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## ORIGIN OF THE "CHIEF'S COPPER" OR "TINNEH"<sup>1</sup>

by

E. L. KEITHAHN

The *chief's copper* or *tinneh* is a shield-shaped object roughly a yard long, two feet wide at one end and a foot wide at the other. The metal in it is from  $\frac{1}{16}$ " to  $\frac{1}{8}$ " thick, sometimes hammered to a slightly greater thickness on the edges. Smaller replicas, generally under 10" in length were made of thinner plate. These were sewed on ceremonial robes and were known as "blanket tinnehs." Small holes drilled along their edges attest to this usage. Some tinnehs bear designs that have been scratched in a black coating said to have been derived in some instances at least from smoking in a spruce gum fire. Others were painted black, the paint outlining the design which appears in burnished copper. Some had engraved designs mostly in the conventional Northwest Coast style and some ignored the style. In all cases, without exception, the tinnehs bore an elevated "T" cross, the vertical portion of which the Indians refer to as the "backbone" along the sides of which some bear conventionalized rib symbols.

The tinneh was first brought to the attention of the world by Capt. Urey Lisiansky who, in Sitka in 1804, described one as follows, "Mr. Baranoff brought with him also two other curiosities: one of which was a thin plate, made of virgin copper, found on the Copper River, to the north of Sitca (sic) (Plate I, Fig. f): it was three feet in length, and twenty-two inches in breadth at one end, and eleven inches at the other, and on one side various figures were painted. These plates are only possessed by the rich, who give for one of them from twenty to thirty sea otter skins. They are carried by the servants before their master on different occasions of ceremony, and are beaten upon, so as to serve as a musical instrument. The value of the plate depends, it seems, in its being of virgin copper: for the common ones do not bear a higher price than a single skin. . . ." (Lisiansky, 1814:150)

In any attempt to establish the origin of the tinneh, Lisiansky's description is most valuable. In the first place, since it was a curiosity to Baranof who had established himself at Old Sitka in 1799, it eliminates the Russians as the originators and also as counterfeiters at least to 1804. It would seem to eliminate the Sitka Tlingit also, since they were trading 20 to 30 sea-otter pelts for one. Only European traders were avidly collecting sea-otter pelts and for 30 years prior to the establishment of the Russians at New Archangel the Northwest Coast seasonally swarmed with traders from Mexico, Spain, England, Bengal, France, and the infant United States.

<sup>1</sup> This paper was read at the 13th Alaskan Science Conference, Juneau, August 25, 1962.



Plate I. Smithsonian Institution Museum of Natural History.

On their own testimony, one can eliminate most of these traders as the manufacturers of the chief's copper, although several no doubt had a hand in its transition from the prototype to its later standardized form. LaPerouse, in discussing iron daggers seen in the hands of the Tlingit at Lituya Bay in 1786 said, "Some of them were also made of copper but they did not appear to prefer them to others. This last metal is common enough among them, they more particularly use it for collars, bracelets and different other ornaments; they also tip the points of their arrows with it. . . ." (LaPerouse, 1798).

Had he seen tinnehs there at that time which was 18 years before Lisiansky



Plate II. Denver Art Museum.





Plate III. Museum of Anthropology, University of British Columbia.

had been shown one as a curiosity at Sitka, he surely would have mentioned it. However, he obviously saw none and traded none although his own trade goods included "sheets of copper" (*Ibid.*:).

Capt. John Meares on the *Felice* out of Bengal, with a crew of 50 men comprising artificers, Chinese smiths, and carpenters as well as European artisans (Begg, 1894:28) claimed to have bought Friendly Cove from Maquilla (sic) in 1788 for eight or 10 sheets of copper and some trifling articles. (*Ibid.*:56). He had wintered the year before (1787) in Prince William Sound and reported seeing no copper there. But at Nootka he said: "The pure, malleable lumps of copper ore seen in the possession of the natives convince us that there are mines of the metal in the vicinity of this part of the Western Coast. We once saw a piece of it, which appeared to weigh a pound, through which a hole had been perforated sufficiently large for a handle to pass, in order to make a kind of hammer. On enquiring of the man in whose possession it was, from whence he procured it, he made us understand that he received it in barter from some of the native peoples who lived more to the Northward. . ." (*Ibid.*:33).

Here, again, we have a trader interested in the presence of native copper, who was trading in sheet copper and had Chinese smiths and other artisans aboard, who makes no mention of chief's coppers. These must have been in use before his time judging from the great demand there was for sheet copper for which there seems to have been no other use among the natives.

Cecil Jane in his translation of Espinosa's account of Galiano and Valdes in their journey on the *Sutil* and *Mexicana* in 1792 states "The rate of barter which we were able to arrange was a sheet of copper of 14# for two skins, one good and the other moderate (Jane, 1930:83)." He adds (*Ibid.*:90) "we were unable to satisfy our curiosity concerning the use to which they proposed to put the great quantities of copper which they were acquiring; they used little of it for purposes of personal adornment while they received a great deal in exchange for skins from the ships which engage in this trade."

Galiano and Valdes were not actually trading, being rather on an exploring mission and were well aware that had they wanted sea otter skins they could get them much cheaper in San Francisco Bay. They purchased merely what the natives brought to them unsolicited in order to please them and thereby maintain peaceful relations. But in what trade they did engage in they demonstrated that as early as 1792 the market for sheet copper was becoming glutted and the price at Nootka had already fallen drastically.

According to Phillips in *The Fur Trade* (Vol. II, 1961:51), Capt. Gray of the American frigate *Columbia* was sent back to the Northwest Coast in 1790 with a cargo selected with a knowledge of what the Indians wanted. It included 143 sheets of copper. While Galiano and Valdes were at Nootka word came that a ship had attacked an Indian village nearby killing seven men and wounding others and robbing the rest of their sea otter skins. Strong evidence pointed to Capt. Gray and the *Columbia*. When he arrived at the



Plate IV. Museum of Anthropology, University of British Columbia.



Plate V. University Museum, Philadelphia.





Plate VI. Museum of Anthropology, University of British Columbia.

village to trade he found the Indians had raised the price on their furs where he stood to lose heavily on his cargo of sheet copper, hence the attack and robbery.

From these accounts and others we can assume that while great quantities of sheet copper were traded on the entire Northwest Coast from 1774 to 1792 the trade was already falling off near the end of that period. From the evidence at hand it seems reasonable to assume also that none of these early traders and explorers manufactured chief's coppers that early and there is no record that any of them ever saw one. One may also be fairly safe in assuming that none of the Indians contacted by these traders had any tinnehs either until after they had acquired commercial sheet copper. If this is so, then there should not be a single chief's copper in any of the museum collections of the world today that is made of native copper.

To test this theory a poll was made recently of some 25 of the great museums of Europe and America known to have Northwest Coast collections. Collectively these museums were found to have a total of some 135 coppers, large and small, none of which were presently claimed to be of virgin copper. However, very few have been tested chemically but tests are continuing. At the National Museum of Canada, which incidentally has the greatest collection of coppers known, tests have been going on for the past year (1962). To date, no copper in their collection of some 50 has been found to be made of native copper and none examined appear to have been hammered. In the 1960 report of the Provincial Museum at Victoria, Wilson Duff says, "We do not know directly of any existing copper which was made of the natural metal."

Opinions and testimony of various writers in the last century are interesting and varied but one thing they have in common is the belief that the chief's copper was made of the virgin copper until counterfeits took their place. John Dunn, in his *History of the Oregon Territory*, 1844, says this on page 288: "A little to the northward of this there is a tribe called the Chilkasts (sic). In their country great quantities of virgin copper are found. Some of it is worked by the natives into a kind of shield, about two feet and a half long, and one foot broad, with figures of men and animals engraved upon it. The labour and ingenuity expended in working one of these shields, give them great value. One of them is estimated as worth nine slaves; and is transmitted as a precious heir-loom from father to son." It is interesting to note that the value of sheet copper and chief's coppers up to Lisiansky's time was computed in sea otter pelts; now they are computed in slaves. George Dawson (1880:135B) has this to say of them "Another article of purely conventional value and serving as money, is the 'copper'. This is a price of native metal beaten out into a flat sheet, and made to take the form illustrated in the margin. These are not made by the Haidas—nor indeed is the native metal known to exist in the islands—but are imported as articles of great worth from the Chilkat country, north of Sitka. Much attention is paid to the size and make of the copper, which should be of uniform but not too great thickness, and give forth a good sound when



Plate VII. The Royal Ontario Museum, Canada.



Plate VIII. Museum of Anthropology, University of British Columbia.





Plate IX. University Museum, Philadelphia.

struck with the hand. At the present time spurious coppers have come into circulation, and though these are easily detected by an expert, the value of the copper has become somewhat reduced, and is often more nominal than real. Formerly ten slaves were paid for a good copper, as a usual price, now they are valued at from forty to eighty blankets." Here again we note that in the changing times coppers first computed in sea otter pelts and then in slaves are now computed in standard \$2.00 blankets, a value carried into modern times.

A few years later (1885), Aurel Krause said this (Krause, 1956:148):

"... on the other hand, they understood the art of working copper which, according to Veniaminof, a woman among the Chilkat discovered. On account of her skill she was called *Schukas-saka* which means half man. More probably the Chilkat obtained this art, which, according to Holmberg, was kept a secret in certain families, from the inhabitants of the Copper River, the Ahtena, with whom they had contact through the Yakutat.

"We have only meager information about the way these copper articles were made. Ismailof said that the inhabitants of Yakutat Bay made their daggers themselves (whether of iron or copper is not stated) on a stone anvil.

"Erman, who gives more information on the question, is of the opinion that the Ahtena who found blocks and lumps of native copper in the Copper River worked them without any smelting through mechanical means and that iron was used in the same way, patience replacing technical knowledge.

"As long as the use of iron was not widely known, copper was used for ornamentation of utensils and carvings and also for daggers, lances and arrow points. Considered as especially costly pieces were the copper plates or shields of a special shape which according to Lisiansky who gives an illustration of one, are carried in front of masters and beaten by slaves on ceremonial occasions. These shields came by trade to the Haida who, according to Dawson, paid ten slaves for one of them. One which Dawson pictures is about two feet tall and is almost an exact duplicate of the one shown by Lisiansky."

In discussing the use of dentalium as currency by the Tlingit and other tribes, Krause (1956:211) noted that it was not highly regarded by the Haida. He said, "In contrast, slaves served as a unit of value, but even higher value was assigned to the native copper which came from the north, probably from the Copper River and which was processed by them into plates of special shape and size, about one-half a meter long and one-fourth a meter wide; ten slaves are supposed to have been paid for such a valuable piece. Now, however, the value of these coppers has fallen because imitations made of ordinary copper have come into circulation, but still they carry a value of forty to eighty woollen blankets."



Plate X. Ehem. Staatl. Museum für Völkerkunde, Berlin.

We see that Krause who credits the Haida with manufacturing the plates from raw copper received from the north is in direct opposition to Dawson who states flatly that they were not made by the Haida.

Another five years elapses then Niblack (1888:335-6) says this: "Throughout the Northwest Coast copper plates or 'coppers' of a conventional pattern are valued as emblems or tokens of wealth, and have been handed down for generations. They originally came from the Chilkat country, where virgin copper is found in considerable quantities, and are made in the form of a shield from  $2\frac{1}{2}'$  to  $3\frac{1}{2}'$  in length, 12 to 25 inches in width, and one-sixteenth to one-eighth of an inch in thickness. They have a groove running vertically in the lower half and transversely across the middle at the narrow part, forming a figure like the letter T. They are sometimes painted, but more commonly etched on the outer surface with the design of the crest or totem of the owner. If they ever served as shields in battle such use has long since disappeared, and now they have only a ceremonial or emblematic significance. To be of great value these plates must be large, of virgin copper, worked by hand, of native manufacture, of uniform thickness, except at the edges, where they should be thicker than elsewhere; and, finally, when struck should give forth a dull sound and not ring. Totemic etching on the outer surface also adds value to them. Modern 'coppers' of European manufacture are not very highly prized, as compared to the ancient ones." Niblack then goes on to quote Lisiansky whom we have quoted earlier as saying they came from the Copper River and served as a musical instrument.

Up to this point none of the records has carried the word "tinneh" in describing the chief's copper. They have used the term "copper" or "coppers," copper plates and "shields." Apparently "tinneh" came into use after Swanton's "Tlingit Myths and Texts" were published in 1909.

Before going into Swanton, I would like to quote from two letters written by George T. Emmons. In a letter which he wrote to William L. Paul on June 18, 1941 he said, in part, "Now one more question about the old copper shield (Tinnah or Denah) what does this name mean. Copper in Tlingit is 'Eek'. The ones made of native copper from the White and Copper rivers were pounded out of copper nuggets of small size probably 3 to 6 to ten pounds—pounded into thin plates which were rivetted together to make the tinneh shape for they could not have hammered out a larger nugget to shape. I have seen smaller ones one or two feet in height of thin rivetted plates but never a really large one. When the early explorers saw the great value far beyond size or weight of metal placed on these, they had made all sizes and flooded the coast with them—heavy commercial copper that would ring when struck while the native copper ones gave only a dead sound. But these commercial coppers were engraved in animal crest figures and can be had today. Do you know of any really old native made pieces?"

On Feb. 8, 1942, at the age of 90, Emmons wrote the following, in part, in answer to an enquiry I had directed to him; "I have never seen an identified



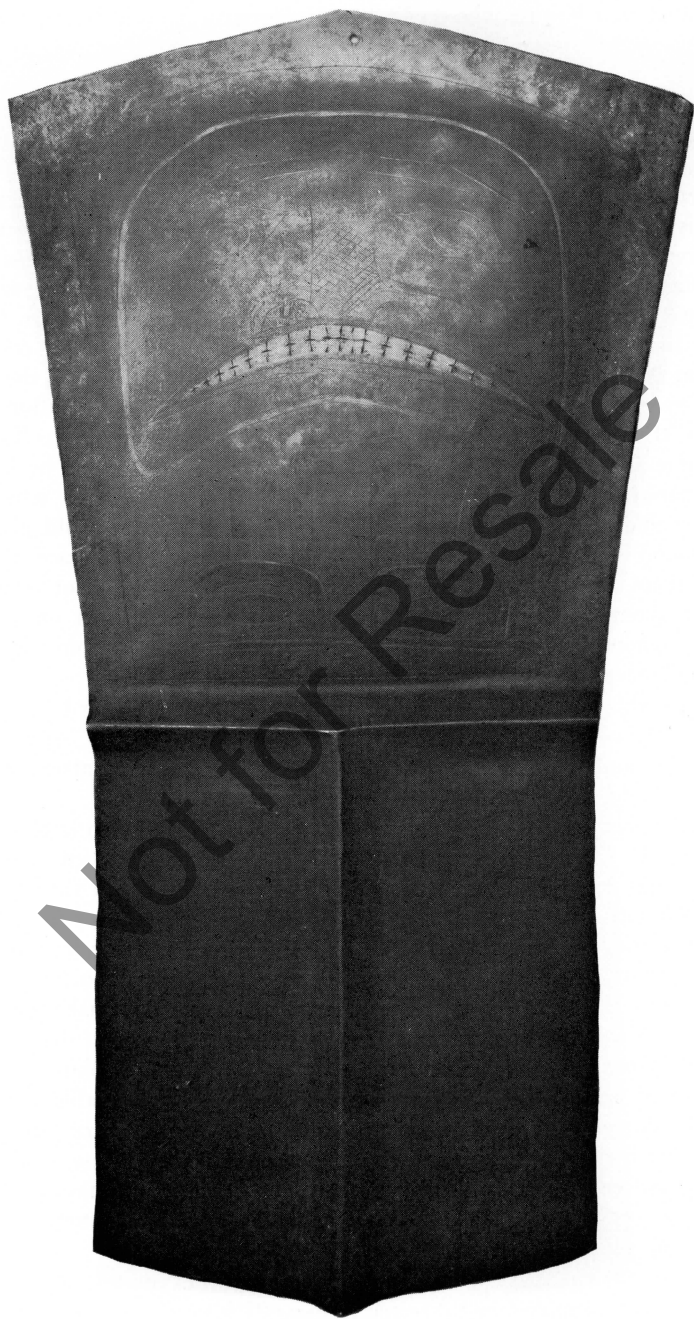


Plate XI. The Chase Manhattan Bank Museum of Moneys of the World, New York.

*native* copper 'tinnēh'. I have seen smaller ones 15 or 20 inches long of very thin copper, some another looking much like ship's sheathing, others more uneven that might have been hammered out, and one or two of plates riveted as the larger older ones must have been made. But all of the larger ones must have been so made of thin plates riveted together for it would seem impossible to have hammered one out with stone boulders from a single nugget. If you will refer to page 347 'Tlingit Myths' by Dr. Swanton, Bulletin No. 33, Bureau of American Ethnology, Story of Kacke Goan you will find the story of the first 'tinnēh'. When I first went to Alaska in 1882 I never saw any large coppers at Chilkat, Hoonah, Sitka among the Northern Tlingit, but south among the Haida at Kasaan there were many, but all of them commercial coppers brought by European traders, when they saw the value the natives placed on such objects. And they were possibly still more abundant among the Kwakiutl of Vancouver Island and B. C. Coast. Their coppers were often beautifully incised or carved in animal designs, some in deep incised figures, others wider, more scraped figures. Generally the surface was blackened or smoked with spruce gum or covered with a black mixture through which the design was scraped in broader lines. What became of the primitive native coppers I do not know. The ceremonial use of the copper was more a feature with the Tsimshian, Haida, Kwakiutl and possibly the Southern Tlingit (this simply my belief). Old coppers were nailed on totem poles and graves by the Haida. . . . Now, we *really* know practically nothing about the origin of the tinnēh in its Interior home even the name itself whether Interior or Coast. Now the Coast people, particularly the Tlingit, were and are very adaptable people and readily accepted what things the early whites brought. Copper as their only metal they valued highly. If when a particular copper object from the copper people was so greatly valued for its shape, they accepted it as a symbol of great value far beyond its mere copper content and the chiefs at once placed it far beyond the hands of the common people, and in its use upon ceremonial occasions, the amount expended at a potlatch where it was shown was added to its original value and so it became an article of prestige, an indication of standing of the whole clan and held its place until the early traders flooded the country with spurious commercial coppers. . . . The thing I want greatly to find out from some native source in the Interior, are any of these shields to be found today. . . ."

Going back now to the tale of Kacke Goan referred to earlier in Emmons' letter as the story of the first "tinnēh" we find that the Tlingit informant, Kadishan, of Wrangell, used the terms "eek" and "tinnēh" interchangeably. In this story the term *yutinna* meaning "a copper" is used three times and the term *yu-eq'* (a copper) five times for the object collected on a branch of the Copper River that it took six men to carry. Obviously, it was a copper nugget such as are often found in that area today and are on display at Anchorage, Chitina, Whitehorse, and perhaps other places today. They have been recorded as weighing up to 6 tons.



Plate XII. The University Museum, Philadelphia.

It has been suggested that the Tlingit name for copper, "eek" came from the name "Eyak," a people living near the mouth of the Copper River from whom they might have gotten their first specimens of this metal. It has also been suggested that the chief's copper or "tinneh" received its name from the Athapascan peoples of the Copper River country variously known as "Tinne'," "Ahtena," "Dene," "Kenai" throughout their range. But the Tlingit did not call them "Tinne'." Their name for the adjacent Athapascans was "Gó-nana." The question then arises: why did the Tlingit call the chief's copper a "tinneh"? The answer is probably found in the same story and further verified in still another. On page 360 is a passage concerning a young Athapascan hunter who killed more things than his brothers. The passage reads, "He always took around bow and arrows with him. They are called dína'." Applying this name to the copper point alone we may have discovered the prototype of the entire production of chief's coppers produced after the introduction of commercial copper plate. The story of Kakeqte (page 155) concerns a Hoonah man who crossed the glaciers to the Interior and was discovered by the Go'nana while roasting fish on sticks. He escaped, the Go'nana ate his fish but left copper-tipped arrows where each roasting stick had been. The incident ends with this statement, "This was the first time a Tlingit had seen copper."

A stone charm in the State Museum collection in the form of a tinneh is significant in that the hole bored for suspension is in one side rather than at either end which would be the case in suspending a copper tinneh. Suspended by a string through this hole, the charm lies horizontally like an aimed arrow. Being somewhat pointed rather than rounded at the top, this tinneh-like charm suggests an arrowhead that might have been hammered from a piece of native copper. If this is what was intended, then the T-cross takes on some significance. The upright or stem part may symbolize the shaft or a groove made to receive it while the horizontal portion would symbolize the lashing or again, the groove intended to receive it.

Since the bow and arrow played only a minor role with the Tlingit whose arrows were usually tipped with shell, a copper arrowhead from the Interior might well have been used as a charm or talisman of tremendous importance. Even the Haida name for the tinneh which is *Tau* signifies "property above all else."

Contemporary with the evolution of the "tinneh" great changes in the cultural life of the Indians of the Northwest Coast were taking place. The sea otter trade had made men wealthy for the first time in history and ways to flaunt this new opulence took on curious forms. Inconspicuous ceremonial aprons were expanded into fringed robes to be worn on the shoulders of the noble class and come to be known as Chilkat blankets; carved and painted treasure chests became the inspiration for carved and painted heraldic screens and house fronts; the shaman's soul catcher grew into a medicine box and chief's staffs became totem poles decorated their entire length with carvings

depicting myths and heraldic legends. It seems reasonable to suppose that some Indian chief, the possessor of a treasured copper arrowpoint or "dena," had a skilled craftsman duplicate his treasure in commercial copper plate received from a trader in a greatly expanded form. This apparently caught on as the status symbol of the time which continued, although its origin was forgotten, until manufactured replicas flooded the Coast and its prestige value was lost and new symbols had to be sought.

In conclusion, I hope that I have presented acceptable evidence that the chief's copper as we know it was never made of native copper and appeared after 1774 when commercial copper plate became available to the Indians of the Northwest Coast; that it was a "blow-up" of a treasured copper arrowhead from the Interior; that the first of them were made either by native craftsmen who were already in possession of European tools and techniques or custom-made by ship's armorers and imported craftsmen; that later on, completed chief's coppers manufactured elsewhere flooded the coast, destroying its value as a prestige piece by making it commonplace and available to almost anyone.

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Alaska Historical Library and Museum,  
Juneau, Alaska



# TOWARDS A CLASSIFICATION OF WEST ALASKAN SOCIAL STRUCTURE<sup>1</sup>

by

NORMAN E. WHITTEN, JR.

## *Problem and Purpose*

The forms of social structure found to be existing along the west coast of Alaska have been given attention of late by some anthropologists.

... it has become extremely doubtful that the relatively dense population of the Bering Sea coast of Alaska is to be included in the type [Eskimo] that bears its linguistic label. (Giddings, 1952:6.)

... St. Lawrence culture is a variant in some important dimensions, such as kinship and social structure, from the generalized model of an Eskimo group. It does, perhaps, fit into what we are gradually seeing as a western Alaskan Eskimo type of socio-cultural patterning that emphasizes clanlike units and patrilineal descent (Hughes, 1960:4.)

This author believes that further investigation will reveal a form of Eskimo culture that is limited to Bering Sea, probably not including St. Lawrence Island and the Aleutians. (Lantis, 1946:259.)

... the North Alaskans can be said to represent a basic Eskimo type of pattern ... Over this is laid a series of Alaskan Eskimo traits. There is then a particular local phrasing of both aspects. It can be said of the North Alaskan Eskimo that theirs was a marginal culture when viewed in the light of Alaskan Eskimo developments at large. (Spencer, 1959:450.)

From the foregoing quotations it should be fairly clear that the authors cited agree on the point that west Alaskan Eskimos are characterized by a social structure aberrant from the more general "Eskimo type" characteristic of the rest of the Eskimo-inhabited north. The concept of an Eskimo type of social organization originated with Morgan (1871:267, 277), was further refined by Spier (1925:79) and attained its present conceptualization at the hands of Murdock:

... the Eskimo type includes all societies with Eskimo cousin terminology and no exogamous unilinear kin groups. ... it is characterized by monogamy, independent nuclear families, lineal terms for aunts and nieces,

<sup>1</sup> This investigation was supported by a Public Health Service fellowship (14,333) from the National Institute of Mental Health, Public Health Service.

The author wishes to express his sincere gratitude to Professors John Gulick and John Honigmann, whose stimulating courses and constant encouragement made this paper possible.

the bilateral extension of incest taboos, and the frequent presence of such bilateral kin groups as kindreds and demes, . . . (1949:226)

My purpose in this paper is both to classify the type of social structure (or structures as the case may be) found to exist in west and northwest Alaska and to suggest the dynamic relationship of such a structure to the Eskimo type social structure. In order to carry out the latter purpose the following postulate is accepted:

. . . the ancestors of the peoples now speaking related languages must once have formed a single linguistic community, which must also have had a common culture including a common social organization. (Murdock, 1949:347.)

The Eskimos of Alaska and the rest of the north are of the same language family (cf. Swadesh, 1951:69; Hirsh, 1954:830). Murdock's concept of survivals will be utilized:

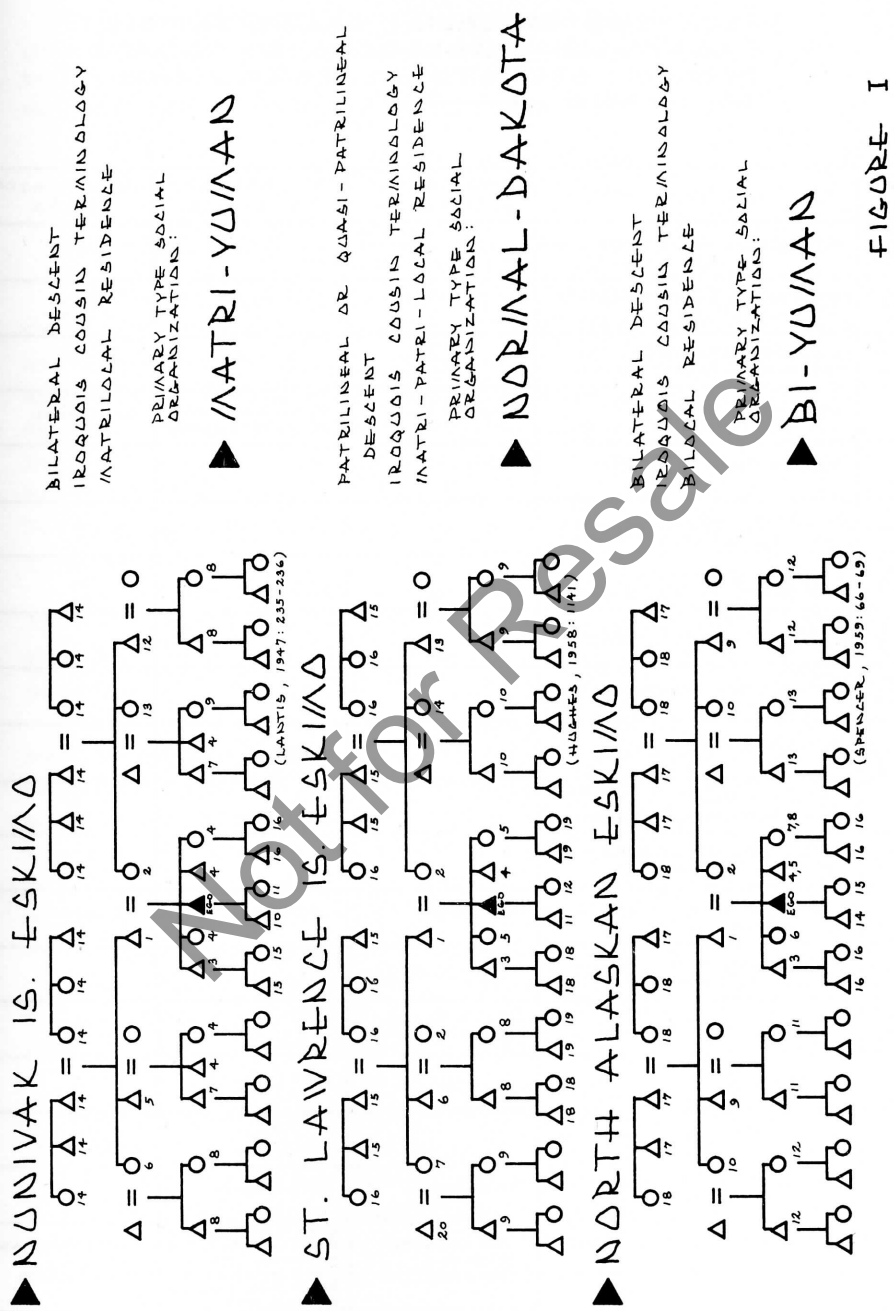
. . . the phenomenon known as "cultural lag" . . . results in the presence of "survivals" from previous forms of organization in most social systems. Analysis of these can frequently yield reliable indications of historically antecedent types of social structure. (Murdock, 1949:323)

to suggest the relationship of the West Alaskan type social structure to the Eskimo type on the basis of a social reconstruction which we will make of three West Alaskan social systems.

Since the writing of *Social Structure* three monographs have appeared which allow us to draw a geographical triangulation of West Alaskan social dynamics. The three Eskimo societies to be examined in this paper are the Nunivak Island Eskimos off the coast of southwest Alaska, the northwest Eskimos including Nuunamiut ("people of the sea") and Tarumiut ("people of the land") and, in the middle, the Eskimos of St. Lawrence Island lying off the west coast of Central Alaska in the Bering Strait.

On the following page (Fig. 1) will be found the kinship system of the three Eskimo societies. Numbers have been substituted for the kinship terms for purposes of visual ease. Applying Murdock's method of classification (1949, p. 224) we arrive at the primary and subtype of social organization of each of the above Eskimo systems.

To find the patrilineal Dakota structure existing in an Eskimo society is somewhat surprising (though perfectly possible on theoretical grounds) due to the usual conception of unilineal and bilateral systems as being mutually exclusive. We will resolve this in the conclusion by recourse to a more recent manner of classifying systems such as the one found on St. Lawrence Island. However, for purposes of effecting an historical reconstruction in the most efficient and convenient method possible, we will adhere, for the present, to the terminology given by Murdock (1949).



FEATURES OF SOCIAL ORGANIZATION  
FROM WHICH INFERENCES AS TO ANTE-  
CEDENT STRUCTURAL FORMS CAN  
BE DRAWN

	FEATURES	DUNIVAC IS. ESKIMO	ST. LAWRENCE IS. ESKIMO	NORTH ALASKAN ESKIMO
A	AVUNCULOCAL RESIDENCE			
B	BILATERAL EXTENSION OF INCEST TABOOS		X	X
C	BIFURCATE COLLATERAL TERMS FOR AUNTS AND/OR NIECES	X	X	
D	DESCENT RULES	BILATERAL	PATRILINEAL OR "QUASI-PATRILINEAL"	BILATERAL
E	ESKIMO COUSIN TERMS			
F	BIFURCATE NEEBING TERMS FOR AUNTS AND/OR NIECES			
G	GENERATION TERMS FOR AUNTS AND/OR NIECES			
H	HAWAIIAN COUSIN TERMS			
I	MATRILINEAL INHERITANCE			
K	KINDREDS		X	X
L	LINEAL TERMS FOR AUNTS AND/OR NIECES			X
M	MATRILINEAL EXTENSION OF INCEST TABOOS			
N	NOMENCLATURE FOR X - COUSINS	IROQUOIS	IROQUOIS	IROQUOIS
P	PATRILINEAL EXTENSION OF INCEST TABOOS			
R	RESIDENCE RULES	MATRILocal OR TEMPORARY MATRI- LOCAL	X	BILocal
S	SORORAL POLYGYNY		---	
T	MATRI-PATRILocal RESIDENCE		X	
U	UNILINEAR KIN GROUPS	PATRILINEAL	PATRILINEAL	
V	VARIANT SURVIVALS	NON SORORAL POLYGYNY (VESTIGES)	GREATER DEVELOP- MENT OF TERMS FOR PATRILocal RELA- TIVES THAN FOR SIBS AND KINSMEN; PATRI-CLANS	PATRILocal AND NEOLocal TENDENCIES

We have already noted Murdock's concept of survival. On Figure 2 are given all of the possibly significant survivals found to be existing in Nunivak, St. Lawrence, and the North Alaskan Eskimo groups. Using these survivals we shall now begin our process of historical reconstruction.

## RECONSTRUCTION

*Nunivak Island Eskimo = Matri-Yuman subtype of social organization.*

In this subtype of social organization we expect to find Iroquois cousin terminology, bifurcate merging avuncular terminology, matrilocal residence, and bilateral descent (Murdock, 1949:231). We find that Nunivak Eskimos have all of these characteristics except bifurcate merging terminology. The significant analytic components in Nunivak society are bifurcate collateral terms, Iroquois cousin terminology, and patrilineal kin groups (Lantis, 1946:233-9; Giddings, 1952:7-10). Matrilocal residence of this group is taken to be a recent innovation rather than a survival following the method of Murdock (1949:221).

The possible antecedent forms which we must examine are all given by Murdock (1949:324-6). In regard to Matri-Yuman the two more likely antecedent structures are Matri-Hawaiian and Matri-Eskimo. Less likely antecedents are Normal-Iroquois, Bi-Yuman, Neo-Yuman, and Matri-Fox.

Bifurcate collateral terms, when occurring with a lack of general polygyny and with a residence rule other than patrilocal, tend to support a patrilocal structure prior to the existence of any of the structures offered above as possible immediate antecedents. This is supported by the statement by Lantis that the matrilocal structure is "temporary" (1946:234, 241) and that men often left their hunting gear at their father's house. Also a son might occasionally bring a woman home to live or establish his own residence. These factors tend to support proximate derivation from a patrilocal structure.

Nomenclature for cross-cousins is especially valuable for inferences since it usually changes later than residence and descent. Here, as noted, we find pure Iroquois cousin terms. One of Murdock's "especially clear indicators" is Yuman from either Dakota or Iroquois (1949:329). With the above discussion of patrilocal residence as a penultimate stage we are forced to exclude the Iroquois type social organization as the probable immediate antecedent. Finally, the existence of patrilineal kin groups allows us to infer that Nunivak is derived, ultimately, from a patrilineal-patrilocal structure. The immediate antecedent which best fits these survivals is that of Neo-Yuman. We suggest that this may have been an unstable transition stage from a previous patrilocal structure.

Our first reconstruction then, is as follows:

Matri-Yuman

↑

(Neo-Yuman)<sup>2</sup>

Neo-Yuman has as its more likely antecedents Neo-Dakota and Neo-Iroquois, and as its least likely ones Normal-Yuman, Matri-Yuman, and Bi-Yuman.

The bifurcate collateral terms together with the vestige of non-sororal polygyny tend to support the Dakota in light of the partilineal emphasis. Neo-Dakota is the only available choice for the antecedent form to Neo-Yuman.

Matri-Yuman

↑

(Neo-Yuman)

↑

Neo-Dakota

The only two choices from which we must select an antecedent to Neo-Dakota are Normal-Dakota and Bi-Dakota. Since we find a bilateral emphasis currently existing rather strongly we will, in the interest of caution, choose as an antecedent structure Bi-Dakota. However, having made this choice we find that the only antecedent to Bi-Dakota is Normal-Dakota. Hence, in our reconstruction of Nunivak Island Eskimo society we come to Normal-Dakota, the same primary type social structure as is today found to be existing among the St. Lawrence Island Eskimos. Our completed reconstruction, then, looks as follows:

Matri-Yuman

↑

(Neo-Yuman)

↑

Neo-Dakota

↑

Bi-Dakota

↑

Normal-Dakota

Before going on to the North Alaskan Eskimo to derive our second point of triangulation let us attempt a bit of extrapolation. That is, what can we answer to the question: "what might Matri-Yuman be developing towards in the light of its past evolution?" We find that Matri-Yuman can be an antecedent to Bi-Yuman which can be an antecedent to Normal-Hawaiian and that it can also antecede Neo-Yuman which can antecede Normal-Eskimo.

*North Alaskan Eskimo = Bi-Yuman subtype of social structure.*

Our expectations as to the major characteristics of this form of social structure are the same (except for residence which is tending toward

<sup>2</sup> Parentheses indicate less likely antecedents.

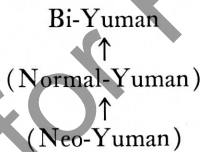


bilocality) as those in the Nunivak Eskimo system. To wit, Iroquois cousin terminology, bifurcate merging terminology, and bilateral descent (Murdock, 1949:231). We find all of these except bifurcate merging terminology.

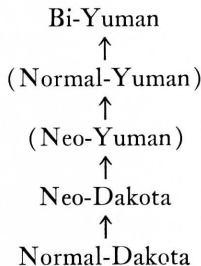
The significant variables for the analysis of the evolution of North Alaskan social structure are lineal terminology for aunts and nieces, Iroquois cousin terminology and patrilineal and neolocal tendencies (Spencer, 1959: 62-71).

The more likely antecedent forms to Bi-Yuman are Bi-Dakota and Bi-Iroquois with the less likely antecedents being Normal-Yuman and Matri-Yuman. The existence of lineal terminology indicates derivation from a neolocal structure (Murdock, 1949:328). Since none of the possible immediate antecedents given by Murdock are characterized by a neolocal structure we are forced to examine the antecedents to the immediate antecedents for a possible penultimate structure.

Both Normal-Yuman and Matri-Yuman are preceded by Neo-Yuman. Neo-Yuman satisfies not only the lineal survival but is also quite compatible with the Iroquois cousin terminology. For the sake of simplicity of illustration we shall make an arbitrary choice and consider the immediate antecedent to be Normal-Yuman. It should be carefully noted that the important point is the transition from Neo-Yuman to Bi-Yuman, and not the exact intermediate stage. Our reconstruction then is as follows:



Likely antecedents to Neo-Yuman are Neo-Dakota and Neo-Iroquois while less likely antecedents are Normal-Yuman, Matri-Yuman, and Matri-Fox. The persisting patrilineal tendencies together with Iroquois cousin terms suggest that the social system in question is derived from a structure emphasizing the patriline. Since one of the clear indicators of antecedent is Yuman from Dakota we suggest Neo-Dakota as an antecedent to Neo-Yuman. The only antecedent to Neo-Dakota is Normal-Dakota so our completed reconstruction is as follows:



As was the case with the Nunivak Eskimo we cannot help but notice that what is a structurally very unstable form (Bi-Yuman in this case and Matri-Yuman in the latter) has been reconstructed through a series of residence changes to what would appear to be a unilineal structure that is more stable but unexpected.

Extrapolating as we did with the Nunivak we find that Bi-Yuman is an antecedent to Normal-Hawaiian and also to Neo-Yuman which is in turn antecedent to Normal-Eskimo. It is quite possible then, that given the inherent instability of the Yuman type of social structure, both Nunivak and North Alaskan Eskimo social structures are evolving into the Eskimo or Hawaiian types. Given the strong emphasis on collaterality it is possible to eliminate Hawaiian and suggest that these societies are developing into the Eskimo type.

We now move to our third society for examination. Unlike the previous two Eskimo societies it currently has a Normal-Dakota structure. We shall not only reconstruct this system but, in so doing, try to suggest the relationship of the reconstruction to West Alaskan social structure in general.

*St. Lawrence Island Eskimos = Normal-Dakota subtype of social structure.*

We expect to find, with this type of social structure, patrilineal descent, Iroquois cousin terminology, non-sororal polygyny, patri-clans, and bifurcate collateral or bifurcate merging avuncular terminology (Murdock, 1949:236). We find all of these characteristics existing except true patrilocal residence. However, the residence form known as matri-patrilocal is a subtype of patrilocal residence and, rather than consider it as a survival we chose to consider it as a recent development. Our choice is based on the postulate by Murdock that residence is the first variable to change (1949:221). It may well reflect change in the direction of Bi- or Neo-Dakota.

The survivals existing in this Eskimo society are startling when found in a unilineal system and further support our feeling that though we label this system Normal-Dakota for purposes of social reconstruction we must bear in mind that in all probability we are dealing with what might better be termed as "quasi-unilineal" system. The survivals are bilateral extensions of incest taboos, kindreds, and Iroquois cousin terminology.

The most likely antecedents to Normal-Dakota are Normal-Guinea, Normal-Yuman, and Duo-Iroquois. Less likely antecedents are Patri-Fox, Bi-Dakota, Neo-Dakota, Normal-Omaha, Normal-Sudanese, and Patri-Iroquois.

The bilateral extension of incest taboos indicates derivation from a bilateral structure; this indication is fortified by the existence of kindreds: "... their presence in a unilocal sub-type of any unilinear type indicates derivation from a bilateral structure. . ." (Murdock, 1949:328).

The Iroquois cousin terms support a Yuman structure given the above emphases. With this strong bilateral emphasis we must choose Normal-Yuman as the immediate antecedent subtype.

Normal-Dakota



Normal-Yuman

The most likely antecedents to Normal-Yuman are Patri-Hawaiian, Patri-Iroquois, and Patri-Eskimo while the less likely are Normal-Dakota, Bi-Yuman, Neo-Yuman, and Normal-Fox. The bilateral extension of incest taboos together with existence of kindreds indicates a Hawaiian or Eskimo antecedent. The bifurcate collateral avuncular terminology weights the decision in favor of Patri-Eskimo.

Normal-Dakota



Normal-Yuman



Patri-Eskimo

The antecedents to Patri-Eskimo are Normal-Eskimo, Patri-Nankanse, Bi-Eskimo, and the less likely Matri-Eskimo. Again, turning to the factors of bilateral extension of incest taboos and the existence of kindreds we choose Bi-Eskimo as the most likely antecedent. Our conclusion then is that it was the change to patrilocal residence that began the evolution of St. Lawrence Island Eskimo society from Eskimo to Dakota.

Normal-Dakota



Normal-Yuman



Patri-Eskimo



Bi-Eskimo

What probably occurred in this society was that, for some reason, the patriline became a focus with the result that patridemes developed. The patridemes probably continued to evolve incorporating the descent principle into the residence principle until the patriclan developed. This process must have been relatively rapid since the kindred and bilateral extensions of incest taboos remained during the evolution of the patriclan. This again fortifies our feeling that the Dakota type as it exists in west Alaska is better considered something less than truly unilineal.

Extrapolating from the available evidence which is the presumed to be recent matri-patrilocality we find that any of the Dakota subtypes are antecedent to the various Yuman subtypes. We suggest that further evolution of this type will be from Normal-Yuman → Bi-Yuman (indicated by current matri-patrilocality) → Neo-Yuman → Normal Eskimo.

What relationship can we find between the structural types in west



Alaska; what is their relationship to the Eskimo type of social structure? It seems that our reconstruction of the Dakota type to the Eskimo type has some empirical support:

Previous ethnographic sketches . . . and contemporary informant's testimony suggests that prior to the modern era each of the small settlements scattered around St. Lawrence Island was composed of persons of only one descent group . . . a band of related people who were identified as coming from a particular place. In these groups marriage very probably was patrilocal and it may have been endogamous . . . (Hughes, 1958: 1145).

The internal structure of the group was apparently much the same as we find today in Eskimo bands of Canada and Greenland, consisting of a loose bilateral kindred . . . (*Ibid.*).

Hughes further suggests that these bands merged on St. Lawrence Island and formed patrilans which further merged into two villages. Today the villages are still in the process of consolidating. He infers this from archeological data which ". . . imply the immigration to St. Lawrence of a clan from the Siberian shore during the 18th century . . ." (Hughes, 1958:1146). Hughes further asserts that the "Reasons for this gathering into a larger heterogeneous village unit are mainly economic as far as we can judge." (*Ibid.*)

If the development of the patrilan and consequent "Quasi-Dakota" structure on St. Lawrence Island is at all characteristic of a general process of social evolution on the west coast of Alaska then we have some suggestions to make. It will be noted that the development on St. Lawrence Island is a recent one. It seems entirely possible in view of our reconstructions of Nunivak and the North Alaskan Eskimo that these societies once went through a similar process but began to develop back toward the Eskimo structure as they moved from the rich and crowded Bering Strait area. (Collins [1951:457] establishes Eskimo migration to be via the Bering Strait.)

Consider patrilocal Eskimo bands to merge as they congregate together on the west coast of Alaska and islands off the coast. A patrilan system develops for economic reasons and takes on the appearances of a unilineal system; then, for one reason or another, residence changes and the system begins to change back to its original (Eskimo) form. This is probably hastened by any movement inland away from the more productive sea.

If these suggestions are viable then we must consider the Quasi-Dakota type as it exists, or existed in west Alaska to be an aberrant form of a bilateral social system. Murdock (1960) has made a re-examination of such forms as Yuman and Dakota and suggests the category "quasi-unilineal" for them. Further, he suggests "Carib type" to distinguish the quasi from the true unilineal (1960:8). The Carib type embraces both the Yuman and the Dakota

type. It may be said to be the characteristic type found to exist in west Alaska. Though this type may appear to be unilineal in some respects, "In all cases, . . . the unilineal principle of organization remains subordinate to the cognatic principle." (1960:7; see also p. 14).

Figure 3 presents a diagram of our conception of the Carib type in dynamic relationship to the Eskimo type. In brief summary: Patrilocal Eskimo groups congregate on the coast and islands and merge for economic reasons. This merger brings about the evolution of the patrilan from the patrideme. With a change in residence, the patrilan system begins to break down and the system begins to change toward the Eskimo structure characterizing the rest of the Eskimo-inhabited Northland, east of the coast of Alaska. What reason can we find for the development of Yuman and probable eventual emergence of the Eskimo type once the Dakota type has been established? Like the reason for the congregating of Eskimo bands we suggest that the consequent development of the bilateral structure and dispersal of bands is due to changing economic conditions (cf. Spencer, 1959:442-3).

Our analysis thus far has been somewhat tenuous. Nevertheless, the conclusions seem justified by the data. Let us now see what further implications may be derived by accepting the process which we have suggested above.

### IMPLICATIONS

Lantis' suggestion that: "further investigation will reveal a form of Eskimo culture that is limited to Bering Sea, probably not including St. Lawrence Island . . ." (1946:259) is not borne out by our analysis. We find that all three groups studied, from Nunivak Island northwest to St. Lawrence Island and northeast to North Alaska may be considered as members of the same general type of social system, merely representing different levels in the evolution from Eskimo to Dakota and back to Eskimo. The implication is that that stage of social organizational development varies concomitantly with the ecological situation though this paper has not dealt directly with this question. It seems that the next step in an analysis of the sort that has been here attempted would be to reconstruct both the movement of Eskimos of west Alaska and note the changing ecological patterns. The hypothesis to be tested is that the richer the environment the more clustered the Eskimo society and the more the tendency towards the Dakota system whereas the less rich the environment the more scattered and more Yuman or Eskimo the society would appear.

Before closing this paper we must make some comment as to the utility of Murdock's method (1949). It should be obvious that a great many *a priori* decisions are necessary to effect a reconstruction. Nevertheless, there is definitely a level of consistency which overcomes, to some extent, errors in judgment. We deliberately made some errors or false insertions (not included in the present paper) to observe the outcome. Invariably, utilizing Murdock's



concept of survivals we eventually arrived at the same reconstruction as we would have arrived at by making the more reasonable assumptions and consequent insertions of structural components necessary in reconstructing. Although it is not possible to maintain that the exact sequence of evolution herein presented for each society actually occurred in all particulars, it is possible to state that quite probably a similar process did take place. Since these societies fall into the same general type and follow the same general process it seems reasonable to infer relationships between them and their closest antecedent and probable predecessors, the Eskimo type.

To conclude, west Alaskan Eskimo societies may be classed as members of the Carib type of social structure which differs from the Eskimo type of social structure in degree of complexity, its major defining quality being a quasi-unilineal emphasis. West Alaskan Eskimo society differs from that of other Eskimos in degree, not kind, and is quite possibly traceable to a difference in ecological setting plus, perhaps, factors of historical accident such as a timely change of residence.

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# GEOLOGY AND ARCHAEOLOGY OF THE YARDANG FLINT STATION

by

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AND IVAR SKARLAND

## INTRODUCTION

One of the difficulties chronically besetting archaeologists working in interior Alaska has been all too often a complete lack of geological context from which inferences of age might be made.

In the following pages is set forth the geology of a site in the Alaska Range for which there is available also one radiocarbon date. The stratigraphic situation is good but, unfortunately, at the present time the artifacts themselves appear to be undiagnostic.

### *Location*

The site, designated the Yardang Flint Station (Mount Hayes 81), is on an alluvial fan of Ruby Creek in the Delta River Valley, a through north-south valley in the Alaska Range, approximately 163 km. southeast of Fairbanks (Fig. 1). The artifacts were found by R. D. Reger and G. C. Bond in loess in a roadcut of the Richardson Highway near where it crosses Ruby Creek at an elevation of 580 m. above sea level (Fig. 1). The loess was artificially exposed in the roadcut and yardangs are currently being eroded in the loess by the wind. The yardangs are a subject of study by geologists at the University of Alaska and the U.S. Geological Survey and give rise to the name for the flint station.

## GEOLOGY

### *Physiography*

The Delta River Valley was glaciated at least three times (Péwé, *et al.*, 1953). Since the glacier of Wisconsin age has withdrawn, tributary streams have built large alluvial fans of gravel into the Delta River Valley. The artifacts were found in loess on the alluvial fan of Ruby Creek on the east side of the valley (Fig. 1). The fan is approximately 1.7 km. wide and 1.4 km. long and has a slope of about  $4^{\circ}$ . The outer edge of this large fan was nipped by the Delta River and a well-developed scarp 20 to 35 m. high exists facing the Delta River. Ruby Creek is entrenched 1 to 2 m. into the gravel fan and a younger, much smaller, lower-level fan is currently being built at the base of the scarp. The apex of the younger fan is at the present Richardson Highway bridge over Ruby Creek. The surface of the lower fan slopes approximately  $12^{\circ}$ . The large fan is blanketed with a loess cover approximately 1 to 6 m. thick (Fig. 2) but the surface of the smaller fan has no loess.

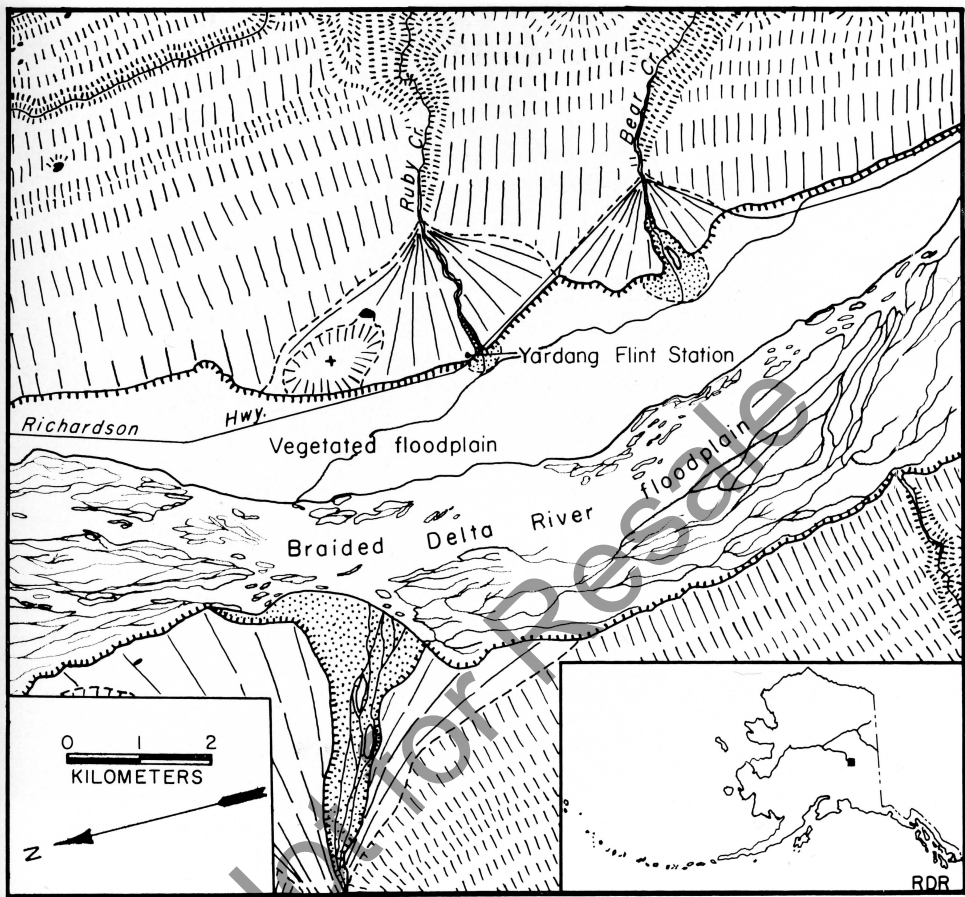


Figure 1. Landform map of part of the Delta River Valley in the vicinity of the Yardang Flint Station, Central Alaska Range.

Stratigraphy

The gravel of the alluvial fan is at least 10 m. thick and consists of particles, averaging 8 to 20 cm. in diameter, in a sandy matrix. Most of the large particles are schist, gneiss, and quartz from the Birch Creek Schist formation that forms the walls of the Delta River Valley in this area. However, a large percentage of pebbles and cobbles are of coal and orange-brown, non-siliceous siltstone of Tertiary age which crop out in the headwaters of Ruby Creek in the Jarvis Creek coal field (Wahrhaftig and Hickcox, 1954). The gravel of the fan is predominantly grey and poorly stratified. At the top of the gravel there is some interfingering between the gravel and the loess.

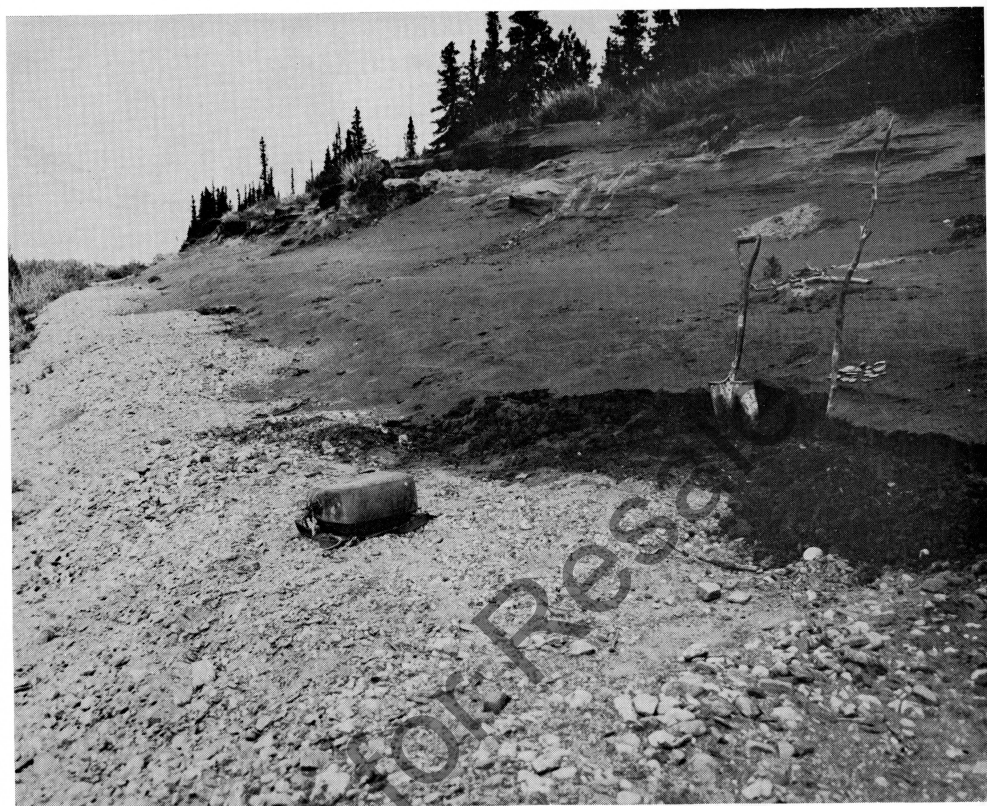


Figure 2. Loess overlying alluvial fan gravel at Yardang Flint Station, Ruby Creek, Alaska. Shovel point at artifact location. (Photograph by T. L. Péwé, July, 1962).

The upper 5 m. of the section (Figs. 2 and 3) of the fan exposed at Ruby Creek consists of loess. The loess is unconsolidated except where frozen, possesses crude vertical jointing, and is tannish grey, mottled with iron-oxide staining and organic material. The silt has rather distinct laminations parallel to the surface of the alluvial fan which are caused by the presence of forest layers or iron-oxide staining (see Table 1).

Stumps of white spruce up to a maximum diameter of 0.8 m. are common in the loess (Figs. 2 and 3). Tree remains and organic-rich layers indicate that the loess has been deposited on a forest floor, thereby burying successive forest layers. Péwé and Holmes (1964) record small cones of silt around trunks of standing spruce on the west side of the Delta River in the vicinity of Donnelly Dome, and have noted the collection of dust on spruce branches in this same area. Spruce trees grow in the area today indicating that climatic

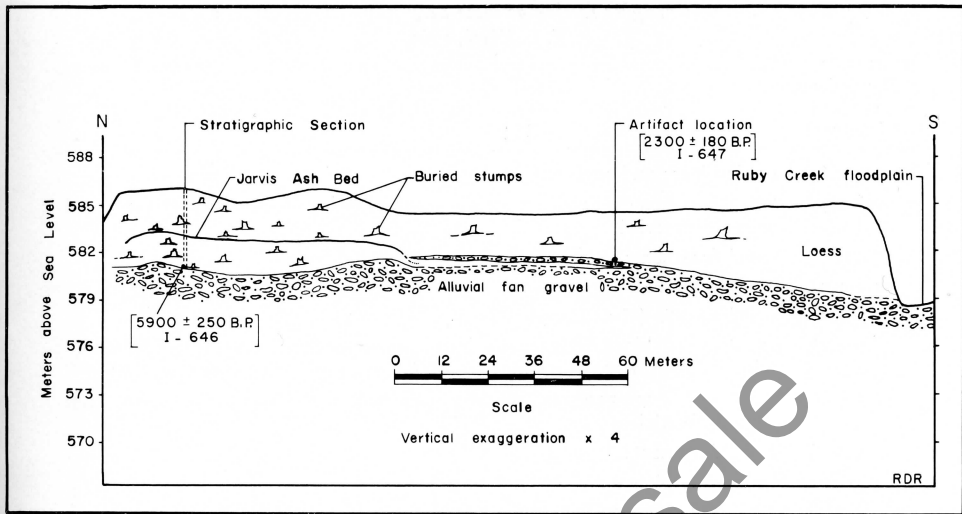


Figure 3. Stratigraphy of the Yardang Flint Station along the Richardson Highway in the Delta River Valley, Central Alaska Range.

conditions have changed very little since the beginning of loess deposition. As much as 5.2 m. of loess has been deposited on the fan in the last 6,000 years. Winds continually pick up silt from the exposed sand and silt bars in the summer in the braided Delta River floodplain today and loess is currently being deposited in the area (P  w  , 1951). Studies of rates of loess deposition are in progress.

Approximately 1.5 m. above the gravel-loess contact in the northern part of the section occurs an ash bed, here termed the Jarvis Ash Bed for the excellent exposures at Jarvis Creek 25 km. to the north. This is a volcanic ash layer which is conformable with the crude stratification of the underlying and overlying silt layers. The ash is cream colored when dry and light grey when wet. It has a relatively uniform thickness of 1 to 3 cm. The ash consists mostly of glass (index of refraction is 1.53-1.54) particles approximately the same size and sorting as the enclosing loess. Near the center of the exposure, the Jarvis Ash Bed dips beneath the tongue of gravel and is pinched off into isolated pods and lenses (Fig. 3).

*Age and Geologic History*

The Pleistocene and Recent glacial history of the Big Delta area, including Ruby Creek and vicinity, has been summarized by P  w   (1952, 1953). After the retreat of the glacier of Wisconsin age that occupied the Delta River Valley, alluvial fans of gravel were built into the valley. These fans perhaps took thousands of years to attain their present size.

TABLE 1. *Stratigraphic section of loess near Ruby Creek, Alaska Range*  
T. L. Péwé, 1960

Depth from surface (meters)	Unit
0.0-0.6	eroded loess and turf mat
0.6-1.3	tan loess, homogeneous, massive, mottled with iron-oxide staining and organic material
1.3	wood fragments
1.3-1.9	loess as above
1.9-2.1	wood stumps (C-14 sample #134)
2.1-2.7	tan-grey to black, micaceous loess, homogeneous, unstratified, mottled with iron-oxide stains, remnants of former logs (flattened tree limbs)
2.7-2.9	tan loess, homogeneous, massive, mottled with iron-oxide stains and organic particles
2.9	wood fragments
2.9-3.7	loess as above, wood (roots) at 3.65
3.7	ash layer 1 mm. to 4-5 mm., pods to 2 cm.; forest bed at level of ash, root (C-14 sample #136)
3.7-4.7	loess as above (at 3.9 silt sample #U-530)
4.7-5.2	grey, micaceous silt; at 5.0 C-14 sample (I-646) root or limb (5,000 $\pm$ 250 year B.P.)
5.2-5.4	coarse quartz sand with 1.3 cm. diameter pebbles; iron-oxide staining

Ruby Creek wandered back and forth over its gravel fan, removing any loess that accumulated. About 6,000 years ago, however, Ruby Creek began to entrench its fan, perhaps because of downcutting by the Delta River, or more likely because of the shift of the Delta River to the east side of the valley, nipping the fan and thereby shortening the course of Ruby Creek. For the last 6,000 years loess has been accumulated on the fan because Ruby Creek became entrenched and could no longer wander over its fan removing the loess. A radiometric date (I-646) of 5,900  $\pm$  250 years was obtained on a spruce root 25 cm. from the base of the loess 112 m. north of the artifact location (Fig. 3).

Between 2,000 and 4,000 years ago (Péwé and Holmes, 1964) the Jarvis Ash Bed was deposited on the fan and became buried by subsequent loess accumulation. At this time the Ruby Creek floodplain extended 170 m. north of its present location (Fig. 3) and the ash, therefore, was not preserved. The position of the north bank of the Ruby Creek floodplain at that time is indicated by the downward plunge of the ash bed in the center of the section (see Fig. 3). Shortly before 2,300 years ago Ruby Creek moved to the south side of its floodplain and loess began to accumulate over the gravel of the inactive floodplain. For the last 2,300 years Ruby Creek has not swung to the north and 3 m. of loess have accumulated over the gravel surface and artifact site burying forests as it accumulated.



TABLE 2. *Artifacts from Yardang Flint Station, Central Alaska Range*

Tool category	Length	Width	Thickness	Material	Remarks	Figure reference
(1) End scrapers						
a—Keel	6.1 cm.	2.9 cm.	1.9 cm.	grey siliceous siltstone	some lateral edge retouch	4:A
Snub nosed, flat	2.4 cm.	2.4 cm.	0.7 cm.	brown chert	one edge retouched	4:B
Keel, triangular	3.6 cm.	3.2 cm.	1.1 cm.	grey siliceous siltstone	surface completely reworked	4:C
Keel	3.4 cm.	2.3 cm.	0.8 cm.	grey chert	fine retouch along right rear edge	4:D
Keel	5.8 cm.	3.8 cm.	1.5 cm.	grey siliceous siltstone	distinct point at end opposite scraper end. Some secondary flaking at sides on vertical surface	4:E
(2) Flake side scrapers						
a—Straight edge	3.8 cm.	2.2 cm.	0.6 cm.	grey siliceous siltstone	one edge only retouched	4:F
Straight edge	5.2 cm.	2.8 cm.	0.7 cm.	grey siliceous siltstone	one edge only retouched	4:G
Straight edge	6.2 cm.	3.2 cm.	1.5 cm.	grey siliceous siltstone	crudely bifacial slight on two other edges perhaps a knife	4:H
Straight edge	5.5 cm.	2.8 cm.	0.8 cm.	white silty or impure chert	one edge retouched	4:I
Straight edge	5.9 cm.	3.8 cm.	1.4 cm.	grey siliceous siltstone	one edge retouched; some use retouch on opposing edge	4:J
Straight edge	5.9 cm.	3.6 cm.	0.6 cm.	grey siliceous siltstone	retouching on several edges	4:K
Straight edge	4.3 cm.	3.1 cm.	0.6 cm.	grey siliceous siltstone	fine marginal retouch on two opposite edges. Perhaps a broken end scraper	4:L
b—Convex edge	4.3 cm.	3.4 cm.	0.8 cm.	grey siliceous siltstone	fine marginal retouch along a concave edge	4:M
Convex edge	7.4 cm.	3.7 cm.	1.4 cm.	grey siliceous siltstone	the one-retouched edge is slightly convex probably a knife	4:N
c—Concave edge	5.2 cm.	4.1 cm.	0.6 cm.	white silty or impure chert	some possible use retouch on edge opposite concave working edge	4:O
Concave edge	5.7 cm.	3.9 cm.	0.9 cm.	grey siliceous siltstone	small area of retouch on edge opposite concave	4:P
Concave edge	5.0 cm.	3.5 cm.	0.6 cm.	grey siliceous siltstone	some retouch on edge opposite concave	
Knife fragment	5.5 cm.	5.5 cm.	1.3 cm.	grey siliceous siltstone	on large flake apparently rounded base of a knife. Possible use retouched sides	4:Q
(4) Utilized flakes, 4	(5.0 cm.—6.0 cm. roughly)			grey siliceous siltstone	deliberate retouch on some; use retouch on others.	4:Q

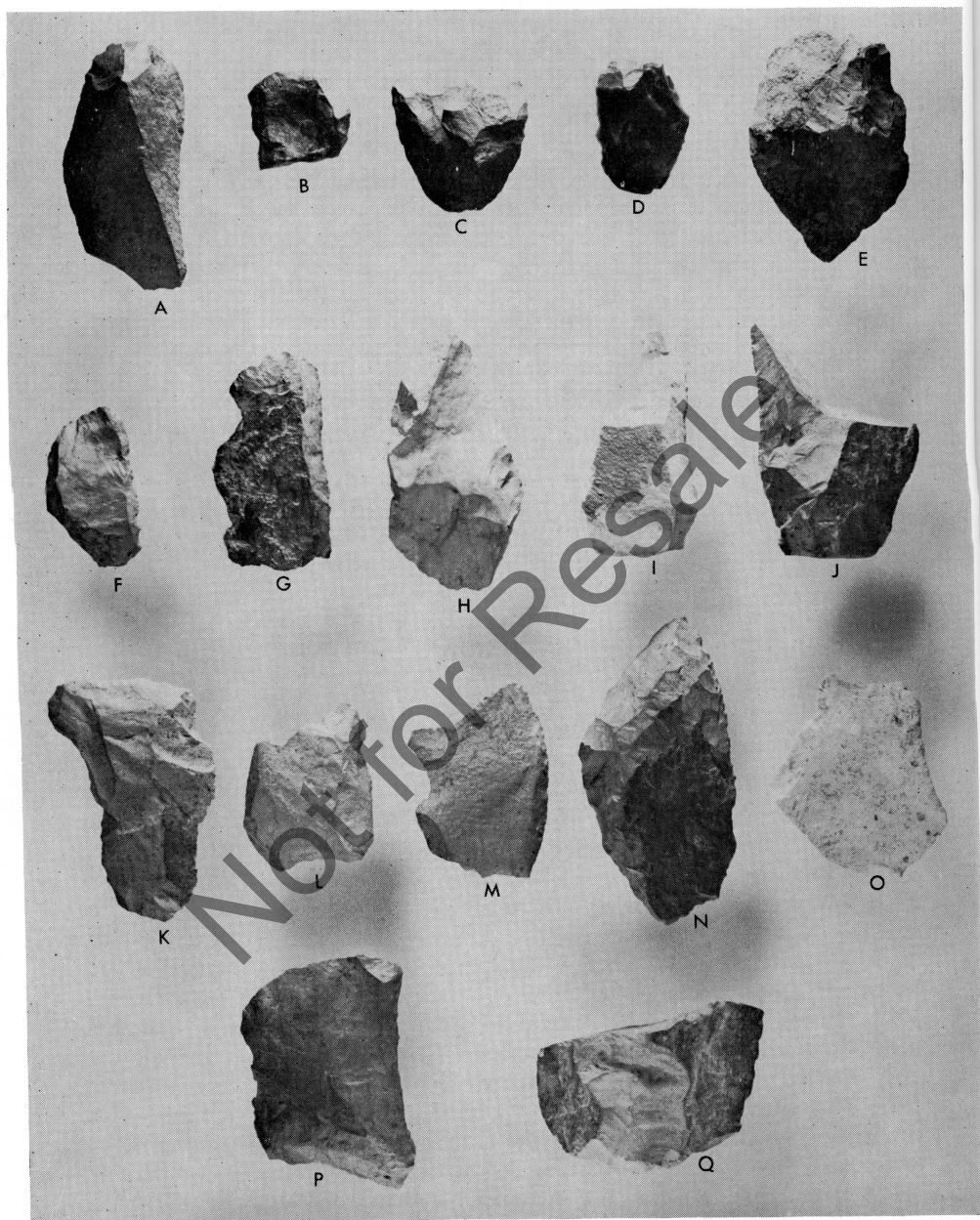


Figure 4. Artifact assemblage from Yardang Flint Station, Central Alaska Range. Length of specimen number 1 is 6.1 cm.

## ARCHAEOLOGY

Twenty-four stone artifacts, concentrated in an area 25 cm. in diameter, were found in an organic-rich layer 1–10 mm. thick 13 cm. above the gravel-loess contact in the southern part of the exposed section (Fig. 3). The artifacts are listed and briefly described in Table 2 and the entire assemblage, excepting the four utilized flakes, is illustrated in Figure 4. The organic material in the artifact layer was determined by radiocarbon analysis (1-647) to be  $2,300 \pm 180$  years old.

The artifacts from the Yardang Site are unfortunately of a degree of characterization that we presently can say nothing about their affinities. They are, for the most part, "tools of the movement"—scrapers and/or knives fashioned on rather large irregular flakes. One specimen may, on the basis of its relative complexity, ultimately prove to be of diagnostic value. This is the end scraper with pointed tail shown as E in Figure 4. It appears unusual in its form, apparently having served multiple purposes. However, we are not familiar with any similar specimens from the North and hence cannot now make a statement as to whether this artifact is idiosyncratic or not. Measurements of all specimens are presented in Table 2.

Functionally, the following observations seem pertinent: 1) Of the seventeen illustrated specimens, all but one are classed as scrapers. 2) Side scrapers predominate by more than two to one over end scrapers. 3) Nineteen of the total of twenty-four pieces appear to have been derived from a common core stone of grey siliceous siltstone. 4) No indications were present of a hearth or structural remains.

It must be concluded therefore that this was neither a habitation nor a kill site. In fact, it appears more probable that a brief instant of time is recorded here—perhaps no more than 1 day. One may imagine a single family or small hunting group pausing near the scene of a kill and dressing out on this hillside the skins of animals taken close by. The location was convenient to a clear water stream which probably was a factor in its choice.

In conclusion it must be said that in view of the presence at this site of a clear stratigraphic situation and of the radiocarbon date, it is truly unfortunate that the artifacts themselves have so little to tell us. Perhaps future research will achieve a degree of refinement whereby materials such as those we have described may be made to yield more information. It is with that thought in mind that we place these data on record.

## ACKNOWLEDGMENTS

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# AN ARCHAEOLOGICAL SURVEY OF THE PORTIONS OF THE NORTHWESTERN KENAI PENINSULA<sup>1</sup>

by

FREDERICK J. KENT, JOHN V. MATTHEWS, AND  
FREDERICK HADLEIGH-WEST

## INTRODUCTION

The University of Alaska Department of Anthropology was granted two contracts for archaeological salvage work on the Kenai Peninsula during the summer of 1960. The Delta Engineering Company (acting for Alaska Natural Gas Company) and the Kenai Pipeline Company both planned to construct pipelines across the Kenai National Moose Range. In recognition of the possibility of inadvertent destruction of archaeological remains in the area concerned, both companies contracted with the University of Alaska to carry out archaeological surveys along the routes of the proposed pipelines.

Frederick J. Kent and Carl Peterson, anthropology students from the University under the direction of Frederick Hadleigh-West, of the Anthropology faculty at the University, carried out the fieldwork.

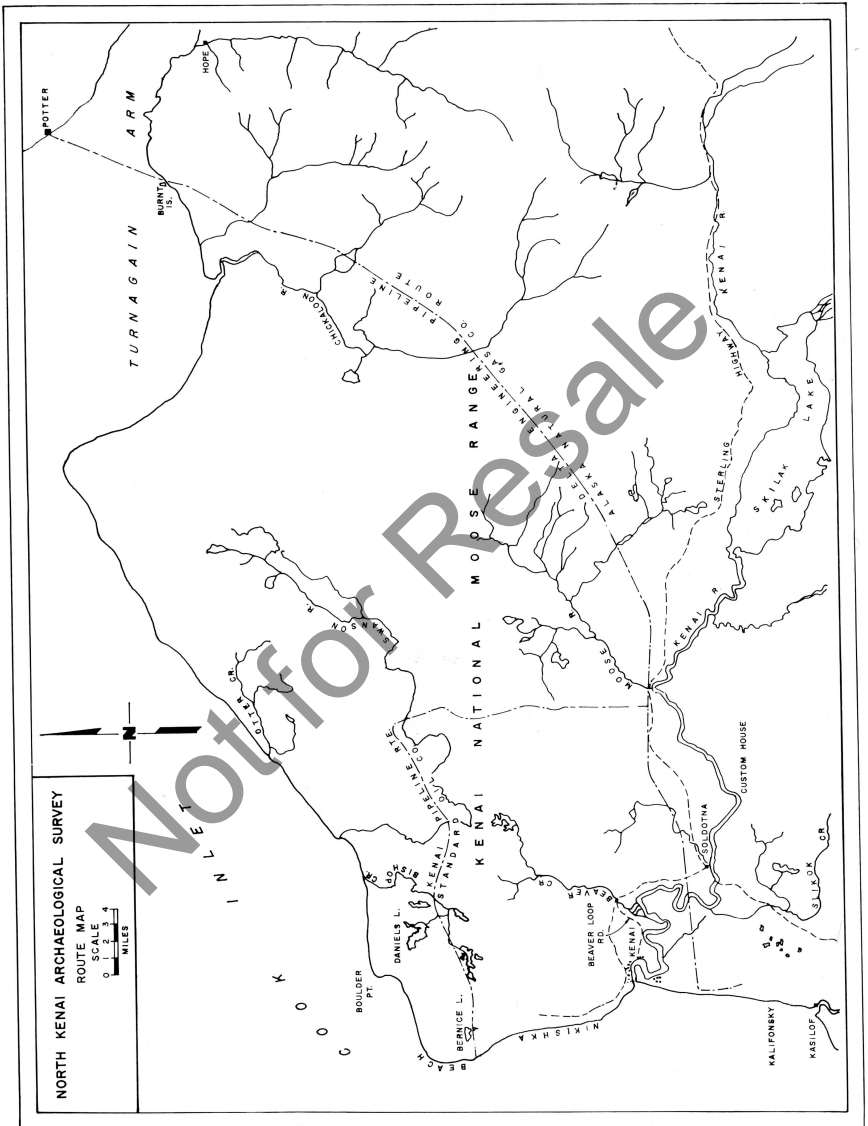
Due to the narrowness of the sixty-five foot right-of-way, not many sites were located within the path of possible destruction. Only eight sites were located within the rights-of-way of both pipelines and none of these sites contained house depressions. All of the sites described in this report are located on the coastal plain although the major portions of the rights-of-way lie in the hills beyond this plain.

The Delta Engineering Company, under contract to the Alaska Natural Gas Pipeline Company, supported the greatest part of the expense for the survey. This pipeline route covers approximately ninety miles and runs between Kalifonski Beach on the Kenai Peninsula and Anchorage (see Map 1). The entire distance was walked from the wells on Kalifonski Beach to Burnt Island

<sup>1</sup> We wish to record our gratitude to the two private companies who generously provided funds for this work. These were the Alaska Natural Gas Company of Anchorage through their agents, Delta Engineering Company of Houston, Texas and the Kenai Pipeline Company of Kenai acting for Standard Oil Company of California.

Those officials of these companies with whom we dealt were uniformly cordial and helpful.

We are grateful too to the many people of the Kenai-Soldotna area who interested themselves in the success of the survey. Of these we should like to single out Mr. David L. Spencer, Refuge Superintendent, Kenai National Moose Range, Mr. John B. Hakala, Refuge Manager, Kenai National Moose Range, Mr. John B. Nelson, Kenai Pipeline Company and residents of the area, Mr. Theodore Meining, Mr. Walter Peterson, Mr. Carl Seaman, Mr. Rex Stubblefield, Mr. Charles Dozer, Mr. Waldo Coyle and Mr. Frank Mullins.



Map 1



on the north end of the Kenai Peninsula. From Burnt Island, the pipeline was to run underwater to Potter on the Anchorage side of Cook Inlet. The segment of line between Potter and the pipeline terminus in Anchorage was also investigated. Only five sites were encountered over the entire distance of the line within the right-of-way (Fig. 1).

The Kenai Pipeline Company route covered twenty-two miles from the Swanson River and Soldotna Creek Units to tidewater at Nikishka Beach. The terminal site at Nikishka #1 Beach was investigated in May by a group from the University of Alaska and again later in the summer by the above-mentioned survey crew. Nothing of archaeological interest was found either time. DeLaguna, refers to a village located at Nikishka #1 in her work *Archaeology of Cook Inlet* (DeLaguna, 1934). DeLaguna numbers the three Nikishka beaches from north to south while the present maps of the area label them from south to north (DeLaguna, 1934: Plate I). The village DeLaguna refers to lies just south of the mouth of Swanson River and is labeled Nikishka Number Three on all present maps. A native resident of Kenai informed us that the people lived in small groups of from one to three houses at the mouths of creeks all along the North Kenai Beach, and that a village as is commonly conceived probably never existed.

Along the twenty-two mile right-of-way of the oil line, only three sites were located and only one of those was within the sixty-five foot limit. Nothing of archaeological interest was discovered and the terminal site and right-of-way were cleared.

There was a heavy population in the Kenai during the precontact era and there are many known remains. By drawing a sixty-five foot wide path across any area, however, regardless how rich it might be in archaeological remains, the chances are slim of encountering a large number of sites. Since the greater part of our time was spent making sure that there were not any sites within the path of possible destruction on the rights-of-way, we are deeply indebted to the residents of the area for their willing cooperation in informing us of known sites.

Whenever possible, and as time allowed, all reports of sites in the area were investigated. Since the primary mission was that of "clearing" the pipeline routes, we cannot claim this as an exhaustive report of sites on the northern Kenai Peninsula. We do, however, believe that the result is a more realistic picture of prehistoric settlement than would otherwise have been achieved. This report contains descriptions of all the sites that were visited both on and off the pipeline routes.

### HISTORIC NATIVE OCCUPATION

Tanaina\* is the term by which the Athabaskan-speaking Indians of the Cook Inlet area call themselves. The Tanaina are made up of several related

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\* A complete discussion of the ethnography of the Tanaina may be found in Osgood, 1937, from which the present material is abstracted.

subdivisions or bands. There are actually seven subdivisions of the Tanaina but this report covers only those of the Kenai area. This area comprises the greater part of the west coast of the Kenai Peninsula north of the Kachemak Bay area and includes the country of the Tustumena, Skilak, and Kenai lakes as far north as Turnagain Arm. The principal native settlement was Kenai. Other known villages, from south to north were: Kasnatchin (Anchor Point), Ninilchik, Kasilof, Skittols (near Kenai), Chinila (near Kenai), Skilak (south side of Skilak Lake), Tilukilsk (near Nikishka), Nikishka (near East Foreland), and Kultuk (near Nikishka) (Osgood, 1937:13).

In describing the physical features of the Tanaina, Osgood quotes Petroff as follows:

The height of the male of the Kenai tribe is greater than that of the Eskimo, and a fullgrown man of less than 5'8" is rarely encountered. They are slim, lithe, and sinewy: the eyes are set straight in the head; the nose is prominent, frequently aquiline; the mouth is large, with full lips, and chin frequently receding; the skin is very perceptibly darker than that of the Eskimo. (Osgood, 1937:17).

Most of the Northern Athabaskan people depend primarily on fish and secondarily on land mammals. The Tanaina area, however, had sea mammals as well as an abundance of fish and land mammals. The distribution is not equal throughout the area, however, which results in groups of villages differing in this and dependent aspects of culture. The outstanding factor affecting the range of the food supply is correlated with salt water. In the Kachemak Bay area there is a regular salt water fauna, but in the narrower upper regions the Inlet is apparently not suitable for many forms of sea life. One thus finds the rich food area in the lower Inlet, and areas gradually becoming poorer as one moves up the Inlet and inland until there was the familiar Athabaskan situation of a people who intermittently starve.

Land animals and vegetable foods are more evenly distributed than sea mammals and played an important role in solving the food problem. In terms of the economy as a whole, however, one can easily say that fish, and especially salmon, were the most important article of diet for the Tanaina.

The Tanaina year, on the basis of residence, was divided into two periods, during each of which the people occupied a different shelter. During the long winter season, they lived in rectangular, gabled, semisubterranean houses commonly called, since the Russians came, "barabara." During the summer, when intensive salmon fishing dominated all activity, the people shared the convenient, lightly constructed, smokehouse with their drying catch.

The Tanaina constructed the *barabara* by first excavating to a depth of around two feet the area over which the structure was to be raised. The builders smoothed over the excavation and at each corner raised four upright posts so distanced that the wall logs could be wedged between them. They then laid ground logs horizontally across around the structure. The walls of horizontal

logs were built up to the height of about five feet above the ground level. The roof was supported by a double row of poles extending from front to back of the house. A large smoke hole was left in the center of the roof. The roof was covered with split poles which were in turn covered with two layers of spruce bark which was lashed down. Dirt was thrown up on the outside of the house after it was thatched. The fireplace was placed in the center of the room and was made by filling a framework with sand thus raising it above the floor level. Extra rooms for sleeping and bathing were usually floored with planks while the main room was covered with grass. From the door of the house, extended a shed-like entryway about eight feet long which was closed at each end with grass mats.

During the year 1786 the Russians settled at St. George, now known as Kasilof, and five years later they erected a redoubt at St. Nicholas, the modern village of Kenai. In 1793, Baranof brought thirty convicts to teach the people agriculture. The next year missionaries began to convert the Tanaina. The Russian-Indian relations were not good and almost constant hostility existed. The bitterness of the natives towards the intruders certainly limited Russian expansion and probably a number of the Tanaina escaped exploitation by keeping out of reach. About 1838, smallpox greatly reduced their numbers, and broke down the group morale, for from that date on the native culture appears to have declined.

The Tanaina population during the historic period can only be estimated, but the following table excerpted from Osgood (1937:20) should serve as a reasonable guide.

TABLE 1. *Estimated populations during historic times*

Date		Population
1805	Lisiansky (estimated)	3,000
1818	Kostivtzof (in Petroff)	1,471
1880	Petroff in 10th census	739
1899	Elliot	1,030
1910	13th census	697
1932	Osgood	650

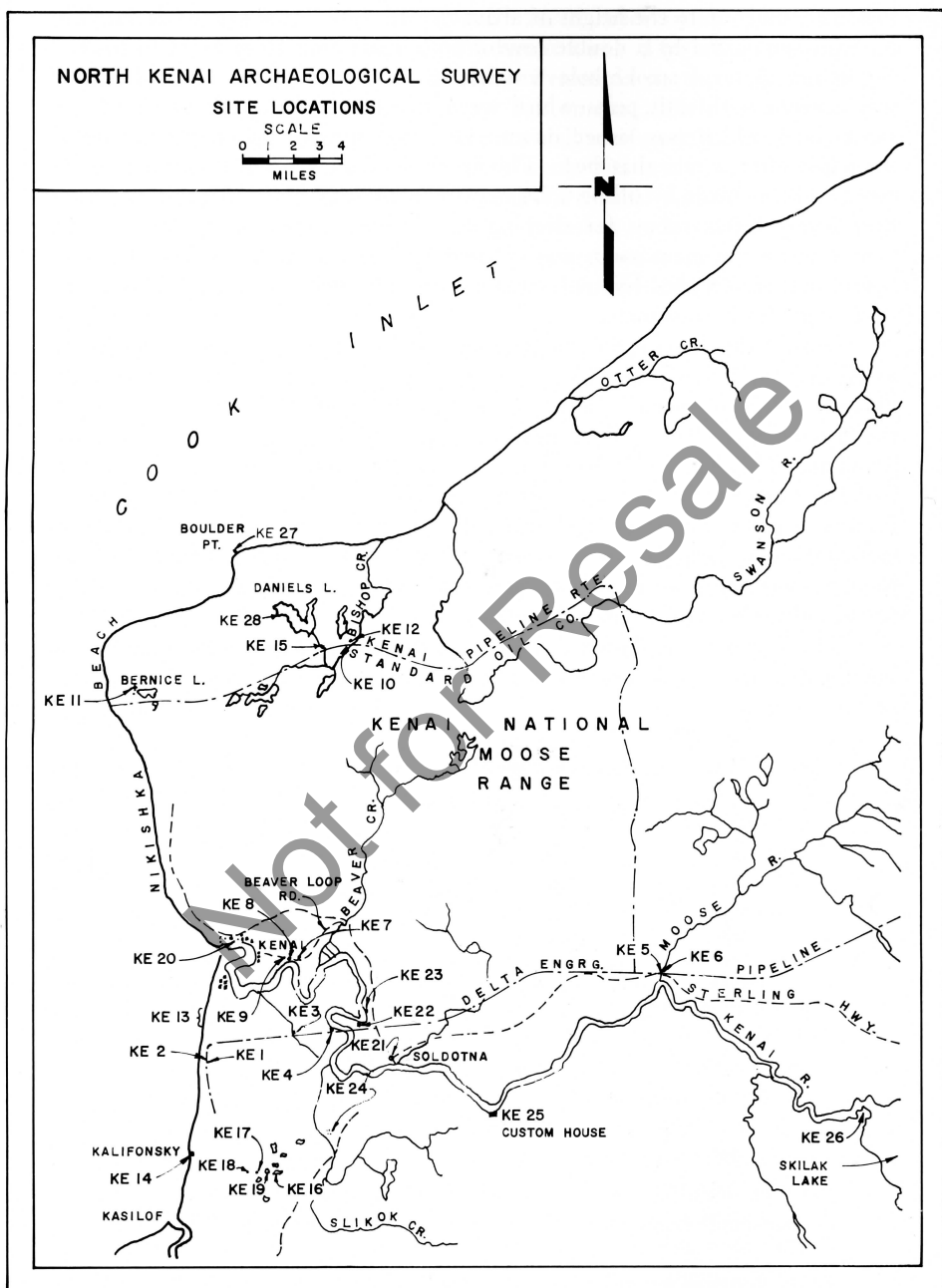
SITE DESCRIPTIONS

Ke1

*Location:* N. W. ¼ of S. E. ¼ of Sec. 31, T. 5 N., R11W. (Kenai B-4)

Just five hundred feet north of Well Number Two\* there are two ten-foot man-made holes that are from two to three feet deep. These pits were

\* These designations refer to natural gas wells of the Alaska Natural Gas Company.



Map 2

the first of a large number of similar depressions we encountered during the summer. We excavated one of the pits completely finding no hearth, postholes, or other evidence of human activity. The floor was saucer-shaped with a low spot in the center. There were mounds of dirt on two sides of the depression where it had been thrown up during the original excavation. The floor layer was just under the moss and below a coarse layer of ash. This ash is found all over the area and was presumably deposited during the 1912 eruption of Mount Katmai which lies on the opposite side of Cook Inlet.

These excavations were probably storage pits or underground meat caches, although in all the pits encountered during the summer not even so much as a bone was found. Some bark was found on the floor surface indicating that the pits may have been bark lined. The only mention DeLaguna makes of similar pits is a reference to a house pit with no entry or extra room that was ten by twelve feet and four feet deep (DeLaguna, 1934:133).

Osgood, in his work, *The Ethnography of the Tanaina*, states that the North Kenai Indians dug large pitfalls for trapping bears. Sharpened knives made of caribou antler are placed upright in the bottom of the pit, and the bear-hunters of Kenai, were said to use wooden shovels (1937:33). This could be another explanation. Both the storage pit and pitfall ideas are possibilities for there are pits located along good salmon streams that were undoubtedly fish storage pits, and there are pits located great distances from water. This report, for convenience's sake, will refer to all such depressions simply as storage pits (see Fig. 2).

#### Ke2

*Location: N. W.  $\frac{1}{4}$  of S. E.  $\frac{1}{4}$  of Sec. 31, T. 5 N., R11W. (Kenai B-4)*

Two hundred feet north of Ke1 there is one storage pit ten by eight feet and three feet deep. A trench dug diagonally across the pit revealed nothing of interest. There was no indication that the pit had been bark lined.

#### Ke3

*Location: N. W.  $\frac{1}{4}$  of N. W.  $\frac{1}{4}$  of Sec. 26, T. 5 N., R11W. (Kenai C-4)*

South and east of Kalifonski road, three-quarters of a mile along the Delta Engineering Company right-of-way, there are two house depressions. The largest (House 1) is twenty feet by twenty-six feet with a six by eight foot extra room. The outside entryway is opposite the entry to the extra room. There were five spruce trees growing in the house—the largest of which had twenty-five growth rings. The walls are from one and one-half to two feet high and about the same in thickness. There are a number of decaying stumps and logs lying inside the house.

House 2 is nineteen by twenty feet with a funnel-shaped extra room that is six feet across at its widest point with the walls narrowing to the point where they connect with the entryway from the main room. The walls of this house are not as well preserved as those of House 1.

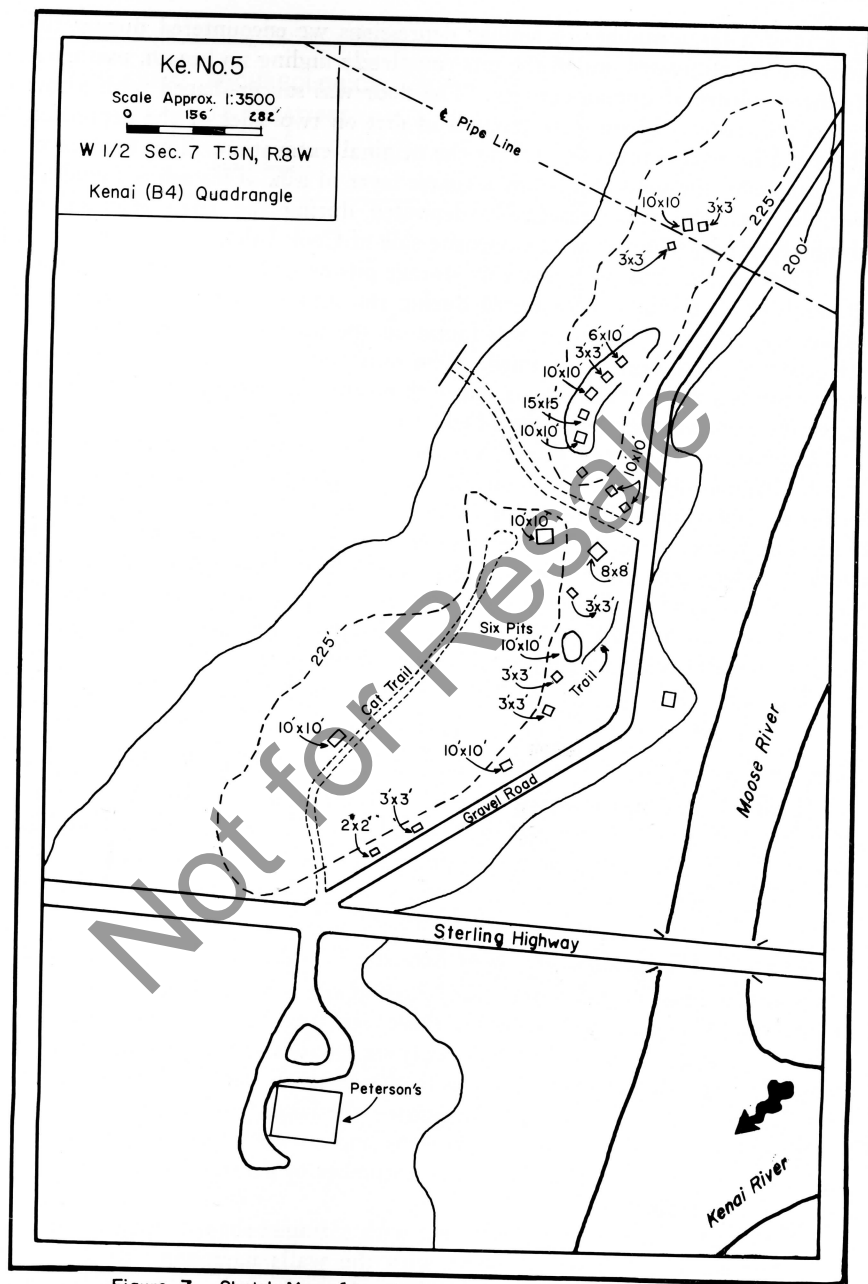


Figure 7 Sketch Map of Ke. 5

The Delta Engineering Company Pipeline originally ran right through House 1, but due to the company's inability to gain right-of-way permission, the line was rerouted ninety feet north of the original line. We were not granted permission by the owner to excavate so we were forced to abandon the site (Fig. 3). When the equipment cleared the swath for the right-of-way, House 1 was buried under twelve feet of debris. This was an unfortunate, and from our standpoint at least, unavoidable situation. House 2 escaped destruction, but we were not allowed to excavate.

Ke4

*Location: S. E.  $\frac{1}{4}$  of S. E.  $\frac{1}{4}$  of Sec. 24, T. 5 N., R11W. (Kenai C-3)*

On the south bank of the Kenai River, the Delta pipeline crosses two former floodplains. On the face of each of these floodplains there are a number of small holes that are from twelve to fifteen inches square and twelve inches deep. DeLaguna mentions similar pits in her report and calls them cooking baskets (1934:134). The pits DeLaguna describes are birch bark lined and were used for stone boiling. We excavated two of the pits that were on the right-of-way and found no indication of bark. The area is extremely damp, however, which would tend to limit preservation (see Fig. 4).

Ke5

*Location: W.  $\frac{1}{2}$  of Sec. 7, T. 5 N., R8W. (Kenai C-3)*

On the west side of the Moose River where it drains into the Kenai River, there are a number of storage pits. There are *twenty-one* between the Sterling Highway and the Delta pipeline route in a distance of one-half mile. The *three* pits that were on the right-of-way were excavated but nothing of interest was found (see Fig. 7). Mr. Peterson, the owner of the property, said that the location would have been ideal for spearing or trapping salmon as they entered the shallow Moose River lagoon from the Kenai River. Mr. Peterson also suggested that the area would have been excellent for duck hunting in the spring and fall.

While bulldozing an area for a tourist trailer park, Mr. Peterson found a ground slate knife blade and a projectile point. The area was probably a summer camping place as we found no house depressions or middens (Fig. 5).

Ke6

*Location: Sec. 7, T. 5 N., R8W. (Kenai C-3)*

Just across the Moose River bridge from Ke5, were found twenty human bone fragments. Mr. Charles Doser, the owner of the property, was told by the crew that built the Sterling Highway that they had found a number of human bones on his property. In the previous spring Mr. Doser found a few bones that had washed down the cutbank during the thaw. We examined the



TABLE 2. *Location of houses in relation to each other, Site Ke8*

House #	Size of main room	Extra rooms	Size	Distance from preceding house in paces
1	28' × 22'	2	3' × 7' 10' × 10'	
2	24' × 22'	2	10' × 10' 11' × 13'	7
3	25' × 23'	1	10' × 10'	18
4	21' × 23'	1	15' × 10'	10
5	26' × 24'	0		2

spot and located a few more bones and one large bead. Only a four-foot strip of land, lying between the top of the cutbank of the road and the area Mr. Doser had worked with his tractor remained undisturbed. The site was undoubtedly a graveyard, but the area has been disturbed to so great an extent as to be of dubious value.

#### Ke7

*Location: Sec. 10, T. 5 N., R. 11 W. (Kenai C-4)*

There are three house depressions in a field and two more in the woods on the property of Mr. Coyle located just off of the Beaver Loop Road approximately seven miles east of Kenai. We excavated House 1 because it had suffered the least damage during the field clearing. It was twenty-four by twenty feet with an eight by ten-foot extra room. The walls were two feet high. The floor layer was just under the sod indicating that the house was not very old. Also, the floor layer itself was not very deep indicating that the house was probably not lived in for very long. The fireplace was located in the center of the room between the outside entrance and the entrance to the extra room. The northeast one-fourth of the main room appeared to be lined with folded birch bark while the rest of the floor was earthen. The extra room was floored with logs which were in a late stage of decay. There were a number of large rocks along the north wall of the extra room leading us to believe that the room was used for steam baths as well as sleeping.

In all, we found forty-three black, red, and white beads, assorted pieces of white china with blue markings, a six-inch piece of wrought iron, two small pieces of sheet copper, some beaver teeth, and assorted small animal bones. Some of these artifacts are shown in Figure 7.

Mr. Coyle has found two stone adzes and other worked items while clearing land. Mr. Coyle also told us that burning green birch would cause the area around the fire to become cemented. After we had removed the floor layer the fireplace stood like a pillar. The fireplaces were raised above the floor layer and consisted of sand held in by log cribbing (Fig. 6).

TABLE 3. *Location of houses in relation to each other, Site Keg*

House #	Size of main room	Extra rooms	Size	Distance from preceding house in paces
1	20' × 11'	1	8' × 10'	
2	29' × 25'	0		23
3	18' × 22'	1	8' × 8'	12
4	28' × 22'	1	10' × 10'	40
5	28' × 23'	1	8' × 10'	10
6	23' × 26'	2	15' × 12'	7
			10' × 10'	
7	21' × 24'	1	8' × 8'	55

There is a small creek about fifty feet from House 1, and the field that contains the three houses is on a small rise that overlooks a spruce flat which leads to the Kenai River three-fourths of a mile away. None of the other houses was excavated.

Ke8

*Location: Sec. 10, T. 5 N., R11W. (Kenai C-4)*

There are five house depressions ninety feet south of Beaver Loop Road which are either on the highway right-of-way or on Mr. Coyle's property. They average twenty-four by twenty-three feet and two of them have two extra rooms. Four are in excellent condition and are probably not very old. The walls protrude a good two and one-half feet above the surrounding ground level making them easy to spot from the road. One of the houses is in poor condition and difficult to locate. There were no obvious middens visible. We did not excavate at this site.

Keg

*Location: Sec. 10, T. 5 N., R11W. (Kenai C-4)*

There are seven house pits one-fourth mile south of Beaver Loop Road about fifty yards from the Kenai River. One of the pits was extremely well preserved with the walls being almost three feet high. The house pit closest to the river was used as a chicken yard and was only a few paces from an old chicken house. The people who owned the property were away for the summer so we did not excavate in the houses. We did dig into one midden finding a number of fire-broken rocks and clamshells.

Ke10

*Location: 60°43' 5'' N. Lat., 151°07' W. Long. (Kenai C-3)*

One-eighth of a mile south of the Kenai Pipeline Company right-of-way crossing on Bishop Creek, there are four storage pits. These pits are located on

a knoll about fifty feet above the creek and command a view of the creek on two sides giving the knoll the appearance of a peninsula. Three of the pits are rectangular and the fourth is circular. The largest pit is eight feet by ten feet and three feet deep. Due to the distance from the right-of-way and the negative results obtained from digging in similar pits, no excavation was attempted. While we were examining the site, we observed a fairly heavy run of red salmon in the little creek, which leads us to believe that the pits were probably for fish storage.

#### Ke11

*Location: S. W.  $\frac{1}{4}$  of Sec. 15, T. 7 N., R12W. (Kenai C-4)*

There are two house depressions at a point one-fourth mile south of the Kenai Pipeline Company right-of-way and just 200 feet east of Bernice Lake Road. The site is only one-half mile east of the terminal site for the oil pipeline. The houses are well defined and do not appear to be very old despite the fact that several large trees are growing in them; the largest of which is in the center of House 1 and is twenty inches in diameter.

House 1 was only partially excavated due to the tangle of roots we were forced to fight. The floor layer was quite thin, lying almost immediately beneath the moss. The fire pit was located midway between the outside entry and the entrance to the extra room. Bird bones and one-half of a stone adz blade were all that was found. The depressions are on private land belonging to Mr. Carl Seaman and are situated in a position that overlooks a small lake. House 1 is thirty-two feet by twenty-four feet with an extra room nine feet by thirteen feet; while House 2 is thirty-five feet by twenty-four feet with an extra room ten feet by eight feet. The entryway on both houses is on the long side opposite the extra room and facing the lake.

#### Ke12

*Location: 60°44' N. Lat., 151°07' W. Long.*

One hundred yards west of Bishop Creek the Kenai Pipeline right-of-way runs between two large storage pits. Pit 1 is ten feet by eight feet and Pit 2 is ten feet by twelve feet. Both are four feet deep. These pits were trenched diagonally but nothing was found. The creek at this point would be ideal for spearing or trapping salmon. These two pits, more than any others located during the summer, however, suggested that they may have been used as pitfalls. They are four feet deep and distinctly rectangular.

#### Ke13

*Location: Sec. 19, T. 5 N., R11W. (Kenai B-4)*

This is a house depression facing Cook Inlet on Kalifonski Beach between Well Number One and Well Number Two of the Alaska Natural Gas Pipe-

line Company. The house pit overlooks the beach and the southwest corner has been eroded away. There are several large spruce from fifteen inches to twenty inches in diameter growing inside the house. A test pit was dug from the back of the extra room to the middle of the main room without uncovering anything of interest.

There are also a number of conical pits in this area that were brought to our attention. We believe these pits are natural features and did not attempt to excavate.

Ke14

*Location: Sec. 24, T. 4 N., R.11W. (Kenai B-4)*

The village of Kalifonski is still listed on the maps although it has been abandoned since 1927. Mrs. Louis Nissen of Kenai, who is the granddaughter of Kalifonski the founder of the former village, said that after the Russians came to the area all the people moved to Kenai, the Russian trading center. Today there is a lot of beach salmon fishing activity in the area. We found five house depressions at the mouth of a small creek approximately where the old village of Kalifonski is situated on the map. None of the houses seemed very old, and in trenching across one of them we found only small bits of iron and small bones. Again the fire pit was located midway between the entrance to the extra room and the outside entrance.

There was also a graveyard at this location, but it appeared to be fairly recent. There are pieces of three or four former grave houses, and one complete one. Someone had dug small holes into a number of the graves to a depth of four to five feet. Someone had also dug in one of the house pits. There is an old abandoned cannery at this site, and there are many indications of recent fishing activities.

DeLaguna (1934) mentions this site but did not visit it.

Ke15

*Location: 151° 0' 30" W. Long., 60° 43' N. Lat.*

There is a house depression in the backyard of a homestead on Daniels Creek midway between Daniels Lake and Bishop Creek. The horizontally laid log walls are still visible in this house which probably means the house is not very old. The homesteader's children use the house for a play area.

Ke16

*Location: N. E. ¼ of the S. E. ¼ of Sec. 21, T. 4 N., R.11W. (Kenai B-4)*

There are four former villages located on high ground six and one-half miles southwest of Soldotna near the Sterling Highway. These villages are in a group of low, heavily wooded, rolling hills. The area is dotted with many small lakes which contain a good supply of freshwater clams and beavers. These hills are the first high land south of the Kenai River, and they are also

TABLE 4. *Location of houses in relation to each other, Site Ke16*

House #	Size of main room	Extra rooms	Size	Paces from preceding house
1	26' × 20'	1	10' × 10'	
2	21' × 27'	1	10' × 10'	100'
3	22' × 26'	2	8' × 6'	0
			10' × 7'	
4	15' × 12'	none		70'
5	24' × 21'	3	8' × 8'	
			8' × 8'	
			10' × ?	
6	22' × 19'	1	10' × 8'	13
7	25' × 23'	none		60
8	24' × 26'	1	12' × 12'	20
9	26' × 22'	1	12' × 10'	0
10	24' × 30'	none		0
11	22' × 24'	none		8 (from #8)
12	17' × 20'	2	poor condition	0
13	24' × ?	1	poor condition	10 (from #11)
14	24' × 13'	none		0
15	23' × 24'	1	12' × 7'	0
16	25' × 24'	1	12' × 8'	7
17	10' × 16'	none		4
18	20' × 25'	2	8' × 8'	10
			8' × 10'	
19	16' × 24'	2	8' × 10'	7
			8' × 10'	
20	29' × 26'	1	16' × 14'	0 (from #18)
21	24' × 24'	1	10' × 6'	18
22	28' × 26'	1	8' × 8'	60
23	26' × 24'	1	8' × 8'	10
24	20' ? × 20' ?	none	poor condition	16
25	20' × 24'	none	poor condition	0 (from #23)

about two miles back, or east, of the old village of Kalifonski on Cook Inlet.

Ke16 is the largest of the four villages, containing twenty-five house depressions. Many pits of various sizes and shapes were found around each house depression. The site is on the homestead of Mr. Rex Stubblefield and is situated on the side of a hill back about fifty yards from a small lake. The entire area is heavily wooded, one spruce tree growing inside a house depression measured sixty-one inches in circumference. These trees do not seem to be the first growth as many of the depressions are littered with deadfalls, old snags, and stumps.

A large oval-shaped mound is located at the southwest end of the village. This mound is roughly twenty feet by thirty feet at its widest point and ranges from eight to ten feet high. There is a portion dug out of the mound that resembles an entryway, but it is a dead end. There was not time to excavate, but the mound should be a promising starting place for such.

Some of the houses were close enough together to be able to use a common

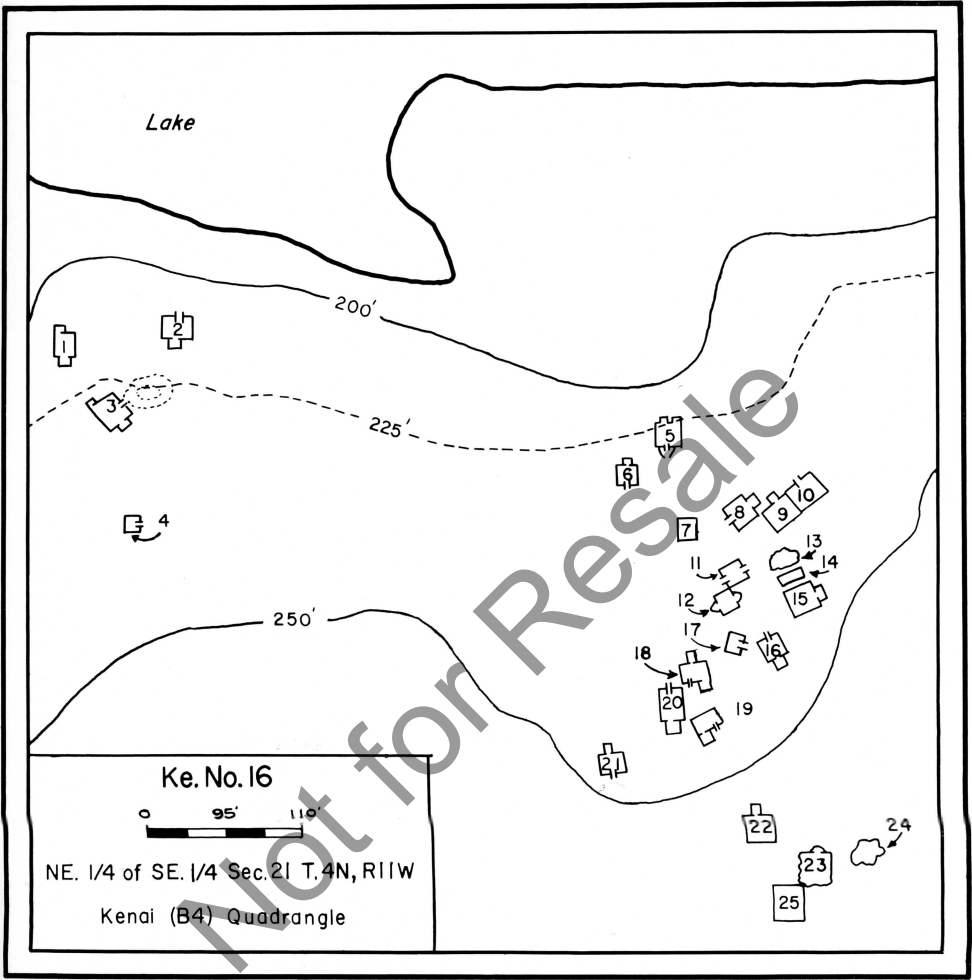


Figure 8 Sketch Map of Ke. 16

wall, while others were as much as one hundred paces away from the nearest house. The houses are in fairly good shape on the whole with most being well preserved but others deteriorated to the point where it is difficult to make out the outline. This was probably a winter village, for the summers would have been more profitably spent salmon fishing along the coast (Fig. 8).

Ke17

*Location: S. W. ¼ of Sec. 21, T. 4 N., R11W. (Kenai B-4)*

Three-fourths of a mile west of Ke16 there is a site that contains thirteen

TABLE 5. Location of houses in relation to each other, Site Ke17

House #	Size of main room	Extra rooms	Size	Distance from preceding house in paces
1	24' × 32'	1	10' × 12'	
2	22' × 24'	none	poor condition	
3	24' × 26'	1	8' × 8'	2
4	22' × 25'	1	10' × 10'	2
5	23' × 26'	1	10' × 10'	4
6	20' × 22'	none	poor condition	3
7	24' × 24'	none		7
8	22' × 23'	1	8' × 8'	
9	24' × 24'	1	12' × 12'	30
10	20' × 22'	1	6' × 6'	6
11	22' × 24'	2	6' × 6'	10 (from #9)
			8' × 8'	
12	22' × 24'	3	8' × 8'	30
			8' × 12'	
			12' × 15'	
13	20' × 24'	3	8' × 8'	30
			8' × 12'	
			12' × 15'	

house depressions. These pits are on top of a rise that gradually slopes toward a lake. The depressions are in two groups with the one on the west side of the lake containing six depressions, and the one at the southern end of the lake containing seven depressions. There are about one hundred and fifty yards separating the two groups with those at the southern end being generally in poorer condition than those on the west side of the lake. This may mean that the location was changed in favor of the western location, and that the two groups of houses were not occupied at the same time. Also in the group on the western side of the lake two of the house depressions have three extra rooms while none of the houses at the south end have more than one.

About seventy-five yards east of the group of house depressions at the south end of the lake is a single house pit. This depression is on a small rise overlooking the lake and the mouth of a small creek. The location would seem to have been the best place for a village. This single depression, being twenty-four by thirty-two feet with a ten- by twelve-foot extra room, is larger than the average depressions in the area. Unlike the group of depressions closest to it on the south end of the lake, it appeared not very old. There was also some indication of recent trapping activity in the area (Fig. 9).

#### Ke18

Location: S. E. ¼ of Sec. 20, T. 4 N., R11W. (Kenai B-4)

One-fourth mile west-southwest of Ke17 there is a site containing six house depressions. This site is on a ridge overlooking Kalifonski Beach on



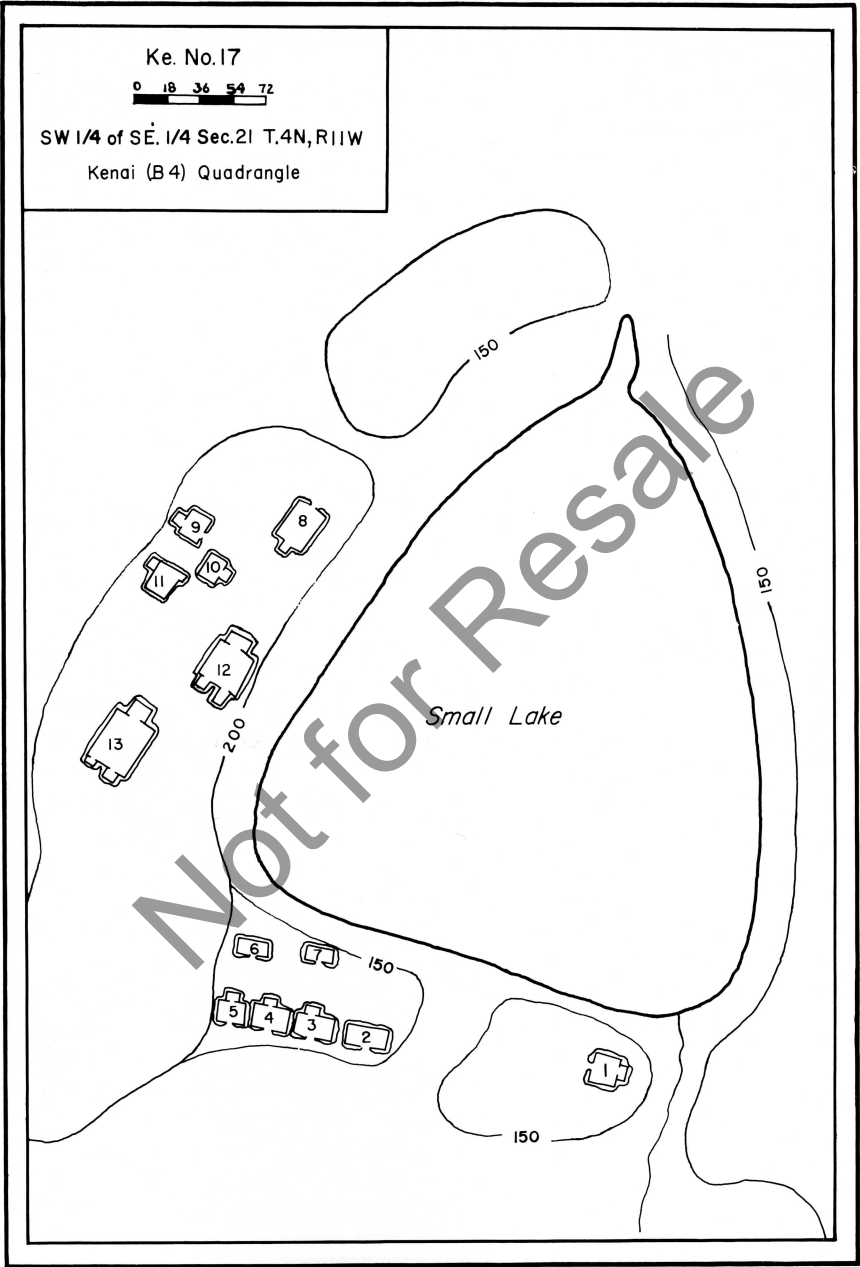


Figure 9 Sketch Map of Ke.17

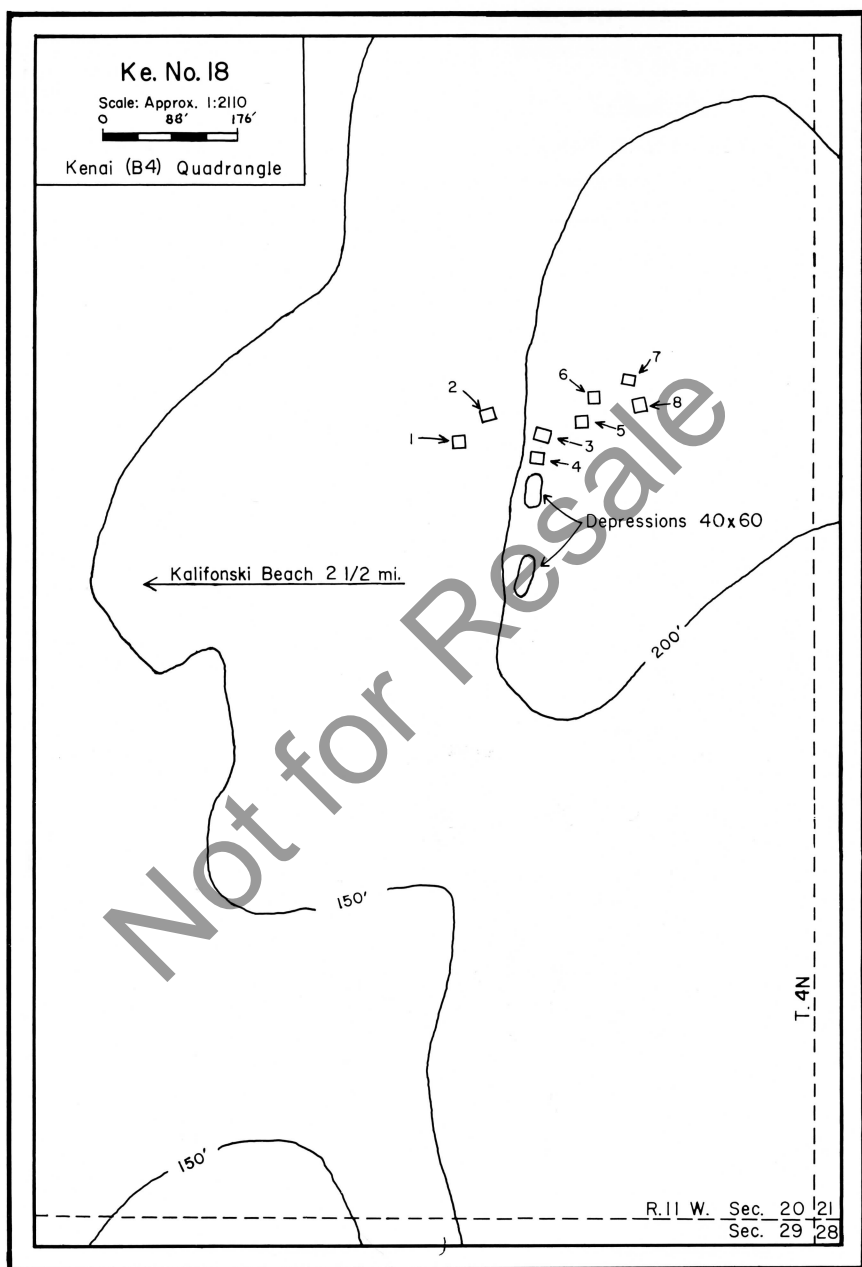


Figure 10 Sketch Map of Ke. 18

TABLE 6. *Location of houses in relation to each other, Site Ke18*

House #	Size of main room	Extra rooms	Size	Distance from preceding house in paces
1	22' × 26'	none	poor condition	
2	24' × 26'	1	8' × 12'	17
3	24' × 24'	none		30
4	25' × 25'	1	8' × 8'	20
			poor condition	
5	32' × 24'	1	8' × 8'	3
6	22' × 18'	1	8' × 8'	7

Cook Inlet just over two miles away. These depressions are very poorly preserved and difficult to define. Often we could only make out two or three of the walls and portions of the extra room. We had to approximate the size of some of the depressions. From the state of preservation it would seem that this site is older than the other sites in the area. There are also two large circular-shaped depressions at this site which are forty and sixty-eight paces in diameter, respectively. These depressions look as though they are natural in origin and yet they appear too symmetrical to be natural. There were house depressions around these larger depressions. We came to no decision as to whether or not they were man-made. We were told of these large depressions by Mr. Phil Williams of Kenai who had seen them from the air (Fig. 10).

This is the only site we found in the survey that was not on a lake or pothole. There is no stream nearby which raises the question of how water was obtained; almost certainly this was a winter village. This site may prove to be the most interesting from an archaeological point of view due to its apparent age. Excavation would have been desirable but time would not allow it.

#### Ke19

*Location: S. E. ¼ of Sec. 21, T. 4 N., R11W. (Kenai B-4)*

There are two well-preserved house depressions on a low ridge overlooking a small pothole midway between Ke16 and Ke17. These two depressions are the same size being twenty-two feet by thirty feet with an extra room ten by eight feet.

The area in which the sites Ke16, 17, 18, and 19 are located has been known for a long time. As early as 1935 Sections 21 and 28 and the eastern half of Sections 20 and 29 were set aside in the Federal Land Withdrawal, E. O. 7888. The withdrawal has apparently been allowed to lapse, however, as there is now homesteading activity in the area. It is unfortunate that the land could not be preserved in some manner as the area is dotted with many small picturesque lakes. The hills around the lakes are covered with large trees which are spaced far enough apart as to give the area a natural park-like

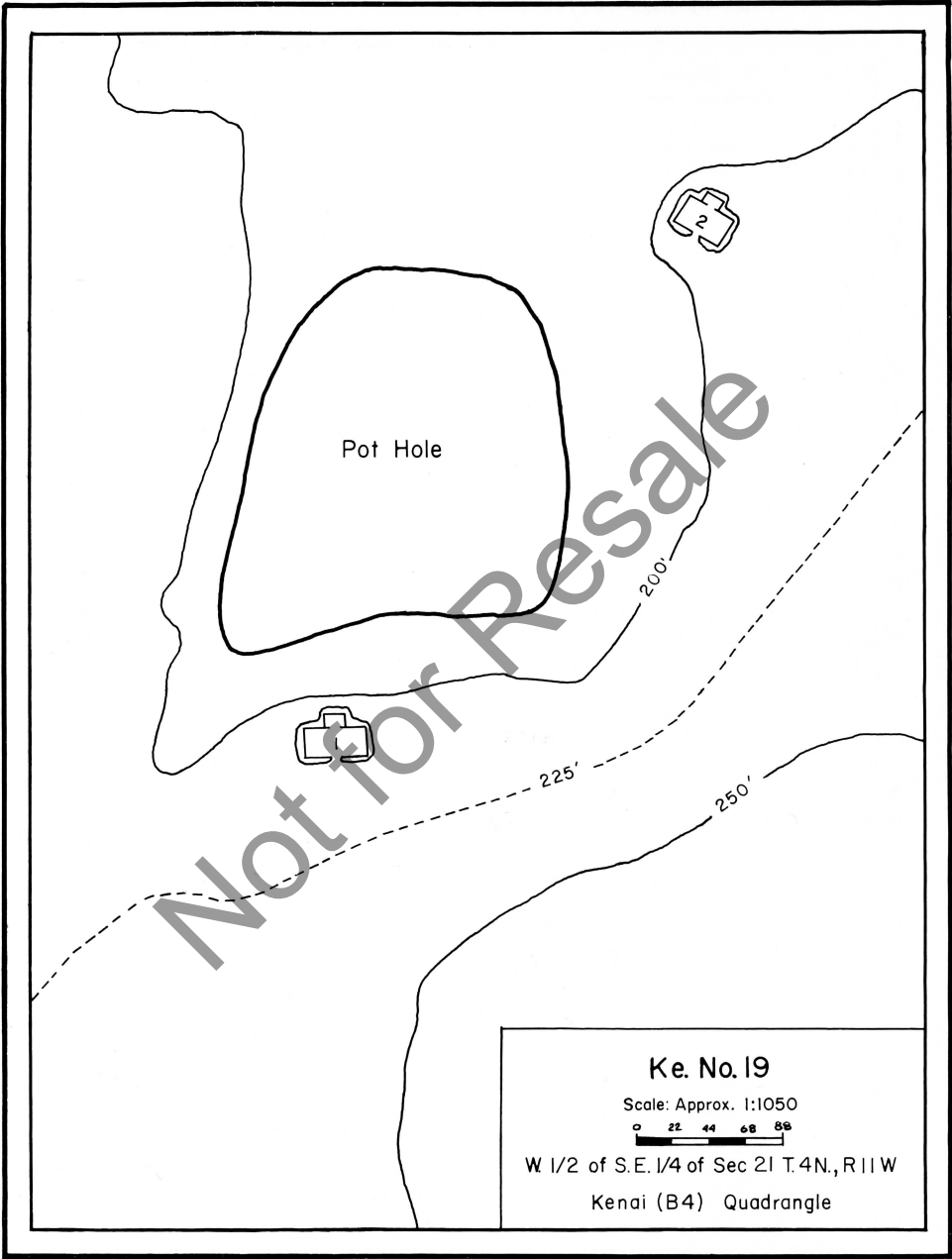


Figure 11 Sketch Map of Ke. 19

appearance. We located the forty-six house depressions on one trip into the area and are convinced that there must be many more village sites in the area as there are a number of lakes that we did not have time to visit (Fig. 11).

Ke20

*Location: Sec. 5, T. 5 N., R. 11 W. (Kenai C-4)*

There is a collection of copper artifacts in the possession of Mr. Jordan, an employee of the Federal Aviation Agency at Kenai. The collection was made during the leveling of the present FAA administrative and employee housing area about one-half mile east of Kenai. This site overlooks the Kenai River and is about one mile northeast of its mouth. Many of the natives moved into the Kenai area after the Russians set up their trading post there.

Ke21

*Location: N. W.  $\frac{1}{4}$  of Kenai B-3*

Behind the Bureau of Public Roads station at Soldotna, there were two house depressions. Mr. Mullins of Soldotna showed us where there had been two house depressions located on the bank of the Kenai River. The depressions had been bulldozed over the bank accidentally earlier in the year. The area around the depressions had only been scraped to a shallow depth but no indication of the depressions remained. We had planned to trench across the area, but due to the negative results obtained from excavating other depressions in the area the idea was abandoned.

*Sites not visited*

Ke22

*Location: Center of Sec. 19, T. 5 N., R. 10 W. (Kenai C-3)*

Mr. Mullins of Soldotna told us of an old campsite on the Kenai River which was called Big Eddy. The site is said to have a spring and a small creek on it.

Ke23

*Location: Center of Sec. 19, T. 5 N., R. 10 W. (Kenai C-3)*

Upstream from Big Eddy just around the bend is a site called Old Camp. Mr. Mullins said that this site was used by the hunters from Tyonek. The hunters used to come from the western side of the inlet to hunt moose. It is interesting to observe that the reverse is now true for a good percentage of hunters from the Kenai side cross over to the western side to hunt.

Ke24

*Location: Sec. 11, T. 4 N., R11W. (Kenai B-4)*

We were told that there was an old graveyard somewhere on the north bank of Slikok Creek in Section 11. We were interested in this graveyard as it was not very far from the large sites of Ke16 and 17. We searched for some time along the creek without finding it, but people of the area claim they have been there so it must exist. There was no opportunity to return and search further.

Ke25

*(Location uncertain)*

Mr. Mullins and other people of Kenai told us of a site called Custom House located somewhere on the Kenai River. DeLaguna mentions this site also as being on the Kenai River but does not state a definite location (1934:134). There were so many other sites in the area for which the exact location was known that we did not take the time to search for this one.

Ke26

*Location: 150°28' W. Long., 60°26' N. Lat. (Kenai B-2)*

Mr. Ted Meining of Nikishka told us that people have been picking up artifacts on a small knoll on the south bank of the Kenai River at the point where the river drains out of Skilak Lake. This site seemed to us to be a natural camping site. We were disappointed not to be able to visit the site due to the lateness of the season. DeLaguna (1934) mentions sites above and below this locality but does not mention this one in her report. Osgood mentions a village called Skilak on the south side of Skilak Lake but gives no definite location (1937:13).

Ke27

*Location: 151°20' W. Long., 60°46' N. Lat. (Kenai C-4)*

A number of people in the Kenai area told us of material that had been collected at Boulder Point north of Kenai. There is a lot of beach seining activity in this area in the summer season, and fish camps are dotted all along the beach. There was no opportunity to visit this locality.

Ke28

*Location: 151°11' W. Long., 60°44' N. Lat. (Kenai C-4)*

Mr. Daniels of Kenai is said to have some copper artifacts he picked up while working his field next to Daniels Lake. We did not have an opportunity to talk with Mr. Daniels or to visit the site. Daniels Lake is about twenty miles north of Kenai.

## ARTIFACTS

Due to the nature of the fieldwork, there was little time for excavating and consequently few artifacts were collected. The greater part of two house pits were excavated, however, besides a number of test cuts—all of which produced little of archaeological value in this connection. This problem of the paucity of artifacts can in part be explained by the apparent short occupation time of the dwellings. In most of the houses tested, the floor layer was close to the surface and the general condition of the pits would tend to indicate that the house pits in most cases are not very old.

The only major archaeological work on the Kenai area was carried out by Frederica DeLaguna in 1933. DeLaguna also mentions the sparseness of artifacts. She states, "The thinness of the humus in three house ruins shows that they cannot be very old. They were probably not inhabited for very long, or we should have found something more than the few objects mentioned and the scanty piles of bath stones outside the door" (DeLaguna, 1934:136).

Osgood (1937) mentions that "the Tanaina are among the less nomadic of the Northern Athapaskan people." From this statement one would conclude that the house pits should show a longer occupation time. The Tanaina had two house types however, the winter and the summer house. The winter houses were those that were dug in and are the easiest to locate. The summer house was constructed aboveground, and often the family lived in the smoke-house with the drying salmon (Osgood, 1937). There would expectably be no surface indication remaining to mark the location of summer houses.

Unlike the Eskimo of the Arctic, the Tanaina had a generous supply of building material from which to construct houses so that a family or clan would not feel compelled to return to an area they had occupied the winter before. In fact, it may have been more advantageous to move to a new location after a couple of seasons to get to better hunting grounds. It would not take long for fifteen men feeding families to deplete the game within a radius of five miles of the village. Therefore, the people of the Kenai area probably did migrate within a given area, but they were undoubtedly back at their favorite fishing camps in early spring.

It is difficult to explain why so few of the sites seemed to be very old. A partial answer may be that older houses were built close to the beach and have since been washed away. This process of erosion was encountered in a well-defined house pit at Ke13. The residents of the area state that after severe storms artifacts have been picked up on the beach. DeLaguna mentions an old village called Titukiksk, which appears on Petroff's map. She believed the village was an old one, but that it must have been covered by slides from the high bluff or by high-tide deposits as her party could find no trace of it (1934:134).

### *Items of Native Manufacture*

A stone adz fragment was discovered on the floor layer of House 1 at



Ke11. It is 9 cm. in length, 7.2 cm. high, and 4.5 cm. in width. It is made of a fine-grained basalt and has a ground groove across its upper surface where it was hafted. The adz is a common artifact in the Kenai area. A number of people have collected them, and DeLaguna mentions them often in her work (DeLaguna, 1934) (Fig. 12, h).

A whetstone 12.8 cm. in length and 2.5 cm. wide made out of a dark slate-like material was found on the floor layer of House 1 at K14. The stone is square on two edges giving the worker three surfaces to use. Three other oddly shaped stones were encountered in this house, but they were unidentifiable as to function (Fig. 12, f).

Three rock fragments discovered on the floor layer of House 1 at Ke7 showed signs of having been used in some process of pounding or grinding red ocher. The pores of the rocks are plugged with a reddish powder. The fragments are from 2 to 3.5 cm. in length (Fig. 12, g).

Osgood, in his work *The Ethnography of the Tanaina*, mentions that the Kenai people liked to put paint on almost "everything." The method of manufacturing paint is given by Osgood as follows: "To make the red paint, they put a red mineral (probably red ocher or hematite) in the concavity of a small rock and place another stone on top. Then they set the whole thing in the center of a fire and cook it for five or six hours. They scrape out the residue and smash it up. Before the actual application they mix this powder with water in a stone mortar" (1937:117).

Five rolls of birch bark from 18 cm. wide and 4 cm. in diameter to 0.5 cm. wide and 1 cm. in diameter were encountered on the floor layer of House 1, and Ke7. The smallest roll was coiled so tightly that it resembled a piece of leather. Birch bark was used for a number of purposes in the Kenai area including baskets, bowls, cooking pits, boats, and roofing (Osgood, 1937). Figure 12 shows the several pieces mentioned above (a-e).

### *Objects of European Manufacture*

There were seven small pieces of china (1.5 cm. to 0.7 cm. in size) encountered on the floor layer of House 1 at Ke7. Although the fragments of china are too small to identify, two of the pieces have blue markings that resemble a piece on exhibit at the University of Alaska Museum. The latter was excavated in 1958 from the Tlingit fort at Sitka destroyed by the Russians in 1804 (West, 1959). It is interesting to note that Osgood comments on the fact that the Tanaina Indians, who were fond of shell beads, traded with the natives in the vicinity of Sitka (Osgood, 1937:52) (Fig. 13, d).

Altogether forty-three glass beads were found in the excavation House 1 at Ke7. It has already been mentioned that the Tanaina traded with the Sitka natives for shell beads. The Tanaina placed much value upon beads and even sewed them into their clothes, especially along seams of garments and on boots, belts, and hats. Beads then were undoubtedly a highly valued trade item among the Tanaina and early Russians. Most of the beads found were cylindrical,

ranged from 2 to 5 mm. in diameter, and were red, black, and white (Fig. 13, c).

One large bead (5 mm.) in diameter was located on the surface of a cutbank at Ke6. This bead was found with a number of human bones suggesting that the beads were burial offerings.

A piece of iron that looked like it may have been part of a cooking pot was also found in House 1 at Ke7. The piece is 10.7 cm. long and 4 cm. wide (Fig. 13, a).

A piece of copper 3.6 cm. on a side and roughly square was also found in House 1 at Ke7. Native copper was gained in trade from the upper Inlet people who in turn obtained it from the Copper River people. Copper was probably also used for trade between the Russians and Tanaina. The piece found had a hole in it indicating it may have been used for ornamentation. A number of residents in the Kenai area have copper artifacts that were found locally (Fig. 13, b).

An interesting piece of iron, 16.7 cm. long and coiled at the ends, was also found at House 1, Ke7. There is a small white stone set in the center of each coil. The piece of iron resembles the style of knife handle found in the area. The two coiled ends would be drawn up together forming a handle. Osgood mentions these knives and describes them as follows: "The knives are long, thin, and have handles ending in double spirals" (Osgood, 1937:102). From this description it would seem that the knives are all one piece with the ends of the handles being split and coiled. The resemblance is too great, however, to classify it as anything other than a knife handle of the design Osgood mentions. The piece compares favorably with the appropriate parts of Kutchin knives on display at the University of Alaska Museum. The handle was probably an attempt to copy the original design with the use of material available. (Fig. 13 shows these several items.)

## HUMAN REMAINS

A few human bones were collected from the surface of a cutbank next to the Sterling Highway at site Ke6. Most of the bones had been picked up by Mr. Charles Doser, the owner of the property, after they washed down during spring runoff. The entire collection consisted of two skull fragments with the auditory meatuses intact, along with a number of smaller fragments; a pelvic fragment, a vertebral section, and one complete phalange. All of these bones were picked up on the surface and had washed down from an area that had been greatly disturbed by machinery.

## FAUNAL REMAINS

The faunal remains collected consist of two beaver teeth, the neurospine of a porpoise, three caribou leg bone fragments that had been cracked to

extract the marrow, the complete radius and part of the ulna of a caribou, and a fragment of a seal pelvic section. This collection from a single house (House 1, Ke7) seems to uphold Osgood's statement (1937) that the people of Kachemak Bay relied heavily on fish and sea mammals, and that this dependence on sea life became less important and caribou more important farther north on the peninsula until, in the upper Inlet area, the people were almost entirely dependent upon caribou. The people of the Kenai area seem to have utilized both land and sea mammals.

A number of clam and nautilus variety sea shells were collected from middens and fire pits along with an assortment of fish and broken bird bones.

## CONCLUSION

The large number of storage pits, the thinness of the floor layer in house pits, and the small amount of artifacts are the most puzzling aspects of the archaeology in the northwest Kenai area. DeLaguna, as well as the few other people who have worked in the area also encountered this problem. The Tanaina made the majority of their tools and utensils out of wood and bone, and the moist climate of the peninsula would tend to limit preservation of these items. Even considering this, however, one should think that more artifacts might be found, for Osgood does not give one the impression that the Tanaina were materially poor.

Both pipeline rights-of-way were walked for their entire length, with a zigzag course being followed. There was nothing of great enough archaeological value encountered on either line to suggest rerouting of the pipelines. Both pipelines were cleared for construction over the proposed routes. As stated elsewhere in this report, the most interesting sites were located off of the rights-of-way.

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Figure 1. Looking south along the Alaska Natural Gas Pipeline Company's cleared right-of-way.



Figure 2. Ker After exploration: storage pit with floor exposed.



Figure 3. Ke3 View from inside House 1 looking out through the entrance.



Figure 4. Ke4 Cooking pit after excavation.





Figure 5. Ke5 Profile of storage pit.



Figure 6. Ke7 Interior of House 1 showing firepit and entryway into extra room.



Figure 12. Artifacts of native manufacture. a-e, 5 sizes of rolled bark; f, 1 piece of stone showing signs of red ocher; g, 1 whet stone fragment; h, 1 adz fragment.

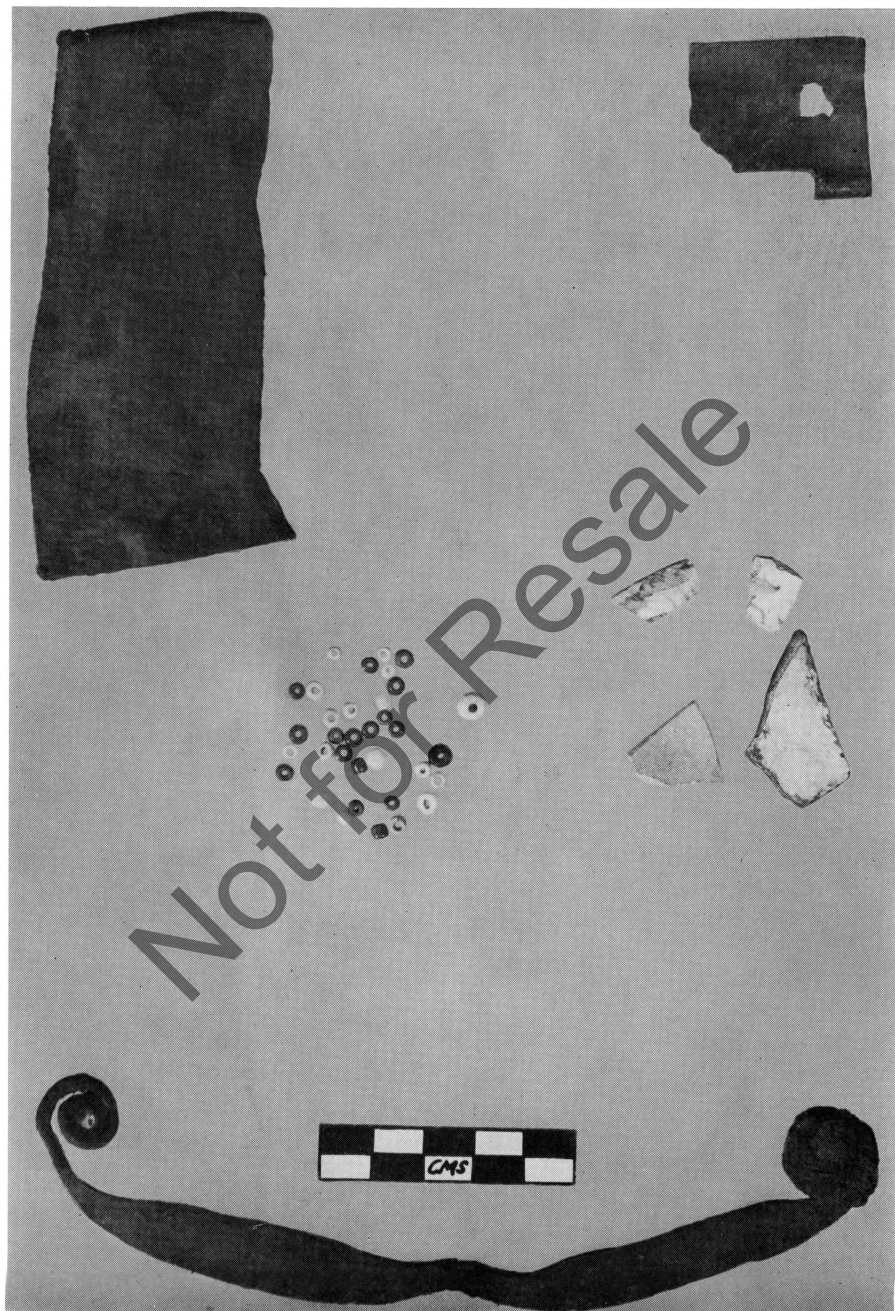


Figure 13. Objects of European manufacture. a, 1 piece of iron from cooking pot; b, 1 piece of copper with hole in it; c, black, red and white glass beads of various sizes; d, 4 pottery fragments; e, knife handle with stones set in the spiral.

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