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Erna Gunther

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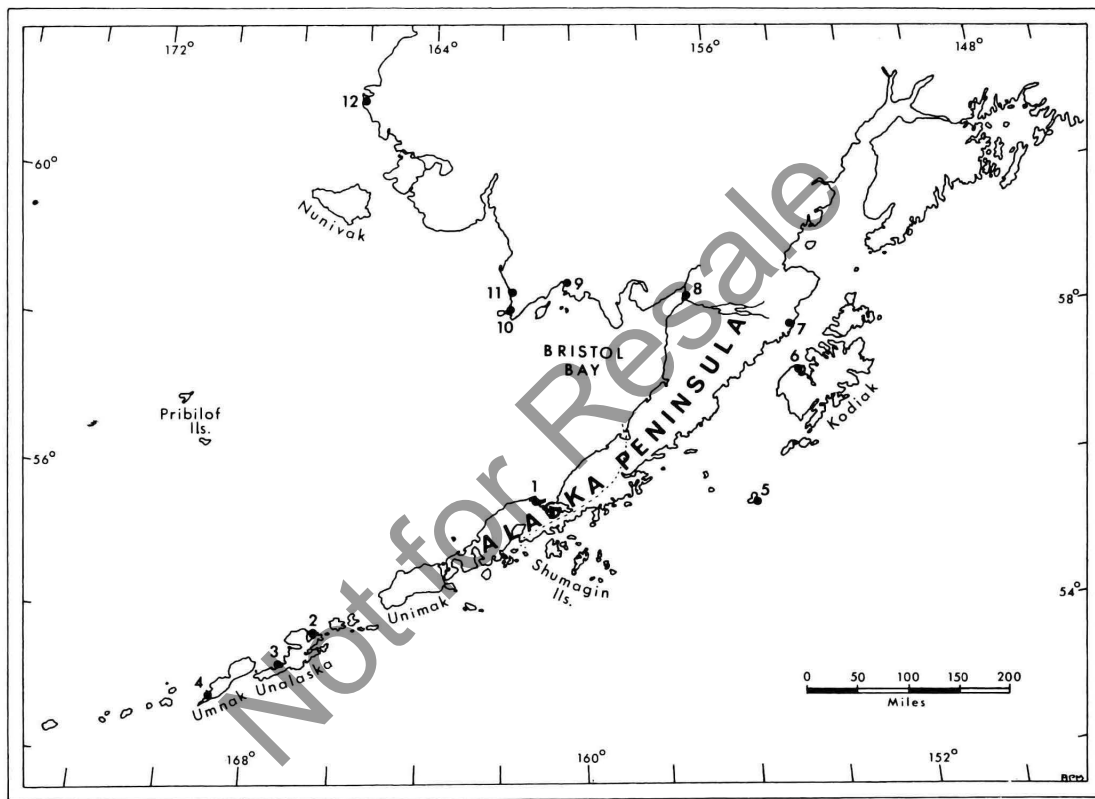


Fig. 1. Map of the Alaska Peninsula and Adjacent Areas. The dotted line across the Peninsula represents the Aleut boundary as determined by Petroff. Some of the important archaeological sites are marked as follows: 1) Port Moller, 2) Amaknak Island-Unalaska Bay, 3) Fortress or Split Rock, 4) Chaluka, 5) Chirikof Island, 6) Uyak, 7) Kafia, 8) Pavik-Naknek Drainage, 9) Togiak, 10) Chagvan Bay, 11) Platinum, 12) Hooper Bay.

PREHISTORIC ALEUT INFLUENCES AT PORT MOLLER, ALASKA¹

by

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Introduction

Recent mention has been made of the Aleut influences at the large prehistoric site at Port Moller, the only locality known archaeologically on the southwestern half of the Alaska Peninsula. Workman (1966a: 145) offers the following summary of the Port Moller cultural affinities:

Although available published material from the Aleutians is scarce and the easternmost Aleutians in particular have been sadly neglected, it is my opinion that the strongest affinities of the Port Moller material lie in this direction. The prevalence of extended burial and burial association with ocher at Port Moller corresponds most closely with the burial practices at the Chaluka site on Umnak Island. Several of the more diagnostic projectile points have Aleutian affinities as do the tanged knives and, possibly, the side-notched projectile point. Strong points of correspondence, particularly in the burial practices and the stone technology, lead me to believe that a definite Aleut component is represented at the site. Data currently available will not allow any definitive statement as to whether or not there are other components represented at the site as well. Complete analysis of existing collections and possibly more field work will be necessary to resolve this important question.

Also, Laughlin (1966b: 154, 1967: 443) concludes that two crania from 5 or 6 feet below the surface in part of the Port Moller middens were those of Paleo-Aleuts, suggesting that

¹ I wish to thank W. B. Workman for reading and commenting on this paper; Profs. C. S. Chard and J. W. VanStone also offered valuable points for consideration for which I am appreciative. I wish to acknowledge the Field Museum of Natural History and the American Museum of Natural History for their cooperation in permitting me to study their Aleutian and related collections, and the Wenner-Gren Foundation for Anthropological Research for partially assisting me in the same.

either all the area west of Port Moller was ancient Aleut territory or at least that the Port Moller region was an Aleut enclave with some time depth.

Indeed, the notion that portions of the Peninsula were occupied by Aleut populations is not a new one. Late 19th century writers on the Aleutians indicated the eastern limits of the aboriginal Aleuts at roughly 160° W. longitude, just east of Port Moller (Dall 1870: 374), or from Cape Strogonof (Port Heiden) on the Bering Sea coast to Pavlov Bay on the Pacific coast (Petroff 1884: 146) (Fig. 1).

Jochelson (1925: ethnographic map) and Hrdlička (1945: 22) follow the Alaska Peninsula distribution of the Aleut, extending the possible eastward spread at least to Ugashik Bay or further east on the northern coast.

Though the Shumagins were inhabited by Aleuts during Veniaminof's day (1840: 202-3) and have been included in the Aleutian area by later writers, we have practically no information about the prehistory of this island group south of the Peninsula and just what cultural affinities the prehistoric inhabitants had at different time periods to either the archipelago or the mainland will have to await further investigations of those islands.

The early geographic estimates of eastern Aleut territory have been accepted by current writers who use one or more of these Alaska Peninsula lines as the general aboriginal boundary (e.g. Cressman and Dumond 1962: 42, Map 2; Laughlin 1952: 67, 69, Fig. 1, 1962:121; Oswalt 1967: Map 2). Though this boundary reflects *sensu stricto* the known Aleut extension at roughly the latter half of the 19th century, one might logically assume a certain amount of time depth for Aleut occupation on the western end of the Peninsula including Port Moller.

As I have recently analyzed the large A. R. Cahn collection in the Field Museum of Natural History and the American Museum of Natural History from sites bordering on Unalaska Bay, one of the "existing collections" referred to by Workman

² Petroff's "ethnological map" included in his Tenth Census report shows the eastern Aleut territory extending to the Ugashik River on the Bering Sea coast and to Cape Ivanof on the southern coast. This Ugashik River division is not consistent with his limits as described in the text above. However, Petroff does state, in discussing the Aglegmiut territorial limits, that the latter group extended "down to the Ugashik River where the Aleutian settlements begin" (Gsovski 1950: 60).

above, I prefer to suggest a revision to the above view, namely that the cultural similarities between the eastern Aleutians and Port Moller were perhaps greater on the earliest time horizon but that prehistoric Aleut influences as far east as Port Moller were minimal during the Christian era. Because the Cahn collection³ is the largest easternmost assemblage studied in the archipelago proper and lies closest to Port Moller (approximately 260 miles), it ought to serve currently as the best cultural datum from which to measure the similarity or dissimilarity of assemblages to the east during the past two millennia.

Before detailing the reasons for seeing no great Aleut time depth or significant cultural influence at Port Moller, it should be emphasized that I do not question the basis for the common ethnic map boundary which survives to the present. On the contrary, the ethnographic/linguistic observations by Dall, Petroff, and other early Russian and American investigators in southwestern Alaska definitely suggest an Aleut expansion along the northern shore of the Peninsula. I would suggest, however, that until archaeological evidence to the contrary is forthcoming, we view this expansion as a recent phenomenon, perhaps occurring within the Russian period, or post-1741. Oswalt (1967: 241) has recently expressed this same view. Intentional scattering of Aleut sea mammal hunters outside the archipelago proper was carried out by the Russians for expansion of the early colonial economic sphere; Aleuts were introduced into such areas as the Commander Islands, the Pribilof Islands, Sitka, and along the California coast during the first half of the 19th century (Dall 1877a: 22; Heizer 1943: 120; Hrdlička 1945: 22-3). With such large-scale population movements dictated primarily by economic expediency, it is doubtful that the pre-contact Aleut boundary can be more than approximated.

A further complication in deriving specific geographic limits of Aleut occupation was the apparent indiscriminate use

³ In addition to the Cahn collection, the Field Museum also has the much smaller VanBarriger collection from one of Cahn's Amaknak Island sites, Site B. Part of the Cahn collection is in the American Museum as is the Larsen collection from another one of Cahn's sites, Site D. All these materials have been inspected (McCartney 1967), along with part of Weyer's original collection in the American Museum. Workman has also made drawings of several dozen Port Moller specimens from the Univ. of Alaska Museum and has made these available for my use.

of the term “Aleut” for many native groups of southwestern Alaska; according to Dall (1870: 530, 1877a: 22), for instance, early traders also called the Koniag (Kodiak) natives “Aleuts.” Such generic usage would certainly not lend itself to reconstructing actual past ethnic boundaries.

Before leaving the matter of culture area limits, we have no evidence that whatever discontinuity existed between the Aleut and mainland Eskimo was ever stable or nonshifting over time or formed a relatively sharp boundary. It is possible that the southwestern end of the Peninsula constituted a cultural continuum rather than a sharp Aleut/non-Aleut line of demarcation, the westernmost area receiving more influence from the archipelago proper and the eastern area being influenced more by Bristol Bay and southern Alaskan peoples.

The most recent and authoritative aboriginal distribution map by Oswalt (1967: 4-5, 8, Map 2) differs from former maps in not dividing the Alaska Peninsula between the Alegmiut, the Koniag and the Aleut; rather the Alegmiut are restricted to the territory along the northern part of Bristol Bay. Peninsular Eskimo is a new division recognized for most of the Peninsula between the Aleuts in the west and the Alegmiut and Koniag in the east. With the sketchy ethnographic data known for the Peninsular Eskimo as well as the lack of prehistoric archaeological data for the Peninsula, no “direct historical approach” is currently open to us in aligning archaeological assemblages with historic groups.

The importance of Port Moller is obvious: it is the only excavated site locality towards the western end of the Peninsula, an area almost totally unprobed by archaeologists but where one might expect three broad cultural spheres of influence to be felt - - from the southern Alaskan coast - Kodiak area to the northeast, from the Aleutians to the southwest, and from the Bristol Bay - western Alaskan coast to the north. Cultural similarity between Chirikof (Workman 1966b) and Port Moller or the eastern Aleutians has not yet been specified.

Only four dozen archaeological specimens from Weyer’s pioneering excavations at the site were ever published (1930), and the more recent investigations of the joint Univ. of Wisconsin - Meiji Univ. expedition have only been reported in summary fashion by Oka *et al* (1961) but in greater detail by Workman (1966a).

The only other archaeological investigations on the Peninsula have been those of Davis (1954) and Oswalt (1955) at the Katmai National Monument, of Dumond (1963; Cressman and Dumond 1962) and Larsen (1950) along the Naknek River drainage at the eastern end of the Peninsula, and of Townsend and Townsend (1961) at Iliamna Lake at the base of the Peninsula. Hrdlička (1930, 1943) located and haphazardly tested several sites on both the northern and southern coast.

Time Periods

Workman (1966a: 145) reports two radiocarbon dates for the lower strata of the Port Moller middens - 2680 ± 250 and 2960 ± 320 B.P. Thus, the Port Moller occupation dates to at least a millennium B.C. and Workman (1966) suggests that the occupation lasted at least until the beginning of the Christian era if not longer.

On the basis of several specific artifactual similarities between Port Moller and Amaknak - Unalaska Bay, I would suggest that portions of the Port Moller locality were occupied through at least the first millennium A.D. and perhaps until the late prehistoric period. We know that the Unalaska Bay site occupations persisted roughly from as early as 200 B.C. to c. 1500 A.D. and at least one site was occupied at historic contact in the mid - 18th century (McCartney 1967: Table 1). Further, Workman (personal communication, 1967) now considers the Port Moller assemblage to be a conglomerate of artifacts representing more than one time period; the very large (250 x 220 meters) and deep (3.5 meters) nature of the middens would suggest that a long occupation span occurred at the site.

Because of the few specific Aleut cross ties and those ties with other relatively late prehistoric mainland - Kodiak assemblages, we cannot discount the preponderant dissimilarity between these two locality assemblages wholly on the basis of dissimilar time periods; rather there appears to be overlapping temporal occupation for at least the middle and upper parts of the Port Moller sequence.

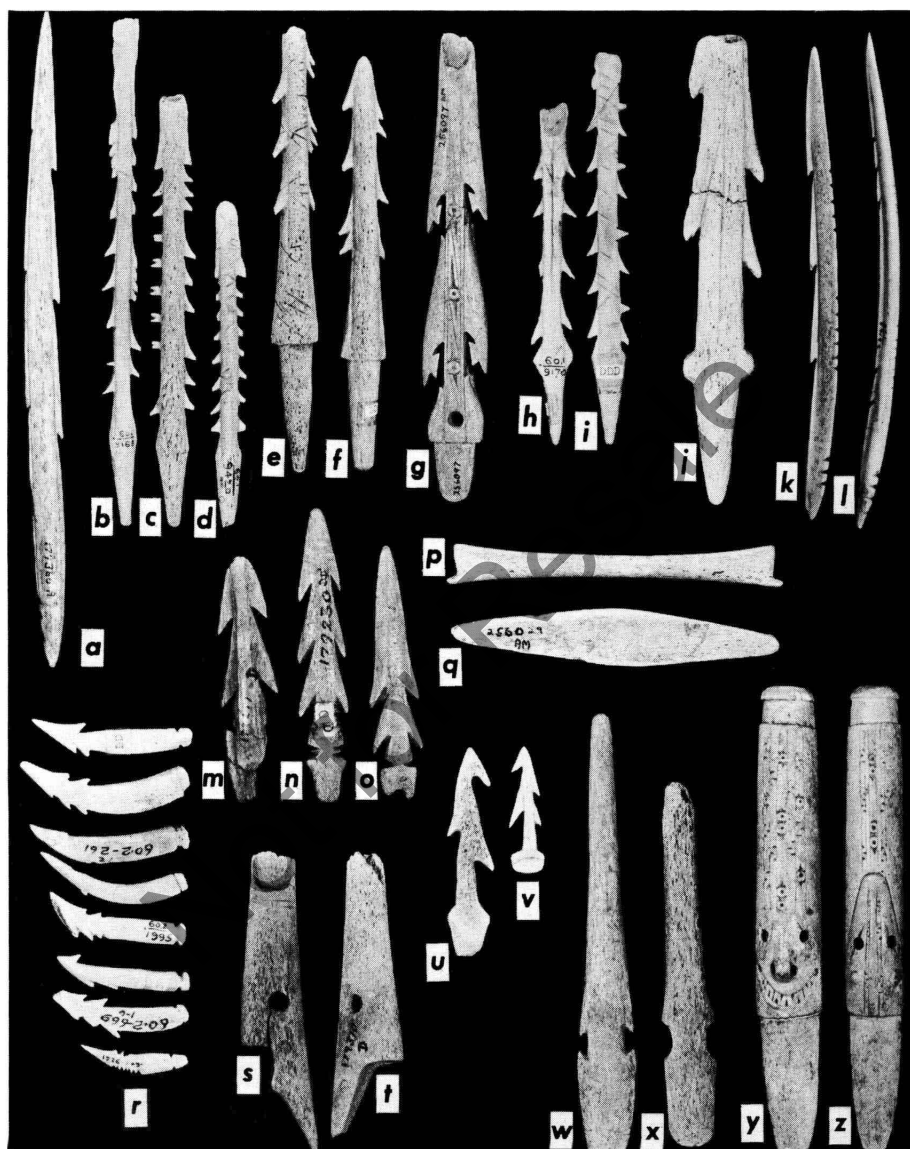


Plate 1. Eastern Aleutian Bone Implements. This composite plate includes several important bone tool types from Amaknak and Unalaska Islands. These specimens are illustrated at different scales and the maximum length measurements are indicated in the following listing; lengths of broken specimens are given in parentheses. a) leister spear center point or side prong - 23.1 cm;

Archaeological Data

The following tabulations and the plate are intended to summarize primarily the degree of similarity and dissimilarity of artifacts found at Unalaska Bay and Port Moller, and secondarily the similarity between these two localities and others in the eastern Aleutians, Kodiak, and southern, western and northern Alaska.

There are obvious pitfalls in such a summary as not all the traits below are comparable nor are they quantified. Some items are artifact types and some are specific attributes; they do not carry equal weight as diagnostic traits distinguishing one locality from another. As neither full type descriptions nor detailed plates are included here, each specific differentiating artifact type cannot be listed separately and briefly and still give the reader an accurate idea about its morphology. Therefore, only a few of the more important types or groups of types are listed and are illustrated in Plate 1. These listings, then, are not all-inclusive but are rather suggestive of kinds of differences between the localities. The presence or absence of comparable artifacts from mainland sites is indicated only on the basis of a brief review of the literature of the area and should not be taken as complete.

The comparative treatment below is based largely on artifacts of bone, ivory or tooth because these materials indicate greater fabricating precision than do chipped stone artifacts and are thus considered more diagnostic. As Workman based his point of Aleut-Port Moller similarity on some stone varieties,

b-f) large, raggedly-barbed projectile points with conical and subconical tangs and incised decoration-25.0, 21.3, 16.3, (17.0), (15.7 cm); g) plug-tanged projectile point with incised decoration-21.6 cm; h-i) small, raggedly-barbed projectile points with contracting wedge-shaped tangs and incised decoration-12.0 & 13.7 cm; j) basal section of large projectile point with conical tang-(13.1 cm); k-l) leister spear side prongs-22.2 & 23.2 cm; m-o) small dart points with bilaterally notched tang sections-7.0, 8.4, 7.3 cm; p) bone gauge, lateral view-15.7 cm; q) bone gauge, plan view-15.4 cm; r) barbed points of composite fishhooks-second from top 6.1 cm; s) toggle harpoon head with open blade basin and closed socket-12.0 cm; t) toggle harpoon head with blade slot and closed socket-11.2 cm; u-v) small dart points with wedge-shaped tangs-7.7 & 4.6 cm; w-x) toggle harpoon loose shafts-12.6 & 10.2 cm; y-z) cylindrical, two-piece foreshaft sections with bifurcated tangs and carved heads and incised decoration-21.4 & 21.0 cm.

this discussion presents another cultural aspect but one which I consider to be of greater comparative value.

Eastern Aleutian Artifacts

Our knowledge of prehistoric assemblages in the Fox Islands is almost as incomplete as that for the Alaska Peninsula. Only two large excavated collections have been studied in the eastern islands, those from Chaluka (Umnak) and from Unalaska Bay. Hrdlička's extensive collections from the eastern area remain unstudied to date. However, the Chaluka and Unalaska Bay collections supplement each other to form a rather long sequence, the former representing largely a period of the first millennium and a half B.C. and the latter representing a period of more than a millennium almost wholly within the Christian era. On the basis of both these assemblages, we may compare artifacts from almost 3,500 years with the early and more recent Port Moller specimens.

We still have yet to work out the intersite correspondences in the Aleutians; we have no other large eastern island assemblage of a corresponding period as the lower portion of Chaluka that might point out the degree of regional distinctiveness which developed at this early Aleut horizon. On a more recent time horizon we are in a better position to postulate stylistic patterns more or less common to all of the eastern Aleutians. Such items as singly or doubly barbed projectile points with wedge-shaped tangs, toggle heads, raggedly-barbed projectile points, plug-tanged projectile points, single-piece foreshafts with carved faces, bone gauges, decorated bone spools, and other more ubiquitous artifact types are found on Umnak and Unalaska and enable us to compare the eastern Aleutian area as a whole to the mainland. As more information is forthcoming, we hopefully will be able to detail what types and styles are common to the entire area and what is specific to regional sub-divisions.

No attempt is made here to compare differences between the western, central and eastern parts of the chain.

Discussion

Table 1 indicates that there are several artifact types and

characteristics found at Port Moller which do not occur in the Fox Islands but which do occur either commonly or infrequently in other parts of Alaska: e.g. toggle heads with V spur (1), toggle heads with parallel blade slit and line hole (2), lobe-tanged projectile points (5), long-shafted projectile points or leister prongs (7), leister side prongs with lashing facets and lips (10), slit salmon spear barbs (11), star-shaped blunts (12), and a general lack of surficial incising and carving (9).

On the other hand, there are several eastern Aleutian types which are not yet known at Port Moller and which, in my estimation, must be present to constitute evidence for significant genetic interaction. These include, for example, raggedly-barbed projectile points (22), plug-tanged projectile points (23), "castellated" or bi-surfaced inner barb margins (27), foreshafts with carved faces (33), non-slit salmon spear barbs (34), curved fishhook barbs (35), large bone gauges (36), bilaterally notched loose shafts (37), cylindrical, decorated bone spools (38), "bear" figurines (39), and elaborate and stylized barbing and incised decoration (31).

Further, it will be noticed that practically all of the types shared by Port Moller and Unalaska Bay are also shared with other Kodiak and mainland sites. Many of these are characteristic of Alaskan Eskimo assemblages as a whole (e.g. bone or wooden spoons, wedges, mattocks, bird and mammal bone awls, etc.) whereas others typify southwestern Alaska as a regional development (e.g. unilaterally-barbed, wedge-tanged projectile points, long rod-like barbed projectile points, long rod-like socketed foreshafts).

In regard to stone artifact types (not included in Table 1), Port Moller is similar to the early Aleut period in the eastern chain in the emphasis on chipped over ground stone; practically no ground slate is found at Chaluka. A great deal of slate is known from the later Unalaska Bay sites. The presence of several ground slate pieces at Port Moller appears to be out of character with the poorly to well-made chipped pieces and can best be interpreted as relatively recent intrusions following the earlier chipped stone.

Similar stone types at Port Moller and the Fox Islands include grooved stone weights, partially ground adze blades, asymmetrical tanged knives, large ovoid blades, and a general

class of lanceolate-shaped projectile points with slightly contracting stems. Port Moller artifacts differ in the presence of perforated stone weights, wide diamond-shaped points with sharply contracting stems, “spade” - shaped points, long finely chipped points with slightly contracting stems or slightly shouldered with squared stems, and long, concave-based points. Besides the presence of ulu blades and other ground slate types at first millennium A.D. sites in the eastern Aleutians, asymmetrically serrated points or knives are also distinctive to the islands and are not known at Port Moller.

The shared absence of ground slate and the simplicity of bone artifact styles which characterize Port Moller and early Chaluka assemblages suggest that perhaps the greatest genetic contact between the Peninsula and the eastern Aleutians was on an early time horizon. However, the more recent addition of a highly stylized bone industry and increased importance of ground slate in the Fox Islands and the recent Port Moller acquisitions as star-shaped blunts, slit salmon spear barbs, and toggle heads with V spurs suggest that regional divergence took place during the Christian era, making the two assemblages even less similar. The Aleutian development was an indigenous one whereas Port Moller reflects the influences of wide-spread mainland Eskimo styles indicating greater contact with contiguous peoples than was geographically possible in the islands.

Late prehistoric Aleut contacts with Peninsula, Bristol Bay, and Kodiak groups, though sporadic, are known (Veniaminov 1840: 184-5) and such intermittent contacts probably had a long history. However, this interaction appears to have been mainly of a belligerent nature and we would not expect cultural exchange to be significant. One lobed-tang projectile point, for instance, found at Unalaska Bay is obviously an intrusive element from the Peninsula because there is no tradition of this distinctive style on Unalaska or at other known localities in the eastern chain whereas this style is very popular on the mainland.

Burial Patterns and Skeletal Remains

Besides similarity in artifact assemblage, Workman has suggested that extended burials and the use of ocher in inhumation perhaps tie Port Moller to the eastern Aleutians. Ocher

in burials may have been most popular in the Aleutians and have influenced the adjacent Peninsula culture, but very little is known about southern Bering Sea burial practices in general and it may be too soon to draw this conclusion. For instance, ocher in burials is reported from at least Pt. Barrow (Ford 1959: 30), Prince William Sound (de Laguna 1956: 83, 252), and two sites at Kachemak Bay (de Laguna 1934: 47, 164). At least one other Prince William Sound burial contained individual lumps of ocher (1956: 70, 72). The use of ocher other than in burials is rather commonplace in coastal Alaska (e.g. de Laguna 1960: 104-105; de Laguna *et al* 1964: 116-117; Heizer 1956: 53; Ackerman 1964: 11, Giddings 1964: 150, 156, 189, 239; Collins 1937: 163, 174, 237, 240, 287; Geist and Rainey 1936: 127, 161; Larsen and Rainey 1948: 72, 86-87) and future investigation may reveal a greater use of red paint or hematite in burial associations on the mainland.

The distribution of extended burials is also little understood, existing in part at Port Moller and almost exclusively at Ipiutak (Larsen and Rainey 1948: 58, 62-3) and at the Uelen cemetery (Levin 1964: 306). Though varying degrees of flexed burials are the norm throughout the Alaskan Eskimo area, isolated extended burials have been found in the Shumagin Islands (Weyer 1929: 237), on Kodiak (Heizer 1956: 12, 120), and on St. Lawrence (Geist and Rainey 1936: 78).

A few extended burials are known from the Aleutians (see Workman 1966a: 136), but by far the most popular practice throughout the chain was inhumation in a flexed position (Jochelson 1925: 43-44, Plates 10-14; Hrdlička 1945; Spaulding 1962: 14-16). Thus, I question the use of extended burials as a trait of similarity with the Aleutians and suggest that when we have more information about the Bristol Bay area, we might find that the Port Moller instances are more attributable to that sphere of influence than to the eastern Aleutians or are unique in southwestern Alaska in emphasizing this burial practice. It might also be shown in the future that different burial positions are associated with different time horizons, but we do not have enough controlled evidence to postulate such associations at present.

Dumond (1964: 39-40) summarizes our current knowledge of human skeletal information for the southwestern

Alaskan area, pointing out that no series of physical remains exists from the coastal Bristol Bay-northeastern Peninsula region. For this reason, it would appear that until comparative series are excavated at Port Moller, Bristol Bay, and other areas contiguous with the archipelago proper, we must bracket our estimates of biologic distance and affinity between the known Aleuts and these neighboring populations realizing that when the raw data become available our present picture of morphological specifics may be altered accordingly.

Summary

Two of the longest and best understood local archaeological sequences have been studied at Chaluka midden and along the Naknek drainage at the northeastern end of the Alaska Peninsula. However, Dumond (1964: 36) points out the lack of specific correspondences in these artifact sequences. On the basis of recent excavations at Port Moller and recent study of existing collections from Unalaska Bay, we are in position to narrow our Aleut-mainland cultural comparisons from a linear distance of roughly 650 miles to 260 miles along the Bering Sea coast.

On the basis of the existing evidence, I suggest that these two latter localities share several specific artifact styles but that the differences are more profound than the similarities, and that the similarities are largely not confined to these two localities but also apply in many instances to the Koniag, Pacific, and Western Alaskan Eskimo areas. This conclusion suggests that the prehistoric Aleut boundary, however irregular or wide, was further west of Port Moller rather than to the east of that bay. Until archaeological reconnaissance is carried out on the southwestern half of the Peninsula, we will not have the data to firm up this amorphous boundary nor will we be in position to specify the nature of the transition between the prehistoric Aleut culture area and that of the Peninsula. And, until much more information is forthcoming on the Bristol Bay area, it will remain impossible to measure the degree of similarity of Port Moller to the Aleut area to the northeast.

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TABLE 1

Distribution of Selected Southwestern Alaskan Traits		Port Moller	Unalaska	Umnak *	Kodiak	Cook Inlet-South Alaska	Northeastern Alaska Pen. to Norton Sound	St. Law. Island	North Alaska
Description									
1) Toggle harpoon heads with V-shaped spur notch, rectangular slot socket, blade slot perpendicular to line hole, spur perpendicular to line hole	X-3, 33, 36	---	---	Rel-6	---	---	Rel-21	---	---
2) Toggle harpoon heads with closed socket, blade slot parallel to line hole, spur parallel to line hole	X-28, 33, 36, 2-37	---	---	X-17	---	---	X-1, 16	X-7, 14 Rel-32	X-13, 15, 34
3) Simple, unilaterally two-barbed projectile points with unilat. basal lip	X-33	---	X-2, 24 Rel-19 up, low	---	---	---	---	---	---
4) Emphasis on centrally drilled tangs of simple unilaterally and bilaterally barbed projectile points (excluding item 44 below)	X-3, 28, 33 36	---	X-2, 24 25, up low	---	---	---	X-16, 20, 29	X-14, 32	X-15
5) Emphasis on unilaterally barbed simple bone points with drilled slight to strong unilateral tang lobes above wedge-shaped bases	X-3, 9, 28, 33, 36, 37	Rr-27 **	Rel-2 low	X-17	X-10, 11	X-30, ?-8	---	---	---
6) Non-toggle harpoon points with blade slot parallel to line hole or perpendicular to wedge-shaped tang	Rr-33	---	---	Rr-5	---	---	X-32	---	---
7) Simple projectile points/leister prongs with relatively small bilateral barbs near tips with long unbarbed shaft-tang sections	X-3	---	---	---	---	X-8, 16, 20	X-32	X-13, 22	
8) Indented, C-shaped tang side notches on barbed harpoon points	X-33	---	---	---	Rr-10	X-16, 20	---	---	---
9) General emphasis on non-elaborate, simply carved projectile points with minimum of incised lines or other surficial decoration on point faces	X-3, 33, 37	---	X-2 low	X-6, 17	X-10, 11	X-20, 29	---	X-34 ?-13	
10) Unilaterally barbed leister side prongs with flattened tangs and lashing lips; sometimes with lashing depression in outer edge above tang portion	X-3, 36, 37	-- ***	---	X-17	---	---	Rel-14, 31, 32	---	---
11) Slit salmon spear barbs or "catches"	X-33, 36	---	---	---	---	---	X-31, 32	X-13, 15, 22	
12) Star-shaped blunts or bird points	X-33	---	---	---	---	X-16, 21	X-32	X-13, 15, 22, 34	
13) Simple loose shafts with unilaterally or bilaterally flared, wedge-shaped tangs	X-33, 37	?-27	---	X-17	---	X-20	---	---	---
14) Straight to slightly curved compound fishhook points	X-3, 37	---	---	X-5, 6, 17	X-10, 11	---	---	X-15, 34	
15) L-shaped compound fishhook shanks with raised exterior ridges or bumps on lower corner and lower arm	X-33	---	Rel-2 mid	---	---	---	---	---	---
16) Unilaterally side notched or full grooved adze heads with closed blade sockets or sleeves	X-33	---	---	X-17	X-10	X-16	X-7, 14, 32	X-13, 15, 22, 34	
17) Unnotched adze heads with open blade basins	X-3	---	X-2 low	X-17	---	---	---	---	---
18) Perforated ivory weights	X-33	---	---	---	---	---	---	---	---
19) Elongated-ovoid labrets with center protrusion or pip	X-9, 36	---	---	Rel-17	---	---	---	---	---
20) Drilled bone "button" or "buckle," square or rectangular	X-33	---	---	X-5	---	---	---	---	---
21) Toggle harpoon heads with open blade basins or slots perpendicular to line hole, spur parallel to line hole, closed socket (Pl. 1-s,t)	---	X-27	X-19	X-17	---	X-20	X-7, 14, 32	X-13, 15, 22, 34	
22) Emphasis on long and short, raggedly-barbed projectile points with open blade basins and surficial decorative incising, cylindrical tangs (Pl. 1-b, c, d, e, f, h, i)	---	X-4, 27	X-2, 18, 19, 24, 25 up	---	---	---	---	---	---
23) Emphasis on large multiple barbed points with plug-tanged bases, drilled center shafts, surficial decorative incisions or raised ridges, open blade basins, some "castellated" barbing (Pl. 1-g)	---	X-4, 27	X-2, 18, 19, 23, 24 up	---	---	---	---	---	---
24) Thin bilaterally barbed points with fine, tooth-like ridged barbing	---	X-27	---	---	---	---	---	---	---
25) Long, flattened (leister ?) points with ridged barbing and notched tang sections (Pl. 1-a)	---	X-27	X-18	---	---	---	---	---	---
26) Emphasis on "step" scarfing tangs on points or shafts	---	X-27	---	Rel-17	---	X-20 Rel-16	Rel-31	---	---
27) Emphasis on "castellated" or bi-surfaced inner barb margins (Pl. 1-g)	---	X-27	X-2 ?-19 up	---	Rr- 11, 12	---	---	---	---

28)	Emphasis on subconical or tapering cylindrical tangs (Pl. 1-b, c, d, e, f, h, i, j)	Rr-3	X-4, 27	X-2, 19, 23 up, low	X-17	X-10	X-20	X-32	X-34
29)	Small three and four barbed, bilaterally asymmetrical dart points with wedge-shaped tangs (Pl. 1-u, v)	---	X-27	X-19 Rel-25, 23	Rel-17	---	---	---	---
30)	Emphasis on bilaterally side notched tang sections (Pl. 1-m,n,o)	---	X-4, 27	X-19	X-17	---	---	---	---
31)	Emphasis on elaborate barbing and surficial incising of point faces (Pl. 1-b-j)	---	X-27	X-2, 19 up	X-17	---	---	X-7, 14	---
32)	Curved leister side prongs with unilateral barbing and tang notching; without flattened tangs and lashing lips (Pl. 1-k, l)	---	X-27	X-19	Rel-17	---	Rel-20	Rel-31	---
33)	Cylindrical one or two piece foreshafts with recessed bifurcated tang sections and carved faces and incised designs (or plain) (Pl. 1-y, z)	---	X-27	X-18	---	---	---	---	---
34)	Non-slit salmon spear barbs or "catches"	---	X-27	X-2, 18, 19 up	?	?	Rel-20	---	---
35)	Slightly to strongly curved compound fishhook points; some elaborate multiple barbing (Pl. 1-r)	---	X-27	X-2, 19	---	---	---	---	---
36)	Large bone gauges (Pl. 1-p, q)	---	X-27	X-2, 18, 19 low	---	---	---	---	---
37)	Bilaterally notched loose shafts (Pl. 1-w, x)	---	X-27	?	X-6, 17	---	---	---	---
38)	Cylindrical bone spools/ornaments with varying sized circle and dot designs on end surfaces	---	X-27	X-18	---	---	---	---	---
39)	"Bear" figurines with squared posterior, heads or headless	---	X-27	X-****	X-17	---	---	---	---
40)	Small, knob-tanged needles	---	X-27	?	X-17	---	---	---	---
41)	Unilaterally notched adze heads with open blade basins	---	X-27	---	X-17	X-10	---	---	---
42)	Long, rod-like unilaterally barbed projectile points with blade slots or open basins; some with ridged barbs; cylindrical tangs	X-3, 33, 36 37	X-27, 35	---	X-17	Rel-10, 12	---	---	---
43)	Thin, unilaterally and bilaterally barbed arrow points with conical tangs	X-3, 33, 36	X-27	X-2, 25 24 up	X-17 Rel-6	---	X-20	X-7, 32	X-22
44)	Unilaterally barbed projectile points with drilled wedge-shaped tangs	X-3	Rr-27	---	X-6, 17	X-10, 11, 12	X-8, 16, 20, 30	---	X-15
45)	Open, recessed blade basins at tips of projectile points	X-33, 36	X-27	X-2, 18 19 up	Rel-17	Rel-10	---	---	---
46)	Emphasis on simple unilaterally and bilaterally flared, wedge-shaped tangs on projecting points	X-3, 33	X-4, 27	X-2, 19, 24, 25 low	X-5, 6	X-10	---	---	---
47)	Short, heavy, two piece foreshafts with double sockets	X-33	X-27	X-18	---	---	---	---	---
48)	Long, rod-like one piece foreshafts with closed point sockets and bifurcated tangs :	X-3, 36	X-27, 35	X-19, Rel-25	X-17	X-10	---	---	---
49)	Emphasis on non-toggling harpoon heads	X-3,33, 36, 37	X-27	X-2, 19	X-5, 6, 17	X-10, 11	X-20	---	---
50)	"Step" beveled drill shafts (?)	Rr-3	X-27	X-*****	---	Rel-12	---	---	---
51)	Drilled or slit plain loose shafts	?	X-27	---	X-6, 17	X-10	X-16, 20	X-7, 14, 31, 32	X-13, 15, 22
52)	Bilaterally notched or full grooved adze heads with open blade basins	X-33	X-27	---	X-17	X-10	---	X-7, 14	---
53)	Multiple-sectioned chain/swivel ornaments carved from one bone piece	X-33	X-27	---	Rel-17	---	---	X-31	---
54)	Ovoid and/or simple plug labrets	X-9, 33, 36	X-27	X-2, 19 up	X-5, 6, 17	X-10, 11	X-8, 16, 20, 29	---	X-13, 15, 22, 34
55)	Flattened bone wedges; some with drill bearing wear	X-3, 28, 37	X-4, 27	X-2, 19	X-6, 17	X-10, 11	X-16, 20	X-7, 14, 31, 32	X-13, 15, 22, 34
56)	Blunt rib "flakers" and/or pointed rib tools	X-3, 37	X-27	X-2, 26	X-17	X-10, 11	X-20	X-7, 14, 32	X-34
57)	Split and whole bird and mammal bone awls	X-3, 28, 36, 37	X-27	X-2, 19	X-6, 17	X-10, 11, 12	X-16, 20	X-7, 32	X-13, 22, 34
58)	Small eyed needles	?	X-27	X-2	X-17	X-10, 11	---	---	X-22
59)	Irregular whalebone upper drill bearings or holders	X-37	X-27	?	?	?	?	X-32	---
60)	Curved compound fishhook shanks	X-3, 28, 37	X-27	X-2, 19 up	X-5, 6, 17	X-11	---	---	---

61)	Bone/wood scoops and spoons	X-37	X-27, 35	X-19	X-6, 17	X-10, 11	X-8, 16, 20, 29	X-7, 14, 32	X-13, 22, 34
62)	Wedge-like whalebone mattock heads with indented margins for hafting	X-33	X-27	Rel-2	X-12	?	?	Rel-32	Rel-22, 34

SYMBOLS

X	Artifacts known, popularity unknown
Rr	Rare, known to occur in low frequency
Rel	Related in form but not identical in all respects
?	Questionable
---	Absent as far as currently known

NOTES

*	Up, mid or low refers to upper, middle or lower parts of Chaluka levels
**	One specimen present; believed to be intrusive elements from mainland
***	Related form included in Amer. Museum Facchin collection, supposedly from Shemya (?)
****	From Ashishik Pt., Umnak (G. Denniston personal com. 1967)
*****	From Univ. of Michigan Bank collection

REFERENCES

1) Ackerman 1964	19) Jochelson 1925
2) Aigner 1966	20) Kowta 1963
3) American Museum - Port Moller photographs	21) Larsen 1950
4) Bank 1953	22) Larsen and Rainey 1948
5) Clark 1966a	23) Laughlin 1963
6) Clark 1966b	24) Laughlin 1966a
7) Collins 1937	25) Laughlin and Marsh 1951
8) Cressman and Dumond 1962	26) Laughlin and Marsh 1956
9) Dall 1877b	27) McCartney 1967
10) de Laguna 1934	28) Oka et al 1961
11) de Laguna 1956	29) Oswalt 1952
12) de Laguna, et al 1964	30) Oswalt 1955
13) Ford 1959	31) Rainey 1941
14) Geist and Rainey 1936	32) Rudenko 1961
15) Giddings 1952	33) University of Alaska drawings
16) Giddings 1964	34) VanStone 1955
17) Heizer 1956	35) Weyer 1929
18) Hrdlicka 1945	36) Weyer 1930
	37) Workman 1966a

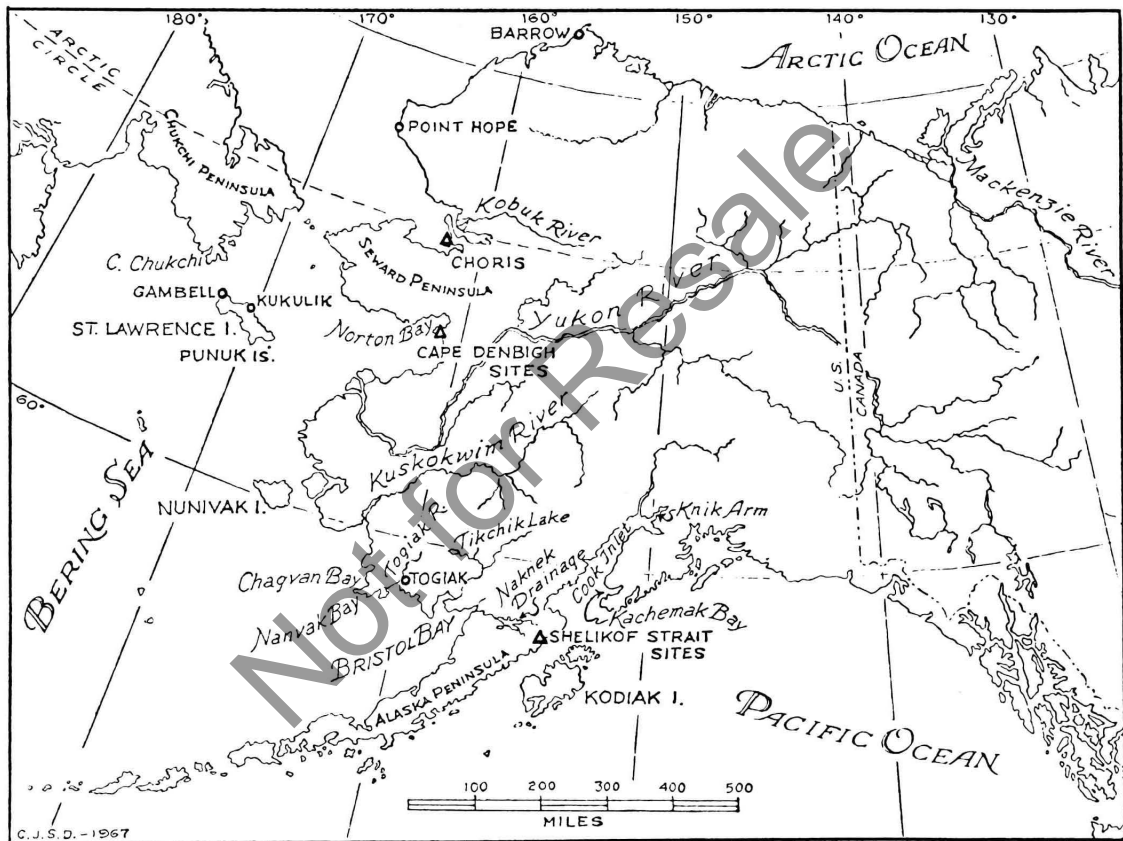


Figure 2. Some Locations Mentioned in the Text.

THE PREHISTORIC POTTERY OF SOUTHWESTERN ALASKA

By

D. E. Dumond

General discussions of Eskimo pottery have been presented previously, notably by de Laguna (1940) and Oswalt (1955). The concern of de Laguna was especially with questions of far-reaching historical significance involving the assessment of cultural similarities and probable connections with non-Alaskan peoples both in the New World and in Asia. Oswalt attempted a precise definition of types valid for Eskimo pottery throughout Alaska. The present attempt duplicates neither of these, being much less far-reaching than de Laguna's, more summarizing than Oswalt's. It is, probably, more superficial than either; but with the luck of him who waits the longest, it makes use of information which was not available to either of them.

Specifically, this paper attempts a synthetic overview of the prehistoric pottery sequence in coastal Alaska south of Seward Peninsula, adding to that area St. Lawrence Island and the tip of the Chukchi Peninsula. Presumably this is an area of some cultural validity, in that it coincides closely with that of the speakers of the Western Eskimo language, also designated Yupik.

This entire zone will be referred to here as the southern Eskimo area, in distinction to a northern area beginning north of Bering Strait. The material will be treated according to two sub-areas: that of the Bering Sea coast; and that of the Pacific coast. Within each of these, treatment will be chronological, with temporal placements based chiefly upon radiocarbon dates.

Before taking up pottery from specific locations, however, a statement regarding prehistoric Alaskan ceramic technology in general seems advisable.

Stated briefly, the level of the technology was low. Although not infrequently pieces of well-fired, hard pottery were

produced - - both in early and in late times - - firing control was generally far from precise. As a result, the color in almost all sherd collections varies from lighter and sometimes reddish shades resulting from imperfect oxidation, to more common darker and sometimes blackish shades resulting from uneven smudging. Hardness may vary substantially from the bottom of a single pot to its top, or from one side to another. Because these characteristics are shared by virtually all Alaskan pottery, neither color nor hardness will be considered further here.

In most of the area under discussion, the tempering material is of major chronological importance. Unfortunately, the addition of temper to the clays may be so haphazard that visible temper will vary from one side of a pot to the other. Consequently, it is in practice often not possible to assign isolated sherds to even general classes of paste for which temper is a diagnostic element. And when the pottery to be classified is plain, as it frequently is, and when vessel shapes involved are simple and similar, as they are, confusion is worsened. For these reasons, any descriptive statement would benefit from statistically supported tabulations of characteristics. These have not been compiled in the present case, chiefly for want of necessary data. This shortcoming should be kept in mind, and the descriptive statements herein must be recognized as impressionistic observations of central tendencies.

Bering Sea

From this area, there are four sequences or near-sequences which cover a considerable span of time and which will be relied upon principally. The first of these is from St. Lawrence Island and the nearby Asian coast (Collins 1937; Geist and Rainey 1936; Rainey 1941; Rudenko 1961). The second is from Norton Bay (Giddings 1964; Griffin and Wilmeth 1964). The third is from the Chagvan Bay area (Ackerman 1964; Larsen 1950). The fourth is from the area of the Naknek drainage to the south (Dumond 1962; 1964; 1965). Other areas represented by smaller collections or known for shorter periods of prehistory will also be mentioned (as in Kowta 1963; Oswalt 1952; VanStone 1954).

Earlier Wares

The earliest dated pottery from the Bering Sea is the collection from Norton Bay which is assigned by Giddings (1964) to the Norton culture, and which has been described by Griffin and Wilmeth (1964). Based on the most recent C-14 determinations (770 B.C. \pm 130, M-1260; Crane and Griffin 1964; 255 B.C. \pm 110, P-13; Rainey and Ralph 1959), the Norton manifestation will be taken to fall sometime between 700 and 200 B.C.

The bulk of Norton pottery has been divided by Griffin and Wilmeth (1964) into two decorated types--Norton Linear Stamped and Norton Check Stamped. In paste characteristics these two types are similar: Temper is predominantly plant fiber (76%), although some examples (16%) exhibit sand grains. Thickness ranges from 3 or 4 mm to more than 10 mm, with the mean around 7 mm. Fracture is said to be irregular, flaking, frequently with splitting. The whole vessel shapes are not described by Griffin and Wilmeth (1964), but most rims are said to be concave or bowl-like, and walls are said to flare outward from a flat base. Sherds examined for this paper suggest the presence of at least two forms, one of them a restricted vase-like jar (Figure 3, a), and the other unrestricted and more bowl-like (Figure 3, b). Giddings (1964: 169) reports the presence of two flat clay lamps, without decoration.

Although the two decorated types apparently were associated with each other at the Norton site, the same association is not consistent throughout the area to be treated here. Relationships of the two types will therefore be considered separately.

Linear Stamped Wares

At the Norton type site, the linear decoration has been described as composed of lands ranging in width from .5 to 2 mm (mean, 1 mm); troughs range from .5 to 3 mm (mean, 1.5 mm). These were presumably made with a grooved paddle (Griffin and Wilmeth 1964). Vessel shape was that of Figure 3, b, and possibly that of Figure 3, a.

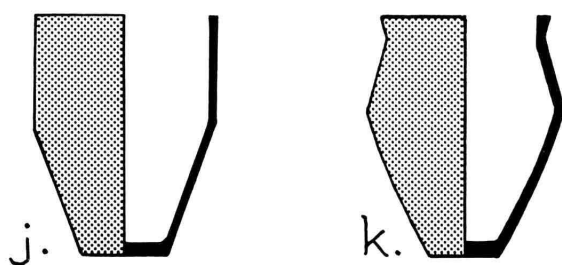
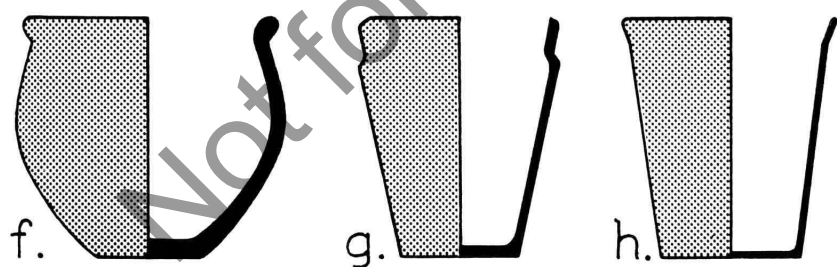
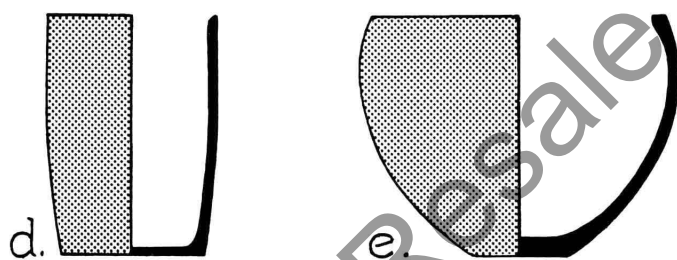
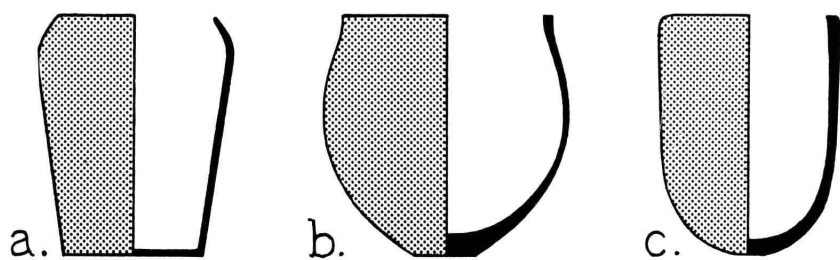
Although the Choris Peninsula is not within the southern area, it seems reasonable to digress far enough to mention the pottery recovered from the Choris culture houses on Choris Peninsula by Giddings in 1956 and 1958 (Giddings 1957; 1967). Charcoal from the houses has been dated at around 700 B.C. ($677 \text{ B.C.} \pm 125$, P-96; $688 \text{ B.C.} \pm 117$, P-203; Rainey and Ralph 1959). A few Choris sherds examined at first hand are tempered with what seems to have been hair, and are about 8 mm in thickness. Lands and grooves are about 1 mm wide. That is, the sherds are within the Norton range. It is customary to consider Choris to be somewhat older than Norton, and this precedent will be followed here, despite the lack of clear radiocarbon evidence in this regard.

Back within the area of interest, and moving southward, linear stamped pottery within the range of Norton ware, with hair temper, has been recovered by Ackerman (1964) at Chagvan Bay, and apparently by Larsen (1950) at Nanvak Bay. Some of the Chagvan Bay sherds were from a trench which also yielded charcoal which was radiocarbon dated at A.D. 660 ± 250 (WSU-117; Ackerman 1964), and apparently accompanied a Norton-like assemblage of stone artifacts.

Still farther south, similar surface decoration is represented in one find in the Naknek drainage, apparently limited to the sherds of a single pot. The sherds were in possible association with charcoal dated about A.D. 725 ± 130 (I-521; Trautman 1964); it must be emphasized that this association is doubtful. Thickness of the sherds is less than 10 mm. Vessel shape could not be determined.

So far, mention has been made of thin ware, generally tempered with fiber. Farther to the northwest, however, there

Figure 3. Some Vessel Shapes Mentioned in the Text. The proportions of each pot are accurate, although the scales of different vessels vary for purposes of illustration; all were drawn from actual examples unless otherwise indicated. a, Smelt Creek phase, Naknek drainage. b, Norton culture, Iyatayet, Cape Denbigh (hypothetical reconstruction from examination of sherds). c, Old Bering Sea, St. Lawrence Island (hypothetical reconstruction from description by Collins 1937 and Oswalt 1955). d, Brooks River Weir phase, Naknek drainage. e, f, Brooks River Camp phase, Naknek drainage. g, Yukon River (after de Laguna 1947: Plate 23, 3). h, Pavik phase, Naknek drainage. j, k, Kodiak Island (after Clark 1966: Fig. 7, and de Laguna 1939: Plate 19).



is a related type in that which Oswalt (1955) has termed St. Lawrence Corrugated. On St. Lawrence Island itself, sherds of this pottery were recovered from the houses of the Hillside site at Gambell, some of them from beneath and between the floor stones in contexts believed to be those of Okvik or Old Bering Sea style 1. Decoration is in the form of broad grooves, apparently made by paddling (Collins 1937: 168) and described by Oswalt as about 3 to 6 mm wide, separated by lands as much as 1.8 mm wide. The thickness of the vessels reportedly averages between 1 and 1.5 cm, so that both vessel thickness and the decoration are outside the range of the Norton specimens. Vessel shape is said to be cylindrical with rounded bottom (Figure 3, c; Collins 1937: 168; Oswalt 1955: 32); thick-walled, shallow, conical lamps also occur (Collins 1937: 342). Temper of the majority of St. Lawrence sherds is reportedly coarse sand and gravel; some of the apparently earlier sherds, however, were tempered with vegetal fiber; and the two tempering agents were never found to occur in the same sherds (Collins 1937: 167). Although the corrugated decoration apparently persisted into the Punuk period, the plant-fiber temper did not (Collins 1937: 238). Recent C-14 dates for the two houses which yielded these earlier sherds at the Hillside site suggest a possible time between A.D. 200 and 600 (A.D. 537 ± 230 , P-70; A.D. 528 ± 121 , P-94; A.D. 316 ± 106 , P-95; Rainey and Ralph 1959).

Similar corrugated sherds are reported from the earliest part of the site at Kukulik on St. Lawrence Island (Geist and Rainey 1936: 223), and from the Okvik site in the Punuk Islands (Rainey 1941: 550)—although in these the temper is not specified. They are also reported from Sirhenik, near Cape Chukchi on the Asian mainland, apparently from Old Bering Sea and early Punuk contexts (Rudenko 1961: 83, Pl. 26); temper is described as both gravel and hair.

A number of corrugated, vegetal-tempered sherds from St. Lawrence Island were examined for this paper. They do indeed appear a relative of the Norton sherds—a relative in which the overall wall thickness has increased, and in which the decoration has been enlarged. In view of the relevant C-14 dates, the St. Lawrence pottery may well be a descendant of

the Norton-Choris ceramics, as, of course, has been suggested by others (e.g., Oswalt 1955).

Summary.—Linear stamping is known from the Norton type site at least as early as the middle of the first millennium B.C. It may appear as late as A.D. 600 or 700 farther south. A variant is the decorated ware of St. Lawrence Island of around A.D. 300 or earlier.

Check Stamped Wares

At the Norton type site, Norton Check Stamped pottery is described as tempered predominantly with plant fiber, mean wall thickness 7 mm., with the exterior bearing paddled impressions of small rectangles or squares, the sides of which normally measure less than 4 mm (Griffin and Wilmeth 1964). Vessel shape was that of Figure 3, a, b. The temporal occurrence at the type site is apparently the same as that of linear-stamped decoration, here considered to begin somewhere between 700 and 200 B.C.

Farther south at Chagvan Bay, thin pottery stamped with small checks is apparently associated with charcoal dated at A.D. 210 ± 60 , A.D. 540 ± 60 , and A.D. 660 ± 250 (WSU-102, WSU-123, WSU-117; Ackerman 1964). The sherds appear in a Norton-like context, and may have been contemporaneous with linear-stamped pottery. Vessel rims (Ackerman 1964: Fig. 7, f) suggest the vessel form to have been similar to that in Figure 3, a.

Pottery virtually identical to both that of Chagvan Bay and of the Norton type site appears in the Naknek drainage by the second century B.C. Here there is no clear evidence that the check-stamped pottery was associated with linear-stamped ceramics. In the resume of the Naknek material which follows, dates cited in the Christian calendar are derived from a battery of thirty-two separate C-14 determinations, both published (Trautman 1964) and unpublished, which are directly pertinent to cultural material. The Naknek drainage ceramics have been only briefly described in print (Dumond 1962).

Smelt Creek Check Stamp is the local designation of the

most Norton-like, decorated with impressed small squares, small rectangles, and small diamonds, all less than 4 mm on the side. Vessels are relatively thin - less than 10 mm - and are tempered with either hair or plant fiber or both. Fracture is irregular, and noticeably platy; vessel walls split easily into hard component laminae; many recovered sherds are split fragments. This pottery apparently appears as early as 200 B.C., and lasts at least until A.D. 100. It is unlikely that it persists beyond A.D. 300, when it is superseded by a descendant characterized by seldom-completely-square checks 4 mm on a side and larger. This larger, later stamped pottery has been called Brooks River Falls Diamond Stamp. In this decoration, lands intersect at an angle between 60° and 90°; the ware is often thicker, ranging from 4 to 15 mm, with the thicker examples generally later in time. The decorative technique lasts at least until A.D. 800, and perhaps as late as A.D. 1000, although before this later time it may rather have been entirely replaced by undecorated pottery of similar paste.

During the entire period from 200 B.C. to A.D. 1000 there is no sharp change in paste characteristics. At all times after A.D. 300, plain sherds outnumber decorated sherds, although during the heyday of the Falls Diamond Stamp decoration it appears that most plain sherds are from vessels made with a checked paddle, which were then carefully smoothed. After about A.D. 800, however, it is possible that no carving was used on the paddle. Throughout this period from 200 B.C. to 1000 A.D., the fiber-tempered pottery of the Naknek drainage is associated with a steadily evolving but generally Norton-like series of stone assemblages.

During this same 1200-year period there is also great consistency of vessel form. The small-check-stamped decoration appears predominantly upon a restricted, frequently graceful, vase-like form (Figure 3, a), a form which, as indicated above, is probably represented at the Norton type site and elsewhere. During the first century A.D., and perhaps during the last centuries B.C., it appeared upon vessels of no other shape. Later, a cylindrical or barrel shape predominates (Figure 3, d), and this form persists throughout the period of the later Diamond Stamp and plain pottery

until A.D. 1000 or 1100. The cylinder shape may also have predated the vase-like form; at least it appears in sherds from one small site dated about 160 B.C. \pm 350 (I-1158)--but of course the range covered by this determination is so great that it would not preclude a date as late as A.D. 200. No pottery lamps are known during this period.

The progression in surface decoration from small checks to large checks is probably not confined to the Naknek drainage. Large checks have appeared on pottery from St. Lawrence and perhaps the Punuk Islands (Collins 1937; Geist and Rainey 1936; Rainey 1941), and on the Siberian mainland from Old Bering Sea or Early Punuk period sites, associated with the corrugated pottery mentioned previously (Rudenko 1961: 83, Pl. 26). Unfortunately, the period of the larger checks is not represented in collections from Norton Bay, and it seems unlikely that it is represented in the collections described to date from Chagvan Bay (Ackerman 1964; Larsen 1950).

Both small and large checkerboard impressions have been previously reported for pottery from Nunivak Island (Collins 1928; Oswalt 1955; VanStone 1954), with checks of all sizes recovered from the same excavation units, implying a lack of temporal significance in size alone. A large additional sample of pottery with checks varying in size from 2 mm to 6 mm on a side was recovered in 1967 by Michael Nowak. The check-stamped pottery is stratigraphically separated from a later, pebble-tempered pottery, which is affiliated with wares to be discussed later, but analysis of the collection is not sufficiently advanced to allow a convincing statement as to whether there is evidence of a tendency for check-stamped decoration to be enlarged through time. A brief examination of the check-stamped pottery has indicated it all to be similar in paste and vessel form. As in the Naknek drainage and elsewhere, fracture is irregular, with the pottery tending to split into hard, platy fragments. But unlike check-stamped pottery mentioned from other areas, the temper--where any is present at all--is almost exclusively small sand. The vessel form is bowl-like, similar to that shown in Figure 3, b, but with broader base and straighter, more erect rim. The Nunivak check-stamped ware is clearly and closely related to other

check-stamped pottery discussed here. In 1967 it was found associated with Norton-like flaked stone implements.

Summary. Small check impressions appeared on fiber-tempered wares by the middle of the first millennium B.C. at Norton Bay, and by 200 B.C. in southern Bristol Bay. Through time there was probably a general tendency for the decoration to become larger; this is not to expect, of course, that any one specific size -- such as the 4 mm square which is useful in separating earlier from later check-stamped pottery in the collection now at hand from the Naknek drainage--will prove universally useful as a temporal indicator. At any rate, larger checks were present after A.D. 300 in the Naknek drainage to the south, and presumably at about the same time on St. Lawrence Island and the nearby Asian mainland. The check decoration was apparently abandoned on St. Lawrence and the Chukchi Peninsula by A.D. 800, and possibly by the same date in the Naknek drainage. By inference, similar pottery existed at the same times in the intervening regions; ceramics from Nunivak Island, while very similar in other respects, commonly contained inclusions of sand rather than fiber.¹

Other Decorated Pottery

Dentate.--One certain example of dentate impression is present at the Norton type site, on a sherd of fiber-tempered ware. This one sherd exhibits three rows of stamps. The date presumably is between 700 and 200 B.C. (Griffin and Wilmeth 1964).

Cord-wrapped paddle. --Twenty-two sherds so impressed and of a single barrel-shaped vessel were recovered in a scanty camp site in the Naknek drainage, a site which also yielded six check-stamped sherds and three diamond-stamped sherds of the later, larger type, and twenty-four unidentifiable

¹This description does not include mention of the fiber-tempered, check-stamped sherds recovered at Tikchik by VanStone (1968) during excavations of nineteenth-century houses. I have examined these Tikchik sherds--as well as a few of the gravel-tempered sherds found with them--and without hesitation I would place them in the fiber-tempered class of wares discussed here; I would expect them to have been made no later than the first millennium A.D. VanStone

sherds. All of them were fiber tempered. That the association of types was valid is unlikely; a C-14 date of 160 B.C. \pm 350 (I-1158) may or may not apply to the cord-wrapped-pad-dle-impressed sherds.

General Summary

Up to this point, discussion has centered upon a class of ware which is marked by the predominance of temper of organic fiber—either plant fiber or animal fiber or both—although in some areas the fiber may be replaced by sand; wares of this class are hard, generally well fired, with a tendency to split into platy segments upon fracturing. The class could be subdivided according to other paste characteristics—as, for instance, thickness. The class frequently includes types characterized by linear or check impressions in some variety of size, of which the size itself may be temporally significant; the class may also include other decorated types as

(1968: 317) is inclined, however, to consider them to be contemporary with the historic Tikhik houses, since they were recovered in the floors, and he concludes that check-stamped decoration persisted into the contact period, an opinion shared by Oswalt (1967: 250).

Besides a scattering of out-of-context occurrences, the additional evidence for their view that is cited by one or both of them includes one sherd recovered from a Tigara phase burial at Point Hope, one from a recent house at Kotzebue, and twelve from a house at Deering known to have been abandoned in 1902; it includes VanStone's earlier experiences on Nunivak Island; and it includes the whole Alaskan pot of uncertain provenience in what is now the Thomas Burke Memorial Washington State Museum, Seattle, described (de Laguna 1947: 229) as tempered with gravel, mended with iron staples, and bearing check-stamp decoration.

Unfortunately, I have not examined any of the sherds referred to, but some recent evidence from Nunivak Island suggesting that check-stamped pottery is properly early at that location is indicated in this paper. In 1968, in the Burke Museum in company with James B. Griffin and George I. Quimby—both surface-decorated-pot buffs with vastly more experience than I—I was able to examine the staple-repaired pot (100-313) as well as another very similar to it and now a part of the collections (2-3197). Both pots are tempered with gravel and one of them is indeed mended with a pair of iron staples; on the basis of paste I should class them with wares of the later, gravel-tempered class described farther on in this paper. The decoration, however, is certainly a dentate stamp, rather than a check stamp; interestingly, a dentate-stamped pot in the Haffenreffer Museum, Brown University, is known to have been made at Cape Krusenstern in the nineteenth century (Douglas D. Anderson, personal communication).

On the basis of present evidence I prefer to continue to operate with the hypothesis that check-stamped pottery, generally fiber-tempered, was early in Alaska, and did not persist anywhere past about A.D. 1000.

well. Pottery lamps are uncommon in collections from the Alaskan mainland, more common in the earliest collections from St. Lawrence Island. The earliest wares of this class probably appeared in the Bering Strait vicinity by the middle of the first millennium B.C., and on the shores of Bristol Bay by 200 B.C. On mainland Alaska and Nunivak Island these wares are associated with a Norton-like stone industry.

The stimulus which gave rise to these wares was undoubtedly Asian, but the collections considered here do not themselves reflect clear evidence of influences moving from Asia. That is, the earliest Asian archaeological manifestation here discussed—Okvik or Old Bering Sea—seems to postdate the appearance of pottery both at Choris and at Cape Denbigh in Norton Bay, and seems to represent an offshoot of a culture already present in America. A discussion of presumably earlier pottery of what has been termed the Neolithic of the Chukchi Peninsula (see Dikov 1963; 1965), which is possibly directly ancestral to this early Alaskan pottery, is outside the scope of this paper.

Later Wares

On St. Lawrence Island vegetal fiber was apparently used to some extent in tempering pottery during the Old Bering Sea period, but it was not so common as coarse sand and gravel. Vessel form in use during the Old Bering Sea period (Figure 3, c) apparently persisted almost until the historic period (Collins 1937: 238f.; Oswalt 1955).

In the Naknek drainage, the cylinder-shaped, fiber-tempered pot (Figure 3, d) continued in ever-thickening versions— to 15 mm or more — until about A.D. 1000, all the time associated with a local, Norton-derived flaked stone assemblage. Around A.D. 1000, however, change occurred rapidly and smoothly. The amount of sand and especially of gravel in the paste—which almost never had been completely without gravel in pottery thicker than about 10 mm — was increased enormously. Virtually immediately after this, the form also was changed and the amount of hair was decreased, so that tempering became predominantly stream-rolled pebbles, some of them 10 mm in diameter. Sherds of this pottery fracture

with an irregular break in which crumbling replaces the pronounced tendency to split which was noted in the earlier wares. The new vessel forms were globular (Figure 3, e, f); unbaked, untempered, saucer-shaped clay lamps also came into use. At the same time this new pottery technique was taken up, the chipping of stone was abandoned in favor of grinding, and the non-ceramic assemblage took on a definite Western Thule cast (Dumond 1962). In a number of cultural elements—not to be enumerated here—continuity is strong, however, and this shift in technology is not interpreted as part of a major population replacement.

Not present on St. Lawrence was a decorated pottery characteristic of much of the Alaska coast for a period after about A.D. 800. This pottery was called by Oswalt (1955) Barrow Curvilinear Paddled, and Ahteut Curvilinear Paddled. It appears in the Nukleet materials of Norton Bay about A.D. 900, to judge from recent C-14 dates (A.D. 900 ± 110 , M-1260; Crane and Griffin 1964). Usual forms there have been described as wide-mouthed bowls with conical or rounded bases (Giddings 1964: 104); the Nukleet collection examined in the preparation of this paper is such as to suggest that the forms include those indicated in Figure 3, e and f. Shallow bowls were used as lamps (Giddings 1964: 106; Griffin and Wilmeth 1964). The forms, of course, are shared with plain pottery of the same period. Decoration is in the form of paddle marks consisting of spirals or concentric circles (Giddings 1964: 104). Temper was chiefly sand and pebbles, although considerable fiber, including feathers, might be added. Thickness averages about 10 mm, with some sherds as thick as 16 mm. Fracture is irregular and generally crumbling (Griffin and Wilmeth 1964). The stone industry with which this appears features the grinding of slate, and in a generic sense may be termed Thule-like.

Similar pottery appears in the Naknek drainage. Although the great mass of sherds of the period after A.D. 1000 is plain, there are six sherds which display concentric circle impressions on the surface. These sherds are identical in paste to the more characteristic plain sherds of the locale and period, and pertain to an occupation dated about A.D. 1300. Walls are thicker than 10 mm. Temper is stream-washed sand

and gravel, which is as large as 10 mm in diameter. Shapes—there are possibly two vessels represented—are that illustrated in Figure 3, e (Dumond 1962).

This curvilinear decorative motif has not been reported between the Naknek drainage and Cape Denbigh, possibly because the proper time periods have not been sampled at intervening sites, such as those at the mouth of the Togiak River and in the Chagvan Bay vicinity.

A change in the dominant pottery at Nukleet is evident at about A.D. 1500 to 1600, when the thickness decreases, shape becomes that of the bucket or situla with wide flat bottom (Figure 3, g, h), and the common decorative elements are incised lines and dots on the exterior and sometimes on the inner surface of the rim. The variety of lip treatments increases. Temper remains predominantly sand and pebbles, with some lesser organic tempering sometimes added as well. Fracture is described as irregular and crumbling (Giddings 1964: 104ff.; Griffin and Wilmeth 1964: 276).

This pottery is assignable to the Yukon Line Dot and Yukon Lined types of Oswalt (1955), the distribution of which has been described by Griffin and Wilmeth (1964) as including the area from Seward Peninsula to the Yukon. It is known from all late sites of this area, including Nunivak Island, and also from at least as far south as Togiak (Kowta 1963) and a site excavated by VanStone on Tikchik Lake on the Nuyakuk River in 1965 (VanStone, 1968). Presumably this lined pottery is closely related to the apparently less widely distributed types like Seward Striated and Hooper Bay Shell Striated, both of which were defined by Oswalt (1955). It is also apparently pottery of this general group which has appeared in Athapaskan territory along the Yukon and on the upper Kuskokwim (de Laguna 1947; LeFebvre 1956). Flat, saucer-shaped clay lamps are common at this horizon (see Oswalt 1953b).

At the Togiak midden excavated by Kowta (1963) a line-dot type appears in the upper half of the midden. It seems to follow after a pottery characterized by exterior modeled horizontal ridges, and its appearance is correlated with a decrease in thickness. This slightly earlier, externally ridged pottery is not yet known with frequency from the

southern Bering Sea area, but it appears in small numbers in the Naknek drainage after A.D. 1500. There is no Yukon Line-Dot known from the Naknek drainage.

It seems reasonable, therefore, to suggest that line-dot decorated pottery is principally at home between northern Bristol Bay and Seward Peninsula. It probably nowhere predates 1550. It appears to have been the dominant pottery in much of this area at the time of contact.

In the Naknek drainage, on the other hand, the pottery of the eighteenth and nineteenth centuries is thin, small-gravel-tempered plain ware which usually takes the form of a bucket or flower pot (Figure 3, h), at times with the barest suggestion of a flare to the rim. It is the direct descendant of the thicker, gravel-tempered ceramics which at times had exhibited concentric circle impressions on the exterior (Dumond 1962). The saucer shaped clay lamp, relatively untempered and probably unbaked, continues.

On St. Lawrence Island the historic pottery is also predominantly thin, plain, and tempered with sand and gravel. Here, on the other hand, the square cooking pot (not illustrated) is standard (Collins 1937: 239; Oswalt 1953a), as is a flat-bottomed rectangular lamp.

Summary.—A later class of wares may be described as predominantly tempered with sand and gravel, although organic tempering is not absolutely lacking. In the southern area the earliest known form of this is from St. Lawrence Island, where it appears by A.D. 300, and where it has completely replaced vegetal-fiber-tempered ware by A.D. 800. On the mainland, the chief representative of this later ware class from about A.D. 900 to 1550 is thick pottery which sometimes bears circle impressions. Because the late temper class does not appear in the Naknek drainage before A.D. 1000, it seems reasonable to suggest that the stimulus for its production moved from north to south through the southern area. This is further borne out by the occurrence of circle-stamped ceramics at Point Barrow by as early as A.D. 800 or even before.

After the introduction of this pebble-tempered ware class, there was a tendency for ceramics to become thinner. On the mainland the thinning is associated with the appearance of

varieties decorated with incised lines and dots in various patterns, pottery pertaining to Oswalt's Yukon Line-Dot type. This subclass of pottery apparently is not at home south of the north coast of Bristol Bay.

The later class of wares is found with implements of polished slate in a stone industry which may generally be said to be Thule-like.

Relationship to Northern Alaska

In general terms, the sequence just described is repeated north of Seward Peninsula. That is, following its apparent first appearance with the Choris culture, the early fiber-tempered class of wares of the Choris-Norton horizon, frequently impressed with checks or lines, spreads north at least to Point Hope (Larsen and Rainey 1948; Oswalt 1955) and reappears in the vicinity of the mouth of the Mackenzie River (MacNeish 1959). The late gravel-tempered wares of Birnirk and Western Thule, often impressed with concentric circles or other similar curvilinear designs, are distributed over the same area—north from Seward Peninsula, and near the mouth of the Mackenzie, but unlike the earlier ceramics are known also in the Barrow vicinity (Ford 1959; Oswalt 1955) and inland up the Kobuk as far as Ambler Island (Giddings 1952; Oswalt 1955). These later wares seem to make their appearance after A.D. 500.

Between the occurrences of these two ware classes, however, the sites between Seward Peninsula and Point Hope commonly display the Norton-like but non-ceramic Ipiutak occupation, which apparently covered several centuries of the early part of the first millennium A.D.

This is not to say, of course, that the order of appearance of particular design elements or vessel shapes in the north exactly duplicates that described for the coast of the Bering Sea. Further discussion of ceramics of the northern area is beyond the scope of this paper.

The Pacific Eskimo Area

By now it is possible to make some definite statements

regarding the arrival of pottery on the north Pacific, and its distribution there. Excavations by the University of Oregon on the Pacific coast of the Alaska Peninsula, first in 1953 and most importantly in 1964 and 1965, have yielded the following information: Pottery initially appears, in very small quantity, around A.D. 300 or a century or so later. This pottery—all of it plain—is identical to the plain ware known from the Naknek drainage of the same period. That is, it is a representative of the earlier, fiber-tempered, barrel-shaped pottery related to Norton ware. By A.D. 1200, there is present a pottery representative of the later class of wares—that is, exactly similar to the Naknek drainage ware which carried the concentric-circle impressions, but without decoration. The situation with regard to ceramics after A.D. 1500 is not known on the Pacific coast of the Peninsula.

Pottery from Kodiak Island has been previously described in print (e.g., Clark 1956; 1966; Heizer 1949; de Laguna 1939; 1940). A number of sherds recovered on Kodiak in recent seasons by the University of Wisconsin were examined for this paper; all sherds seen are clearly of the later, pebble-tempered class of wares, and most of them are thick.

It is clear that pottery was concentrated on the southern portion of the island, although a few sherds have been found on the northern tip of Kodiak Island proper (Clark 1966: 173). The earliest radiocarbon date clearly pertinent to pottery is near A.D. 1000 (Clark 1966), which in view of the situation in the Naknek drainage must be the earliest possible date for this pottery on Kodiak. The latest Kodiak pottery seems to be characterized by an increasing complexity of lip form. This may be related to a lip complexity which goes with the Yukon Line-Dot type farther north. The later Kodiak materials also include exterior ridges and occasional incised grooves (Heizer 1949). The vessel forms (Figure 3, e, j, k; see Clark 1966; Heizer 1949; de Laguna 1939; 1940) seem generally reminiscent of the globular Naknek drainage forms (Figure 3, e, f) of the period between A.D. 1000 and 1500, rather than of the bucket-like forms which occur at the time of Russian contact farther north.

Northeast of Kodiak on the Pacific coast, the occurrence of pottery is infrequent. De Laguna (1934; 1947: 245) reports

finding only two sherds at Kachemak Bay, and discusses some scanty finds of Jacobsen from the area.

In 1884, Jacobsen recovered sherds from a house in a village believed to be an early post-contact, and perhaps in part pre-contact, settlement of Tanaina (Woldt 1884: 370-73). Both de Laguna (1947: 255) and Osgood (1937: 77) have taken this as probable evidence of the use of pottery by Tanaina. An alternate view—with which Jacobsen's account does not conflict—is that these sherds were proper to an underlying pre-Tanaina Pacific Eskimo occupation; this position has been taken elsewhere (Dumond and Mace 1968), and is adhered to here. Jacobsen describes those sherds as resembling the pottery in use during the nineteenth century on the lower Yukon, which seems an accurate description of virtually any of the pottery known from the Pacific coastal area.

In 1966, sherds of relatively thick gravel-tempered ware, globular in form (Figure 3, e), with a simple rim identical to those from the Naknek drainage of the time between A.D. 1000 and 1500, were recovered from what was interpreted as a Pacific Eskimo occupation at a site on Knik Arm, the northernmost extension of Cook Inlet (Dumond and Mace 1968).

It seems reasonable to say that there is at least a sporadic occurrence of the later pebble-tempered pottery along the shores of Cook Inlet. Pottery is not known farther south along the Pacific coast, from areas such as that of Eskimo speech on Prince William Sound.

General Summation

A schematic indication of the temporal and spatial distribution of the classes of pottery discussed in this paper is contained in Table 2.

1. An earlier class of related, fiber- or fine-sand-tempered wares, having a pronounced tendency to split into hard laminae on fracturing and commonly associated with Norton-like stone implements, is known at Norton Bay, where it appeared perhaps before 500 B.C.; it was presumably related to perhaps still earlier pottery from the Choris

Peninsula in Kotzebue Sound. This class was present in southern Bristol Bay by 200 B.C. It was apparently reflected in the earliest known ceramics of St. Lawrence Island. It had been spread to the shores of the north Pacific no earlier than about A.D. 300, but apparently did not penetrate to Kodiak Island.

2. A later class of wares is of predominantly inorganic temper, gravel and very coarse sand, has a noticeable tendency to crumble rather than split, and is commonly associated with Thule-like implements of ground slate. Representatives of this class occurred on St. Lawrence Island during Old Bering Sea times--before A.D. 500, probably--and appeared around Norton Bay by A.D. 900. Its first representatives at Norton Bay were relatively thick, and frequently bore the impressions of concentric circles or spirals. Representatives of this class appeared first on the northern edge of the Alaska Peninsula at or shortly after A.D. 1000, and again were in some cases found with circle-shaped impressions. At about this same time the class appeared in its plain aspect on the Pacific coast of the Peninsula and on Kodiak Island.

A second version of the same class was thinner, with some changes in form, and appeared often with incised lines around the rim, either inside or outside the vessel. This incised form appeared chiefly from Seward Peninsula to northern Bristol Bay, probably after A.D. 1550 or 1600. The accompanying tendency towards thinness, however, extended farther, involving the late prehistoric and historic pottery of St. Lawrence Island, and the late ware of the Alaska Peninsula and perhaps of Kodiak Island. It is this later version, especially in the area of the incised line decoration, which is characterized by the so-called situla shape.

Acknowledgments. An earlier version of this paper was read at the thirty-first annual meeting of the Society for American Archaeology, in Reno, Nevada, in 1966. Samples of pottery from the following areas were examined at first hand in its preparation: Choris Peninsula, St. Lawrence Island, Cape Denbigh, Nunivak Island, Chagvan Bay, Togiak, Tikchik Lake of the Nuyakuk River system, Iliamna Lake, the Naknek drainage and Pacific coast of the Alaska Peninsula, Kodiak Island, and the Fish Creek site on Knik Arm. Pottery of the

Naknek drainage and Pacific coast of the Alaska Peninsula, and of the Fish Creek site, was recovered during research by the University of Oregon sponsored by contracts from the National Park Service and by National Science Foundation grants G-12964, GS-79, GS-655, and GS-1037; the pottery is now in the Department of Anthropology of the University of Oregon, and will ultimately be deposited in the Museum of Natural History of the University of Oregon. Pottery from Nunivak Island which was recovered by Michael Nowak during 1967 in research financed by National Science Foundation grant GS-1412 to The Colorado College, is now in the Department of Anthropology of The Colorado College, and will ultimately be deposited in the Museum of Natural History of the University of Oregon. I am grateful to the

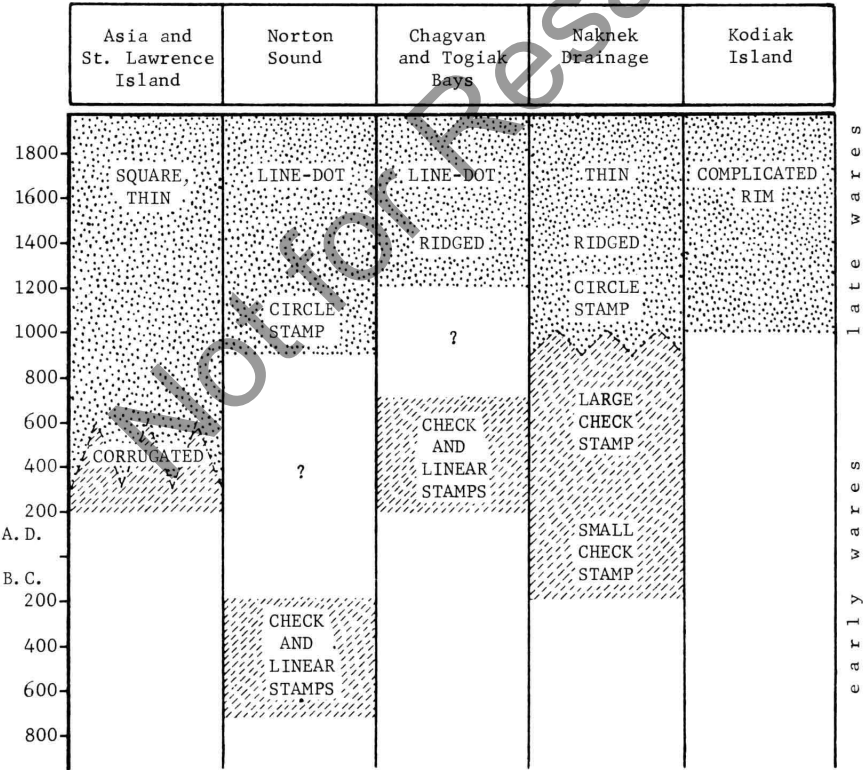


Table 2. Temporal and Geographical Distribution of Some Pottery Mentioned in the Text.

following people and institutions who made collections or parts of collections available: Robert E. Ackerman, Donald W. Clark, Henry B. Collins, Mrs. J. L. Giddings, Mark Kowta, Margaret Lantis, Michael Nowak, Joan B. Townsend, James W. VanStone, the Lowie Museum, the U. S. National Museum, the Thomas Burke Memorial Washington State Museum, and the Museum of Anthropology of The University of Michigan. The illustrations for this paper were drawn by Carol Steichen Dumond.

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Not for Resale

CONTRIBUTIONS TO THE ETHNOBOTANY OF THE ST. LAWRENCE ISLAND ESKIMO

By

Steven B. Young and Edwin S. Hall, Jr.

In a recently published textbook dealing with the native peoples of North America, we find the following statement: "...the Eskimo chose all but to ignore the not inconsiderable vegetable resources of their region..." (Spencer, Jennings, et. al. 1965:4). In quantitative terms this evaluation may be correct. Certainly the aboriginal Eskimo depended on hunting for subsistence to a greater extent than any other of the world's peoples (cf. Lee and DeVore 1968). However, a brief review of the dependence of Alaskan Eskimos on vegetable resources reveals the following (adapted from Hall 1961):

Group	# of Species Known to be Used for Food	# of Species Used for Medicine, Manufacture, etc.	Estimated % of Diet from Vegetable Resources
Chugach	30	29	15
Aleut	17	48	10
Western-Eskimo (Kotzebue to Alaskan Peninsula)	57	47	up to 15
Nunamiut	21	8	5
Tareumiut	6	5	1

The sources summarized in this table include: Anderson 1939; Bank 1951, 1952, 1953; Birket-Smith 1953; Collins, et. al. 1945; Gubser 1961; Hall 1961; Hawkes 1913; Heizer 1943; Heller 1958; Ingstad 1954; Lantis 1946, 1959; Murdoch 1885; Nelson 1896; Oswalt 1957; Ransom 1946; Rausch 1951; Spencer 1959; Stoney 1900 and Weyer 1932.

It appears that the Alaskan Eskimos may have been aware of and made use of more plant species than is customarily

scattered bushes at isolated locations. Salmonberries (*Rubus Chamaemorus* L.) are of fairly common occurrence, but the fruit set is so light that it is seldom worth the trouble to gather them except casually. Some of the older Eskimos claim that there is a good crop of salmonberries only once every four years.

In general, the gathering of berries and other wild fruits is presently of little use to the St. Lawrence Islanders. The collection of various "greens," particularly *Sedum Rosea* (L.) Scop. is of considerably more importance and some of the women spend a good deal of time engaged in this activity. Women and young girls undertake trips of several miles from Gambell to procure greens during the summer. However, gathering expeditions often appear to be an excuse for a social occasion rather than a serious subsistence activity. The recreational aspect of gathering also has been noted (by Hall) among the Noatak River Eskimos and the Nunamiut of Anaktuvuk Pass. A third motivation for gathering, beyond subsistence and recreation, may be pride. Some Gambell families express pride in continuing old ways. Finally we might note that berries and greens provide a certain amount of variety in a somewhat restricted diet.

The plant species known to have been utilized by the St. Lawrence Eskimos are listed below.

Seaweed. Species unknown. A number of kelp-like seaweeds are gathered in the spring and fall. As Hughes (1960:121) notes, seaweed is eaten both raw and cooked; in the latter case it usually is served with meat. Many of the organisms considered as "seaweed" by the natives are actually marine invertebrates.

Sphagnum spp. Dried *sphagnum* was used for lamp wicks. Because of the highly absorbent nature of dried *Sphagnum*, it probably had other uses, perhaps, for example, as diapers.

Elymus arenarius L. There is presently no native basket-making industry on St. Lawrence Island. The Eskimos mentioned that baskets can be made of the stems of the beachrye grass as is presently done in the vicinity of Nelson Island. The local Bureau of Indian Affairs schoolteacher had a well made basket made by an old Gambell woman.

Grasses undoubtedly were used for a number of purposes in

earlier times. Collins (1937:272) notes that dry grass insulation was placed between the wooden walls of Old Bering Sea houses. He (Collins 1937:172) also found a small bundle of grass wrapped with baleen and of unknown use in an Old Bering Sea deposit.

Salix spp. The young leaves of *Salix pulchra* Cham. are occasionally collected as greens. *S. reticulata* L. (Eskimo: Okviuk) may also be used for this purpose. The other willows of the island are generally either too small or too densely pubescent to be used as food, though *S. arctica* Pall. may be eaten occasionally.

Geist (1936:9) maintains that most willows are collected for the edible root bark and only secondarily for the leaves.

Rumex arcticus Trautv. (Eskimo: Ahkakuk). This rather common plant is usually found in rich wet soil along river sloughs and near human habitations. The large leaves are boiled until tender. The taste is reminiscent of rhubarb (to Young).

Oxyria digyna (L.) Hill. (Eskimo: Kowillingok). This species is common throughout the island. This plant is apparently never collected for later use but is much appreciated as a thirst-quenching snack. It is particularly valuable because most of the surface water on St. Lawrence is contaminated by the tapeworm *Echinococcus multilocularis* and most of the Eskimos prefer not to drink the water unless it is boiled. The sour leaves of *O. digyna* are satisfying when no good water is available. We can safely assume that this usage predates white contact.

Polygonum viviparum L. (Eskimo: Soochluk). The small, potato-like tuber of this species is occasionally collected. The plant is usually too rare and the tubers too small to be of much importance. The St. Lawrence islanders apparently do not normally distinguish between this species and *P. bistorta* L., a larger species with a similar tuber which is even rarer on the island. *P. bistorta* is also eaten.

Hughes (1960:122) probably refers to this species when writing about the "Eskimo potatoes" or *Claytonia tuberosa* which were collected in the fall from the storehouses of mice and other rodents.

Parrya nudicaulis (L.) Regel. The licorice-flavored roots of this species are often eaten in the field. Some Eskimos mentioned that the roots can be stored. The species is not common enough to be of much importance.

Sedum rosea (L.) Scop. (Eskimo: Nooneevuk). This is by far the most important "greens" plant. *S. rosea* is found most commonly on bird cliffs and sandy backshores. A particularly lush stand occurs on a disintegrated lava flow near Ataakas Camp, about 15 miles east of Savoonga, and the people of Savoonga often collect greens there. The greens are usually put in a barrel, formerly a sealskin poke, and allowed to ferment and then to freeze. During the winter frozen chunks are mixed with seal oil to make Eskimo "ice cream."

Use of this species is also noted by Geist (1936:9, 15), Moore (1923:355) and Hughes (1960:121-2). According to Hughes, the roots of *S. rosea* are collected in the fall and eaten with meat.

Rubus chamaemorus L. (Eskimo: Ahkahavazik). This species usually is not available in large enough quantities to be gathered systematically, but the berries are relished whenever they are found. The St. Lawrence Eskimos say that when the berries are exceptionally abundant, the phenomenon is called yewewmattomililingook, meaning "man with no clothes on" because the berries can color the tundra flesh-colored. It is doubtful, with the present climatic conditions, that this phenomenon occurs often on the island.

Rubus arcticus L. (*s. lat.*) This species is of fairly common occurrence on the south side of the island. It was not observed to set fruit in 1966 or 1967. Although a few of the older Eskimos claimed to be familiar with the species, they did not mention eating the berries.

Potentilla spp. The long tap roots of some of the *Potentilla* species allied to *P. hyparctica* Malte occasionally are eaten. These roots are rather small and have a strong medicinal taste. The plants are found as scattered individuals on high rocky barrens and sandy backshores, usually some distance from the villages. It seems doubtful that they would ever have been an important part of the native diet, but apparently some Eskimos consider the roots to have medicinal value.

Geum glaciale Adams. This plant has roots similar to, but larger than, *Potentilla*. The Eskimos claim it is good to eat. Although conspicuous, the plant is rare and is usually found only in isolated areas in the higher mountains. It can hardly have been an important source of food.

Dryas octopetala L. (Eskimo: Kiyuk). The Eskimos claim that the leaves of this plant make a good tea substitute. Tea is one commodity that everyone keeps in good supply, so present use of this species is limited. The local word for tea, *Kiyouoo*, may be derived from the word for *Dryas*.

Moore (1923:355) mentions a plant (possibly the same species) from which a drink was made when tea was scarce.

Empetrum nigrum L. This species is quite rare on St. Lawrence. The small, black berries are collected when found.

Epilobium latifolium L. (Eskimo: Angookuk). This plant is common only along rocky streambeds. Apparently it is occasionally collected for use as greens.

Angelica lucida L. (Eskimo: Tepplook). This species is found commonly only along the barrier beaches of the south side of the island. It is eagerly sought out by the natives and this fact may be responsible for the relative rarity of the species. The extremely strong-tasting root is used fresh or dried. It is considered to have great medicinal value, supposedly being a "broad spectrum" drug, useful in the treatment of most illnesses and feelings of malaise. The Eskimos believe it is desirable to eat a small piece of the root each day as preventive medicine.

It is interesting to note that this is essentially the same plant which many other peoples, from the Classical Greeks onward, have considered to have great medicinal value, hence the name *Angelica*. Also, this is not basically an arctic species. Except in the regions of the Bering Sea, *Angelica* is mostly confined to temperate regions. The possibility that the St. Lawrence Islanders learned to use *A. lucida* from the white man should not be overlooked.

Ledum decumbens (Ait.) Lodd. A close relative of this shrub, *Ledum groenlandicum* Oeder, has often been used as a tea substitute in many areas of the far north. During the summer of 1966 Young mentioned this to the Eskimos. They were anxious to try using the aromatic leaves of *L. decum-*

bens and added a few leaves to regular tea. Whether they liked the highly perfumed tea or simply the novelty, the idea was a success, and several people in Gambell and Savoonga were shown how to recognize the plant. During the summer of 1967, a party of anthropologists at Gambell were quite interested in the ancient Eskimo custom of using *Ledum* leaves for flavoring tea. Had Young not been there to explain, this custom might have become part of the ethnography of the St. Lawrence Island Eskimo.

Cassiope tetragona (L.) D. Don. This species is occasionally abundant on high, rocky barrens. It may form a thick, dry mat which consists mainly of dead twigs and leaves and is therefore quite inflammable. The Eskimos say that they often use it for fuel. There is always abundant driftwood along all of the coast of St. Lawrence Island, so *Cassiope* would be used only on trips to the interior.

Arctostaphylos alpina (L.) Spreng. The black, rather insipid berries of the species are gathered, but the plants are seldom abundant enough to be of much importance.

Vaccinium vitis-idaea L. (Eskimo: Kaetmik). The sour red berries of this species are gathered whenever possible. The species is reasonably abundant, but the plants are usually very small and set few fruit. Last year's berries are sometimes collected in the spring.

Valeriana capitata Pall. (Eskimo: Ahseukpuk). Part of this plant apparently is used as a medicine for stomach troubles. Young also noticed that several people were quite pleased to discover this species, saying it was good luck.

Artemisia Tilesii Ledeb. (Eskimo: Raychlook). This species has highly aromatic, minty-smelling leaves and stems. It grows abundantly over much of the island, particularly in the vicinity of human habitations. One of the women of Gambell (who was the local Avon cosmetics representative) claims that this plant once was used as a body deoderant. Also, jokes were made about smoking *A. Tilesii* when someone ran out of tobacco.

Other species are known to have been used by St. Lawrence Islanders through time. Fuel and raw material for the manufacture of many items of the material culture were provided by the abundant driftwood, predominately white spruce [*Picea glauca* (Moench) Voss]. Birch bark, stripped from

driftwood, may have been used for baskets or for tinder (Collins 1937:175). Undoubtedly, many other species of plants have been used for one purpose or another. There are a number of species not mentioned which have edible leaves, including *Taraxacum* spp. and *Senecio pseudo-Arnica* Less., but we have no evidence of their consumption.

The data now available indicate that the St. Lawrence Eskimos at present or in the past utilized at least 17 plant species for food, 3 for medicinal purposes and about 10 (including a number of species present as driftwood) for fuel or manufacture.

It is extremely difficult to evaluate the importance of vegetable products in the aboriginal diet. The dependence of the St. Lawrence Eskimos on plant foods must have varied from year to year depending on the availability of both the plant species utilized for food and of sea mammals, the basic food source. We would estimate, admittedly on the basis of very little evidence, that in prehistoric times perhaps 4-5 percent of the diet was derived from plants on a year-round basis.

Hughes (1960:160-5) presents the only statistical data available on the consumption of vegetable products during recent years:

Year	Month	Approximate % of total food-meal units ²
1940	June	2
	August	7½
1954-55	November	4
	January	5
	March	5
	late June	1½
	late August	3½

Young's casual observations during the summers of 1966-67 indicates that the percentage importance of vegetable products in the diet has continued to decline. Gathering of wild plant foods is of diminishing importance to the St. Lawrence Islanders.

There is no doubt that some of the older St. Lawrence Island Eskimos have knowledge of the dietary and medicinal

² A "food-meal" is that unit constituted by one type of food eaten at one meal.

uses of the native plants that Young did not have time to record. The list of plants given here is far from complete. A definitive ethnobotany of St. Lawrence Island is still to be done. It seems to us that the relationship between the Eskimo and his environment was more encompassing than investigators in the Arctic usually acknowledge. Future research should emphasize the way Eskimos view and categorize the plant world as well as delineating the extent of plant usage in given areas.

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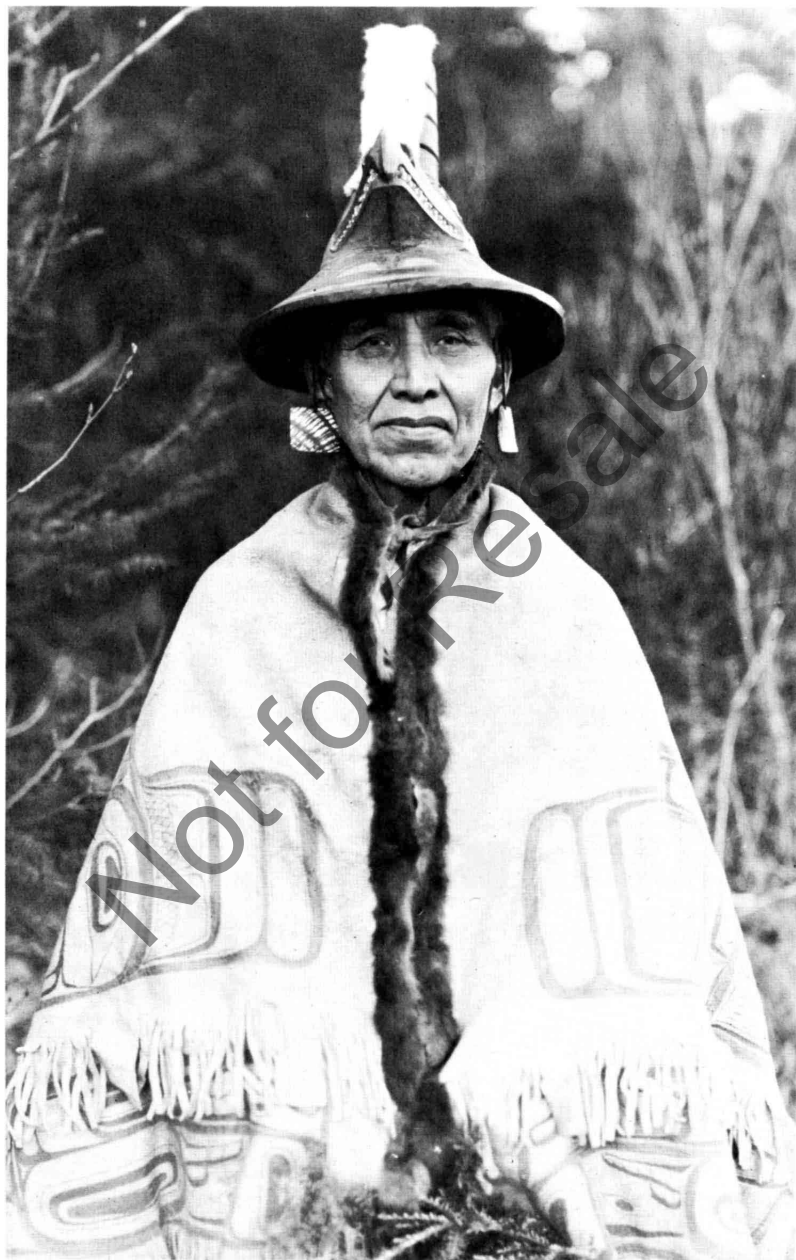


Plate 2. William Wells in Ceremonial Costume.

A POTLATCH FEAST AT SITKA, ALASKA

By

Esther Billman

Introduction

The accompanying manuscript is one of the earliest descriptions of a potlatch, unpublished and written by William Wells, whose Tlingit name was Kah'dsuhti. It tells of the potlatch which William Wells attended in 1877, as a small boy of eight or nine years. He was one of the early students of what is now Sheldon Jackson College, the school having started as a day school for native children. He probably wrote this article as an exercise in "English", as we know that later students wrote stories which were occasionally published in the school paper, at that time called "The North Star", now the "Verstovian". It has been published almost continuously since 1888. In an old folder this article was found in the old style handwriting of its author. William was an apt student of English, and after he finished the few years of schooling that was offered at the time, he was employed as the second interpreter for the Presbyterian Church, translating the service from English into Tlingit. He held this position for many years, and he is still remembered and honored by the older people of Sitka.

The story tells that William Wells, as the nephew of the chief of the Loknauxudi Clan, which meant in this matrilineal society that he was slated to become the next chief, was sent from Sitka to Kake to invite the people there to a potlatch in Sitka. In 1877, Alaska had been under the jurisdiction of the United States for ten years, long enough for the Russians to have departed, but still no government had been given to the people of Sitka. During these "years of neglect" the highest governmental authority was the Customs Collector, so that no

one interfered with the old native customs. In fact, the next year an uprising was planned among the Indians, to drive the white people out, since the American government apparently did not care about its citizens. The uprising might have succeeded but for the loyalty of a few Indians, and the arrival of a gunboat from Victoria.

In that same year Dr. Sheldon Jackson arrived as a representative of the Presbyterian Church to survey the situation. As a result of his survey the need for a school was recognized and in 1878 a day school was started, which soon became a boarding school, and William Wells attended to get an education that would fit him into the American culture.

The story gives a good explanation of the customs of the Tlingit, as near to the aboriginal ways as we are able to find today, and expressed in the language of one of them. The distance from Sitka to Kake by water goes around to the far side of a large island, but it is not so far that it should have taken thirty days by canoe. Apparently the weather was very bad and probably they fished and hunted along the way to have something to take with them.

The manner of greeting of the Sitka chief seems difficult to understand. Mr. A. P. Johnson, a Tlingit of Sitka, explained it briefly: "The diplomatic relation of the two must be understood before action could take place. The invitation could be a dedication of a new clan house, or to a memorial feast of a great man . . ." "There will be no more disagreement, but peace from now on." The greetings were often given in a dramatic form, in concepts recognized only by the members, in terms of the clan histories and traditions.

The picture shows William Wells, as an older man, wearing his clan emblem, the Coho, his painted skin blanket, wooden hat and abalone shell earrings, backed possibly with native copper. The earrings are now in the Sheldon Jackson Museum in Sitka on the college campus.

A POTLATCH FEAST IN SITKA

As Told by William Wells, a Tlingit, in about 1885

When I was quite a small boy, about eight or nine years old, my uncle invited the Kakes to come to our home in Sitka to attend a potlatch feast. When the invitation was given

I represented my uncle and went with the messengers over to Kake. There were six of us in the canoe.

As we started I was seated in full costume, emblem shirt, ear bobs, and headdress, near the stern. We moved a short distance out from the beach and waited for the Chief, my uncle, to make his speech which we were to deliver as his invitation. There were many people gathered on the beach to see us off and to hear the speech. When my uncle finished we started away.

The trip was made in the cold winter and took nearly thirty days. Sometimes as we traveled we were caught in storms and we often suffered from the snow and exposure. But my uncle and all the family knew we would have to suffer before we got there and no one minded it. Hardships and trials must be endured patiently to satisfy our family which had been in mourning for a year. This invitation meant that we were to forget all sorrow. We intended now to let it pass and cheer up.

About half an hour before arriving at Kake I had to be in full dress. So, as at the beginning of that day, I put on my emblem shirt, ear bobs, and headdress. This was time when high caste showed in manner of dress which spoke for itself. Such an appearance meant that great respect must be shown the guest. So we were highly received and welcomed.

But before we landed one of the men in the canoe delivered the speech of our chief. This had to be done before the messenger gave the invitation to the Kake chief. He was called by his honorable name. "You are honorably invited by the Chief to come to Sitka". And so every man was called by his honorable name. One by one every man was called and answered "here!" This was the custom. If there were fifty or a hundred or more in number all were called by name and each one answered.

When we got through naming all of the guests, the chief man on shore gave his welcome address. As soon as he finished speaking we were asked to come ashore and were received in the chief's house. Then according to our custom, we washed our hands as a sign of respect. While we were eating every man who was invited was in the room singing and dancing. This was the style and custom of the Indians.

And this was the way they entertained the messengers. Of course we were well treated as was always the case while waiting for the guests to get ready and while we waited for good weather to start back to Sitka. Every evening while we were eating as soon as we were served the invited guests started to sing and we got used to their songs. The people at home were also practicing singing and dancing until we returned.

When good weather came, ten or more canoes started on the way. After they moved out a little way they started to sing a song according to their custom. Everyone waited until the song was finished. Then, at a signal given by one canoe, they all started together. All kept time together by calling "Whoo-hoo, Whoo-hoo, Whoo-hoo!" In one day's journey the canoes crossed back over Frederick Sound. The messengers, my party, traveled ahead to select a suitable camp site and to build one big fire for the whole fleet. Before starting on the next morning the messengers called attention to the fleet telling all the canoes not to pass White Water Bay village where they planned to feed the guests. When they reached that place in the evening they had a chance to practice the songs and dances. But during that hour one of the canoes drifted away. This was serious trouble. All that night the messengers were out on the water hunting for the canoe. At last without success we turned back to the village and my father arranged for another canoe.

Good weather favored us the next morning and the fleet started across Chatham Strait with the messengers traveling ahead as usual. Just as we were coming close to the beach near a sandy shore we sighted the lost canoe. It was lying unhurt where the tide had left it up on the beach. This was very lucky. We stopped and put the canoe up in the woods where it stayed safely until it was picked up by the Kakes on the return trip. After this we kept going until the day was nearly over. Then the messengers looked up a camping place and stopped to make a fire.

The next day the guests asked us not to travel ahead. This meant that we were near our home, Sitka. The guests were going to surprise the people at home. One big war canoe loaded with all the men she could carry came quietly out in

front of the Sitka village. All at once they broke out in a big noise, all shouting together. This was unexpected and caused quite an excitement in Sitka. Soon drums were beating and answering shouts were heard. This was kept up for some time until the war canoe, having accomplished the purpose of announcing arrival, returned, according to custom, and all the guests spent the night in camp. The messengers came on to their homes in Sitka.

The next morning my family went over to build a fire and feed the guests from Kake. As soon as we finished this we returned home. When we were sighted about twenty canoes came out to meet the Kakes. The people were singing and dancing in the canoes. This is the way they treated the outside party. They they returned home.

Soon the Kakes came in singing and dancing. They came to the front of the chief's house just where they were to be received. There they waited until the home party gave a return dance. There were really four dances: first, the Kake's dance, imitating the Tsimshian; then, three Sitka dances, the Stick dance, an Aleut dance and another dance called "Men Without Clothes" dance. This last was an imitation of a Filipino dance.

After the dance the Chief invited the Kakes who were to be received as guests now. Instead of making a speech he did it with acting like a play. Taking a bow and arrow in his hands he drew it like he was going to shoot someone. Then he ran down to the canoes. Some one in the crowd back of him called "Stook quatch! Stook quatch!" This was as much as to say "Keep coming, kill it!". Then he broke the bow, threw it on the ground, turned back and answered the crowd: "You think Stook is as foolish as that, to kill big game?" Now perhaps the guest party understood the meaning but some did not. Then they called the fleet to land.

This was only the beginning of many happy times during the Potlatch which lasted about four weeks. Every day was a busy one. Every day was a feasting day. There were about fifteen hundred people in attendance. During a potlatch there were always many ceremonial dances, much feasting, and at the end many costly presents were given away.

At first the guests had only breakfast in the morning. The

rest of the day was spent in dancing. All four parties for the four different dances met in the Chief's house because he had invited them. This was the custom the first day. The next day was a feast day. The Kakes were the leading party on this important day. Since they were outside guests they received many honors. When the messengers went from house to house inviting the guests they announced first the name of the head man of the house. Then the messengers called in order of rank the names of all men of honor and stated "You are all invited to the feast!" When the invited guest came to the house where the feast was to be held his name was announced in a loud voice as he came through the doorway. This was done to show him honor and respect. Following this announcement the Chief would reply "Let him be seated in his honorable place!" The places of honor were in the middle of the room or on the sides. To be seated in a corner was taken for an insult. When a guest arrived and was not announced he was expected to take his seat quietly in a corner, which he did unless he had lost his self respect. Then a big question arose in his mind: "Why am I seated in a corner?" Soon he discovered for himself that he had done some wrong. Then he knew that he had to bear his shame quietly. And so he learned his lesson while sitting in the corner. If the host saw a change in him he was placed again in his honorable seat.

The next night the four parties of dancers came in groups to the feast. As each group arrived its members sang and danced before sitting down. When all four parties had come in and all had sung and danced the Chief gave a talk or address. In his response the guest chief announced his new name, Koo-gllh. This was always the case, and this way the Chief gained honor and respect from his guests. So Alm-ka-dugh-steen became Koo-gllh. This made everyone happy and one party gave another dance. Then each of the other parties gave a dance, too. Everything was equal between these groups of dancers. This was a sign of respect and honor to each other. If one group tried to add one more dance than another that meant they were trying to make trouble. Then the chief and his helpers tried to keep things peaceable. They placed emblems on display or on their heads. When the guests saw these they became peaceable and respected the emblem. After this the

Chief appointed one of his helpers to make a peaceful speech telling all to show every respect during the feast.

The next day everything was quiet. The guests were resting. Some visited with friends and others walked about talking sociably among themselves. On this day the Chief hung out a wooden box drum and had some one beat on it so that its sound was heard all the rest of the day. This had a meaning that debts were to be paid. Sometimes back maybe a year ago, a sister had given her brother's wife a very valuable gift. Now the brother was to pay his brother-in-law back adding a large percent. When a debt was paid everyone asked each other how much had been given. Pride came in here. When a man paid big everyone said "Cla-coh-gee!", which was an expression of surprise. It was quite a sight to see the display of goods turned over all day in discharge of debts.

The next day was Wa-dee-hon which means "Stand Up". The chief and his helpers, according to custom, stood on their feet all day. Only women danced on this day. They filled in three squares in the large room and men filled in the fourth to manage the singing. The first four songs were ceremonial songs of the Chief's tribe. After these four songs a man appointed by the Chief called out names one by one. When he called one and said "Kosh-wa-ah!", that is, "Have courage, do the very best you are able!", this man would tell of his family and his descendants. Then according to his birth, he chose a song. Following his announcement he started to sing his song. The men, under a director, helped him while the women danced. In like manner everyone belonging to the Chief's tribe was called on for a song. This took from early morning until the next morning. For a whole day and all night the guests had to bear patiently the things as they came. This meant that they were well pleased with the affair. The next day was another resting day.

On the following morning the messenger went from house to house inviting all to come to the feast, from each house in a body. Then as the groups arrived they each went in and gave a dance. As one group finished another came in. Everyone came in his best dress, as there was an occasion to show the best dancing. It was really a big contest. The house had one big open place in the center. Spectators even

crowded on the roof. Everybody wanted to see the sight. The dancers watched very carefully on the opposite side to see if any mistake was made in movement. If there was one mistake the people made remarks and that meant that the side making the mistake lost praise. All was for the glorification of the dancers. The spectators spoke of the winner and this was his reward. A star dancer gained a famous name. Even when the feasting was all over he was talked about. The story would be told for years to come if he was of noble family.

However, the ceremonial dances were the most important. They had to be performed with careful attention in order to have everything correct. If they made mistakes they would have bad luck in the near future. And if you did not live a pure life your years would be shortened. Many more things were connected with this according to tradition. The ceremony was the most important part of this affair. It alone took eight days. Our Chief and his helpers, the hosts, attended strictly and honestly. The Chief gave this his entire attention during that time. He was also fasting so that everything would go well. All of the houses had names. The name of our Chief's house was Kar-gash-ka-hitthe, meaning a house on a platform. This was the first Indian house built on posts and it took two years to build it. Other Indian houses were built on the ground. The inside of these houses was dug out into the ground. Some were dug four feet deep and had one floor. Others were dug eight feet deep and had two floors. For protection all four sides were timbered-up with timber six to eight inches thick, to about four feet above the ground. Inside these houses people could sit peacefully around the fire.

On the eighth and last day of the ceremonies the Chief ordered out a copper plate, three or four feet high on end and hammered out smooth. This was obtained from the Copper River Indians, in trade, and was valued at one slave. Then the Chief called for his descendants, including all of his immediate family and all near relatives to come forward to the front of the large room. The guests were all to witness what was to take place at this important time. It was an event to which all had been looking forward during the entire feast. First the Chief gave a talk in behalf of his grandsons and

granddaughters who were to be advanced in tribal honor. They were also to receive new names. This was the sign used to show it. Two men took up the copper plate and started rubbing it on the foreheads of those receiving the honor. Altogether there were twenty of them standing in a row. All rubbed their foreheads on the copper plate. Then the chief ordered it dropped into the deep sea. so, following his order, the two men took it out in the canoe and dropped it in the channel. This was a sign of great respect and high honor. Some people are yet living who witnessed this memorable event. Mrs. Harriet Anderson is one. In fact the potlatch really was called to honor her father, Chief Koo-gllh, a famous chief who had died about three years before. As I have related my uncle now became the new chief. Mrs. Morris White, the Chief's daughter, and myself, are the others.

The next day, which was the day before the end, all movements were performed quietly and reverently. The guests invited Chief Koo-gllh and all his tribe to a feast. This was a welcome rest and we were all well entertained. The food was the best obtainable and not the least part of the entertainment were the stories told by the Kakes. They were carefully selected and excellently related with many gestures and much acting.

The last day was a farewell party, or Cla-to-os-dake, which meant to us that every dance expressed goodbye. Before each dance one of the visitors made a speech expressing appreciation and thanks. This was in the first round of dances among the four parties, and each party distributed gifts of goods and money to Chief Koo-gllh and to his tribe. After this was finished the dance began again and lasted until late that night. There were no harsh words or ill feelings. The guests felt that they had received good treatment during the entire visit.

The last dance of the potlatch was the Yake dance or Spirit dance, and was used to welcome and entertain strangers and as a farewell portion. This was the final ceremony. So the dances ended but rich memories always remained.

After the potlatch the Kakes stayed on in Sitka for nearly two weeks. Since they were in no hurry to leave this was taken as an additional sign that they were well satisfied. If they had been displeased, their departure would have taken

place the next day after the final ceremonies. During this time the guests gave us the Hydah dance as a parting tribute. In this dance the dancers used headgear well filled with white feathers. When they shook their heads the air was filled with the white feathers so that it looked like a snow storm. Those who shook out the most feathers were considered the best dancers. The feathers were harmless and if any were thrown so they landed on the Chief he received this with a grateful heart. There were a few other small entertainments and similar dances while the guests were waiting and taking their time getting ready to make the trip back home.

Not for Resale

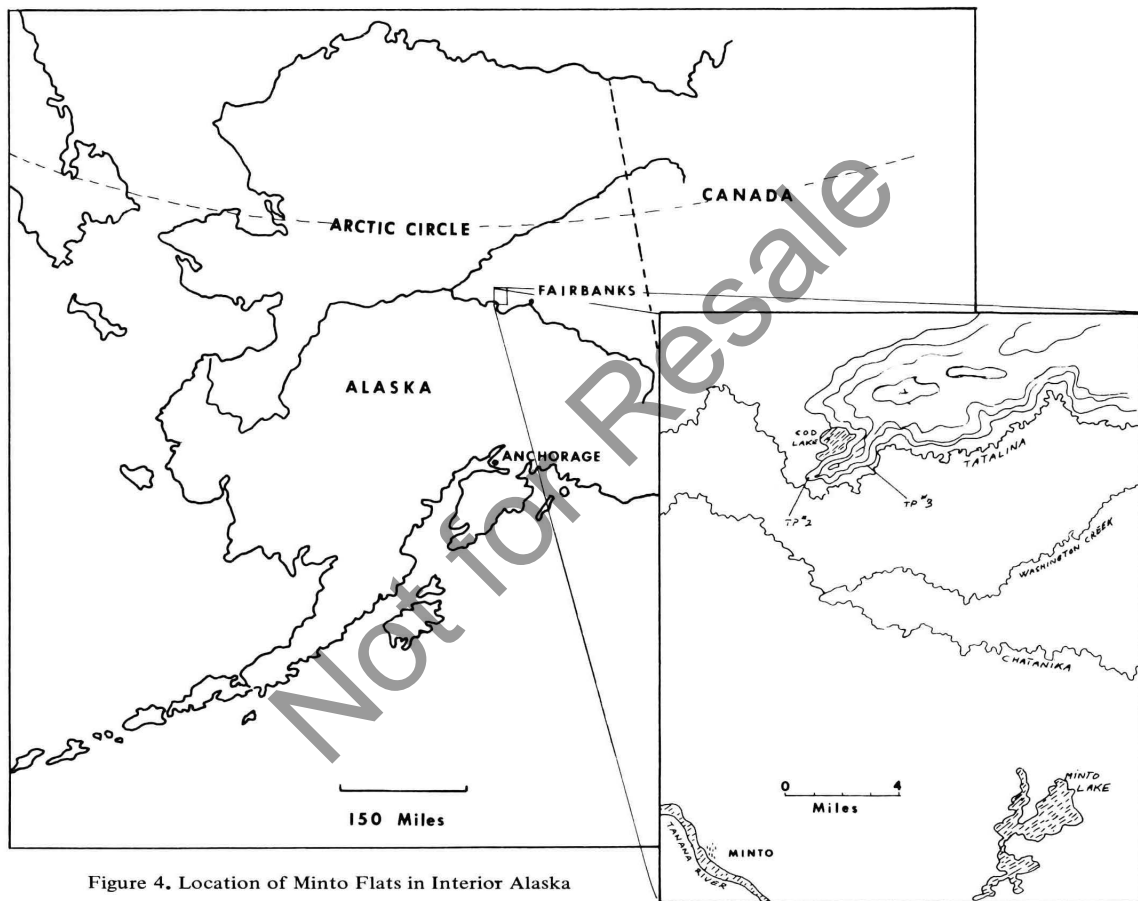


Figure 4. Location of Minto Flats in Interior Alaska

ARCHAEOLOGICAL SURVEY OF C. O. D. LAKE AREA, MINTO FLATS

By

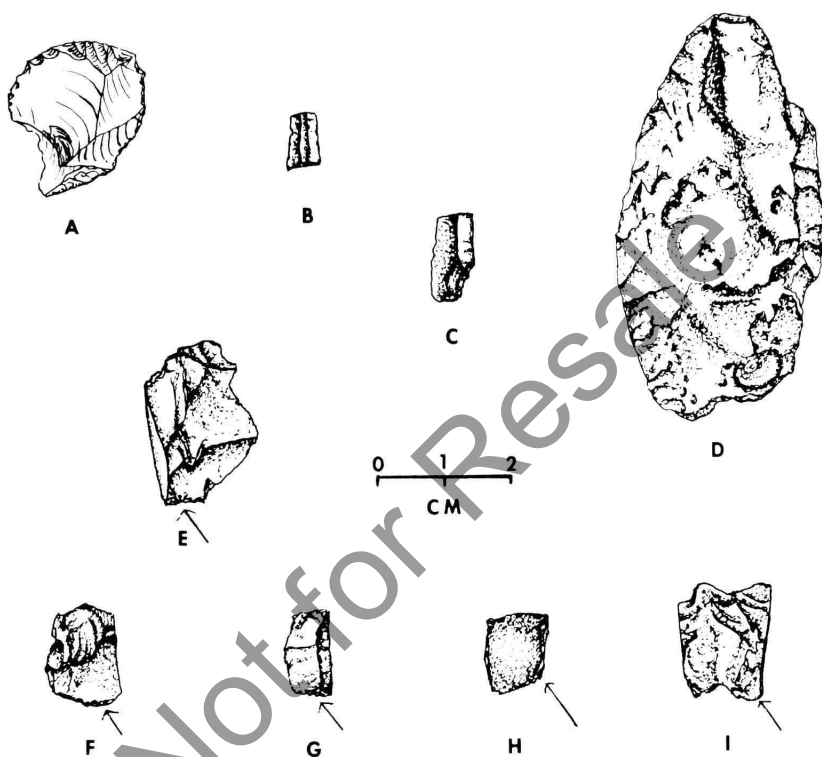
Peter Schledermann and Wallace Olson

During the month of August 1968, an archaeological survey was conducted by the authors in the C.O.D. Lake area. The location was chosen for its variable ecological setting and pertinent information obtained during an ethnographic study of the village of Minto, Alaska (Olson:1968). Upon inquiry concerning old hunting sites, several of the elderly residents referred to caves and campsites near "Lookout".

The area referred to as the "C.O.D. Complex" includes the southwest trending ridges, lakes, streams and rivers extending halfway out into the northern section of the Minto Flats (Figure 1). Much of the bedrock formation in this area consists of limestone belonging to the Tolovana Limestone Formation located on the southeast facing slopes. At varying distances from the base of the hills, on the southern and eastern side, the Tatalina River meanders eastward; north of the C.O.D. Complex, the Tolovana River presents a similarly swampy landscape underlain by permafrost. Entrenched between the hills at the western end of the "complex" lies the rather large and shallow C.O.D. Lake. The hills increase in elevation from west to east, culminating in a large, dominant ridge with an altitude of 1394 feet. This hill is known as Big C.O.D.

Ecological and Geographical Background

The Minto Flats, surrounding the C.O.D. Hill on three sides, are characterized by innumerable lakes and streams together with rivers in all stages of geomorphic cycle. The summer temperatures range as high as 80° -90° F, with a winter minimum as low as -70° F. The yearly average temperature is about 25° F, and cool weather prevails



- A. Obsidian scraper
- B. Blade fragment, chert
- C. Blade fragment, retouched, chert
- D. Basalt scraper
- E. Burin, chalcedony
- F. Flake, chert
- G. Flake, chert
- H. Flake, chert
- I. Flake, chert

Figure 5. Objects found in the test pits. Illustrations by Mary Pat Wyatt.

through most of the year. The area lies within the Hudsonian ecological zone and has an average annual precipitation of ten to fifteen inches per year. Vegetation in the flats consists of swampland, grasses, sedges and willow brush, separated by elevated areas, some of which are old sand dunes. On the higher ground are stands of paper birch, quaking aspen, alder and some white and black spruce. The C.O.D. Hills are covered by several large stands of spruce and birch, alternating with areas of recent burns now covered by densely situated stands of birch and aspen. The range of species and their abundance in a region is determined by a variety of factors such as climate, flora, physiography, isolation and many other interrelated factors, not the least of which is man himself. There is no stable condition in time but rather a constantly changing combination of animals, shifting from an abundance of one species to another. Only thirty years ago there were caribou feeding in these hills, today there are none. The flats now support a large moose population although the older villagers maintain that these animals only arrived in the valley recently.

In order to survive on a hunting and gathering level man had to be highly adaptable to the varying abundance or scarcity of his prey and highly mobile in order to follow the changing faunal conditions. He would also, for very practical reasons, select an area most favorable in its variable ecology and providing a variety of potential food resources. The C.O.D. Complex offers such variety. The streams and lakes support a variety of fish such as salmon, sheefish, pike, grayling and Arctic char. Migratory waterfowl are important on a seasonal basis, together with the year-round residents such as ptarmigan, spruce hens and willow grouse. There is no lack of bear nearby, possibly because of the great number of caves and both the black and grizzly species are present. In addition there are wolves, wolverines, land otters, lynx, marten, mink, muskrats, weasels and beavers.

Mammalian Paleoecology Of Interior Alaska

Considering the recent finds at Healy Lake, Alaska, dated at $11,090 \pm 170$ B.P. (Cook:1969) it is quite likely that man has lived in the interior of Alaska for fifteen thousand years, if not longer. The climatic conditions, along with the faunal

TEST PIT NUMBER 2	
SOIL	DESCRIPTION
2"	One piece of bone - 25 wasteflakes
4"	8 wasteflakes (one obsidian) - one burin
6"	143 wasteflakes (one reddish brown obsid. flake)
8"	
10"	
GREYISH-BROWN 2.5 Y 5/4 (light olive brown)	

TEST PIT NUMBER 3	
SOIL	DESCRIPTION
2"	Small pieces of bone, one obsidian flake - charcoal
4"	Limestone Pebble - Bone - 4 chert flakes - one obsidian scraper - charcoal
6"	Bone - 13 chert flakes - 6 obsidian flakes - charcoal
8"	Bone - 6 chert flakes - one blade fragment 3 obsidian flakes, one basalt scraper, charcoal
10"	Bone - 5 chert flakes - Limestone pebble - charcoal
12"	Bone - 10 chert flakes - one blade fragment 3 basalt flakes - charcoal
14"	
16"	
18"	
20"	
22"	
GREYISH-BROWN 10 YR 5/4 (yellowish brown)	
LIMESTONE RUBBLE	

Table 3 — a, b

variations over this period, would have an important bearing on the life patterns and tool assemblages to be found in the area. Guthrie has made some noteworthy observations regarding four fossil assemblages of large mammals from Pleistocene sediments near Fairbanks (Guthrie 1968:346-363). Bison, horse and mammoth were the most common animals in these four faunas and it was noted that they were all grazers pointing to the probability of a grassland environment in the interior during the Wisconsin glaciation. Among other fossil remains were caribou, musk ox, bears, lions and wolf. Dependence on caribou could therefore be a very old trait in the New World as it was in the Old World. It should be mentioned that although moose was one of the least common ungulates in the assemblage, they were present, so that the characterization of them as new-comers by the present day natives of Minto is rather relative. The onset of the second major advance of the Wisconsin glacial period brought with it a lowering of temperatures, although the interior remained practically ice-free because of insufficient precipitation. This lowering of summer temperatures is estimated to have depressed the tree line as much as 400 meters (Repenning; 1964). Such a lowering of the tree line in the Yukon-Tanana Uplands would practically eliminate the forested areas in this region.

Geology, Past and Present

The Yukon-Tanana upland region is composed of many geological formations. There has been extensive metamorphism and igneous activity together with folding and faulting, and in a few instances, there are signs of glaciation (Prindle 1913:22). Crystalline schists, mostly of sedimentary origin, make up the largest portion of the region and date back to pre-Ordovician times. Igneous rocks, both intrusive and extrusive, are widespread and granitic rocks are found, both the metamorphosed and unmetamorphosed. The entire region presents a geologic time span extending from the Precambrian to the Quaternary.

At the present time Dr. Florence Weber, aided by field notes by Bond Taylor, is preparing a geologic map of the area. Dr. Weber assisted the authors in preparing a brief

summary of the formations. One of the most interesting features of the region is the Tolovana Limestone Formation. This is a limestone band approximately 90 miles long and from 2 to 5 miles wide, running through the hills in a southwest to northeast direction. The formation dates back to the middle Devonian (or Silurian) period. It is a part of a much larger belt of "Silurian" carbonate rock formations extending from Cape Krusenstern eastward along the southern edge of the Brooks Range and into northwestern Canada (Church 1961:56). In the limestone outcroppings along the southern slope of the western end of C.O.D. hill, the authors found many caves of varying sizes. It was in these caves, and on the neighboring hills, that the Minto people hunted bear. Because most of the caves were occupied by bears at the time, the caves themselves were not investigated.

The major geological formations in the C.O.D. hills are composed of quartzite, igneous intrusive gabbro, greenschist (mainly phyllite) cut by a fault line and continuing with volcanics and finally the Tolovana Limestone. Dr. Weber does not feel that there have been any major geologic changes in the area in the past fifteen thousand years other than the stream channels and the addition of alluvial deposits. It appears that at one time the Tanana River extended a slough from the Nenana Hill northward, past the westernmost tip of C.O.D., thence turning west and joining the Tolovana River flowing southward, and emptying into the main channel of the Tanana River.

Associated Information

The fieldwork was limited to exploratory excavations and a general survey of the region. On several occasions the authors noticed thin spruce poles propped against a larger spruce, creating a conical framework. The Athabascans of the interior at the present time continue to use a similar structure for an overnight campsite. There were also stretches of fence-like structures with thin spruce poles placed (or fallen) in a position reminding one of caribou fences. Tradition in Minto holds that this region has been, and continues to be, a principal hunting area. The southern ridge of the western end of the hill is known as "Lookout" and contemporary Minto

hunters climb the hill to survey the flats for game animals. All of these factors point to the site as a natural observation point and has been used for this purpose for many years.

There have been several forest fires in the area, but some large spruce are still standing. The Bureau of Land Management has cut some survey lines across the hill and one of the largest trees they had felled was approximately 165 years old when cut.

Results of The Archaeological Survey

The authors were mainly concerned with selecting a good vantage point for the test pits, since there was little doubt as to the significance of these hills to a hunter watching for game. At the same time it was important to find an area which was level enough to have retained a fair depth of soil in order to gain some stratigraphic information. The first test pit was mainly designed to establish the depth of soil along the ridges, which proved to have a fairly distinct separation between the upper reddish-brown and the lower greyish-brown soil. The second test pit was dug at the westernmost edge of the hills, on a point rising only about twenty-five feet above the surrounding flats. The table (3 a,b) shows the test pits in relation to soil depth and stratigraphy together with a description of the material found within each two inch level. The material can be located at the University Museum, University of Alaska, under accession number 68-64 (1 to 350). The soil color indicated is based on the Munsell soil color charts. It should be noted that the highest concentration is located between the four and six inch level in both test pits. Test pit number two did not yield any charcoal and only one piece of bone, whereas test pit number three yielded pieces of bone and charcoal throughout.

Trowelling down in two inch levels in a two-by-two foot test pit, we soon encountered a profusion of small chert wasteflakes. In the two-to-four inch level we located a burin of the Campus site type. There were no other distinctive implements among the 176 wasteflakes, although there may be one exception. The soil depth varied from ten to twelve inches and the upper reddish-brown horizon showed fairly sharp transition to greyish-brown at about a depth of eight

inches. The third area we selected for testing was located on a fairly level "bench" near the top of "Lookout". A two by two foot test pit yielded the same profusion of small wasteflakes together with small broken bones and limestone pebbles. A small obsidian scraper was located in the two to four inch level and a cruder basalt scraper plus a broken blade fragment showing very fine retouch were found in the six to eight inch level. Another blade fragment was located in the ten to twelve inch level. The burin (E in Figure 5) was found to have definite signs of wear as indicated by the arrow, however, while studying the wasteflakes under a microscope (figure 5, F,G,H,I) similar wear was noticed on four other pieces. These four fragments have only one other thing in common, i.e., a burin-like facet, yet they are not true burins.

Pieces of charcoal were located throughout the test pit in no specific concentration. The reddish-brown soil was very hard which, together with the charcoal, may be fair evidence of numerous campfires. At a slightly higher elevation a few hundred yards away from the test pit we located a large number of wasteflakes directly on the exposed bedrock surface.

The limited time in the field produced enough material to establish the fact that a people of the Northwest Microblade Tradition inhabited the area from time to time. The survey did not produce a real stratigraphic site although we feel that such a site can be located in the area. The three test pits were located in places similar in situation to the Campus site and the material found, judged by the burin typology, indicates the possibility of a similar time period. The Campus site has yielded an obsidian date of 8400 BP. (Hosley, 1968) and until recently we would have assigned the finds from the C.O.D. Hills to a similar date. The correlation of this material with that from the Campus site is probably valid, however, there is a question concerning the accuracy of the obsidian dating of the Campus site. A stratigraphic cultural sequence at Healy Lake has been established and the radiocarbon dates there strongly suggest an age of the Campus type material in the early part of the Christian era., (Cook, 1968). Dr. Hadleigh West has shown a close correlation between some of the characteristic artifacts from the Campus site and his Denali

Complex, specifically the Donnelly Ridge site. He has two radiocarbon dates from the latter site, both ranging between A.D. 100 and A.D. 200, (West, 1967: 372). Dr. West felt that the dates refer to a late tundra fire and therefore would not be of any value in relation to the artifact dating. It is now, however, difficult to ignore the possibility that these dates, including those from Healy Lake, may show that the Northwest Microblade Tradition has persisted far longer in the interior than has so far been assumed. Test pit number three on "Lookout" produced enough evidence of fires to ensure an adequate sample of charcoal for dating and hopefully it will be possible to go back in the near future and obtain enough charcoal for dating and possibly throw some more light on the question of the range of the Northwest Microblade Tradition in the interior.

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Plate 3a Paintings in blazed stump, indoors.



Plate 3b Stump from which tree was cut.

BRIEF NOTES

TREE PAINTINGS NEAR TOK, ALASKA

Mr. Sterling True, while lumbering at mile 93.2 Tok cut-off on the Glenn Highway, noticed a tree which had been blazed, or the bark peeled off, and the open area painted with pictographic type figures. His partner, Mr. Virgil McClure reported the find to the Anthropology Department and the following day the authors traveled to the area to photograph the find.

McKenna (1959:114) reported the following concerning such paintings:

"The Upper Tanana make little or no use of picture writing. An early white prospector in the Chisana Valley told me that he had seen a few crude figures of animals drawn on blazed trees but I saw no such figures myself. Today [1929, Ed.] the Indians occasionally amuse themselves by drawing a few crude figures of animals about their camps but they have no particular meaning. A young hunter after a kill will occasionally draw a crude figure of the animal on an available tree as a record of his exploit, but this is the only approach to picture writing."

Since McKenna has been found by the authors to be very precise in his reporting, it would appear that the paintings date to a time prior to his study and that by the time he arrived, the art had been discontinued.

Description:

The tree, a black spruce measuring 19" x 16" in its oval-shaped diameter, had been cut approximately 48" above the ground level. When the painting was discovered on the stump, Mr. True cut the remaining stump, containing the painting, and brought it to his lodge. The stump was cut at ground level. The bottom of the blaze mark is 14" above ground level. The actual remaining blaze mark (Figure 1) measures 22 $\frac{3}{4}$ " in height. The top of the open area is 7" wide, narrowing to 6 $\frac{1}{2}$ " at the level of the figures, and only 5" at the bottom line. Three tree-borings were taken, and

before leaving, the authors secured an entire cross-section of the tree cut approximately 12" above the top of the blaze. Borings #1 and #3, (Fig. 1) show 122 annual growth rings before reaching a darkened ring which seems to be a continuation of the blaze. Boring # 2 was taken 4" below the very bottom of the blaze. The area above it had filled in with pitch and some bark; this debris was cut away before the boring was taken. It was agreed among those present at the drilling, that this boring was begun on the same surface, or on the same growth ring, as the blaze and paintings themselves. The borings were compared and boring #2 corresponds to the rings inside, or older than the darkened ring which seems to correspond to the blazed level. The conclusion from the borings is that the blaze was made 122 years ago and that the effect of this was to leave a damaged or darkened ring extending into the growth-ring pattern above the blaze. Secondly, no adze marks or other indications appear to indicate that the blaze was made by cutting into the solid tree. It appears that the bark was simply stripped away at the time. From this it is certain that the paintings cannot be older than 122 years.

In thawing the tree, the pitch came out in some parts of the tree and also drained down from the top. The pitch has obscured part of the paintings, but they appear to have been produced with carbon black using animal fat as a vehicle for the paint. The marks themselves have been made with a brush-like object and are not incised into the tree; they are simply painted on the surface.

The paintings seem to refer to the site itself. The tree was located in a narrow valley along the Tok river. The top triangular figures seem to represent the Mentasta Mountains to the west and the bottom triangular figures seem to refer to the Nutzotin Mountains to the east. Since the painting was found on the northeast corner of the tree, it would appear that the triangles indicate the site as viewed by the artist. The bottom-most line, apparently beyond the mountains, is a puzzle. If it were to indicate the nearby Tok River, it should be between the mountains; there is no clue at the present time as to its meaning. Evidently the major figures are human. There are three styles found in the painting. The outer-most figures are simple stick figures; while the two inner sketches

are variations of the human figure. The figure second from the right has hook-shaped feet, the second from the left has a large empty circle in the pelvic region. It is not known if these variations would indicate, sex, age, action or any other important distinction. Over the right hand figure is a long vertical line, apparently connected to the head. This may possibly denote rank, age or some accomplishment, or it may be considered as descending from the mountains. To the right of the human figures is a hook-shaped line. This may or may not be related to the human figures. Both the line above the human figure and the mark to the right appear to be intentionally included in the work.

The animal figure below the human is somewhat unusual. The head appears quite long, and is made with heavy lines. The two curving lines arising parallel from the neck region, followed on the left by three small vertical lines are small and precise indicating that the broad lines for the head are not due to an inability to make finer lines. As will be seen below, the animal figure and the human figures, are presently open to many interpretations.

Site Locations and Age

As McKennan points out (1959:3) concerning the region:

"No fur traders - Russian, British or American - had penetrated the region during the nineteenth century, and not until the short-lived Chisana stampede of 1913 had miners in any number found their way into the mountain fastness of the Chisana and Nabesna basins. As a result much of the original Indian culture was still functioning in 1929, and it was my good fortune to deal with informants who were living here when the first white men entered the Upper Tanana area."

When the original highway was cut through the valley it followed the eastern edge of the valley; the tree was found west of the river. It has only been in the past three or four years that the area around the site was accessible by road. The tree itself was found approximately 200 yards east of the new road, on an old trail leading towards the river. This particular stand of spruce has not been burned over for many years. A full count of the growth rings gives the tree a total age of 263 years; many neighboring trees were of equal diameter. From these facts, it would appear that the stand of

spruce in which the tree was found, had not been traveled nor used by white men prior to the construction of the new highway route in recent years. Since it is located at the base of the Mentasta mountains, on a long level stretch leading down to the river and fresh water, it would make an ideal campsite for caribou or moose hunters. Mr. True pointed out that in the summer months, many old trails can be discerned leading into the area of the tree. Even with snow on the ground, the site appeared to be a fine location for a camp. In a few places within a hundred yards from the tree were small spruce trees propped up against a larger spruce forming a cone-shaped framework. Such a frame was formerly used, and still is used today by some of the neighboring Tetlin residents, as an over-night shelter. Over the framework skins were thrown, and more recently canvas, and the occupants slept in the shelter of the tree. Such quickly-made shelters are found throughout the hills of interior Alaska. These factors seem to indicate that the site has been used for a long period of time as a temporary hunting camp for the Indians.

The blaze mark itself gives some indications as to its age. The paintings could have been made at the time the tree was blazed 122 years ago, or any time since then. However, the left-hand border of the blaze gives some indication that the paintings were made a long time ago. The left half of the small human figure on the left, and the left end of the animal figure, have been covered over not only with pitch and bark, but the new growth of the tree seems to have spread over and covered them partially. It was impossible to determine at the time whether the paintings continued under the new growth. The authors concluded that the new growth would be at least 15 to 20 years old and that the paintings would have to have been made prior to that time to account for the healing process.

It is the author's conclusion then, that the paintings were made at least 20 years ago, and possibly as early as the blaze itself more than 100 years ago.

Interpretation

The time for study was limited and so the authors proceeded fifteen miles down the road to the south to the present village of Mentasta. Here they spoke with Mr. and Mrs.

Fred John. Several people had gathered in their cabin for a funeral and the paintings were shown to all present including several people about sixty or more years old. Mr. John is approximately 50 years old. No one present could identify the paintings. They said that they had heard of such paintings, but had never seen such things themselves. The people said that they had heard that in the old days such paintings were left on a tree if someone had died, or if people were traveling, they would leave a painting as a message for others. The authors feel certain that the people were honest and open in their comments; the older people showed a genuine interest, but appeared unable to interpret the paintings.

The writers then drove to the home of Mr. Charlie David, 15 miles east of Tok. Mr. David is the former chief of Tetlin, and has lived around Tetlin, Northway, Mentasta and Tok all of his life. He is the minister for the Assembly of God Church at Northway. He conferred with his wife, Helen, and offered several suggestions. First, he had heard of such paintings, but had never seen them. He said that such paintings might have been made as a message to other band members to let them know that the people were moving somewhere. To this day, the older people of Tetlin will place a stick along the trail indicating to others the direction in which they are traveling. Mr. David thinks that the paintings might have been intended to be such a message. Mrs. David said that she thought that the animal figure might indicate a dog packing a load. The two curved vertical lines arising from the neck region may symbolize a pack. Secondly, it was asked if the sign might have been made by a medicine man. Mr. David was sure that a medicine man would not leave his "mark" on a tree. Both of the informants seemed sure that it was not done as a shamanistic practice by the medicine man.

The next informant was Mr. David Paul of Tanacross. He is an elderly native man, a deacon in the Episcopal Church, and is apparently well-informed on much of the old culture. He concurred that it might be a painting indicating that people were moving somewhere else. He mentioned that in former times a painting of a human figure was made on a tree to indicate that someone had died. He said that the work could

be interpreted either way. He had never seen such paintings before, but had heard old stories about them. He felt that the animal figure might be that of a caribou or moose, and that if it were of a dog packing, that it should be rounded on the back to show the packs.

Upon returning to Fairbanks, residents of the Lower Tanana at Minto, were contacted and they had never seen such paintings. They mentioned that men would blaze a tree to indicate a trail for those following them, but they had not heard of anyone painting a message on a tree. One informant, about sixty-five years old, said that he had heard of a time when the "wild people" or "bush men" had stolen a baby from a camp. The entire band went looking for the child. When the baby was found, it had been abandoned by the "bush people" and there were marks on the tree above the child. It was his conclusion that these paintings could have been made by the "bush men".

Two potentially valuable informants could not be contacted. Mr. Walter Northway and Mr. Frank Sam are two of the oldest and most respected men in the Tok area. Photos of the tree will be sent to them and they will be contacted in the near future.

Conclusion

It is yet too early for any definite conclusions or interpretations to be made. Yet it would seem that this is a valuable discovery. The painting does not appear to be a recent work and seems even to pre-date the oldest informants available. It appears to be work of someone in the Upper Tanana region to indicate to other band members that someone (or a group) has died, or that they are moving somewhere. It may even indicate that they are hunting, or were successful in a hunt at this point. All of these may be combined in the painting. Present plans call for Mr. Vitt to make another extended visit to the area to look for other paintings and to interview anyone who might have information that could lead to a full interpretation of the work.

University of Alaska

Wallace Olson
Ramon Vitt

¹The following letter was received by Mr. Olson in response to his sending a copy of this report to Professor McKennan.

DARTMOUTH COLLEGE Hanover New Hampshire 03755
Department of Anthropology

Mr. Wallace M. Olson,
Department of Anthropology,
College of Behavioral Sciences
and Education,
University of Alaska,
College, Alaska 99735

April 30, 1969

Dear Wally:

Thank you for the most interesting information regarding the pictograph found on an old blaze in the Tok area. It seems to me your draft description covers the matter very well. Personally I see no difficulty in including this drawing in the general categorization I make on page 114 of my monograph and which you have quoted. It seems to me that your drawing might very well be of the kind described to me by the Chisana prospector, and I dare say that eventually somewhat similar drawings may show up here and there in the Upper Tanana country. As I recall the literature, I believe Simpson mentions somewhat similar drawings for the Chipewyan, as does Morice for the Carrier. Schmitter also mentions some kind of crude signs for the Han, although I don't recall now just what form these took. Neither do I remember just how the human figure was handled in those rock drawings at the mouth of Moose Creek, but inasmuch as some of these have been preserved in your own museum, you might find it interesting to check them.

Sincerely,

Robert A. McKennan
Professor of Anthropology

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LETTER TO THE EDITOR

ANTHROPOLOGICAL PAPERS OF THE UNIVERSITY OF ALASKA

After H. M. W. Edmonds' manuscript about the St. Michael Eskimos was published as Vol. 13, No. 2 of the Anthropological Papers of the University of Alaska, John Leighly, professor of geography, emeritus, of the University of California, Berkeley, sent me information that cleared up the considerable mystery of Edmonds' identity. In my role of archival detective and of bloodhound on a cold trail, I began to understand why such illustrious sleuths as Dick Tracy sometimes took the greater part of a lifetime to solve a case.

I am indebted to Professor Leighly for the data about Dr. Edmonds contained in his letters of November 6 and 22, 1967, extracts of which are reprinted here verbatim. Information within square brackets is from the November 22 letter; the rest is from that of November 6.

December 28, 1968

Dorothy Jean Ray

Dear Mrs. Ray:

I am prompted to write this letter by reading "The Eskimo of St. Michael and Vicinity as Related by H.M.W. Edmonds," 1966, which you edited. It appears from your prefatory material in this publication that you had little if any information about Dr. Harry Marcus Weston Edmonds (1862-1945) beyond what you found in the reports in this publication and in your and Mr. Blaker's *Eskimo Masks*; it seemed to me that you might be interested in learning more about him. I knew him because he was the father of my first wife, Katherine Edmonds, 1904-1956.

You lost sight of Dr. Edmonds in 1909, when he left the Coast and Geodetic Survey. At that time he went to the newly established Department of Terrestrial Magnetism of the Carnegie Institution of Washington, with which organization he remained until his retirement in 1930. With the Department of Terrestrial Magnetism he carried out a great deal of work on the non-magnetic vessel *Carnegie*, being in command

of it on one of its long cruises in 1917-1918. His service with the Department involved only one long land expedition, a magnetic exploration of the country west of James Bay and Hudson Bay in 1913. This expedition must have reminded him of his early work in Alaska: traveling by canoe in wild country. He established a magnetic observatory for the Department in Peru in 1919, and spent time in magnetic work in Samoa and Australia as well. You will find a memorial article about him in *Terrestrial Magnetism and Atmospheric Electricity*, Vol. 50, 1945, pp. 145-46... He was in the Washington office of the Department of Terrestrial Magnetism from 1921 to his retirement in 1930.

What Dr. Edmonds wrote about the Eskimo of St. Michael sounds like him: sober and objective, sometimes dull. He was a rather large man with a sound physique, which he kept in good form in his more sedentary days when I knew him by active walking and, in Washington, by canoeing on the Potomac, where he kept his own canoe. So far as I know he never owned an automobile. In his last years here in Berkeley he walked about town and in the hills every day.

He was not a gregarious or talkative man, but reserved, and had only a small circle of friends. In most circumstances he seemed not entirely at ease, but made an effort to be agreeable. My relations with him were fairly distant, though in his later years Katherine invited him to our house often. Katherine and he then played cribbage, which both of them liked to play; I never learned the game, and so did not participate. I think that on these evenings he was most at ease on the occasions that I observed him. I have often heard him speak admiringly of the Eskimo, with whom he first had contact when he was a member of the party surveying the Alaska-Canada boundary. But by the time I knew him he had been in many other out-of-the-way places, and had things to say about other exotic peoples, too. He said that in all his travels he was most interested in the people he saw; this is an interesting comment, in view of his lack of gregariousness among his own people.

Edmonds grew up in San Francisco in comfortable circumstances. His parents had come overland from Maine, and he was born in Oshkosh, Wisconsin, in the course of their

westward migration. He received his A.B. from the University of California, and then went to Germany, ostensibly to study medicine. But in some way he was deflected from this purpose, and worked at two universities mostly in classical philology and archeology. One summer he spent in archeological field study in Italy. After his return to the United States he took his M.D. at Hahnemann Medical College in Chicago. He tried in a half-hearted way to practice medicine, but evidently found it distasteful. It was at this time that he applied for work in the Coast and Geodetic Survey again, as you recount on P. 4 of your edition of his report on the St. Michael Eskimo. [From letter of November 22, 1967: Now, on reading your letter of November 17, I am trying to think about what additional information I might give you. I have a rather full set of Dr. Edmonds's academic documents, which Katherine salvaged from what was left of his effects in Berkeley after our return after the war in 1946. These include:

Diploma (classical course) from San Francisco Boys' High School, 1878

Diploma (artium liberalium baccalaureus), University of California, dated May 31, 1882

Commission as second lieutenant "in the battalion of university cadets" issued by the Governor of California, dated April 14, 1882

Diploma Medicinæ Doctoris, Hahnemannianum Medicorum Collegium, Chicago, dated April 17, 1892

License to practice medicine and surgery in California, issued by the California State Homoeopathic Medical Society, dated December 21, 1892

There were also two matriculation documents from German universities, Bonn and Heidelberg, I think, but I haven't been able to find them.

From your chronology Edmonds could have been at Hahnemann Medical College immediately before receiving his degree only during the academic year 1891-1892. I don't suppose one could get a medical degree in one year; perhaps he had been in attendance before he went to Alaska in 1889. Not having the documents from the German universities, I don't know the dates of his attendance at them; I think that

attendance must have been immediately after his graduation from the University of California in 1882. No one living would be able to give that information now . . .] He had been married in 1889 to Mary Bigelow, a member of another New England family resident in San Francisco. The Edmondses had three children, Marc Weston, born about 1894, Dorothy, born about 1896, and much later, Katherine. Marc had a career in the United States Forest Service, and died a few years ago shortly after his retirement. Dorothy (Mrs. Francis Anderson) is still living, at Lower Lake, California. Marc had two daughters and Dorothy one; Katherine and I had no children. Marc's widow is still living in Berkeley.

While students in the University of California both Harry Edmonds and his brother Frank worked in vacations for the Coast and Geodetic Survey under George Davidson, so that it came easy for them to continue such work after they graduated. After a few years Frank quit because the work kept him away from his family, and went through Stanford Medical School. He spent the rest of his life in practice in Oakland.

Harry Edmonds left his family at about the time he went to the Department of Terrestrial Magnetism, and Mrs. Edmonds brought the children up here in California herself. Later, when Marc and Katherine were in the University, he helped them, and still later contributed to the support of Mrs. Edmonds. After his grandchildren were born he began to visit the family again, beginning with visits in summer and at Christmas. The visits gradually became longer, and ended by his moving back with Mrs. Edmonds in her house in Berkeley

It is odd that A.L. Kroeber was unable to find out anything about Dr. Edmonds in 1904, at which time Edmonds was in Sitka. But Edmonds was not a person to attract attention to himself; he would do anything, such as giving his material to the Museum, inconspicuously. Both Katherine and I used to meet Kroeber socially, so that if the proper connections had been made Kroeber could have got all the information he needed from Edmonds. I am sure that Katherine knew nothing about her father's having contributed material to the Museum. And of course Kroeber had no

means of connecting Katherine with an accession to the Museum made before she was born. If there was any material among Dr. Edmonds' papers at the time of his death that would supplement what you recovered from the Pratt papers, it was certainly lost. When Katherine and I returned to Berkeley after the war we salvaged a few books from his effects before the rest were disposed of. I don't remember any other material . . .

Very truly yours,

John Leighly
(Professor of Geography, emeritus)

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