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THE TUKTU COMPLEX OF ANAKTUVUK PASS

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Anaktuvuk Pass is a broad glacial valley which trends north and south through the central Brooks Range of Alaska at about 68° N., 151° W. The summit of the pass lies at an elevation of 2,100 feet, and is slightly less than 20 air miles north of the tree line. Our first knowledge of the prehistory of Anaktuvuk resulted from the finds of William N. Irving and Robert J. Hackman in 1950 and 1951 (Irving, 1951, 1953; Solecki, 1951; Solecki and Hackman, 1951), and since 1956 my associates and I have further surveyed and excavated in the region.

The Tuktu complex, discovered in 1959, is one of at least nine quite distinctive cultural components in the known Anaktuvuk archaeological sequence.[1] The complex consists of several hundred stone implements from a site on the nearly level top of a kame terrace four air miles north of the summit of the pass. That well drained, gravelly terrace extends for several miles along the eastern side of Anaktuvuk Pass, and its flat, dry surface has provided excellent camp sites, as well as an ideal route of travel, for generations of caribou hunters. The eastern wall of the pass rises about two miles east of the Tuktu site, and a few yards directly west of the site the kame terrace upon which it lies drops sharply 70 or 80 feet to the swampy floor of the pass valley, which contains a small north flowing stream and several glacial lakes. The nearest of those, Cache Lake, a kettle a little more than one-half mile in length, lies a few hundred yards south-southwest of the Tuktu site. And a bend of the Anaktuvuk River, a Colville tributary, lies one-half mile northeast.

Kames, kame terraces, eskers, and moraines in the region about Anaktuvuk Pass are characteristically covered with a thin layer of tundra sod, two to three inches thick, and most of the Tuktu site was protected by that veneer. The site measured approximately 345 feet north and south by 120 feet east and west. Within that area five concentrations of cultural remains occurred. The areas of artifact concentration ranged from 12 to 24 feet in greatest dimension, and were separated by distances of 6 to 156 feet. Besides the artifacts they contained, those areas within the larger boundaries of the site were quite clearly marked by the dirt of human occupation. Although the only organic materials recovered from the Tuktu site were three bone fragments and two radiocarbon samples, one of wood charcoal,

[1] The 1959 work was supported by the Arctic Institute of North America, and the Arctic Research Laboratory of the Office of Naval Research, Department of the Navy. My capable field associates were Messrs. Nicholas J. Gubser of Yale University, Thomas H. Follingstad of the University of New Mexico, and Simon and Raymond Paneak of Anaktuvuk Pass. The Tuktu collection has been deposited in the United States National Museum.

and the other of bits of charred bone, the earth which yielded the stone artifacts was stained a different color than the surrounding soil. Nearly all Tuktu implements occurred in a thin cultural layer which extended from the base of the sod to a depth of six inches below the present ground surface. A few artifacts were found on top of the ground among exposed gravels, and a few were recovered from slightly beyond the six inch level, but no cultural remains of any kind were encountered at depths greater than eight inches.

Features

Features in the Tuktu site consisted primarily of hearths. Each of three of the five areas of artifact concentration contained a single lens of charcoal, and in one other area three hearths were associated with the remains of a house. None of the fireplaces were very well defined, and most of them implied the building of small fires, on the old ground surface, which were not enclosed nor contained by hearth stones. A few water-worn cobbles, ranging in maximum dimension from about four to twelve inches, were associated with three of the six hearths, but the stones were not set in any particular pattern, and in two of the three instances it was not possible to determine whether the association of the cobbles with charcoal was an intentional or fortuitous one. In greatest horizontal dimension Tuktu fireplaces ranged from 14 to 36 inches, and in greatest vertical depth from two to four inches. All occurred beneath the sod, and the deepest hearth extended from four inches to eight inches below the present ground surface. Charcoal, within those lenses, consisted of very small flecks of wood or bone, and only two hearths contained enough for radiocarbon samples. The fireplaces did, however, yield a number of Tuktu stone artifacts. Exclusive of the three hearths associated with the house, which I shall presently describe, two chipped pebble sinkers were recovered from one fireplace; one projectile point, one large, fragmentary biface, seven scrapers, one microblade, and one micro-core came from another hearth; and two large, fragmentary bifaces were recovered from a third. In every instance those artifacts occurred in direct association with a charcoal lens.

The outstanding Tuktu feature was the house, mentioned above, which lay at the southern boundary of the site. It was essentially a surface structure, and nearly circular, measuring 12 by 10 feet in diameter. About 20 water-worn cobbles, the largest of which measured 14 inches in greatest dimension, were spaced around the perimeter eight to forty inches apart. The upper portions of several of those stones protruded through the sod. An entrance, 24 inches wide, faced due east. A few cobbles on either side marked the former position of the door opening, but there was nothing to indicate that there had been any sort of extended entranceway. In the center of the house, immediately beneath the sod, there was a small fire-

place, 14 inches in diameter and three inches thick, marked only by the presence of charcoal stained earth. No hearth stones were associated, nor were any artifacts. Few fires had burned at that interior hearth, and I think it served for smudging or heating rather than cooking. In the house entrance there was another small charcoal lens, of nearly the same dimensions as the one described above. Again, no hearth stones were associated, but the base of one projectile point, one large, fragmentary biface, and one microblade were recovered from the charcoal stained earth of the entranceway hearth. I think that in all probability, that fireplace served as a mosquito smudge. The third hearth associated with the Tuktu house was situated nine feet east, and directly in front of the house entrance, and was probably used for cooking. It was typically grown over with sod, and in depth extended from two inches to six inches below the present ground surface. It measured 20 by 25 inches, in diameter, and its long axis was oriented north and south. Eight cobbles, the largest of which measured 12 inches in maximum dimension, were irregularly placed around and within the hearth, and formed no particular pattern. No stone implements were directly associated with that fireplace, but many were found between it and the house entrance. None of those three fireplaces associated with the house contained enough charcoal for a radiocarbon sample.

No features, other than the three hearths, were associated with the Tuktu house, but many artifacts were recovered from the house floor, and from the area immediately outside of the entrance. Scattered about the interior of the dwelling, two to six inches below the present ground surface, we collected five projectile points, one notched end blade, three large fragmentary bifaces, two end scrapers, four side scrapers, four microblades, one micro-core, one doubtful micro-core fragment, and 127 unworked chert, chalcedony, and obsidian spalls. The spalls collected represented 85 per cent of those encountered. The above artifacts include those from the entranceway hearth. From two to six inches beneath the sod, on either side of the exterior of the entranceway, and in a trench five feet wide, which was dug from the house entrance to the fireplace nine feet beyond, we recovered seven projectile points, one notched end blade, four large fragmentary bifaces, nine end scrapers, one end-and-side scraper, nine side scrapers, eighteen microblades, three micro-cores, one large fragment of tabular chert, and one hundred and forty-eight unworked chert, chalcedony, and obsidian spalls. Those spalls represented 66 per cent of the total number of unretouched flakes encountered in that trench.

Two other features were possibly associated with the Tuktu site. Two pits lay several yards east and west, respectively, from the southern boundary of the site. Both measured between three and four feet in greatest diameter, and both were slightly less than four feet in greatest depth. They were not investigated in detail, but they closely resemble late prehistoric or early

historic Eskimo cache pits, which are common in the area, and I think it likely that they were dug by the antecedents of the Nunamiut Eskimos, who presently inhabit the region.

The Artifacts

The Tuktu collection contains 1,529 artifacts of stone, most of which are unretouched spalls. A large majority of both implements and unworked flakes are either chert or chalcedony, among which there is much variety in color and hardness. Tuktu chert is of various shades of brown and gray, and the numerous chalcedony specimens, which tend to be quite glassy, range in color from nearly white to black. Bedrock in the Anaktuvuk area is sedimentary, and deposits of chert occur locally, but I think many Tuktu artifacts were fashioned from stone which was quarried well beyond the boundaries of the pass. Even within historic times the Nunamiut Eskimos traveled long distances in the Brooks Range to quarry sites which contained types of chert and chalcedony particularly desirable for tool making. Old men among the Nunamiut still recall the locations of quarries, some of which are well over 100 air miles from Anaktuvuk Pass, and similar, widely scattered deposits among those mountains and along the Arctic Slope have unquestionably been exploited for thousands of years.

Eighty-eight specimens of obsidian, including eight implements and eighty unretouched spalls, were recovered from the Tuktu site. Since all obsidian encountered was collected, it is disproportionately represented in the complex, and it is probable that obsidian amounted to one per cent or less of the total number of artifacts in the site, including unworked flakes. Obsidian is not abundant in any Anaktuvuk site, but it is present in nearly all of the archaeological complexes which have been discovered there. There is relatively little exposed igneous rock, and no known deposits of obsidian, in the Brooks Range, and I formerly thought that the Anaktuvuk obsidian had perhaps been brought into the area from regions of volcanic activity such as Seward Peninsula. However, Tuktu, and other Anaktuvuk sites, which together span several thousand years, have yielded obsidian artifacts containing remnant water-worn surfaces, and I now believe that obsidian stream cobbles occur somewhere in the Brooks Range. Other stone represented in the Tuktu collection consists of one unworked fragment of quartz crystal, one implement of quartzite, eight of sandstone, one of felsite, and two of micaceous schist, all of which probably occur locally.

I have divided the Tuktu stone assemblage into 15 major categories. Those include projectile points, notched end blades, flaked side blades, large bifaces, end scrapers, end-and-side scrapers, side scrapers, blades, microblades, micro-cores, pebble hafted axes, pebble choppers, pebble sinkers, rubbed stone artifacts, and unretouched spalls and other stone fragments (primarily the bi-products of implement manufacture).

Projectile points. The 31 Tuktu projectile points are of two basic types. Corner-notched points are represented by five essentially complete specimens (Pl. I, 1, 3, 4, 6), and seven basal fragments (Pl. I, 5). One is of obsidian. The remainder are chert and chalcedony. Complete examples range in length from $1\frac{3}{16}$ inches to $2\frac{3}{16}$ inches, but one fragment (Pl. I, 5) represents a larger point. The 12 notched points perhaps most outstandingly set apart the Tuktu complex from other known archaeological components in the Anaktuvuk area. There is some variety within this small series, particularly as concerns size, depth of notching, relative proportions of stems to tips, and forms of basal edges. The bases of three examples are quite straight; six are slightly convex (Pl. I, 1, 3, 4); and three are slightly concave (Pl. I, 5, 6). In general, however, Tuktu notched points are characterized by slightly expanded bases, relatively shallow corner-notches, and broad, often heart shaped tips. Most Tuktu notched points are well flaked on both faces. The base of each of the 12 was thinned by the removal of small flakes at right angles, or nearly right angles to the basal edge. Edge grinding is present at the base of one specimen and in the notches of two others.

There are 17 bifacially flaked leaf shaped points of chert and chalcedony in the Tuktu collection, at least two of which are intrusive. Leaf shaped points which probably belong to the complex include six complete or nearly complete specimens (Pl. I, 7, 8, 9), and nine basal fragments. Complete examples range in length from $1\frac{3}{8}$ inches to $2\frac{3}{8}$ inches. Nine Tuktu lanceolate points have convex bases (Pl. I, 7), four have straight bases (Pl. I, 8), and the basal edge of one is slightly concave (Pl. I, 9). The base of another is missing. Basal thinning is present on nine, including all of the specimens having straight bases, and the single example with a concave base. None are edge ground. The leaf shaped points are very well made, and in general exhibit finer, more well controlled flaking than the notched points described above. Of the 15 points of this type which I consider to properly belong to the Tuktu complex, 10 (Pl. I, 7, 8, 9) are relatively thin, and flat-lenticular in lateral cross section. And seven of those ten (Pl. I, 7, 8) are relatively broad in proportion to length. One of them, a basal fragment (not illustrated), was reworked to form an end scraper. Two complete points among the thin, broad examples are nearly lozenge shaped in outline (Pl. I, 8), and it is very likely that two broken specimens were also lozenge shaped. A single point is broad, but thickly lenticular in lateral cross section, and unlike the other lanceolate examples it is asymmetrical in outline. Basal fragments of the four remaining leaf shaped points represent long, narrow specimens, thickly lenticular in lateral cross section.

In addition to those just described, one fragmentary, and one complete point from the Tuktu site are Kayuk points (Pl. I, 12), and I consider them intrusive here. The Kayuk type site (Campbell, 1959) lies on a kame terrace at the summit of Anaktuvuk Pass, four air miles north of Tuktu. That

early hunters' camp has yielded a large number of stone implements, the most distinctive of which are beautifully fashioned, lanceolate, obliquely flaked projectile points. The two examples from the Tuktu site are not as finely made as many of the Kayuk specimens, but both, nevertheless, are typical Kayuk points, and they do not belong in the Tuktu complex. Finally, there are two point tip fragments in the Tuktu collection, the original shapes of which cannot be determined. It is noteworthy, however, that one is retouched only along the edges, and that retouching is almost entirely confined to one face.

Notched end blades. There are four distinctive, asymmetrical, corner-notched end blades of chert and chalcedony in the Tuktu collection (Pl. I, 2, 11), which I think represent hafted knives rather than projectile points. Complete specimens range in length from 1½ inches to 2⅜ inches. Three are similar to Plate I, 2, in having relatively short, broad tips. Except for their asymmetrical outlines, those four artifacts are very much like typical Tuktu notched points. Secondary flake scars extend across most of both faces of each specimen. They are all basally thinned, and all are corner notched. The basal edges of three are straight, and that of the fourth is slightly concave. Slight edge abrading occurs in the notches of one example only. A portion of one of the long edges of one notched end blade (Pl. I, 2) appears at first glance to have been broken. I doubt it, however, and if so that edge was subsequently reworked. In any event, the other three examples definitely appear to have been purposely fashioned asymmetrically. One of the four is notched on one edge only, and it is the only artifact in the collection which did not come from the Tuktu site. That end blade was found in a kame terrace four and one-half miles to the south, but in all probability it is a Tuktu implement.

Flaked side blades. A single Tuktu implement of chert, 1¾ inches in length, is probably a side blade (Pl. I, 10). Unfortunately, a small portion of its base is missing, but because of its typical asymmetry, its thinness, and its relatively small size, I think it was probably made to be inset in the side of a projectile head of antler or other hard material.

Large bifaces. There are 42 large Tuktu bifaces of chert and chalcedony, which probably served as hand-held knives (Pl. I, 13, 14, 15, 16). They are well made, leaf shaped artifacts, retouched on both surfaces, and lenticular in lateral cross section. All were fashioned from flakes. The single unbroken example (Pl. I, 13) measures 3⅜ inches in length. A few fragments imply that some Tuktu knives of this type were slightly smaller than the complete specimen, but many fragments represent much larger implements (Pl. I, 15). Various degrees of control of the flaking technique are reflected in this series. Secondary flake scars and fine retouching are restricted to the margins of almost all of the large bifaces. Primary flake scars on the inner portions

of the faces apparently testify to a preliminary dressing of the large flake blanks. Plate I, 14, however, represents a large biface fragment on which fine secondary retouch scars extend from edge to edge on both faces.

End scrapers. The 32 Tuktu end scrapers include 30 examples of chert and chalcedony, and two of obsidian. The largest end scraper in the collection (Pl. II, 1) is 3¾ inches in length, and the smallest is ¾ inch, but 23 of the 32 are less than 1½ inches in greatest dimension. Twenty-seven end scrapers may be characterized as being "snub-nosed". The remaining five are small flakes, very slightly retouched at one end, and those five lack the steep working edges associated with the "snub-nosed" type. All Tuktu end scrapers are entirely unworked on one face, and in almost every instance a bulb of percussion or bulb remnant is present on the unworked surface. Every example was retouched at one end only on the non-bulbar face. Slightly less than half are quite pronouncedly concave-convex in medial cross section, as viewed from the side. The remainder tend to be plano-convex. In outline, a few are triangular, but the majority are roughly oval or rectangular. There is a single keeled example (Pl. II, 1), and at least three end scrapers were fashioned from blades (Pl. II, 2, 3). All, or nearly all of the rest, however, are flake implements (Pl. II, 4, 5).

End-and-side scrapers. The nine Tuktu end-and-side scrapers are of chert and chalcedony, and range from 1 3/16 to 3¼ inches in greatest dimension. Seven of the nine scrapers of this type are nearly identical to the "snub-nosed" Tuktu end scrapers except that in each instance the worked edge includes other portions of the border in addition to one end. The other two scrapers in this category are chert spalls, slightly retouched on two edges, but lacking steeped working edges. On five end-and-side scrapers, end retouching extends upward along two opposing edges (Pl. II, 6). Retouching on each of the other four examples is restricted to one end, and one other edge only (Pl. II, 7). Three specimens are plano-convex, and six are concave-convex in medial cross section. One end-and-side scraper (Pl. II, 6) was fashioned from a blade. The remaining scrapers of this type are flake implements.

Side scrapers. This large category contains 55 specimens, 51 of which are of chert and chalcedony. Four are of obsidian. In greatest dimension Tuktu side scrapers range from 1 inch to 4⅛ inches. These implements are relatively large, and 38 measure 2 inches or more in greatest dimension. With two exceptions they are retouched along one or more edges on one surface only. Two side scrapers are retouched on one surface along one edge, and on the opposite face along the opposing edge. Except for five examples, including the two scrapers noted above, retouching is restricted to the non-bulbar or dorsal surfaces. At least nine side scrapers were manufactured from blades (Pl. II, 8, 9). All or most of the remainder are flake

implements (Pl. II, 10). Thirty-five Tuktu side scrapers are worked along one edge only (Pl. II, 8), and 20 are retouched on two opposing edges (Pl. II, 9, 10). This class of Tuktu implements is a heterogeneous one, and there is much variety in size and shape. Some examples are triangular in lateral cross section, others are plano-convex, a few are roughly lenticular, and a few are roughly rectangular. In outline, they range from triangular to oval. The amount of marginal retouch, and the size of retouch flake scars also vary greatly.

Blades. The 21 large, chert and chalcedony blades from the Tuktu site range in length from 1 7/16 to 4 1/8 inches. Scrapers were fashioned from 13 of them. Examples 1 and 2 in Plate III represent blade side scrapers. The specimen illustrated in Plate III, 1, is retouched on one edge only. Plate III, 2, represents a double-edged blade side scraper. Eight of the large blades in the collection have not been deliberately retouched (Pl. III, 3, 4). Very small nicks along the edges of seven of the eight (Pl. III, 3, 4) may have resulted from use. Large Tuktu blades are typically triangular or trapezoidal in lateral cross section. Some retain bulbs of percussion, and striking platform remnants are clearly present on several.

Microblades. There are 59 Tuktu chert and chalcedony microblades, complete or nearly complete examples of which range from 5/8 inches to 1 1/2 inches in length. A few fragments represent somewhat larger specimens, and in terms of size Tuktu blades and microblades intergrade. Most microblades in the collection exhibit a high degree of control of the manufacturing technique. Typical examples are parallel-sided, and triangular or trapezoidal in lateral cross section. Forty microblades show no evidence of retouch or use (Pl. III, 5-7). Nine specimens are scarred on the dorsal or non-bulbar surface at the bulbar end (Pl. III, 8-11), and on some of those the scarring appears to have resulted from use. The ends of at least four, however, were deliberately retouched. Ten Tuktu microblades are scarred along one or both of the long edges, rather than at the ends (Pl. III, 12-14). The scarring is very fine, and cannot be clearly seen without magnification, but in at least some instances it appears to be the result of purposeful retouching. Among those edge-scarred microblades, six specimens are scarred on one long edge only, on the non-bulbar face (Pl. III, 12); two are scarred on one long edge only, on the bulbar face (Pl. III, 13); and two are scarred on one long edge on the non-bulbar face, and along the opposing edge on the bulbar face (Pl. III, 14). The end or edge scarred microblades perhaps imply bone or antler engraving, and the unretouched specimens possibly served as inset side blades.

Micro-cores. Nine micro-cores in the Tuktu collection include eight examples of chert and chalcedony, and one of obsidian. In greatest dimension they range from 1 1/16 to 1 3/4 inches. In this category there are four

doubtful specimens. Three of the five examples which are undoubtedly micro-cores are relatively thick, quite typical, polyhedral cores (Pl. III, 15, 16), although in no instance are blade scars present on more than one third of the combined total surface area of the several sides. Plate III, 15, represents a nearly pyramidal specimen, the striking platform of which is roughly triangular in outline. At least seven microblades were removed from the surface presented in the photograph. In addition, two other blade scars, oriented at right angles to those shown, occur on another side of this core. The specimen thus contains a typical, relatively flat, prepared striking platform at one end, from which the majority of the microblades were struck, while the edge of one of the steep sides was also used as a striking platform. An opaque obsidian micro-core (Pl. III, 16) contains a sharply sloping platform. From this core, microblades appear to have been struck from an acutely angular, rather than horizontal, striking platform. Microblades were removed only from the side shown in the photograph, although one other side was dressed by the removal of several flakes at right angles to the long axis of the blade scars. A thick, polyhedral micro-core, not illustrated, is noteworthy because of the smallness of some of the blade scars it contains. At least eight fragmentary scars are present on one surface. Four of these, which occur together, range in length from $\frac{1}{2}$ inch to $1\frac{1}{8}$ inches, but average only about $\frac{1}{16}$ inch in width.

Two Tuktu micro-cores (Pl. III, 17, 18) are relatively quite thin, and probably represent fragments of broken cores rather than cores that have been exhausted by the removal of microblades. In both instances blade scars are present on one surface only. The original surface of the striking platform of one (Pl. III, 17) is missing. The platform surface of the other (Pl. III, 18) is relatively flat. In addition to the five micro-cores discussed above, there are four flake or blade fragments in the Tuktu collection, each of which contains on one surface a few scars resembling those resulting from the removal of microblades. While I think it probable that the scars on those thin chert and chalcedony fragments only fortuitously resemble blade scars, it is possible that some Tuktu microblades were struck from larger blades, or flakes, rather than from the usual cores.

Pebble hafted axes. There are two sandstone, pebble artifacts in the Tuktu collection which appear to have been hafted (Pl. IV, 3, 4). Perhaps they were not used for cutting wood, but I think they represent ax-like implements of some sort. The first, (Pl. IV, 3), is $3\frac{3}{4}$ inches long, and thickly lenticular in lateral cross section. Several large, primary flakes were removed from both faces at one end to form a sharp cutting edge. The ground notches on either side probably received a haft or the lashings of a haft. Another sandstone, pebble ax (Pl. IV, 4) is 4 inches long, quite flat, and thinly lenticular in cross section. It is possible that this artifact belongs in the category of sinkers, which I shall presently describe, but I think it is more probably

a hafted tool. The side notches were achieved by the removal of primary flakes from both faces on two opposing edges. Slight edge abrasion is present in the notches. The bifacial scars at either end appear to be at least partially the result of use.

Pebble choppers. The single quartzite pebble chopper (Pl. IV, 6) is 5⅛ inches long. It is a thick and relatively heavy implement. Large, primary flakes were removed from both faces at one end, and on the face not shown most of the original pebble surface is missing.

Pebble sinkers. Six quite flat, notched pebble artifacts (Pl. IV, 5), ranging from 3⅞ to 5 inches in maximum dimension, were probably used to sink fish nets or lines. Five are sandstone, and one is felsite. Four, including the one illustrated, are essentially complete pebbles, the waterworn surfaces of which are intact except for the notches. The other two sinkers were fashioned from large, thin flakes struck from the outer surfaces of pebbles, and in each instance the original surface remains on a part of one face only. On each of the six sinkers there are two notches on two opposing edges, formed by the bifacial removal of primary flakes. A few flake scars occur elsewhere along the edges of three of the specimens. The notches on the four sinkers fashioned from whole pebbles are slightly abraded. The two large pebble flake sinkers are not abraded.

Ground stone artifacts. Two ground or rubbed implements of micaceous schist, one of which is fragmentary, measure 5⅛ inches and 2¾ inches in length, respectively (Pl. IV, 1, 2). Plate IV, 1, represents a flat fragment, slightly smoothed on the surface illustrated. Numerous parallel incisions occur on both faces. In width the incisions are of two quite different sizes, and most of them run at right angles to the long axis of the artifact. This object was found in two pieces, several feet apart, and the dark color of one face of the larger piece is probably the result of grease staining. Only a small portion of one face of the fragmentary specimen in this category (Pl. IV, 2) has been intentionally smoothed. I do not know the use of either of the implements.

Spalls and other stone fragments. There are 1,266 unretouched flakes in the collection, which in greatest dimension range from less than ¼ inch to 4⅛ inches. Most are considerably less than two inches in greatest dimension. One thousand one hundred and eighty-six are chert and chalcedony, and eighty are obsidian. The sample represents far less than half of the total number of unretouched chert and chalcedony spalls discovered in the Tuktu site, but, as I have noted previously, every piece of obsidian encountered was collected, and obsidian is therefore disproportionately represented in the spall series. There is one heavily waterworn chalcedony spall. Perhaps it was present in the glacial drift in the kame terrace prior to the Tuktu

occupancy, and it is possible that its several fracture surfaces are not the result of human agency.

A small fragment of quartz crystal, and a tabular piece of gray chert complete the Tuktu collection. The quartz crystal is unworked, but I think it is a part of the Tuktu cultural inventory. The specimen of tabular chert probably indicates the form in which much of that material was transported to the site. The angular piece, which is 4¾ inches long, is quite flat on two surfaces, and has a nearly uniform thickness of 1 to 1⅛ inches.

A Reconstruction of Tuktu

It is not presently possible to speak of a Tuktu culture. The Tuktu artifacts and features do permit, however, a partial reconstruction of a particular phase of an old arctic society. The series of stone artifacts represents a constellation of distinctive tool making techniques and traditions, which in turn testify to the subsistence economy of the Tuktu phase. A flake tool tradition is reflected in the projectile points, notched end blades, the flaked side blade, large bifacial knives, and most of the many scrapers. A highly developed blade tradition is represented by the relatively few, but handsomely fashioned large blades, the numerous microblades, and the micro-cores. And ground stone tool making, although not highly advanced, was also a part of the complex.

The fairly large projectile points, and especially the abundant scrapers and large bifacial knives, unquestionably stand witness for an economy based primarily on big game hunting, but some fishing is also represented by the several notched pebble sinkers. In addition, the various types of stone from which the Tuktu implements were made, imply that the Tuktu peoples were not emigrating through Anaktuvuk Pass, but were well established in the Brooks Range, and intimately acquainted with its resources, since only human groups long resident in those mountains would know the locations of the widely scattered quarries which yielded the materials of manufacture.

In terms of the Tuktu features, while only one house was discovered, I think that the five small areas of artifact concentration represent separate dwellings. Each contained a fireplace, and refuse stained soil, and each yielded artifact types that one would expect to find associated with the variety of daily household tasks of a hunting group. It is also noteworthy that the large number of tools of food and artifact preparation, particularly the abundant scrapers, imply a sexual division of labor, which re-enforces the hypothesis that those areas represent households. I do not know why we failed to discover the cobble outlines of houses in four of the five areas of artifact concentration. Perhaps in those instances the house stones were scattered subsequent to the original abandonment of the individual dwelling sites, and perhaps fewer or smaller house stones were used, and we did not

recognize them. It should be recalled that in the instance of the single well defined house the only associated features consisted of hearth. And since numerous artifacts were found immediately outside of that dwelling, the only indisputable evidence for the specific position and outline of the house was the ring of stones around its perimeter. I think that perhaps the explanation for our not finding house rings in four of the dwelling areas is that one or two families discontinuously occupied the site for a period of several years, and re-used the cobbles at different house locations within the camp area.

In any event, the outline of one house, and its associated hearths, considerably illuminates the probable size and type of the Tuktu family group, the form of the dwelling, and the time of the year it was occupied. It is reasonable to assume that the house contained a nuclear family of no more than four or five individuals. The nearly circular floor outline implies a hemispherical or conical dwelling, and on the basis of a common more recent Brooks Range house type, I think it not unlikely that the Tuktu house was hemispherical, and covered with hides bent over a willow frame. Willows, in abundance, have probably grown in the nearby flood plain of the Anaktuvuk River for thousands of years. And the exterior cooking hearth, and the probable smudge hearth in the entrance, certainly indicate that the dwelling was occupied during the warm season.

The Tuktu site thus represents a phase of a well established Brooks Range culture. The Tuktu phase contained a constellation of several notable stone tool techniques and traditions, most of which were oriented toward the killing and preparing of large game mammals. The Tuktu phase was also characterized by small family groups, which, during summers, occupied Anaktuvuk Pass, where they lived in very small encampments of probably hide-covered, circular houses. At Anaktuvuk they supplemented hunting by catching fish in the streams and glacial lakes of the area.

Antiquity and Cultural Relationships

The two forthcoming radiocarbon dates from the Tuktu site are awaited with anticipation. Meanwhile, the scarcity of organic material in the site and a typological comparison of Tuktu artifacts with those from other arctic localities permits an estimate of the relative age of the complex. Two restricted areas of the previously mentioned shallow Kayuk site, which lies on a kame terrace four miles south of Tuktu, yielded a series of typical Ipiutak implements of stone, bone and antler. Those artifacts postdate the Kayuk stone implement assemblage. Typologically they may be directly equated with specimens from the Ipiutak type site at Point Hope, Alaska (Larsen and Rainey, 1948), and as such should have an age of 1,500 to 2,000 years. I cannot positively say that soil and drainage conditions are

exactly the same in the kame terrace occupied by the Kayuk site and that terrace occupied by Tuktu, but the two glacial features appear to be very much alike, and I think that conditions of preservation at Kayuk and at Tuktu are probably nearly identical. Therefore, since, with the exception of a little charcoal and a few bone fragments, organic remains were absent from the Tuktu site, I believe that it predates the Anaktuvuk Ipiutak component, and, if I am correct, a minimum age of 1,500 to 2,000 years may be assigned to the Tuktu complex.

Turning to typological comparisons of the Tuktu artifact assemblage with those from other northern sites, the Tuktu collection appears to represent a distinctive arctic complex which can not be directly equated with any previously reported finds. If considered separately, and broadly, in terms of both age and cultural alignments, most of the implement types, and most of the implement manufacturing techniques represented in the Tuktu complex have a wide range in northern North America, and are therefore difficult to use, in any very specific sense, as time or culture markers. I refer here most directly to Tuktu bifaces, scrapers, and the notched pebble artifacts, but my remark also applies to blades and microblades, polyhedral cores, and implements of ground stone. While variations within these artifact types are becoming increasingly useful in placing archaeological units in particular traditions or cultural continua, we have not yet reached the place in northern archaeology where age, at least, can be confidently reckoned according to subtle characteristics of blades or cores. Nor is age (or cultural affinity) revealed by such amorphous artifacts as contained in the impoverished Tuktu ground stone inventory.

The corner-notched points and end blades represent the only Tuktu artifact type that, if considered in the context of accompanying implements, is sufficiently distinctive to presently permit any very direct comparisons with other northern North American finds. (In this respect, except for the two intrusive Kayuk points, I do not derive any particular meaning from the various lanceolate points in the Tuktu series (Pl. I, 7-9), nor can I, in specific terms, comparatively evaluate the single flaked side blade (Pl. I, 10). Not many corner-notched points have been reported from the American north, although they have been found over a wide area, and occur in both the boreal forest and the tundra regions. And among those northern complexes that contain corner-notched points there are primarily three that presently promise meaningful relationships with Tuktu. In no instance is the affinity clear, but I think there is a connection between Tuktu; the Lockhart River complex of the Artillery Lake region near Great Slave Lake in the District of Mackenzie (MacNeish, 1951); finds from the Ratekin site on the Denali Highway in west-central Alaska (Skarland and Keim, 1958); and the Palisades assemblage, recently discovered at Cape Krusenstern on Kotzebue Sound, Alaska (Giddings, in press).

The Lockhart River complex consists of a small series of stone implements collected from the surfaces of five sites on the barrens east and north of Great Slave Lake. Organic materials were apparently absent. Although most Lockhart artifacts are relatively rude in appearance, perhaps because nearly all were fashioned from quartzite, the majority of the implement types, including corner-notched points (a few of which are quite possibly asymmetrical, notched end blades), a few leaf shaped points, large bifaces "blades", end scrapers, side scrapers, blades "prismatic flake knives", and choppers (MacNeish, 1951, pp. 32-7; Pls. III-VI) resemble those of the Tuktu collection. From the photographs (MacNeish, 1951, Pls. III-IV), the notched points of the Lockhart River complex, of which there are about 20, particularly resemble Tuktu specimens. Lockhart lacks, however, fine microblades, micro-cores, ground stone, and notched pebble implements. Since the sites postdate the last glacial ice sheet in the area, which is estimated to have melted 4,000 to 7,000 years ago, and because of the positions of the sites on ancient beaches, for which a chronology has been tentatively established, MacNeish estimates that the Lockhart River complex is 1,000 to 4,000 years old (MacNeish, 1951, 33).

Abundant stone artifacts in the Ratekin site, which was located at about timber line, occurred from the surface to a maximum depth of six inches. No organic materials remained in association. The site yielded corner-notched points, at least one asymmetrical notched point or end blade, large bifaces, end scrapers, end-and-side scrapers, and side scrapers (Skarland and Keim, 1958, pp. 82-6), all of which are very similar to Tuktu implements. Blades, microblades, micro-cores, and pebble artifacts were absent from the Ratekin site, but an "arrow-shaft shaper", smoothed by pecking, was found with the other materials. Skarland and Keim (p. 81) have remarked that ". . . on the basis of patination of flint specimens, one might safely assume that the material is at least 2,000, perhaps more than 4,000 years old."

It is noteworthy that the estimated age of those Denali Highway finds agrees quite well with the tentative conclusions reached by Irving regarding the antiquity of artifacts from a surface site near the Tyone River in the Susitna watershed which drains to Cook Inlet, Alaska (Irving, 1957, p. 48). The Tyone River site contained microblades, and corner-notched and lanceolate points similar to Tuktu specimens (Irving, 1957, pp. 42-4, 50, 51; Pls. I-II). Irving's Tyone series is a small one, and I am reluctant to speculate on its cultural affinities, but I think it quite possible that the Tyone collection is related to both Ratekin and Tuktu.

Giddings' Palisades assemblage contains patinated stone artifacts recovered from the surface and just below the surface on the top of a bluff (Giddings, in press). Again, no organic materials remained. The collection

lacks chipped pebble and ground stone implements, as well as microblades, micro-cores, and the variety of Tuktu scrapers. It contains, however, two large flake chopper-like implements. And corner-notched points, asymmetrical corner-notched end blades or points, large bifaces, and large blades from the site appear closely akin to those types of implements from Tuktu. On the basis of the relationship between his Palisades site, and a sequence of sites on nearby fossil beaches, Giddings has tentatively assigned an age of five or six thousand years to the Palisades series.

Thus, in terms of age, because of the scarcity of organic materials at Tuktu, and the presence of well preserved Ipiutak artifacts from essentially the same depths in a very similar glacial feature at Anaktuvuk Pass, it appears that the Tuktu complex is at least older than the Anaktuvuk Ipiutak component. And on the basis of typological comparisons, Tuktu is very probably related to other northern notched point complexes that are perhaps as old as five or six thousand years. It is my hunch that Tuktu is about 3,000 or 4,000 years old, although this is admittedly a guess date.

In terms of broader cultural relationships, it seems to me that we are obtaining increasing evidence from the American arctic and subarctic for the former presence in those regions of a previously unrecognized notched point tradition, of which the Tuktu complex was a part. That tradition was primarily oriented toward the hunting of large land mammals, and possibly toward sea hunting as well. A final definition of its limits in both time and space, and a further knowledge of its relationships to other cultural components in the several northern North American sequences, await further investigations. But meanwhile it appears that the northern notched point tradition ranged widely in time, and its wide spatial and environmental range is witnessed by its occurrence on the barren grounds, deep in the northern forest zone, on the coasts of the Chukchi Sea, and among the arctic mountains.

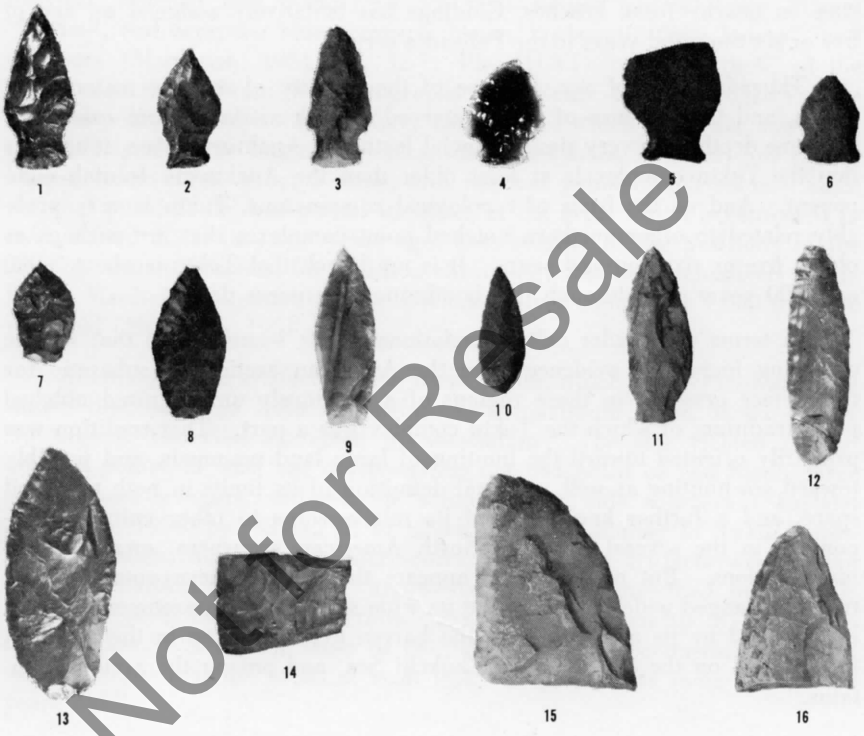

Plate I

Projectile points, notched end blades, flaked side blades, and large bifaces from the Tuktu site. 1, 3-6, typical Tuktu corner-notched points; 7-9, Tuktu leaf shaped points; 12, intrusive Kayuk point; 2, 11, Tuktu corner-notched end blades; 10, flaked side blade; 13-16, large bifaces. To scale, length of 1, $2\frac{3}{16}$ inches.[2]

[2] United States National Museum photograph.

Plate II

Scrapers from the Tuktu site. 1, keeled end scraper; 2, 3, blade end scrapers; 4, 5, flake end scrapers; 6, blade end-and-side scraper; 7, flake end-and-side scraper; 8, blade side scraper worked on one edge only; 9, blade side scraper retouched on two opposing edges; 10, flake side scraper retouched on two opposing edges. To scale, length of 1, 3¾ inches.[2]

[2] United States National Museum photograph.

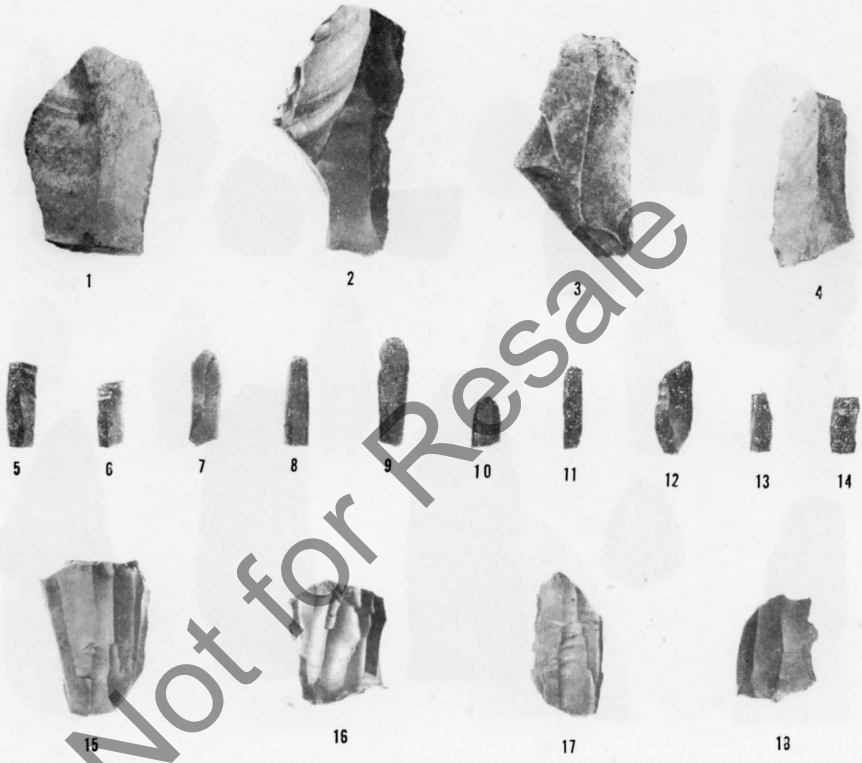

Plate III

Blades, microblades, and micro-cores from the Tuktu site. 1, 2, retouched blades (side scrapers); 3, 4, unretouched blades; 5-7, unretouched microblades; 8-11, microblades scarred on the non-bulbar surface at the bulbar end; 12-14, microblades scarred on one or both of the long edges on one or both faces; 15, 16, micro-cores, 17, 18, thin, micro-core fragments. To scale, length of 1, 2 inches.[2]

[2] United States National Museum photograph.

Plate IV

Ground stone artifacts, and axes, sinkers, and choppers from the Tuktu site. 1, 2, objects of ground or rubbed micaceous schist; 3, 4, pebble hafted axes; 5, notched pebble sinker; 6, pebble fragment chopper. To scale, length of 1, 5⅛ inches.[2]

[2] United States National Museum photograph.

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CULTURE CHANGE AND PERSONALITY MODIFICATION AMONG THE JAMES BAY CREE[1]

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Introduction

Students of culture-personality must deal with disparate classes of phenomena. *Cultural Processes,* such as residence rules and economic activities, are patterns of interpersonal behavior whose genesis lie in the history of a tribe. *Personality Processes,* such as ego defenses, tendencies to introversion vs. extroversion, are attributes of individuals whose genesis lie in the history of that particular person. Since the history of any person is contingent upon many cultural processes, it is reasonable to suppose that culture-personality relationships may exist. This paper is a methodological study dealing with the isolation and verification of such relationships.

At the outset, we postulate that non-random associations between cultural and personality processes are reflections of culture-personality relationships. The degree of randomness of such associations can be assessed from two points of view. In the first, the protagonists of a cultural process are grouped together. The frequency of a given personality attribute occurring among these people is then determined. This process can be repeated with several different cultural processes. If the ratio of this frequency to the number of people in each group tends to remain the same, the personality process in question is randomly distributed with respect to the different cultural processes. Thus no culture-personality relationship is indicated. If, on the other hand, this ratio varies markedly when different cultural processes are considered, then such an asymmetry of distribution would constitute evidence for a culture-personality relationship.

In the second, tribal members are grouped according to some psychological criterion. Asymmetries in the occurrence of cultural processes among these groups can then be determined. A variant of this approach will be used in this paper. The question arises how such a grouping is to be carried out. Conceivably one might "measure" each subject according to some extrinsic criterion such as "degree of introversion," and then rank them in conformance to their score. Another approach would exploit some intrinsic properties of the groups' behavior—measuring each person not against an extrinsic criterion but rather against the collective behavior of the other

[1] This paper is based on a dissertation presented to the faculty of the graduate school of Yale University, in candidacy for the degree of Doctor of Philosophy. The field work was financed by the Department of Anthropology, and the writer wishes to express his gratitude for the support of this research. My thesis advisors Dr. Edward M. Bruner and Dr. David E. Hunt criticized the evolution of the dissertation. Dr. Floyd G. Lounsbury and Dr. Alfred F. Glixman clarified many obscurities in the quantitative methods developed here. The census data used in this paper was collected in collaboration with Dr. John J. Honigmann during the 1955 field season.

tribal members. This would permit the investigation of homogeneity of behavior within a tribe. Inversely, a member's idiosyncratic behavior could serve as a criterion for grouping him according to a psychological variable.

The purpose of developing a formal technique of grouping people is to resolve the antecedent conditions of a hypothesis into a concrete form; the technique is an operational definition of certain antecedent conditions. Asymmetries in the occurrence of cultural processes can then be interpreted as the consequent conditions, and the stability of the relationship between antecedents and consequents evaluated in several empirical contexts. One may hope that such investigations will eventually suggest general principles from which other empirical relationships may in turn be deduced; i.e. that anthropologists will be able to predict, as well as merely to organize phenomenon. For example the laws of reflection and refraction in optics are statements of empirical regularities between antecedent and consequent conditions. However Fermat interpreted both laws in terms of a general principle of least action. From this principle Hamilton in turn predicted the phenomenon of conical refraction, whose existence had not previously been suspected.

The aim of this paper is somewhat more modest. It discusses a hypothesis which suggested itself in the course of field work, and the evaluation of a more general principle abstracted from it.

Hypothesis

During the summer of 1954 the writer traveled into the North for the first time. The village was called Great Whale River, at the southeastern corner of Hudson Bay, Canada. It was chosen because Cree Indians and Eskimo lived side by side, making it an anthropological laboratory where the characteristics of one tribe can be placed in perspective against the other. These characteristics became evident soon after the writer's plane landed in the river. Both Cree and Eskimo lined up on the sand dunes by the river, and inspected the new arrivals closely. However the group which pulled the freight canoes onto the beach, and clustered around the visitor. was made up entirely of Eskimo. The Cree stood further off, a silent, wary, group. After the initial excitement had worn off, and the plane had left the river, the Cree drifted back to their camps. The Eskimo were still around, chatting among themselves, and listening to the visitor getting acquainted with the Hudson's Bay Company manager and the local missionary. The Eskimo accompanied the ethnographer in searching for a suitable campsite. They helped erect the tent and stayed behind to look the new camp over after the ethnographer had left. The Cree were nowhere to be seen.

Only some hours later did the first Cree initiate a contact. He was a young man who had learned some English while hospitalized in the south,

and now offered his services as an interpreter and informant. His family was the first group of Cree who accepted my presence, and only slowly did other members of the tribe follow their lead.

The Eskimo, in spite of the language barrier, were fairly accessible and demonstrated their technology, such as preparing skins, with considerable pride. No such uniform reaction occurred among the Cree. Some of them came to accept me, others never lost their air of suspicion. The friendly attitude of my interpreter was clearly idiosyncratic compared to that of the majority of Cree, who tended to exhibit a rather homogeneous air of suspicion.

This disparity in attitudes within the Cree community can be understood by considering the history of the people involved. My interpreter was accustomed to dealing with whites. No doubt his experiences in a Canadian hospital contributed to his sophistication. In other words his life entailed a much wider range of cultural phenomena than that of the other Great Whale River Cree.

One can draw two conclusions from this example. First, a correlation between wider cultural experiences and a decrease in suspicion is indicated. Somewhat less obvious is the second, that wider cultural experiences are associated with idiosyncratic emotional reactions whereas more restricted experiences are associated with homogeneous reactions to a stranger.

The second, somewhat more general hypothesis does not mention the specific emotional reactions of the people, as does the first. Rather it is an abstract describing the distribution of emotional reactions among different groups of tribal members; where each group is characterized by having experienced different cultural processes. As such the second hypothesis has a wider field of application than the first, which merely discusses a single concrete association between cultural and personality processes. The evaluation of this second hypothesis will be carried out with data from Attawapiskat, another Cree community.

Method

Before proceeding to the data there are a number of procedures to be clarified. In particular a more explicit definition of "personality processes" must be developed. This can most readily be done in terms of an operational definition. Second, a formal method for describing the distribution of such processes must be clarified so that a sample of tribal members can be grouped according to their tendency to exhibit homogeneous vs. idiosyncratic personality processes. When these objectives have been attained it will be possible to consider the data from a second Cree community and evaluate the asymmetry in cultural processes among these groups.

The deduction of personality processes from a corpus of non-Western data is a hazardous procedure. However such data can be classified into broad categories which very likely reflect different personality processes.

Such data must be elicited in a variety of stimulus situations, in order to sample a range of personality processes displayed by a subject. These situations must be the same for all of the subjects in the sample. Ideally these stimulus situations should arise spontaneously in the day to day life of the people. However the need for comparable data and the limited time available in field work suggest the use of a standard interview such as the Thematic Apperception Test. Accordingly a set of TAT plates, developed by William Henry for research among American Indian groups, was used in this study (Henry, 1947).

Each of the 12 plates showed some Indians engaged in a variety of activities. The subject was asked to make up a story about this activity. It was postulated that the treatment of the story reflected some of the personality processes evoked in the subject by this task.

The TAT protocols were collected by the writer and his wife in the summer of 1955, among the Cree living at Attawapiskat on the west shore of James Bay, Canada. Four interpreters were used to collect the TAT protocols. One was an elderly conservative man, two were younger and relatively acculturated men, and one was a girl. The male interpreters primarily solicited subjects in their own age and sex group. These were interviewed by the writer. The female interpreter worked with the writer's wife, and collected protocols from both the young and older women. Considerable effort was made by both of us to conduct interviews in all of the segments of the community. Forty subjects contributed protocols, resulting in a total of 480 stories.

These stories could be sorted into seven different categories, according to their treatment by the subject. Three of these categories dealt with the handling of aggression—by the repression of a conflict, by its displacement onto others, or by its unmodified expression. Others included the expression of fantasy, and of social interaction. Two final categories dealt with ineffectual activity, by the actors in the story, or by the storyteller himself. The criteria used to sort the stories into these are as follows:

(A) The subject starts to describe a conflict, but does not carry it to a resolution. This can take the form of changing the story to a neutral theme, or saying that he does not know what happened next.

(B) The subject does not annihilate a conflict but rather repudiates any personal connection with it. The conflict remains, but is ascribed to another person, another age, or another tribe.

(C) The subject tells a story in which strong action is taken with little or no modification of impulse.

(D) The subject uses a less concrete approach in making up a story. This includes wish fulfillment or the use of imaginative rather than literal plots.

(E) The subject describes empathic, socio-centered activities.

(F) The subject tells a story in which the persons are unable to carry out purposeful behavior because of senility or confusion.

(G) The subject gives a static description of the picture and makes no attempt to tell a story.

An eighth type (H) was scored by exclusion. Since it was not possible to tell if this represented a single reaction or not, it was not used in the formal analysis.

The distribution of these treatments within the Attawapiskat sample can be described with the following method. Since the TAT interview presented each subject with 12 situations in a fixed order, their treatment can be described with a column of 12 letters. The 40 columns of all of the Cree in the sample can be grouped together as a rectangular array.

Table No. 1. Each row of this array describes the treatment used by the entire sample in describing one of the TAT plates. The frequency of each treatment in a row is readily determined. This information can be stored by replacing each letter in the array by the frequency of its occurrence in that row.

When this transformation has been carried out independently in each of the 12 rows, we can realize the implications of the 40 columns. Each column now reflects the relative frequency of the treatments used by a subject in describing all of the 12 TAT plates.

Consider the subject who consistently used idiosyncratic treatments, i.e. ones which occur infrequently in the rows of the array. The column representing his behavior will consist of low numbers. A subject who consistently uses widely shared treatments will, on the other hand, be represented by a column of higher numbers.

Hence the sum of the 12 numbers in each column is a measure of the distribution of treatments used by that subject for all 12 TAT plates. There will be 40 such numbers, one for each Cree in the sample. These numbers have been arranged in ascending order and recorded in Table No. 2. This sequence ranks the Cree in the sample according to their tendency to use widely shared treatments.

Table No. 2. Each type of treatment very likely reflects a different personality process. Hence this sequence ranks the subjects according to their tendency to exhibit idiosyncratic or widely shared personality processes

in a standard interview situation. The hypothesis to be tested states that within this sequence there are at least two groups of people who have experienced different cultural processes in their personal history. Furthermore the group exhibiting idiosyncratic responses will have had a wider range of cultural experiences than the other.

Cultural Experiences of the Attawapiskat Cree

Attawapiskat is located on the west coast of James Bay, about halfway between the railhead at Moosonee and Great Whale River to the north. Attawapiskat is a large community located in flat, forested land, whereas Great Whale River is a small trading post on the tundra very close to the timber line. There is a large Catholic mission at Attawapiskat, which provides opportunities for wage labor and facilities such as saw mills and medical care. The 20-bed hospital is staffed by Catholic nuns. While the primary economic activity of the Cree in both villages is fur trapping, Attawapiskat appears far more acculturated than does the Great Whale River community. Hence it offers a more diversified sample of people with which to test the hypothesis.

The yearly cycle of the Attawapiskat Cree alternates between bush and trading post. During the winter most of the Cree are scattered throughout the bush, living in small enclaves and tending their trap lines. During the summer they return to the trading post to visit friends and to repair equipment. A few people remain at the post all year around. These include young school children at boarding school, old people living on a government pension, and a few who carry on wage work for the whites.

Many of the Attawapiskat Cree have had some formal schooling at a Catholic mission, and the children at present attend the boarding school at Fort George or Fort Albany. A major item of instruction is the Catholic liturgy; the Indians know about 18 different plain-song masses by heart, and sing the Latin texts fluently.

We may return to the hypothesis which is to be tested with data from these Attawapiskat Cree. A sample of them have been ranked according to the strength of their tendency to exhibit idiosyncratic personality processes in a standardized interview situation. The hypothesis states that within this sample there exist two groups of subjects such that the tendency to use idiosyncratic responses is greater in one group than in the other, i.e. that these groups tend to cluster at opposite ends of the ranked sequence of subjects. Furthermore it states that there will be asymmetries in the distribution of cultural processes between these two groups, such that wider cultural experiences are associated with the "idiosyncratic" group and that more restricted experiences are associated with the "homogeneous" group.

Two groups which meet these conditions exist in the sample. One consists of people who spend a gregarious winter in the bush, camping in enclaves larger than the nuclear family. These people have experienced a good deal of mission schooling (mean 2.3 years). They exhibit idiosyncratic personality processes. The other consists of people who spend a more isolated winter in the bush, camping with their nuclear family only. They have experienced substantially less mission schooling (mean 1.0 year). They exhibit homogeneous personality processes. There is no statistically significant difference in age or sex between these two groups. Such a non-random association between winter residence pattern and the diversity of emotional expression tends to confirm the hypothesis which arose from the Great Whale River data.

Acculturation, in the form of mission school experience, would seem a reasonable parameter accounting for this culture-personality relationship. The mission school removes children far from their native village for ten months during the winter. Their parents are scattered throughout the bush; there is no such thing as weekend visits home. Instead they meet children from all parts of James Bay and thus experience a far wider range of culture than an Indian living only in one village. The persistence of gregarious habits, reflected in the winter camping pattern of later life, is scarcely unexpected.

A substantial amount of mission schooling would enlarge the emotional experience of an Indian child. Emotional reactions to self and to others are thoroughly explored in the teaching of Christian ethics. Such an experience would very likely broaden the range of emotional expression. This would explain diversification or emotional expression among the group with substantial mission training.

Statistical Considerations

Confirmation of the hypothesis consists of proving that there exist two groups of subjects in the sample such that the people camping in larger enclaves differ significantly from those camping with their nuclear family only in (1) the strength of their tendency to exhibit idiosyncratic responses, and (2) the number of years of mission schooling experienced.

We postulated that a culture-personality relation would be reflected in the non-random association between cultural and personality processes. For example suppose that one group of subjects has experienced cultural process "A", and the second a complementary cultural process "B". Further, suppose that it is possible to rank all of these subjects in a single sequence according to some psychological criterion variable (such as the tendency to exhibit idiosyncratic responses). Should the cultural process experienced by these ranked subjects be intermixed: ABABAB, then a random associa-

tion between the personality and cultural processes exists. However if they are dispersed: AAABBB, then a non-random association exists.

Actual sequences are rarely as clearcut, so that a more formal definition of randomness (or its absence) must be used. There exist several alternatives, depending on whether a linear or non-linear relationship between culture and personality is being tested, and on the level of measurement (nominal, ordinal, equal-interval) attained by the criterion variable. In the present case the hypothesis is linear and the criterion variable attains an ordinal level of measurement. Under these circumstances the probability that the relationship between the personality variable and the cultural processes is non-random can be evaluated with the Mann-Whitney "U" test (1947). This test indicates whether one of two variables is stochastically larger than the other, i.e. whether the empirical data tends to an AAABBB sequence. It evaluates the number of protagonists of an "A" process which precede each protagonist of a "B" process. The sum of these numbers will be larger for an AAABBB sequence than for an ABABAB sequence (9 vs. 6). This sum can be transformed into the desired probability value.

The Cree have been ranked according to the strength of their tendency to exhibit idiosyncratic responses (Table No. 2). If we abstract from this table the subjects who wintered in the bush, it is possible to form a sequence describing which alternative camping pattern was used by each subject—cultural process "O" (camping in a wider enclave) or "N" (camping with nuclear family only). This data has the form: O,O,O,N,N,N,N,O,O,O,O,N, O,O,O,N,N,N,N,N,O,N,O,N,N,N. The number of "N's" which precede each "O" of this sequence are: 0,0,0,4,4,4,4,5,5,5,10,11. The sum of these numbers yields the statistic "U", equal to 52 in this case. This "U" can be converted to a probability value, equal to $p=0.0495$ for these numbers of subjects. In other words the chances are 19 out of 20 that one variable is stochastically larger than the other, i.e. that a non-random association between the personality variable and the two alternatives of the cultural variable exists. Further, it is evident that the subjects who camped with their nuclear family only tend to cluster at the upper (homogeneous) end of this sequence, whereas the other group tends to cluster at the lower (idiosyncratic) end.

If these same subjects are ranked according to the number of years of mission schooling attained, one can form a sequence describing their camping patterns. It is then possible to test the hypothesis that the protagonists of process "N" tend to cluster at the lower end, whereas the protagonists of process "O" tend to cluster at the upper end of this sequence. In other words we can test whether the protagonists of "N" experienced less mission schooling than the protagonists of "O". The data has the form: N,N,N,N,O,O,N,N,N,N, N,N,O,O,N,N,O,O,O,O,N,O,O,O,O. The statistic "U" equals 28 in this case,

TABLE 1

Tactics Used by 40 Attawapiskat Cree in 12 Interview Situations

Interview situation	Subjects 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	H	B	E	A	D	C	E	A	B	H	C	A	E	E	A	C	E	E	A	E	E	A	E	E	A	E	E	A	A	E	A	E	E	E	E	F	C	B	B	E
2	H	H	H	H	D	C	A	H	H	C	C	A	H	H	A	B	H	H	H	D	H	H	F	H	H	H	B	E	H	H	E	C	B	C	D	E	B	C	B	B
3	H	H	H	H	E	C	C	E	E	D	D	H	E	C	E	C	H	H	H	D	E	C	B	E	H	E	C	C	A	A	E	E	E	C	E	F	E	C	C	H
4	H	C	H	H	H	B	E	C	F	F	F	D	H	C	H	E	F	H	F	D	A	F	D	F	F	H	F	F	F	F	F	F	C	F	F	F	F	F	F	F
5	G	D	G	G	D	B	C	H	H	C	F	B	G	G	G	G	G	G	D	D	H	D	B	B	G	G	H	G	D	G	H	H	B	H	D	B	D	G	D	G
6	G	H	H	H	F	B	C	H	H	F	H	F	H	H	E	H	F	F	F	F	F	C	F	C	H	F	H	C	F	A	F	E	C	H	F	F	F	F	H	F
7	G	H	G	H	H	D	E	C	C	H	C	C	C	H	H	F	G	H	H	C	C	H	H	A	C	C	C	C	H	H	A	H	E	C	C	C	C	B	C	C
8	H	H	H	A	C	C	C	D	H	A	C	H	H	E	C	A	H	E	B	F	C	B	E	H	E	A	C	A	E	A	E	E	A	A	H	E	H	A	E	E
9	G	B	E	A	B	C	B	C	C	A	C	C	A	H	E	E	H	C	H	D	C	E	E	A	E	H	B	F	E	E	E	E	E	A	H	A	D	A	E	E
10	G	F	H	H	H	C	B	H	E	E	F	D	H	A	E	E	H	H	F	A	C	C	F	C	B	H	H	A	B	F	C	E	C	E	F	C	F	A	A	E
11	H	H	H	H	H	F	B	C	H	H	H	F	H	—	C	C	H	C	B	D	H	G	D	H	H	H	H	E	H	H	F	C	C	C	H	C	D	F	F	H
12	G	F	G	B	G	C	C	F	A	H	H	D	F	B	H	D	G	C	B	F	H	B	B	B	C	G	B	H	B	B	H	D	B	C	D	B	B	B	B	F

TABLE 2
Attawapiskat Cree Sociological Data

Subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Score	26	33	54	55	59	60	63	65	70	72	73	73	75	76	78	79	79	80	82	86
Sex	M	M	M	M	M	M	M	F	M	M	M	M	F	F	F	M	M	F	F	M
Age	75	53	24	26	37	41	31	18	51	40	43	61	16	24	68	32	60	40	30	14
Years Schooling	0	1	?	3	2	0	3	0	1	1	0	2	2	8	1	3	1	1	4	3
Winter Location	T	T	?	BO	BO	BO	BN	T	BN	BN	T	T	BN	BO	BO	BO	BO	BN	BO	T

Subject	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Score	87	92	93	93	94	94	97	97	99	100	101	102	105	108	109	112	113	114	114	129
Sex	M	M	M	M	M	M	M	F	M	F	M	M	M	M	M	M	M	F	F	F
Age	28	36	47	25	46	68	21	79	69	65	54	12	31	26	24	46	65	34	67	57
Years Schooling	2	0	1	2	2	1	?	0	1	0	0	0	2	1	2	0	0	0	1	1
Winter Location	BO	BO	BN	BN	T	BN	BN	T	T	T	BN	T	BO	BN	BO	BN	BN	BN	?	T

Key

M	Male
F	Female
T	Town
BO	Bush, with others
BN	Bush, nuclear family only

which is equivalent to a probability value of 0.01. In other words the chances are 99 out of 100 that the subjects who camped with their nuclear family only have experienced less mission schooling than the subjects who wintered in a wider enclave.

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THE McGRATH INGALIK

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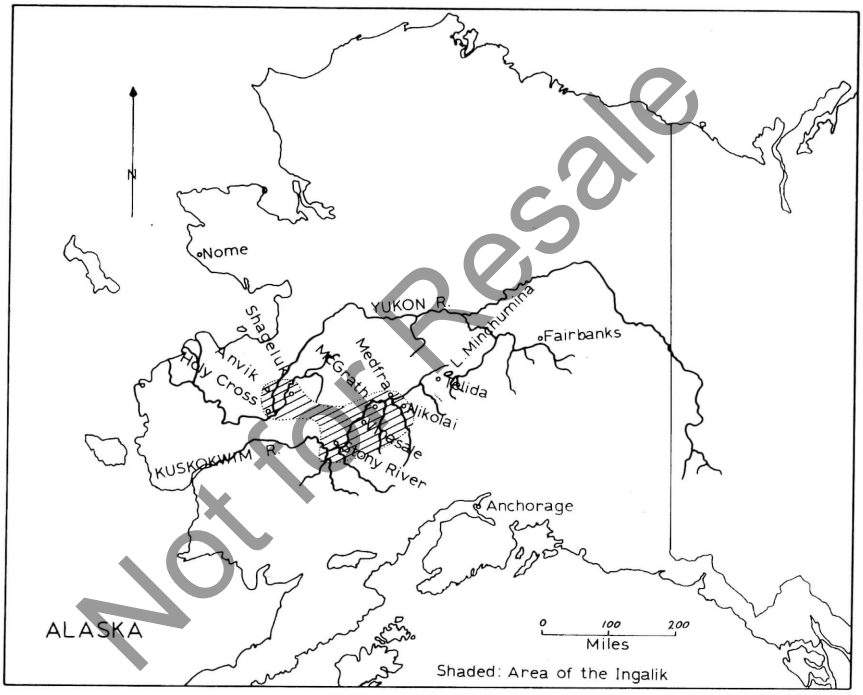
During the summer of 1960, the writer spent three months studying the McGrath Ingalik, a northern Athabaskan group situated on the upper Kuskokwim River, in central Alaska. The bulk of this time was spent in the settlements of Medfra and Nikolai, on the North and South Forks, respectively, of the Kuskokwim River.[1] The field data was obtained by personal observation and through informants.[2] This group has not, to the best of my knowledge, been previously studied, although they are mentioned briefly in several accounts by early travelers. As a result, very little is known of the past or present culture of these people. There is evidence which indicates that the present group is an amalgamation of at least two earlier societies, and they show strongest connections with the Ingalik of the lower Yukon River. In view of this affinity, I will retain Osgood's designation of these people as the McGrath Ingalik (Osgood, 1940, p. 31).

The region of the upper Kuskokwim River was first penetrated by the Russian explorer Zagoskin, who traveled up the Kuskokwim River to Vinasale village and the mouth of the Takotna River in 1844. In 1889, the Alaskan pioneer Frank Densmore, with a party of prospectors, passed from the Tanana River to the Kuskokwim, and descended the latter to the Yukon portage (Spurr, 1900, p. 95). In 1898, the geologist J. E. Spurr crossed the Alaska Range from the east, and going down the South Fork of the Kuskokwim River reached the main body of the Kuskokwim, which he then descended (Gordon, 1917, p. 105). In 1899, a small party of soldiers under the command of Lieutenant J. S. Herron crossed the Alaska Range near Rainy Pass, and descended the South Fork of the Kuskokwim to the vicinity of the present site of Nikolai Village. The expedition then struck off northward, in the direction of the Tanana River, visiting Indian villages at Telida Lake and Lake Minchumina en route (Herron, 1901, pp. 18-44). This expedition is still remembered by many of the older Ingalik of the region, particularly for the horses which they mistook for moose.

The major white habitation center in this area at the present time is the town of McGrath, located on the Kuskokwim River at its juncture with the Takotna River. A trading post was first established here in 1907, while

[1] Financial support for this study was provided by a grant from the George C. Barker Memorial Fund of the University of California, Los Angeles. I am indebted to Dr. Wendell Oswalt, who first suggested this study, and aided me with comments on an earlier draft of this paper.

[2] My primary informants for this study were Junior Gregory, Bobby Esai, Antone Pitka, and Chief Wathili Devian, all residents of Nikolai Village. They were most helpful and patient in answering my many questions. I am also indebted to Mr. Bob Stone, and Mrs. Bertha Winans, long-time residents of the area, whose assistance and hospitality greatly aided me in contacting and working with the McGrath Ingalik.



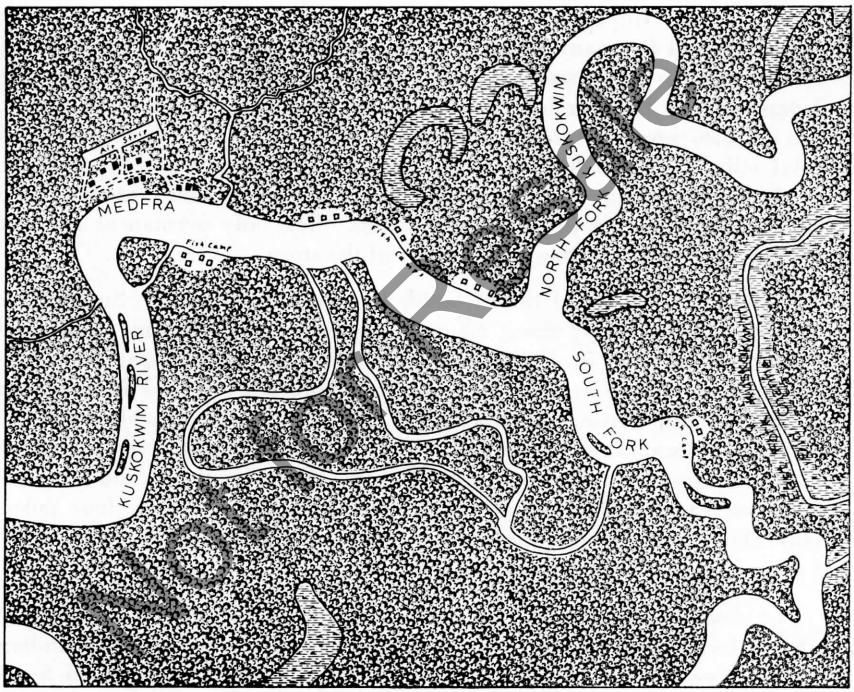
Peter McGrath was U.S. Deputy Marshall for the gold diggings on the Takotna and Innoko river drainages. During the Second World War, the town grew substantially in size, with the construction of a large airfield by the U.S. Army. At the present time, it is a minor stop for scheduled airlines, and is the site of an F.A.A. facility. McGrath has two stores, several boarding houses, numerous residences, and a charter air service. There is a permanent population of about 80 residents, including two or three Indian families, and several Indian women who have intermarried with white residents.

The community of Medfra is approximately 50 miles upstream from McGrath, on the North Fork of the Kuskokwim River. It has been the site of a trading post for many years. At the present time, Medfra consists of a small dirt airstrip and several log buildings, one of which serves as the store and post office. A larger log structure is the residence of the store owner. There are also several storage buildings. A cabin, built by the Indians of Nikolai village, is also located there, and used by them on their periodic trips during the winter. A dirt road about 10 miles long extends from Medfra to some mining property in the hills. The only permanent resident of Medfra at the present time is the owner of the store.

Nikolai is a village of the McGrath Ingalik located on the South Fork of the Kuskokwim River, about 30 miles upstream from Medfra. It moved to its present location in 1925, previously being situated several miles further upstream. There are 12 one-room log cabins, two school buildings, a small men's bath house, and a Greek Catholic Russian Orthodox church. The village is located on a low bluff, 20 to 40 feet above the river, and most of the cabins are within 50 yards of the stream. Each family, in addition, has at least one cache which is a small, closed, log structure set on four poles, usually about 5 feet above the ground. In this are kept furs, tools, food, and other items not kept in the cabins.

The small settlement of Telida, some 100 miles up the North Fork of the Kuskokwim from Medfra, is the permanent residence of three Indian families. Two of these are Ingalik from Nikolai, and the third, Carl Sesui and his wife, is apparently the last of a once much larger group inhabiting the area near Lake Minchumina. Telida has been at its present location since 1916. Herron gave the population of (Old) Telida in 1899 as 17 persons, and estimated Carl Sesui as having been about 5 years old at that time (Herron, 1900, p. 67).

The present population of the communities of Nikolai and Telida totals approximately 100, 86 of whom reside in Nikolai. Of this 100, 66 are under the age of 20, and 32 of these attend school. With the availability of modern medical care, families tend to be large, sometimes as many as eight surviving children, but with an average of between four and five.



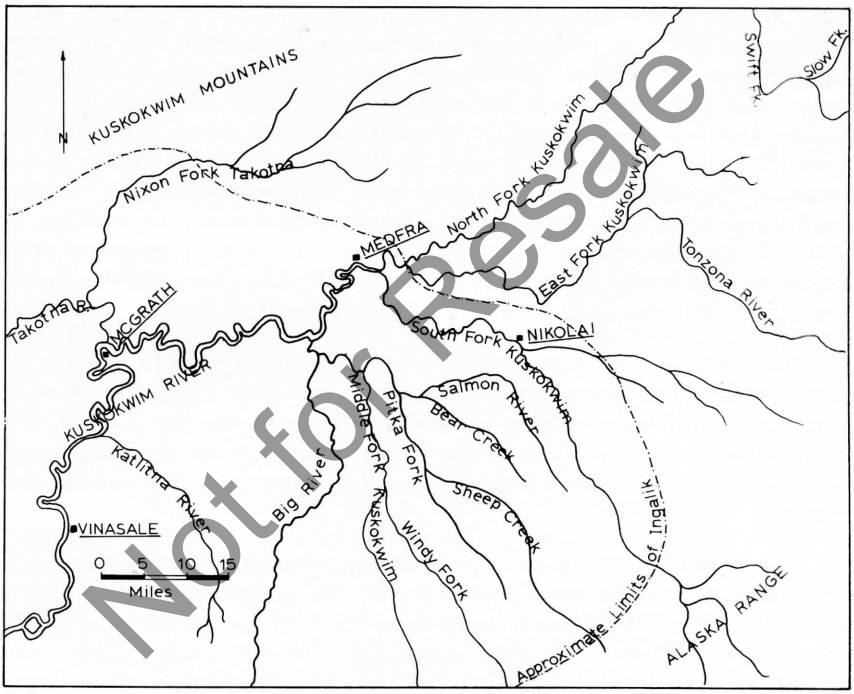
MEDFRA AND VICINITY

The region of the upper Kuskokwim River and its many tributaries is a wide, flat, forested alluvial plain, marked occasionally by low, rolling hills. There are numerous streams of varying size, often quite wide, generally draining to the northeast from the foothills of the Alaska Range until the base of the Kuskokwim Mountains is reached. Here, the main body of the Kuskokwim River trends southeastward, emptying ultimately into Kuskokwim Bay, some 600 miles away. North of Vinasale, the rivers are generally slow-moving and sinuous, often doubling back on themselves, with innumerable sloughs and abandoned channels. Heavy summer rains and moderate winter snows are typical, and the temperatures generally range from —50° in the winter to 80° in the summer. The aspect is such that cross-country travel is unfeasible except in winter, and most summer transportation is by water. There is good spruce of considerable size, as well as much birch and poplar, and numerous shrubs and smaller plants. Fish obtained from the streams and lakes are primarily whitefish, grayling, some trout, and in season, varieties of salmon. Animal life includes black and brown bears, moose, a few scattered caribou herds, wolf, fox, wolverine, lynx, martin, beaver, and rabbits, among others. There are also numerous varieties of birds. During the summer months, daylight is almost continuous, with periods of dusk lasting from 10:00 pm until 2:00 a.m. Permafrost is found in much of the area, at a depth of from two to six feet.

There are no year-round roads on the upper Kuskokwim, except for short stretches near towns, military facilities, and some of the larger operating mines. All transportation is either by air, or on the rivers. McGrath and Medfra are supplied largely by barges, which ascend the Kuskokwim during the summer months, but air transport is becoming increasingly important.

The population at Nikolai represents the remnant of a formerly much larger and more widespread population in the upper Kuskokwim region. Within the last 40 to 50 years, habitation sites have been abandoned at Big River, Vinasale, Slow Fork, the Tonzona, the Takotna, Salmon River, and the Nixon Fork of the Takotna, as well as earlier locations of the villages of Telida and Nikolai themselves. Some of the residents of former villages at Vinasale and on the Takotna River moved down the Kuskokwim River, but the majority moved to Nikolai village because of kinship affiliations. This has been the end result of the decimation in numbers caused by diseases such as diphtheria and smallpox, shortly after the first contacts with Americans around the turn of the century. Most of the abandoned communities were reduced to but one or two families, who continued to live there until the older people died.

It is apparent, from ethnographic evidence and linguistic affiliations related by informants, that at one time, there were two distinct groups of



AREA OF MCGRATH INGALIK

Indians in the upper Kuskokwim region. One of these, in an area extending from the South Fork of the Kuskokwim River, south to the region of Stony River and Sleetmute on the lower Kuskokwim, was most closely affiliated with the Ingalik of the lower Yukon River regions of Holy Cross, Anvik and Shageluk. The second group, from about the Tonzona River north to Lake Minchumina and the upper Kantishna River, although linguistically close to the Ingalik, was seemingly more nearly related to Indians of the Tanana region and the middle Yukon River. In addition, there is evidence that a small group of Koyukon Indians from the Yukon River settled near Lake Minchumina about the middle of the last century.

The above indicated dichotomy agrees with a statement of G. B. Gordon (Gordon, 1917, p. 201) regarding a division between Indians below the South Fork of the Kuskokwim River, and those further north.[3]

PAST AND PRESENT CULTURE

Seasonal Round

Today, in the spring, shortly before or after the river ice breaks up, families without school-age children leave Nikolai and travel downstream in their boats to the vicinity of Medfra. The remainder follow in early June, at the end of the school year. Near Medfra, usually scattered at wide intervals for two or three miles on both sides of the river, the Indians set up their summer fish camps in groups of two or three families related through brothers or sisters. Dwellings consist of canvas tents, one to a family, and in addition there is usually a small canvas bath house, an open smoke house with a canvas or metal roof, and sometimes a small cache. The dog teams, usually five or six dogs per family, are staked out at intervals about the camp, and skiffs with outboard motors are usually moored a few yards from the tents. The tents, as with the cabins at Nikolai Village, invariably face the river. The groups customarily remain sedentary until early September.

The Indian families usually return to the same fish camp site for several summers, and the location is considered to be the property of the families occupying it. Changes of location, however, occasionally are made in midsummer because of a relocation of fish wheels, or due to minor strife between neighbors.

[3] Gordon states that "the traditions of the Sikmuit [i.e., Sleetmute] . . . pointed to the Upper Kuskokwim, and away from the Yukon. . . . They occupied the Kuskokwim Valley from the point where the Eskimo held them in check up to the Istna [South Fork of Kuskokwim] and including that stream. They were in touch with and closely related to the Minkhotana who occupied the Lake Minchumina country, the Upper Kantishna River, and the upper Kuskokwim. . . ."

Upon reoccupation of a site in the spring, the men return the fish-wheels to the river. These are drawn up on the banks during the winter, to prevent damage from the ice jams. Each family has at least one fish wheel, and usually more than one. Until the salmon run in the early fall, however, these collect only a dozen or so fish a day, mostly whitefish. Fish wheels were introduced into the Kuskokwim River region about 1910-1920, by Americans. They are large, paddle-wheel affairs, constructed of peeled saplings, scrap lumber, and chicken wire. They are turned by action of the current, and dip fish swimming upstream into baskets. Fish wheels are most often placed on the outside of a curve in the river, where the water is usually deepest and swiftest, and are generally located within walking distance of the fish camp.

In former times, weirs in conjunction with fish traps were employed, and stationary gill-nets are still used by some, although the latter are no longer made by the Indians themselves.

Despite the fact that the river near Nikolai is narrower than at Medfra, and thereby a better location for fishing, the people travel downstream to Medfra. In part, this is in order to be close to the store and post office located there. More important, however, is the fact that once the fish-camps have been set up, and fish wheels repaired and placed in the river, the men have little to do until early August, when the salmon run begins. They therefore are free to take summer jobs in McGrath and elsewhere, particularly with the Forest Service fire crews. The presence of a radio-telephone and an airfield at Medfra facilitates their apprisal of, and transportation to, areas where work is available.

In early August, the men of Nikolai who have been working, return to their fish camps and prepare for the salmon run. At this time, they may cut winter wood for the few whites in the area, and for shipment by barge to McGrath. In addition, they may build new fish wheels, tend a few small garden plots, and hunt. Berries ripen at this time, and the women and children usually spend several days gathering them.

During the salmon run, the fish are cleaned and split, and then either dried in the smoke houses, or salted in barrels for winter use. Fish are now used primarily for winter dog feed, the people subsisting largely on purchased staples.

In September, with the onset of cold weather, the McGrath Ingalik return to Nikolai village, and the children return to the school there which has been in operation for five or six years. At this time also, they harvest their small garden plots at Nikolai, which they have tended from time to time during the summer. The crops grown are primarily potatoes, with some rhubarb, lettuce, carrots, onions, and turnips. The amount of land culti-

vated, however, is generally small, and the average plot for a family is only about 20 feet square.

In preparation for the winter season, dog harness is mended, dog sleds and snowshoes constructed or repaired, and prior to the river's freezing, boats are removed from the water, painted and repaired. Some wood for winter fuel may be cut, but this is customarily obtained only as needed, since anyone with a large supply of wood soon loses it to his neighbors and relatives.

In the fall, some hunting is done, mainly for moose and ducks in season, and preparations are made for fur trapping. The furs thus obtained are primarily beaver, although numbers of other skins are also obtained. With a full limit of 20 beaver skins, a family can expect to add several hundred dollars to their income. Although the prices for fur fluctuate, large prime beaver pelts bring as much as twenty dollars in McGrath or Medfra. The men follow set trap lines, usually the same one every winter. The region is, however, beginning to be trapped out, and the Indians are finding it necessary to go far afield to obtain results. The trap lines are run by dog team, although there has been a tendency for the more affluent men to have their supplies flown out to the trap line. Most families have at least one dog sled, to which the teams are hitched in tandem.

During the early spring, little is done at Nikolai aside from some occasional hunting and trapping, and periodic trips by dog team to Medfra for mail and supplies. The people are usually impatient for warmer weather, and at the first sign of thaw or spring breakup, several families will immediately prepare to leave for their summer fish camps, although it may be several weeks before the snow leaves the ground.

The above seasonal round is quite different from that which was observed in earlier times. Up until some 40 or 50 years ago, it was the practice of the Nikolai group to travel in the early spring from their village, then located several miles further upstream, to the mouth of Big River to the south. There, they would be joined by relatives from Vinasale, and the people would then travel by dog team southeastward toward the Alaska Range, reaching the foothills prior to the spring breakup of the river ice. This group would then spend the summer in the foothills, traveling northeastward across the upper reaches of the Middle Fork of the Kuskokwim River, Windy Fork, and Sheep Creek. During this time, the Indians would hunt and fish, drying the meat for winter use. By fall, prior to the onset of freezing weather, the group would have reached the headwaters of the South Fork of the Kuskokwim. Here, they would build bull boats of caribou hides stretched over a sapling framework, load their summer's catch, and return downstream to their villages.

That this was a general aboriginal practice for the region is indicated by the statements of Mr. Bob Stone, a white resident of the area for some 40 years. He stated that in his earlier days, he saw numerous abandoned summer campsites on McKinley and Foraker Creeks in the Kantishna drainage, often with moose blinds still in place on the sand bars.

McGrath Ingalik informants stated that it was also a general practice, in former times, for Eskimos from far down the Kuskokwim River to ascend to the Alaska Range to hunt caribou. This was done in the spring by means of the Stony River Drainage. Upon reaching the foothills, these Eskimo would also spend the summer months hunting and drying the meat for winter use. They would move north to the headwaters of Big River, and occasionally as far as the South Fork of the Kuskokwim River. There, in the fall, the Eskimos would construct sewn-skin boats, and descend to the Kuskokwim River and their own villages to the south. Contacts between Eskimos and the McGrath Ingalik were few and peaceful, however, and the Eskimo boats usually drifted past the Ingalik villages without stopping.

Technology and Housing

Summer tents are made by the Ingalik women from canvas yardage purchased at Medfra or McGrath. A widower or bachelor will usually have one made for him by a sister or other relative. These are well-made tents, and average 8 x 12 feet in size, with a 6 foot peak. They have a pitched roof, straight side walls, and stand firmly against the often strong summer winds with the aid of a framework of saplings. The floor of the tent is covered with spruce boughs, which are renewed regularly. A small metal cooking stove is placed near the entrance of the tent, and blankets, sleeping bags, and extra clothing are placed on the floor at the rear of the tent.

The winter cabins at Nikolai are generally constructed of unfinished and, more recently, three-sided logs. The cracks are chinked with clay and moss, and the pitched roof may be of sod, or covered with flattened gasoline cans, tar paper, or corrugated iron. The single room is an average 12 x 20 feet, and there is a plank floor. Dirt is usually banked about the exterior of the house to a height of 1 or 2 feet to conserve heat, and the windows are usually double-paned. Furnishings usually include a table, two or three chairs, a cast-iron cooking stove, and a large steel-drum stove for heating. In addition, there are two or three low wooden shelves which serve as beds, and often an old army cot as well. Bedding consists of blankets and sleeping bags, with the parents' bed often screened off by a curtain. On shelves and in boxes are stored foodstuffs, clothing, cooking utensils, rifles, traps, and other items. On the rafters are often placed harness, snowshoes and sleds in various stages of construction, and lines for hanging clothes.

Most families own gasoline-powered washing machines, gasoline lan-

terns, gasoline-powered chain saws, and battery-operated phonographs and radios. All of these items are generally carried with them during the seasonal changes in residence.

The men and older boys take steam baths at all times of the year, daily whenever possible. At the summer fish camps, a low sapling framework from 4 to 5 feet square is covered with canvas for this purpose. Inside, stones are heated in a fire or on a stove, and water is poured over the hot stones to produce steam. At Nikolai, the bath house is a low log structure, about 5 feet high and some 10 feet square, with one low door and a small window. Within, a steel drum stove is nearly covered with boulders and cobbles brought from several miles upstream. Along the walls of the bath house are low wooden benches upon which the men sit while bathing. Ravenwing fans are used for cooling. Due to the drying effects of the intense heat, the bath house periodically burns down, and a new one is then erected by the cooperative effort of the men of the village. In former times, after taking a steam bath, the men would run and dive into the river. This is no longer done, however, apparently due to fear of acquiring colds.

The McGrath Ingalik, although increasingly dependent upon manufactured items for their subsistence, are still skilled at a variety of crafts. In the processing of hides, for example, the women are quite adept. After a moose is skinned, a paste is made of moose brains and water, and this is spread over the skin. Then the flesh and hair are scraped off. The process is repeated until the skin is free of hair and reduced to the desired thickness. When the skins of fur-bearing animals are processed, the fur is of course retained. The skins are then closely hung over a smoke fire of rotten wood placed in a pit, so as to allow as little of the smoke to escape as possible. The smoking process is essentially for color, and imparts a deep brown hue and a pleasant smoky odor to the leather. From prepared skins, the Indian women make moccasins, gloves, caps, small bags, and other items, mostly for sale in the stores at Medfra and McGrath.

Babiche, or rawhide line, is cut by the women from untanned moosehide, and is used in lashing together dog sleds, and in the stringing and lacing of snowshoes. The women also manufacture birchbark baskets sewn with spruce roots. These are very well made, and are used for a variety of things, such as sewing baskets, trinkets, small articles of loose clothing, and in former times were used for stone boiling.

Material for the construction of sleds and snowshoes by the men is obtained by splitting spruce wood. After the wood strips are roughly carved, they are steamed until pliable, bent to the desired shape, and hung in the cabin until dry. Although the sleds are primarily held together by lashings of babiche, points of stress are strengthed by the use of bolts and other metal fastenings. Sled runners are made of imported ironwood, metal runners

proving unsatisfactory at the extreme temperatures encountered in this region.

Bows and unfletched, side-notched arrows are still made by the men for children, but are no longer used for hunting. Game and furs are now obtained with rifles and steel traps. A few of the older men of Nikolai, however, can recall when the only weapons available to them were cap-and-ball rifles, and most hunting was done with bows or long lances. Deadfalls and snares are still sometimes employed, although rapidly falling into disuse in favor of the more easily handled steel traps. Most men have a variety of rifles and shotguns and are excellent marksmen.

Although pottery is no longer manufactured by any of the McGrath Ingalik, it was used within the memory of the older people. I was shown a place on the bank of the Kuskokwim River where the proper type of clay was obtained, and informants stated that beaver hair was always added to the clay as a temper.

The Indians build their own flat-bottomed boats, generally from commercial lumber. These are usually from 15 to 20 feet long, with a beam of from 3 to 4 feet, but are occasionally larger. In addition, they build canvas-covered hunting canoes. The McGrath Ingalik formerly made canoes of birchbark over a framework of spruce, caulking the seams with spruce gum. They deny, however, ever having made sewn skin canoes, although they were known from the lower Kuskokwim River.

Canoe paddles are today crudely carved from a single piece of spruce, and have a flat, squarish blade. One older paddle, however, was beautifully fashioned with a thin, concavely curved, and ribbed blade. This construction was in order to insure silence while hunting from a canoe.

Economic Life

The McGrath Ingalik are well integrated into our money economy, and depend upon furs and summer work for the bulk of their income. State aid also plays an important part in their economy, with old age assistance and aid to dependent children amounting to over $1000 a month. The average yearly income of an Indian family at Nikolai is from $1700 to $2000 a year.

The Indians obtain a substantial amount of their subsistence from the environment, including game, fowl, fish, and berries in season, but they purchase the bulk of their food from the store at Medfra. Staples include flour, sugar, canned goods, coffee, tea, butter, eggs, bacon, and powdered milk. Except for some articles of winter wear, all clothing is also purchased either at Medfra or McGrath, and occasionally also through mail-order houses.

As a result of this dependence upon the stores for most of their needs,

and the sporadic nature of their income, most things are purchased on credit, and the Indians usually have a standing debt of from $50 to $200. In addition, they rarely buy large quantities of food, preferring to make frequent trips to Medfra, even during the winter months.

Religion

Religion plays an important part in the lives of the McGrath Ingalik, and the Greek Catholic Russian Orthodox church in Nikolai village, a rather imposing frame structure, is a source of community pride. The regional priest, an Eskimo, visits Nikolai only once or twice a year, and the people look forward to his coming. Whatever the time of year, the Indians drop whatever they are doing at the time, and if away from the village, return for a week or more of services. While the writer was in the area, the priest arrived for a visit, and everyone, including those who were working at McGrath, went to Nikolai Village. Only one or two young people were left at Medfra to tend fish wheels and dog teams.

The people are generally very devout and have icons and religious pictures on the walls of their cabins. During the winter, in the absence of the priest, weekly services are conducted by a lay reader, who also performs baptisms and burials when necessary. Weddings, however, are conducted only by the priest.

All marriages are now sanctified by the church, although this was not the practice in the past. In recent years, pressure has been brought to bear by church officials and the territorial marshall, requiring both civil and church marriages. This was at first resisted by some of the men at Nikolai, however, as prior to this time they could divorce their wife by simply leaving her and taking another woman. When the priest informed them that those couples that had not been properly married could not attend church services, however, the men eventually complied.

At the present time, only one polygamous marriage exists, and all evidence indicates that it was always a rare circumstance. In the present case, the first wife is a legal one, the second, common-law. This situation was brought about by the failure of the first wife to produce any children. Although the first wife at first protested vigorously, she is now apparently reconciled to the situation. However, as a consequence of this second marriage, the man concerned has not been considered to be eligible for church or village offices, although his age (55) and the fact that he is the son of a former chief, would otherwise qualify him.

Under the influence of the priest and local white residents, arranged marriages are no longer common, although attempts are still half-heartedly made in this direction. On the whole, young people, especially the girls,

exercise free choice in marriage. Unwed mothers are fairly common, but there is apparently no stigma attached, nor is this a bar to later marriage. In former times, most marriages were arranged, often while the parties concerned were very young. Marriage to a maternal first cross or parallel-cousin, formerly the preferred one, is no longer practiced. This relative remains a "joking relative", however.

In earlier times, when a person became ill, his relatives simply surrounded him with candles and religious pictures, and waited for him to either get well or die. In recent years, however, with the increased use of the airplane and the availability of medicines, many of the Indians now go to the Bureau of Indian Affairs Hospital in Anchorage, often even for childbirth.

The church has been a strong influence, since the first missionaries in the early twentieth century, in doing away with native beliefs and folklore. The answers to most inquiries concerning the religious beliefs and practices before the advent of the Russians were vague. Statements were usually to the effect that at that time, the Indians were ignorant of laws and of God, and did not know that what they did then was wrong. As an illustration of this, one informant stated that the Indians did not know that it was wrong to cremate the dead, until the missionaries told them that the dead should only be buried.

Informants consistently stated that prior to the coming of the church, the general belief was that a person just died and that there was no spirit or afterlife. Such statements, however, do not agree with other of their beliefs. For instance, it was related to me in another context that when a person came from another village with news of a death, ashes were scattered across his trail to prevent the dead man's spirit from following it. Also, when a child died soon after birth, it was believed that his spirit would reappear in the next child to be born in the village.

Education

A school, under the auspices of the Assembly of God Church, has been in operation at Nikolai for the past several years, and the majority of the children under the age of 18 have a reading and writing knowledge of English. Many of the older adults as well, having either taught themselves or attended some school during the winters, read and write, some quite well. As a result, English is rapidly replacing the aboriginal language as the vernacular of the younger generation, and the speech of all the Indians is generously interlaced with English words. It is possible that English will almost completely replace the aboriginal language within the next 30 years. A contributing factor in this is the fact that all school work is conducted in English.

At the present time 32 pupils are attending school, all grades being taught together by a single teacher until the eighth grade. After this the boys usually no longer attend school. Where it can be afforded, however, some of the girls attend high school in Anchorage. This has tended to result, in recent years, in some girls remaining in the larger cities, not returning to Nikolai except perhaps to visit their parents.

Because of religious conflicts, the adults of Nikolai have, in the past, driven out some of the school teachers, and at other times kept their children from attending school. However, due to a growing realization by the parents of the importance of reading and writing, particularly for getting better jobs during the summers, combined with the practical desire to have the children kept busy during the long winter months, they now make their children attend. The Orthodox priest has also been instrumental in urging the Indians to send their children to the school, and in smoothing over the religious question.

Socio-Political Organization

Little information was obtained on the past kinship and descent systems, apparently due to their no longer being present as functional elements. Residence tends to be initially matrilocal after marriage, with some semblance of bride service, until the husband can build his own cabin. Indications are also that this was generally the rule in the past. Descent is patrilineal, and this also seems to have been the case in former times, with the chieftainship sometimes passing from father to son. However, the choice of a chief at the present time depends more upon personality and leadership qualities than anything else.

Status and rank depend upon age, wealth, generosity, and often upon whether one has an ancestor who was a chief or other leader. Persons who have no children, or who were born outside of Nikolai Village, sometimes have a rather low position in the village status structure.

The governing body of Nikolai Village is a tribal council made up of a chief, a sub-chief or "marshall", and all the adult men of the community. Through this, the village is self-governing, only major crimes and problems being referred to external authorities. The chief and sub-chief are elected by the council, and hold their positions until removed. The present chief is 77 years old, and has held this position for 40 years. Prior to that time, he was sub-chief. There is also a sub-chief at Telida Village, subordinate to the chief at Nikolai.

This village organization is one which has been adopted by the McGrath Ingalik since Russian contact, and informants state that they formerly had no chiefs. Instead, the villages were directed by the older and wealthier

men. The present tribal council is generally an effective organ of self-government. In a recent case of theft by one of the young men of the village, pressure by the tribal council caused the man to return the stolen articles and turn himself in to the state authorities. A year or two ago, when the sale of alcoholic bevarages at Medfra was causing a good deal of drunkenness in the village, the people under the leadership of the chief requested the state not to renew the beverage license of the store owner.

The inhabitants of Nikolai are in general a cohesive group, with nearly all adults belonging to one of three families, and there are in addition several instances of brothers married to women who are sisters. However, some animosity is often shown to persons who were not born in Nikolai or Telida. One Eskimo from the lower Kuskokwim River, recently married to a girl from Nikolai, was constantly subjected to vocal and physical abuse. As a result, the couple has left the village, and now are living at Medfra. Another inhabitant, an Ingalik born in another village, was discriminated against over disputed rights to the inheritance of a cabin. This man now plans to move his family to Telida Village, and further stated that he felt he was generally ostracized because he was poor and not faithful in attendance at church.

A basic feature of the village social structure is the great degree of sharing and cooperation that is expected of its members. Should one of the villagers have extra food, wood, money, or gasoline, and not offer to share it with the rest when needed, he is looked upon as stingy and mean. Similarly, when an Indian contracts with someone for cutting wood, it is expected that he will ask all of his neighbors to share the work and profits. An individual who consistently works alone and shares little is not considered to be a good member of the village, and his voice on the village council is generally ignored. The unity of the sibling groups in Nikolai, however, which cut across almost every family line, tends to keep such divisive frictions at a minimum.

Ritual Observances

The Orthodox Church has strongly opposed many of the aboriginal ritual observances, and most of them are no longer practiced or even remembered clearly. A few practices, however, remain from earlier times. One of these, still practiced by most families, is the sequestration of girls when they reach puberty. As it is now practiced, this consists of what the McGrath Ingalik call "going into the corner". At her menarche, a girl is hidden from the view of men behind a screen or blanket, in a corner of the cabin or tent. She is kept here for a period varying from a few days to several weeks. During this time, she may eat no fresh fish, meat, or berries, and may not leave the cabin during the day. The girl feeds herself from special

dishes, and the food is prepared for her by her mother or other female relative. There is apparently no restriction on her touching herself, however. In addition, no restrictions are placed on subsequent menstruations. Nursing mothers, however, are also forbidden fresh foods.

Another practice, still very strong, is that of a taboo against bears for all women of child-bearing age. Women may not eat bear meat, sleep or step on a bearskin, or walk on the ground where a bear has been slain. When a bear is killed, care is taken by the men to allow none of the blood to fall on the ground where a woman might inadvertently step on it, such as near a camp or on a trail. It was stated that should a woman do any of these things, she would not be able to bear children. In addition, a pregnant woman would become ill, and the unborn child would be aborted.

Some minor rites are still practiced by the men in handling the bodies of certain animals. When an otter is killed or trapped, it is skinned, and the carcass is suspended in a tree. It may not be thrown on the ground, nor may it be eaten. The same treatment is accorded caribou and moose bones, except where these are used in manufactures. Similarly for a wolf, after the animal is skinned the carcass is cut into several pieces, these are then suspended in a tree. When asked the reason for these customs, the reply was only "that is the way we always do". The practice in connection with wolverines, however, is more complex. While skinning it, a weapon of some kind, such as a knife, must be placed on the ground beside the animal. The carcass is also disposed of in a tree, and may not be eaten. When asked the reason for this placement of a weapon beside the animal, the answer was that it was in order to "protect" the hunter.

The McGrath Ingalik have several ways in which they attempt to make it stop raining. One of these is to kill a "camp-robber" (Canada Jay), pluck the head clean, and then throw the bird into the river. Another method is to place ashes in the bottom of a birchbark basket, build a small fire in it, and set it adrift in the river. Still a third way is to burn a raven in a large fire, or to simply burn a tree which contains a raven's nest. As with the wolf and wolverine, ravens are never eaten.

Although no longer practiced, the potlatch was formerly an important part of Ingalik ceremonial life. These were usually held during the winter months, and were apparently of two basic types. In one case, potlatches were held which were essentially feasts, and to which members of neighboring villages would be invited. At these feasts, which lasted several days, quantities of foodstuffs would be consumed and given away, and presents or gifts of various kinds presented to visitors. It was considered an honor to give such a potlatch, and invited guests were then under an obligation of reciprocity. When asked how often such potlatches were given, my informant answered "whenever there was too much stuff to give away".

A second type of potlatch was held as soon as feasible after the death of a member of the village. These were not generally given for a child, but upon the death of an old and wealthy man, the ceremony, described as a "happy time", would last several days. At this potlatch much food was eaten, and all of the possessions of the deceased would be distributed by relatives to the other members of the village. Distribution was according to rank, which was based primarily on age, and if the deceased had owned a rifle, it was always presented to the oldest man in the community.

An informant born on Slow Fork, a tributary of the North Fork of the Kuskokwim, stated that potlatches were held with villages at Telida Lake, Lake Minchumina, Birch Creek on the Kantishna, and further north, but not with groups to the south.

Legend and Folklore

Numerous stories relate the power and abilities of shamans in former times. Shamans apparently served both as medical practitioners and sorcerors. Curing ceremonies involved chanting, trances, and beating on a tambourine drum. "Seances" were also held in which the shamans would go into a trance, voices would be heard, and objects such as the drum and paddle would be seen to fly through the air. Rival shamans would occasionally "fight" each other, performing tricks such as swallowing live coals, and testing each other's "spirit power". One informant stated that the loser of such a battle lost his life. A second, however, stated that when a shaman lost one of these "games", he forfeited the life of a near relative, who soon sickened and died.

As recently as a few years ago, there was a man who claimed to be a shaman living at Nikolai Village. It was reported that he was generally respected and feared by the women of the village, but apparently most of the men failed to take him seriously. The older Indians of the village said that in former times, shamans were powerful men, greatly feared, and able to cause death among their enemies. It was further stated, however, that they did not appear to be too successful in curing illnesses, and that present-day shamans aren't really medicine men, because they lack the "power".

One story told concerning a shaman at Vinasale, a grandfather of one of my informants, was that when he died, his body remained warm for several days. The shaman's brother, upon observing this, then went to the old man's canoe and "killed" it by slashing it with his knife. It was related that the body of the shaman then turned cold and rigid.

Another story from Vinasale tells of an Indian who had an argument with a shaman. The shaman became very angry and threatened the man's life. The man laughed at this and walked away from the shaman. Later

this individual went out hunting, and while he was descending the slope of a hill (the location was very carefully described), he observed a large whirlwind, full of dust and leaves, coming directly towards him. Believing it to be the shaman coming to kill him, he fired both barrels of his rifle into it, after which it dissipated. Upon returning to Vinasale, the Indian discovered that the shaman had died during his absence. The obvious connection was made, and the area where the shaman had been "killed" was thereafter carefully avoided.

In former times there was apparently a considerable amount of feuding and raiding carried on by the occupants of the upper Kuskokwim River region, both among themselves and with groups on the Yukon River. Villages especially reknowned for this were Vinasale, villages on the Takotna and Salmon Rivers, and villages near Lake Minchumina.

One traditional tale concerns the village at Salmon River, now abandoned. It is said that this community was once headed by an Indian who was attempting to establish a reputation for himself as a powerful war leader. He had many followers who wore wooden slat-armor above the waist and raided other villages for women, killing all of the men. This leader was finally stabbed to death in his sleep by two brothers seeking revenge, and his warriors were allowed to go free.

Another story is about members of the village of Vinasale, and a village on the lower Takotna. In retaliation for raids across the Kuskokwim hills by Indians living on the Yukon (said to be Koyukon) all of the men who had had relatives killed took part in a war party to the Yukon and Innoko rivers. This group crossed the Kuskokwim Mountains and descended the Yukon, raiding and burning villages as they went. At one of these, the Ingalik war party killed a powerful shaman. In order to prevent his spirit from harming them, they cut open his body and ate parts of his internal organs, thus acquiring some of his power. The raiding party descended the Yukon to the Kuskokwim portage, and eventually returned up the Kuskokwim River to their villages. My informant's maternal great-grandfather participated in this raid, and the approximate date may thus be fixed around the middle of the nineteenth century.

Carl Sesui, who states that he is the last of the original inhabitants of Telida, tells the following story concerning the origins of the occupants of the upper Kuskokwim River in the area of Lakes Telida and Minchumina. Sometime during the last century, while the original inhabitants of this region still lived in semi-subterranean pit houses, a large band of Indians from the Yukon River (possibly Koyukon) surprised a hunting party from a village near Lake Minchumina. The group from the Yukon attacked and killed all members of the hunting party, then split up into small groups to avoid pursuit and headed back to their villages on the Yukon River. One

band of men came across the village of the group they had ambushed and discovered two sisters hiding there. These men remained, married the sisters, and founded the village of Old Telida. It is claimed that all of the people in the Minchumina area came from this village.

Another story concerning origins is one told by an old Indian born on Slow Fork. He stated that when he first came to live at Old Nikolai Village (some 25 miles from the present location), there was a very old man living there whom everyone called "grandfather", and who was considered to be a more or less closely related ancestor to nearly everyone in the village. This old Indian, who had originally come from Vinasale, told my informant that all of the people then in the upper Kuskokwim region were descended from some originally from the Holy Cross region on the lower Yukon River. He also said that these people came across the mountains and first settled on the Takotna River and at Vinasale on the Kuskokwim.

Conclusions

Because of the conflicting evidence and disruption caused in the Kuskokwim River region by disease within the last century, I do not feel that it is possible at this time to delineate precise ethnic boundaries for the area. This region has been one of settlement, migration, and conflict, and what were once at least two, and possibly three different Athabaskan groups, make up the present population of the region.

McGrath Ingalik born in Vinasale before its final abandonment some 20 or 25 years ago, showed a much greater agreement in vocabulary with the Anvik-Shageluk group of Ingalik than did informants born further north on the Kuskokwim.[4] In addition, an informant of 32 years of age from Vinasale identified nearly all illustrations of material culture elements by name and correct usage and volunteered the information that he had seen his parents and grandparents employ most of them (Illustrations from Osgood, 1940). A much older informant, born further north, was not nearly so successful, however, and stated that the objects pictured "looked a little" like things he remembered being used, but that the ones he recalls were different in some respects. Some items, such as sled and snowshoe types, this latter informant immediately identified as being common to the lower Kuskokwim and Yukon rivers.

Indians from the northern part of the upper Kuskokwim tend to show a stronger affiliation with groups to the north in the Tanana and upper Yukon rivers as evidenced by claimed linguistic similarities and exchanges

[4] This list was taken from Osgood's "Ingalik Material Culture", pages 459-477. Only words agreeing closely with Osgood's orthography were considered valid, as many Athabaskan words in Alaska have a wide distribution with only slight sound shifts.

of potlatches, and by a tradition that they originally came from "upriver", i.e., the northeast.

It is probable that at some time in the early nineteenth century, an Ingalik group from the lower Yukon River crossed the Kuskokwim Mountains and settled at the mouth of the Takotna and at Vinasale. That the region was already occupied, possibly by Tanana Indians, is probable, and possibly indicated by the stories of warfare between villages in the upper Kuskokwim area. The Ingalik then expanded south to the area of Sleetmute, but apparently did not move much beyond the South Fork of the Kuskokwim River in the opposite direction. But that they did go at least this far northward is supported by stories of the original inhabitants of Old Nikolai Village coming from Vinasale.

The original inhabitants of the area north of the South Fork of the Kuskokwim were probably also Tanana Indians, but here again we have the story of unidentified invaders from across the mountains to the east settling at Telida Lake, apparently about the middle of the nineteenth century. This latter story, moreover, was unknown to the informant born at Slow Fork.

It is possible that further archaeological work on known sites in the Minchumina and Telida region, as well as elsewhere in the upper Kuskokwim drainage, may shed some light on the above problems. However, the writer feels that at this time it is possible to conclude that the McGrath Ingalik are closely related to, and ultimately derived from, Ingalik Indians on the lower Yukon River. Also, that the true McGrath Ingalik probably never extended much beyond the South Fork of the Kuskokwim River, and that the region to the northeast of this was probably originally inhabited by groups closely related to the Tanana Indians to the north.

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