

Prehistoric Cultural Contacts in Southwestern Alaska

Archeology makes possible an explanation of
early cultural change on the Alaska Peninsula.

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The background of the Eskimos, with their spectacular adaptation to the Arctic coasts, has been of special interest ever since they were first encountered by Europeans. People of pronounced Mongoloid appearance, they and their cousins the Aleuts constitute the entire body of speakers of languages of the Eskaleutian linguistic stock, a division apparently genetically distinct from any other major language stock of the New World, yet one probably related, not too distantly, to languages of northeast Asia (1). For these reasons, the Eskimos have generally been thought to be among the latest aboriginal immigrants to the New World.

Although their ultimate origin has been sought in various places, several students have argued that the New World region of prime importance to Eskimo prehistory is the Alaska Peninsula in southwestern Alaska, both because the real center of their population strength lay there and because the major cleavage within the Eskaleutian language stock occurs there—between Eskimoan on the one hand and Aleut on the other. Since 1960 the northern part of the Alaska Peninsula has been the focus of archeological research sponsored by the University of Oregon. This article summarizes some results of that work.

Distribution and Subsistence

At the time of the earliest European contacts, which occurred over several centuries but were largely completed by A.D. 1900, Eskimos were spread across the northern edge of North America from the Alaska Peninsula, at

about Port Heiden (Fig. 1), to the northern portion of the Gulf of St. Lawrence and northern Newfoundland, and occupied the coast of Greenland. Both their eastern and western boundaries within North America coincide very closely with those of seacoasts that freeze in winter or that receive substantial amounts of drift ice. Indeed, Eskimos may be said to have occupied all the coastal strip of North America that was consistently iced-in during winter and that was occupied by any humans at all, with the exception of the south shore of Hudson Bay. This distribution closely parallels that of another inhabitant of Arctic coasts, the walrus (2).

In this area, Eskimo economy included, for the most part, a relatively balanced reliance upon game of the sea and game of the land. Some sea-oriented specialization occurred in a few of the Alaskan villages where geography permitted the regular taking of large whales—at Wales, Point Hope, Barrow, and some others, all of them located on points of land projecting into the sea between Bering Strait and Point Barrow. Along major rivers of Alaska, substantial reliance was placed upon anadromous fish, and some Eskimos lived far upstream. And in two regions in particular—the Brooks Range of northern Alaska and the Barren Grounds of Canada—Eskimos concentrated upon caribou hunting. But in virtually all of the relatively inland areas people still relied upon sea products, particularly sea-mammal oil, obtained either by trade with coastal Eskimos or by periodic coastward hunting trips. The only exception was a small group of people of the Barren Grounds—some of those called Caribou Eskimos—who apparently used no sea products at all. In much of the area, winter subsistence

depended to some extent upon fish or sea mammals taken through the sea ice (3).

The origin of this subsistence pattern has been interpreted in different ways. Some students have argued that the pattern of nonexploitation of coastal products was ancestral—that indeed the Barren Grounds Eskimos represent a survival of the most ancient pattern, which was altered only as the people who lived originally in the interior moved northward to the Arctic coast. Most students at present, however, think that the modern cultural unity of the Eskimos is based upon an archeologically evidenced migration of people of the sea-mammal-oriented Thule culture, who moved from northern Alaska to Greenland around the 11th century A.D. These students interpret the Brooks Range and Barren Grounds concentration upon caribou hunting as a late development—a response by people who earlier had a definite adaptation to the sea coast, but who responded to population pressure and deteriorating environmental conditions by adjusting to resources of the interior (2, 4).

An earlier geographical distribution similar to that both of the Thule culture and of the later, historically known Eskimos is in evidence in another major archeological horizon—the so-called Arctic Small Tool tradition of around 2000 B.C. Specifically, this is taken to indicate the initial spread of people from Alaska to Greenland. In the west, on the Alaskan coast, these people were the progenitors of people of Norton culture, who in turn were the progenitors of those of Thule culture. In the east, these early people were direct ancestors of people of the Dorset culture, who in turn, after A.D. 1000, were met and apparently inundated by people of the Thule culture.

In fact, continuity between the Arctic Small Tool tradition and the much later Thule tradition has not been conclusively demonstrated. Nevertheless, in the interests of parsimony and because of a few evident continuities in tool types, together with an almost identical distribution and presumably a similar ecological adaptation, it has become common to consider these people of the Arctic Small Tool tradition ancestral Eskimos, in a linguistic as well as in a more general cultural sense (2).

In the Aleutian Islands, the earliest radiocarbon evidence from a relatively certain Aleut habitation—at the Chaluksa Midden on Umnak Island—indicates human occupation at about the same

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date, 2000 B.C. Hence it seems reasonable to think that, for at least the last 4000 years, Aleuts have occupied the area from the tip of the Aleutians to the border of winter sea ice on the Alaska Peninsula, and Eskimos have occupied the area from that point north and east around the Alaskan coast, across northern Canada to Newfoundland and Greenland.

A major exception to this coincidence of Eskimos and icy coasts is found south and east of the Alaska Peninsula, in the area of the so-called Pacific Eskimos. There, adapted to the rainy, open coasts of the north Pacific, dwell the Koniag of Kodiak Island and the Chugach of Prince William Sound, people who have much in common ecologically with their western neighbors the Aleuts, but who speak a dialect of Western Eskimo. Linguistically they are close to Eskimos of the Bering Sea, closer indeed than are the Bering Sea Eskimos to their ecologically similar Eastern Eskimo cousins north of Bering Strait (5). The closeness of this linguistic tie raises a question concerning the conditions of relatively recent cultural contact between people of the tundra-bordered Bering Sea and of the open, precipitous coasts of the Pacific—between hunters of the walrus and hunters of the Steller sea lion—across the ecological boundary represented by the Aleutian Range.

It was this question, with its immediate bearing upon broader questions of Eskimo prehistory, that much of the fieldwork of the University of Oregon was designed to answer.

Between 1960 and 1967, work in the drainage of the Naknek Lake and River system on the Bering Sea side of the Alaska Peninsula—both within and outside Katmai National Monument—was directed toward the development of an archeological sequence representative of the Bering Sea coast (see Fig. 1). The bulk of the work was concentrated upon Brooks River, a short, rapid stream between Brooks and Naknek lakes, which, although approximately 40 miles (65 kilometers) from the mouth of the Naknek River, was apparently in seasonal use by Bering Sea coastal dwellers.

In 1964 and 1965, attention was also directed toward the development of a comparable sequence from two sites on the Pacific coast of the Alaska Peninsula, geographically as close as possible to the Naknek system, but located on the opposite side of the Aleutian Range. The sites—Kukak Bay and Takli Island

—are about 20 miles apart and 50 miles from Brooks River (Fig. 1), and, like that site, are within Katmai National Monument.

The two sequences are briefly reviewed here (6). Where two or more cultural phases were defined from excavations in one area, the geographic designator within the phase name is abbreviated: Brooks River becomes "B.R.," Kukak Bay becomes "K.," and Takli Island becomes "T."

The Naknek Drainage

The Naknek drainage sequence consists of eight cultural phases; certain of these are sufficiently similar to one another that it has been possible to group

them into four cultural periods (see Fig. 2). The temporal assignments are supported by 31 radiocarbon determinations directly relevant to cultural material. The sites excavated include a few permanent habitations and numerous seasonal camps. Brooks River, in particular, was obviously chosen by early people because of the ready availability of migrating salmon in the summer, but seasonal caribou hunting was also important, to judge by what little bone waste has survived. I describe the sequence by period and phase, beginning with the earliest.

Kittewick period. This period, lasting from about 2500 to 1900 B.C., consists of the time represented by a single cultural phase, the B.R. Strand phase. The artifacts include chipped scraping

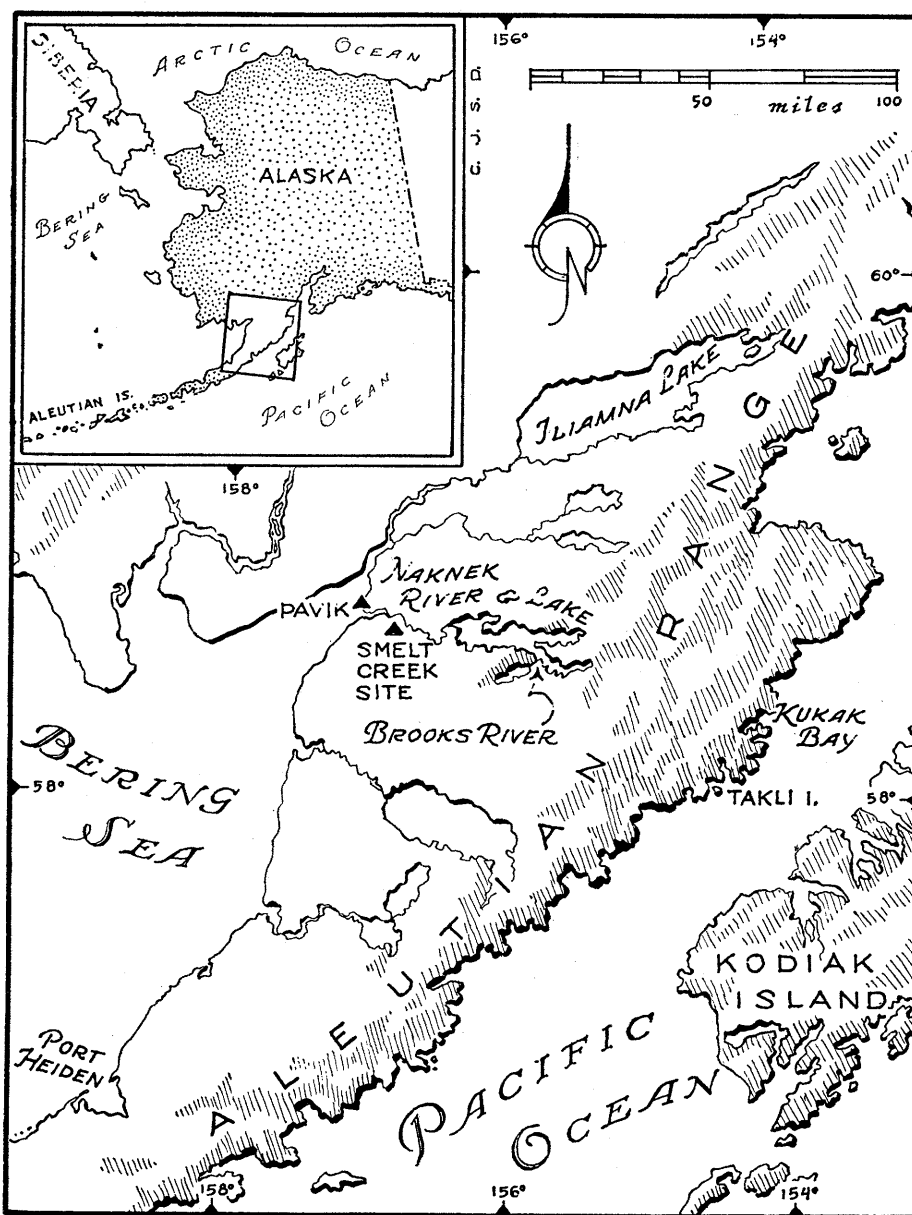


Fig. 1. Map of the northern part of the Alaska Peninsula, showing locations of the archeological work described. [Drawing by Carol Steichen Dumond]

implements and chipped side-notched and leaf-shaped knives showing obvious similarity to implements of about the same time from northern sites with a predominantly interior orientation, such as the Palisades II complex (7), and *not* to implements of the relatively coastal cultures of the Arctic Small Tool to Thule continuum. Such tools probably were commonly implements of non-Eskimos. In addition, however, the major thrusting implements of the B.R. Strand phase were of polished slate, similar to those used at the same time on the Pacific coast (in the T. Birch phase, mentioned below), and the people also used open lamps of stone in which, presumably, sea-mammal oil was burned—another Pacific coastal characteristic. The most reasonable interpretation of this phase is that these were Indians who had lived in the vicinity of the Pacific long enough to pick up some coastal habits, but who still retained material evidence of their noncoastal cultural heritage (8). All sites excavated were apparently the remains of temporary camps. The phase is known only from Brooks River.

Gomer period. This period also consists of the time represented by a single phase—designated B.R. Gravels (9); it is dated from about 1900 to 1000 B.C. Remains of the period include many temporary camps as well as relatively permanent houses about 4 meters square, excavated less than half a meter into the contemporary ground and equipped with a sloping entrance passage. The artifacts are predominantly chipped tools of chalcedony and include double-pointed end blades, burins, and microblades. There are no oil lamps. Affiliation with the Arctic Small Tool tradition is obvious. It seems clear that the B.R. Gravels phase represents an influx of new people who arrived from the north, replacing B.R. Strand phase people completely and quickly; from this time on the Naknek drainage sequence may reasonably be said to pertain to Eskimos. During this Gomer period in particular, virtually no signs of contact with contemporaries of the Pacific coast are evident. The period is followed by a time when Brooks River—the only area in the Naknek drainage in which Gravels phase materials have so far been found—was apparently not inhabited. Whether this was the case for the entire Naknek region is not certain, but it seems unlikely.

Brooks River period. This period consists of the time represented by three sequential phases—Smelt Creek,

B.R. Weir, and B.R. Falls (10)—which together span the time between 200 B.C. and A.D. 1000. The remains are spread throughout the Naknek drainage. The Smelt Creek phase saw the introduction of check-stamped Norton-culture pottery, an obvious import from the north and ultimately from Asia. However, in stone implements, continuity with the preceding Gomer period is strong, some artifacts pertaining to the two periods being indistinguishable. Gravels and Smelt Creek people used identical small polished stone adze blades, and made some similar small chipped points of chalcedony, although the range of styles of stone implements had increased by Smelt Creek times. The B.R. Weir and B.R. Falls phases are recognizably different from one another and from Smelt Creek, but are obviously joined with the more Norton-like Smelt Creek phase in a local evolutionary sequence. The pottery of all these phases is similar, made with inclusions of hair or plant fiber to control cracking while the clay was drying before being fired. It is possible that the Smelt Creek phase represents an influx of new, Norton-culture people into the drainage; on the other hand, the continuity in stone implements is strong enough, in view of the time elapsed since the Gomer period, to suggest that importations may have consisted of ideas, rather than people. Whatever the situation may have been in the drainage as a whole, however, Brooks River itself was reoccupied. There, temporary camps of the Smelt Creek phase have been found, and it is thought that more permanent habitations may have existed at the Smelt Creek type site on the lower Naknek River. One house of the B.R. Weir phase, similar in form to houses of the Gravels phase, has been excavated at Brooks River, but the occupation debris was scant; the rest of the Weir phase localities and all of the B.R. Falls phase localities excavated either represented temporary camps or—as was very common—had been so torn up by occupants of later periods as to render any house form undecipherable. Nevertheless, the presence of numerous well-constructed fireplaces of the B.R. Falls phase suggests that relatively permanent habitations were present at Brooks River by that time. During the Brooks River period, the use of polished slate implements steadily increased.

Naknek period. This period includes the time represented by three sequential phases—B.R. Camp, B.R. Bluffs, and Pavik—which are apparently repre-

sented throughout the drainage; it lasts from A.D. 1000 to 1900. With the first of these phases there appears a major reliance upon the polishing of slate, in place of the chipping of chalcedony or hard igneous rocks. At the same time there appears pottery in which the fiber inclusions have been replaced by gravel, and which occasionally are impressed with concentric-circle decorations. Pottery of this composition, like the reliance upon stone polishing, continues throughout the period. The Pavik phase, made up predominantly of material recovered from a 19th-century settlement at the mouth of the Naknek River, dates from the Russian occupation and includes iron, window glass, and glass beads; there is a decreasing proportion of implements of stone. With the beginning of the Naknek period there was also initiated the use of square, heavily timbered, semisubterranean houses with entrances sunk as much as half a meter below the floor of the house proper. Some of these houses, even though equipped with sunken entrances, were nevertheless small and apparently intended only for occupation during brief summer periods. Others were obviously suitable for relatively permanent occupancy.

The Pacific Coast

The Pacific sequence is divided into five phases, the divisions being less fine than those in the Naknek drainage sequence, simply because much less work has been done. The phases are not grouped into periods. Temporal control is established in large measure by 12 radiocarbon dates on charcoal apparently directly related to human activity. Of the phases, only the two earliest (T. Alder and T. Birch) are definitely represented at both areas of intensive work—Takli Island and Kukak Bay (Fig. 1). Extensive surveys in the 100-mile (160-kilometer) stretch of coast within Katmai National Monument, however, suggest the presence of at least two of the later phases at other sites, so the sequence may be taken to represent the entire mainland coast of Shelikof Strait. Sea mammals are still abundant near the major sites.

T. Alder phase. Dated between 4000 and 3000 B.C., this phase includes chipped stone implements both of basalt (chiefly projectile blades and leaf-shaped knives) and of chalcedony (especially as a distinctive projectile blade in which the stem has a triangular

cross section, probably for use in a specific kind of bone harpoon head). No stone polishing was practiced, except in the manufacture of small adze blades. This phase is clearly related to one of the same time on Kodiak Island, designated Ocean Bay I (11). I have argued elsewhere that it is also related to cultural remains known from the Near Islands at the western tip of the Aleutian chain. Specifically, stone implements of this phase and those of a published collection from Krugloi Point, Agattu Island, were found closely comparable in having triangular-sectioned stems on projectile blades, a high incidence of similar large leaf-shaped and ellipsoid bifaces, and other features in common. On the basis of this systematic set of resemblances it was hypothesized that at about 4000 B.C. the Aleutian Islands and the Pacific coast of the Alaska Peninsula were inhabited by a single people (12). In the interest of parsimony it was proposed that these collections represent a cultural manifestation that will be found to be ancestral to the known prehistoric culture of all the Aleutian Islands, and that they represent a population of ancestral Aleuts. In this view, ancestral Aleuts and their direct cultural and linguistic descendants inhabited the Pacific coast of the Peninsula and probably also Kodiak Island until after the beginning of the Christian era.

T. Birch phase. This phase, dated between 2200 and 800 B.C., is clearly descended from the T. Alder phase, and may be related with confidence to materials of the same date on Kodiak Island, belonging to the Ocean Bay II assemblage (11). Slate polishing had been taken up by this time and was used extensively for ulos and large knives and thrusting implements. Oil lamps were definitely in use. Contact is evident between early representatives of the T. Birch phase and people of the B.R. Strand phase, from the Naknek drainage, but contact is not evident between people of the later part of the T. Birch phase and their contemporaries of the B.R. Gravels phase. Additional research will undoubtedly permit subdivision of this long phase into tighter units, but its relationship to preceding and succeeding phases is clear. Although people of this phase are presumed to have been descended from ancestral Aleuts of the T. Alder phase, they had by now diverged culturally from their relatives in the Aleutian Islands.

T. Cottonwood phase. This phase,

dated from A.D. 200 to 500, resembles the Birch phase in many ways; it has the same large projectile blades of polished slate, and open lamps of shaped stone. Pottery appears, however, for the first time on the Pacific coast—pottery identical to some of that of the B.R. Weir phase of the Naknek drainage. Some chipped projectile blades are smaller than those of the T. Birch phase, and many more of them are made of chalcedony in a tendency that seems a reflection of preferences for stone materials evident in the Naknek drainage at the same time. With this phase, then, there is an obvious increase in contact across the Alaska Peninsula with people of the Weir phase of Brooks River. At the same time, the T. Cottonwood phase seems to have less in common with contemporary cultural units of Kodiak Island, suggesting that communication from the Naknek drainage reached only as far southeast as the Pacific coast of the Peninsula and did not penetrate farther into the Pacific area.

K. Beach phase. This phase, dated from A.D. 500 to 1000, is an exact contemporary of the B.R. Falls phase of the Naknek drainage, and the similarity between the two is so great that one must conclude that people of the Naknek drainage had actually taken up residence on the Pacific coast, at least at the site on Kukak Bay where the bulk of the Beach phase collection was obtained. There is a marked decrease in the polishing of slate from the amount evidenced in the Cottonwood phase, and a further increase in the proportion of small, chipped chalcedony projectile blades. But similar pottery and chipped implements are present in collections of the Cottonwood phase, and thus one cannot conclude that there was a complete lack of continuity between the Cottonwood and Beach phases of the sort that appeared, for instance, between the Strand phase and the Gravels phase at Brooks River. The close relationship at this time between Brooks River and the Pacific coast is still not reflected on Kodiak Island, again suggesting that contact across the Alaska Peninsula did not extend farther into the Pacific zone.

K. Mound phase. Dating from A.D. 1000 to 1500, this phase (13) is contemporary with the B.R. Camp phase, as well as an almost perfect duplicate of it. By now it is clear that a single people lived on both sides of the Aleutian Range on the Alaska Peninsula, at Brooks River and at Kukak Bay. Fur-

thermore, not only do the two assemblages from the Peninsula show such similarities, they are both markedly similar to contemporary collections from both the Bering Sea and Kodiak Island. It is at this time, A.D. 1000 or slightly later, that pottery first appears on Kodiak Island (11), in the same thick Thule-like ware with gravel inclusions that is found at Kukak Bay, at Brooks River, over most of coastal Alaska as far north as Point Barrow, and, for that matter, occasionally at Thule culture sites of arctic Canada. At the same time, implements of polished slate were of paramount importance—implements foreshadowed in form by tools known from the Pacific coast as early as the T. Birch phase. In all, one is forced to conclude that by A.D. 1000 there was clear communication across the Alaska Peninsula in both directions—to Kodiak on the south and to the Bering Sea coast and beyond in the north. By this time the people of the Pacific coast surely were speaking a form of Western Eskimo. Interestingly, this was also the time of the Thule migration from Alaska to Greenland.

Unfortunately, the period between A.D. 1500 and 1800 is not represented by collections from the Pacific coast of the Alaska Peninsula. Examination of collections of the period from Kodiak Island, however, suggests that communication across the Peninsula did not stop at A.D. 1800 but continued with little abatement until the arrival of the Europeans.

Explanation

Having concluded that there was a movement of people across the Alaska Peninsula after the beginning of the Christian era, as suggested by the data outlined above and summarized in Fig. 2, the next problem is to account for it. Two sets of explanatory hypotheses immediately present themselves—one dealing with a change in climate, the other with a change in culture.

Environmental change. It is generally held that hunters, who control their environment relatively little but are closely attuned to it, may respond directly to environmental changes by migrating to follow the climate to which they are adapted. In the case at hand, then, one would expect that people adapted to life in an area characterized by freezing coastlines would move southward during times of colder weather, as the limit of ice moved

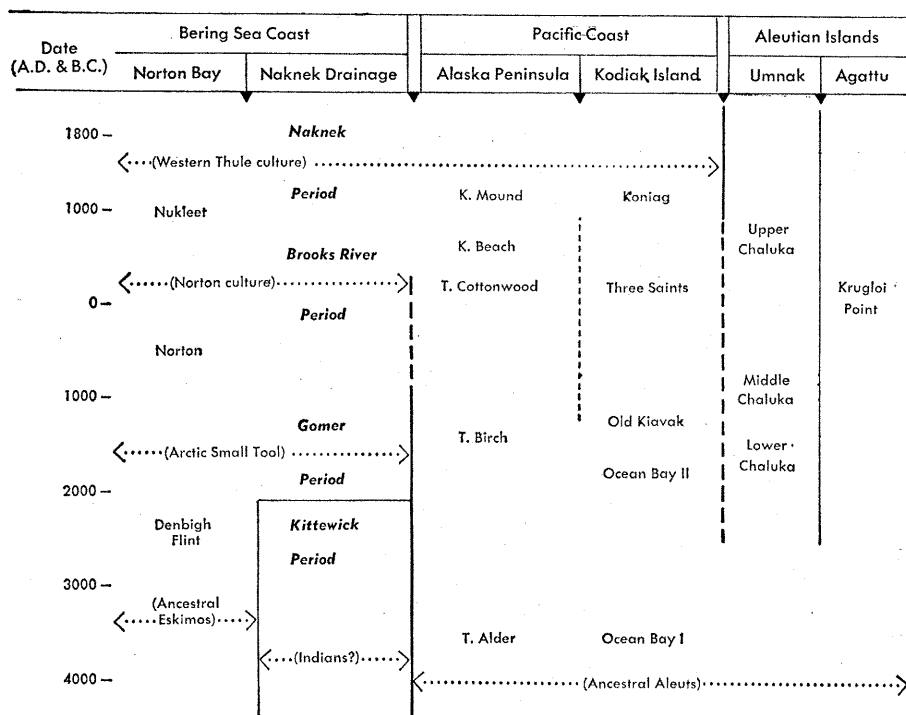


Fig. 2. Inferred cultural relationships in southwestern Alaska. Solid vertical or horizontal lines between areas or periods indicate apparent absence of contact; dashed lines indicate substantial but intermittent contact; the absence of lines indicates unrestricted contact or cultural transmission. The dotted horizontal arrows indicate the geographic extent of major cultural horizons or ethnic groups.

south, and would shift northward during warmer times as the ice edge retreated. Hence, one would hypothesize as follows:

1) A period of cold accompanied the arrival of the earliest putative Eskimos (of the Gomer period) in the Naknek drainage, and persisted throughout that first stage of occupation—that is, from about 1900 to 1000 B.C.

2) A warming period coincided with the apparent lack of occupation at Brooks River, from about 1000 to 200 B.C.

3) A cold period began as people of Norton-like culture appeared in the Naknek drainage at about 200 B.C., and the cold increased after the beginning of the Christian era, leading these Norton descendants to penetrate to the Pacific coast.

4) The period after A.D. 1000 was the coldest of all, inducing Bering Sea Eskimos to move to the north Pacific in considerable number.

This set of hypotheses can be tested fairly directly by reference to pollen profiles from the Naknek drainage, Kukak Bay, and Kodiak Island, summarized and interpreted in Fig. 3.

1) The period from 1900 to 1000 B.C. was relatively cool both in the Naknek drainage and on the Pacific coast, as hypothesized.

2) The period from 1000 to 200 B.C. was a time of relatively *greater* cold, rather than lesser; this conclusion is supported by evidence from other areas, such as that concerning the beginning of glacial advance in southern Alaska, the southward migration of the tree line in central Canada, and the probable development of the ice shelf at Ellesmere Island (14).

3) The time from 200 B.C. to A.D. 1000 was characterized by steady warming, rather than cooling.

4) Warming probably continued after A.D. 1000. Although there is no indication of it in Fig. 3, the climate of the 11th century is generally considered to have been unusually warm; specifically, it is estimated, from tree-ring evidence, that the average temperature in northern Alaska was higher by perhaps as much as 2.3°C than the average in the century that ended A.D. 1950 (15). Indeed, the only cooling suggested in the uppermost portions of Fig. 3 is limited to the Kukak Bay profile, where it probably refers to the climax of the so-called Little Ice Age, in the 16th century.

No reasonable man would consider the set of hypotheses to be supported by this evidence.

Ecology. The second hypothesis has to do with cultural change. It posits a

shift in Eskimo subsistence practices, which resulted in a change in the ecosystem of which the Eskimos were a part and a concomitant change in the territory they occupied. Unfortunately, food trash from the earliest presumed Eskimos has not survived in a quantity to permit close testing of this proposition, so one must perforce assess it on a more abstract level. Therefore, one may simply hypothesize a general decrease in the relative desirability of territory on and adjacent to freezing coastlines after about the beginning of the Christian era. There is some relevant evidence.

The limits of the spread of the Arctic Small Tool tradition are indicated above. Most of the known sites of this cultural tradition—in Alaska, at least—seem to be the remains of temporary campsites, undistinguished by constructed habitations. Such is the case with the coastal sites at Cape Denbigh on Norton Bay of the Bering Sea, and at Cape Krusenstern north of Bering Strait on the Chukchi Sea; it is also true of the interior sites in the central Brooks Range (16, p. 195; 17, p. 280; 18). The remains of more substantial habitations, interpreted as relatively permanent dwellings, are now known in Alaska only from three locations—at Onion Portage, on the Kobuk River, at Itivlik Lake, near Howard Pass in the upper Noatak River drainage (19), and at Brooks River in the Naknek drainage. These locations lie between 40 and more than 150 miles from the coast.

Thus the sea-mammal hunting of the occupants of these dwellings may be interpreted as a briefly seasonal affair; otherwise, these people seem to have relied heavily upon caribou and probably also on fish. At least, the Naknek, Kobuk, and Noatak drainage systems all receive migrations of anadromous fish, while there is some evidence that those areas within the central Brooks Range that were occupied by considerable numbers of people of the Small Tool tradition had sizable fish runs at that time, although this is no longer the case (17, p. 280; 18, p. 87).

One is bound to conclude from this that the freezing coastline itself was *not* the primary focus of attention during the time of the Arctic Small Tool tradition, but that the favored territory was in fact the strip of ground, chiefly tundra, 100 miles (160 kilometers) and more in width, *adjacent* to those coastlines.

Unlike the people of the Arctic Small

Tool tradition, their descendants of Norton culture apparently did not occupy the central Brooks Range, even though they traveled as far east as the Firth River in extreme northwestern Canada near the Alaskan boundary (20), where, it may be presumed, they arrived by transit along the coastline. Their constructed houses are known to be relatively abundant at locations on the coast—at Point Hope and Wales in the north, and Cape Denbigh and the Platinum region on the Bering Sea, and probably along the tidal portion of the Naknek River. The Eskimo use of oil lamps begins, or becomes widespread, only in this period. Furthermore, at Point Hope, whaling harpoons are known from deposits of Near Ipiutak, a Norton variant, bespeaking a specifically summer occupation. That is, the presence of abundant sea-mammal hunting gear and particularly of whaling harpoons indicates the development of techniques for taking large sea mammals in open water (16, p. 125; 17, p. 189; 21).

No comparable evidence exists for people of the Arctic Small Tool tradition in Alaska, and apparently none exists in Canada or Greenland. Hence an initial movement from the shallow shores of the southern Bering Sea to the deep, rocky, sea-mammal-rich coast of the Pacific would be expected precisely in Norton times.

The cause of this shift toward maritime resources is not certain. It has been suggested that the general lowering of temperature during the first millennium B.C. forced a greater reliance upon ocean products (22), but archeological evidence concerning the transition from Arctic Small Tool tradition to Norton culture is much too poor to permit a convincing determination.

Whatever the initial cause, increased use of resources of the open sea led to a florescence of techniques of sea hunting in the vicinity of Bering Strait, with development of the Old Bering Sea and later the Punuk cultures of St. Lawrence Island and the Asian coast, and with related developments in Alaska leading to the Thule culture of the end of the first millennium A.D. (22, 23). At this time, a period of mild climate and the accompanying retreat of the southern border of the polar ice pack apparently changed the migratory pattern of the great whales and also permitted a substantial degree of open-sea hunting of whales and lesser sea mammals in northern Canada (24). Practiced sea hunters of the Thule culture took this

opportunity to move across the Arctic coast to Greenland. In southwestern Alaska, people of similar culture moved decisively toward the north Pacific, not only penetrating the coast, as their Norton forebears had, but moving as far as Kodiak Island, where Thule-like pottery and other traits appeared not long after A.D. 1000 (11), and where a Western Eskimo dialect came to be current.

In short, the hypothesis of a shift in subsistence emphasis from a landward bias to a maritime or at least a pronounced littoral bias seems of considerable power not only for explaining developments in southwestern Alaska but also for illuminating Eskimo prehistory in general, and seems to be supported by present evidence, in spite of the absence of specific food remains at crucial

periods. Furthermore, it may lead to additional testable hypotheses.

For instance, if the upper portion of the Naknek drainage was depopulated in the first millennium B.C., was it because an improved adaptation to the Bering Sea coast simply attracted the people thither? Did their descendants then move again to Brooks River only when the population density on the coast approached a point where additional diversification of food resources became desirable? If this were the case, one would expect no lessening of population on the coast proper during the first millennium B.C., but a decided *increase* in population as people of the Arctic Small Tool tradition moved downstream and took up permanent residence near the beach. A test of this hypothesis is now being planned.

Date (A.D. & B.C.)	Bering Sea Coast Naknek Drainage		North Pacific Coast			
			Kukak Bay		Kodiak Island	
1800 —			Alder (incr.) Sedge, Sphagnum Alder (min.), Birch	Warmer Cold & humid	Warmer & more humid	Spruce Alder
1000 —	Rising temp. & humidity	Birch Alder Spruce Sphagnum	Alder Birch (min.) Heath Sedge	Warm & stable	Rising temp. & humidity	Alder Birch Spruce Sphagnum
0 —						
1000 —	Cooling	Birch (incr.)	Alder (decr.) Birch Heath Sedge	Cooling	Cooling	Alder Birch Heath
2000 —	Cool & stable	Birch Alder Heath				
3000 —	Cooling	Birch (incr.) Alder Heath	Alder (max.) Birch Ferns	Warm	Warm	Alder Birch
4000 —	Warm	Birch Alder (max.) Ferns				
5000 —	Unknown					
6000 —			Birch (max.) Alder (incr.) Heath Sedge	Cool	Cool	Fern Sedge Umbellifer
7000 —						

Fig. 3. Prehistoric flora and climate in southwestern Alaska, as indicated by profiles of bog-derived pollen. Solid horizontal lines divide major climatic episodes; dashed horizontal lines divide less pronounced episodes. The termination of the Hypsithermal on the two sides of the Alaska Peninsula appears to be out of phase. C. J. Heusser argues that this is the case, on the basis of radiocarbon-dated peat samples (27).

Recapitulation

The reconstruction developed here and shown diagrammatically in Fig. 2 may be summarized in five points.

1) By 4000 B.C., the Pacific coast of the Alaska Peninsula, much of the span of the Aleutian Islands, and probably Kodiak Island were occupied by a single people adapted to hunting sea mammals on unfrozen sea coasts. These are presumed to have been ancestral Aleuts. Sometime after about 3000 B.C., the descendants of these people on the Peninsula and on Kodiak Island began to manufacture implements by polishing slate, and from this time onward they diverged in material culture from their relatives of the Aleutian Islands.

2) By about 2500 B.C., the interior portion of the Alaska Peninsula northwest of the Aleutian Range was inhabited by an inland-oriented people, presumably Indian, who had been in contact with their neighbors on the north Pacific coast and islands long enough to have taken up the use of polished-slate thrusting implements and of lamps burning sea-mammal oil.

3) Around 1900 B.C., a movement of people from the north, bearing the Arctic Small Tool tradition and presumed to have been ancestral Eskimos, displaced these inland-oriented hunters. The new people inhabited the upper portions of the Naknek drainage in some number; they built relatively permanent winter houses along inland streams, but had almost no contact with their neighbors and distant linguistic relatives of the Pacific coast. The latter continued their stable life based upon the hunting of sea mammals. Around 1000 B.C. the early Eskimos moved out of the upper portion of the Naknek drainage; whether they left the lower drainage or the Peninsula entirely is not known, although it may be hypothesized that they moved no farther than to the Bering Sea coast.

4) By 200 B.C., the upper portion of the Naknek drainage was reinhabited by descendants of the earlier people of the Arctic Small Tool tradition, who were well adapted to life on the summer seacoast and the hunting of sea mammals from boats. By A.D. 300 they had made contact with the people of the Pacific coast. They and their descendants increased their pressure upon the Pacific coast until, by late in the first millennium A.D., some people of the Naknek drainage were actually living on that coast, at Kukak Bay. The

motivation for their move was interest in the open-coast hunting of sea mammals.

5) By the beginning of the second millennium A.D., with use of the communication channel opened across the Alaska Peninsula during the preceding several hundred years, contact between people of the Bering Sea and of the Pacific reached a climax, as ideas were shared throughout a sphere of exchange larger than any that had existed before on the Alaskan coast.

This spread of people within the Christian era is presumed to account for the close linguistic relationship between Pacific and Bering Sea Eskimos. And, in view of the apparent early archeological connection between the people of the Pacific coast and the people of the Aleutian Islands, it is here tentatively concluded that the language spoken on the Pacific coast in the last millennium B.C. was a form of Eskaleutian that no longer exists, a form more closely related to present-day Aleut than to Eskimo. With the present knowledge of archeology and linguistic distributions, no other reconstruction seems tenable at this time.

This construction, however, raises two separate problems. (i) The subsistence practices of the early people of the north Pacific must have been adequate to support a population of considerably greater density than that to be found north of the Alaska Peninsula. Why, then, would a migration southward have been possible, and how could it have resulted in language capture? (ii) Although the reconstruction accounts for the modern distribution of Eskimo speech, includes a tentative ethnic identification of early people of the Pacific coast, and accounts for the divergence between Eskimo and Aleut speech through the interposition of an alien people, it does nothing to simplify the problem of locating the common ancestor of Eskimos and Aleuts—who, as linguistic relatives, must at some time have had a single forebear. Indeed, it tends to obscure it.

Some time ago I hypothesized that this common ancestor lived in coastal Alaska around 4000 B.C. (2, 25). But if the proposed connection between people of the Aleutians and people of the Pacific coast at 4000 B.C. and the identification of both as ancestral Aleuts is valid, this possibility becomes less likely, simply because the Pacific coastal people of 4000 B.C. seem impossible ancestors for people of the Arctic Small Tool tradition.

A more tenable statement is as follows: The common ancestor of Eskimos and Aleuts will be found on a time level considerably earlier than 4000 B.C., and in circumstances that allow for the subsequent development of two relatively distinct subsistence patterns—one for exploiting the open coastal environment, to be developed by descendants who became Aleuts; a second for exploiting the tundra-covered territory adjacent to coastlines that freeze, to be developed by descendants who became Eskimos.

In the interest of parsimony, one may still wish to seek this ancestor in Alaska. But, as the interval of time within which the Eskaleutian ancestor must be sought is pushed farther and farther into the past, nearer and nearer the time in which Alaska and Asia were one land mass, the possibility of his being discovered within the present spatial bounds of Alaska becomes less and less likely (26).

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9. This was first described as two phases (B.R. Gravels and B.R. Hilltop). The distinction between these has been abandoned; there is no longer a B.R. Hilltop phase.
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25. See also W. S. Laughlin, in *The Bering Land Bridge*, D. M. Hopkins, Ed. (Stanford Univ. Press, Stanford, 1967), pp. 409–450. My own formulation does not incorporate the early finds (about 6000 B.C.) from Anangula Island, discussed by Laughlin, because, on the basis of present knowledge, I do not find it possible to relate them systematically to other archeological evidence from southwestern Alaska.
26. See also W. N. Irving ("Proc. 8th Intern. Congr. Anthropol. Ethnol. Sci., 1968," in press), who argues that the Arctic Small Tool tradition represents a second wave of Eskaleutian speakers from Asia.
27. Figure 3 is based on information in C. J. Heusser, *Late-Pleistocene Environments of North Pacific North America* (American Geographical Society, New York, 1960), p. 178, and in —, *Amer. Antiq.* 29, 74 (1963). Information on Kukak Bay derives from samples obtained by D. E. Dumond; pollen counts by C. J. Heusser.
28. The work described was initiated in 1960 through the efforts of L. S. Cressman, and has been supported by NSF grants G-12964, GS-79, and GS-655; by three research contracts from the National Park Service, for one of which funds were provided by the National Geographic Society; and by the Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service.

What We Must Do

A large-scale mobilization of scientists may be the only way to solve our crisis problems.

John Platt

There is only one crisis in the world. It is the crisis of transformation. The trouble is that it is now coming upon us as a storm of crisis problems from every direction. But if we look quantitatively at the course of our changes in this century, we can see immediately why the problems are building up so rapidly at this time, and we will see that it has now become urgent for us to mobilize all our intelligence to solve these problems if we are to keep from killing ourselves in the next few years.

The essence of the matter is that the human race is on a steeply rising "S-curve" of change. We are undergoing a great historical transition to new levels of technological power all over the world. We all know about these changes, but we do not often stop to realize how large they are in orders of magnitude, or how rapid and enormous compared to all previous changes in history. In the last century, we have increased our speeds of communication by a factor of 10^7 ; our speeds of travel by 10^2 ; our speeds of data handling by 10^6 ; our energy resources by 10^3 ; our power of weapons by 10^6 ; our ability to control diseases by something like 10^2 ; and our rate of population growth to 10^3 times what it was a few thousand years ago.

Could anyone suppose that human relations around the world would not be affected to their very roots by such changes? Within the last 25 years, the Western world has moved into an age of jet planes, missiles and satellites, nuclear power and nuclear terror. We have acquired computers and automation, a service and leisure economy, superhighways, superagriculture, supermedicine, mass higher education, universal TV, oral contraceptives, environmental pollution, and urban crises. The rest of the world is also moving rapidly and may catch up with all these powers and problems within a very short time. It is hardly surprising that young people under 30, who have grown up familiar with these things from childhood, have developed very different expectations and concerns from the older generation that grew up in another world.

What many people do not realize is that many of these technological changes are now approaching certain natural limits. The "S-curve" is beginning to level off. We may never have faster communications or more TV or larger weapons or a higher level of danger than we have now. This means that if we could learn how to manage these new powers and problems in the next few years without killing ourselves

by our obsolete structures and behavior, we might be able to create new and more effective social structures that would last for many generations. We might be able to move into that new world of abundance and diversity and well-being for all mankind which technology has now made possible.

The trouble is that we may not survive these next few years. The human race today is like a rocket on a launching pad. We have been building up to this moment of takeoff for a long time, and if we can get safely through the takeoff period, we may fly on a new and exciting course for a long time to come. But at this moment, as the powerful new engines are fired, their thrust and roar shakes and stresses every part of the ship and may cause the whole thing to blow up before we can steer it on its way. Our problem today is to harness and direct these tremendous new forces through this dangerous transition period to the new world instead of to destruction. But unless we can do this, the rapidly increasing strains and crises of the next decade may kill us all. They will make the last 20 years look like a peaceful interlude.

The Next 10 Years

Several types of crisis may reach the point of explosion in the next 10 years: nuclear escalation, famine, participatory crises, racial crises, and what have been called the crises of administrative legitimacy. It is worth singling out two or three of these to see how imminent and dangerous they are, so that we can fully realize how very little time we have for preventing or controlling them.

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