, 11)					1	2			
Fishing ice pick, antler (Pl. 8, 1–3)	1			2		2		1	
Salmon harpoon dart head, antler									
Type 1 (Pl. 8, 5, 7–8, 12)	1	1			4	1		1	1
Type 2 (Pl. 8, 9)	1	2			1				1
Type 3 (Pl. 8, 6)			1						

APPENDIX Akulivikchuk trait list with items in the sequence of the text descriptions.—*Continued*

Item	Location								
	H-1	H-2	H-3	H-4	H-5	H-6	H-7	K	T-1
Fish spear side prong, antler (Pl. 9, 3)							1		1
Fish spear center prong, antler									
Shoulderless (Pl. 9, 4)					1				
Socketed (Pl. 9, 2)				1					
Fish spear point, antler (Pl. 9, 1)	1								
Composite harpoon head, antler									
Finished half (Pl. 9, 5–7)	1				2				1
Unfinished half	1			1					
Mesh gauge, antler									
Complete (Pl. 9, 19–20)		1		1					
Fragment									1
Arrowhead fragment, antler (Pl. 9, 15)				2		1		1	
Unbarbed, socketed projectile point, antler									
Type 1 (Pl. 9, 10, 13–14)	1		1			1			
Type 2 (Pl. 9, 8, 11–12)			1	1		1			
Blunt arrowhead, unfinished, antler (Pl. 9, 9, 16–17)	1	1				1	1		1
Splitting wedge, antler									
Complete (Pl. 9, 18; Pl. 10, 11–12, 15)	3		3	2	3	5	1	3	5
Fragment							1	2	2
Skin scraper, bone (Pl. 10, 16)				1					
Awl									
Antler (Pl. 10, 10)		1		1		1			
Bone (Pl. 10, 4–5)					1	1			1
Crooked knife handle, bone (Pl. 10, 6–7)						1		1	
Engraving tool handle, antler (Pl. 10, 8)								1	
Adz head, antler (Pl. 10, 13)								1	
Spoon, antler									
Complete (Pl. 10, 14)	1								
Fragment (Pl. 10, 9)				1					1

APPENDIX.—Akulivikchuk trait list with items in the sequence of the text descriptions.—*Continued*

Item	Location								
	H-1	H-2	H-3	H-4	H-5	H-6	H-7	K	T-1
Storyknife, antler (Pl. 10, 1)		1			1				
Sled shoe section									
Antler (Pl. 11, 6–7)	1				1	2	2		3
Bone (Pl. 11, 1)	2				2		2		10
Kayak shoe section, antler (Pl. 11, 8)	1								
Bear tooth pendant (Pl. 10, 2)									1
Unidentified object, antler (Pl. 10, 3; Pl. 11, 9)					1				1
Cut antler fragment	11	4	6	3	5	13	5	46	195
Cut bone	212	303	31	37	59	195	120	28	88
CLAY									
Potsherds		1	1						
Lamp fragment (Pl. 11, 10)		2		2		6	2		
BARK									
Birch bark basket fragment (Pl. 11, 12–13)		9	20			3			1
Net float, cottonwood bark (Pl. 11, 11)				1					1
GLASS									
Bottle glass scraper (Pl. 11, 2, 5)				2		1			
Chipped fragment of window glass				1					
WOOD									
Unidentified object (Pl. 12, 1–2)									2
NON-ESKIMO POTTERY									
Sherd with drilled hole (Pl. 11, 4)								1	
Labret (Pl. 11, 3)								1	
METAL									
Blunt arrowhead (Pl. 12, 5)						2			

APPENDIX.—Akulivikchuk trait list with items in the sequence of the text descriptions.—*Continued*

Item	Location H-1	H-2	H-3	H-4	H-5	H-6	H-7	K	T-1
Musket ball (Pl. 12, 11)								1	1
Fragment of melted lead				1					
End bladed knife blade									
Complete (Pl. 12, 3, 7, 10)	2				1	1			
Unfinished						1			
Ulu blade (Pl. 12, 6, 14)	2		1			1			
Crooked knife blade (Pl. 12, 8–9)	1	2		1		2			
Adz or scraper blade (Pl. 12, 17–18)						1	1		
Awl (Pl. 12, 4)						1			
Fragmentary metal dish	1		1	1					
Scoop (Pl. 12, 15)			1						1
Pothook			1						
Sled shoe section									
Complete (?) (Pl. 12, 16)					1				
Unfinished (?)	1			1		2			
Cartridge drilled for bead separator			1		1	2			
Pendant (Pl. 12, 13)						1			
Reinforcement piece (Pl. 12, 12)	2		1			2			
Sieve (?)						1			
Cut can fragment	13	1	1	2	1	10		3	20
Fragment of cut heavy metal	4	2		4	1	1		3	3
Cut metal rod fragment	1		3			3		2	1
Fragment of cut brass		1				4			
IMPORTED MANUFACTURED NON-ESKIMO POTTERY									
Plain white, undecorated	30	1	19	18	17	20	4	2	8
Transfer Prints									
Brown and blue "willow" ware (Type 1) (Pl. 13, 1)			9					5	

APPENDIX.—Akulivikchuk trait list with items in the sequence of the text descriptions.—*Continued*

Item	Location H-1	H-2	H-3	H-4	H-5	H-6	H-7	K	T-1
Flow blue (Type 2) (Pl. 13, 2)	2		2						
Blue and white geometric band (Type 3a) (Pl. 13, 3)				1				1	
Brown, green floral (Type 3b,c,d) (Pl. 13, 4–5, 8)			1			1			1
Black pictorial (Type 3e) (Pl. 13, 11)									1
Blue floral (Type 3f) (Pl. 13, 7)	1		2				1		
Blue floral, stylized (Type 3g) (Pl. 13, 18)								1	
Hand Painted									
Floral design in red, green, blue and purple, (Type 4a–d) (Pl. 13, 9, 12, 14, 25)	28		11	18	12	31		7	8
Purple lines, brown flower (?) (Type 4e) (Pl. 13, 16)			1						
Hand Painted and Stamped									
Blue undulating line and purple circles (Type 5) (Pl. 13, 15)	4								
Blue and green leaves, purple flowers (Type 6a) (Pl. 13, 13)			1			1			
Green leaves, red flowers (Type 6b) (Pl. 13, 6)	1					1			
Broad blue band, red flowers (Type 6c) (Pl. 13, 20)	1								
Stamped									
Green flowers (Type 7) (Pl. 13, 21)			3	2	3	4			1
Green and red leaves (Type 8) (Pl. 13, 26)	1		1			1			1
Red fleur-de-lis with red, brown, or green crosses (Type 9) (Pl. 13, 22–24)			2		2	4			
Blue flowers (Type 10) (Pl. 13, 17)						2		1	1
Purple flowers and green ovals (Type 11) (Pl. 13, 27)			1			4			
Red leaves (Type 12a) (Pl. 13, 19)						3			
Green leaves (Type 12b) (Pl. 13, 10)		1							
Unidentified Decorated Fragments			3	1		3		1	1
GLASS									
Button, 4-hole, white (Pl. 14, 14–15)	2					1			2
Button, 4-hole, colored (Pl. 14, 12)			1			1			
Window glass fragment				2		2			3

APPENDIX.—Akulivikchuk trait list with items in the sequence of the text descriptions.—*Continued*

Item	Location H-1	H-2	H-3	H-4	H-5	H-6	H-7	K	T-1
Bottle									
Patent medicine, fragment				2		2			
Fragment	11	6	3	16	5	7			2
Drinking glass fragment					1	1			
Bead									
White	32	81	15	7	59	117	20	6	23
Blue (Pl. 14, 13)	8	26	2	1	73	21	9	1	4
Black		1			15				
Green	1	2					1		
Brown-lined red	1	1				2			
White-lined red			1			1			
Polychrome	1					1			
Blue faceted							1		
Clear						1			
Red							1		
White, painted						1			
METAL									
Nail									
Square cut (Pl. 14, 9)									1
Fragmentary, unidentified					1				3
Cut spike, fragmentary (Pl. 14, 1)	1					1			2
Planing adz blade (Pl. 14, 16)	1			1	1				
Planing adz blade fragment							1		
File fragment (Pl. 14, 3)			1						
Saw blade fragment						2			
Drill bit (?) (Pl. 14, 8)						1			
Iron ring (Pl. 14, 7)						1			
Trap jaw fragment (Pl. 14, 10)	1								
Pendant (Pl. 14, 6)		1							
Cast iron kettle fragment (Pl. 14, 17; Pl. 15, 14)	5		1						

APPENDIX.—Akulivikchuk trait list with items in the sequence of the text descriptions.—*Continued*

Item	Location H-1	H-2	H-3	H-4	H-5	H-6	H-7	K	T-1
Lug for kettle handle (Pl. 14, 2, 4–5)		1				2			1
Kettle handle (?), copper or brass (Pl. 14, 11)				1					
Tablespoon (Pl. 15, 12)		1							
Tablespoon fragment						1			
Teaspoon (Pl. 15, 13)						1			
Kitchen knife fragment (Pl. 15, 11)	1								
Scissors (Pl. 15, 7)	1								
Scissors fragment			1						
44 Henry rimfire cartridge		1							
Percussion cap			2						
Fragment of bar lead (Pl. 15, 1)	1								
Brass crucifix (Pl. 15, 8)								1	
Cans and Identifiable Fragments									
Type 1 (Pl. 15, 6)	1			1	3	6			1
Type 2			1						
Type 3	1								
Type 4 (Pl. 15, 5)	2			1	1	1			
Lead screw cap (Pl. 15, 6)	1			2					
Unidentified iron and brass fragments	1	1			1		2	1	1
Unworked can fragments	15		3	6	4	12	1		
MISCELLANEOUS MATERIALS									
Knotted leather strap fragment (Pl. 15, 4)						5	1		
Braided leather fragment (Pl. 15, 9)						1			
Heel of man's shoe (Pl. 15, 3)			1						
Heel fragment of woman's or child's shoe (Pl. 15, 10)			1						1
Broadcloth fragment						1			
Gun stock fragment (?), wood	1								
Gun flint (Pl. 15, 2)		1							

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