

Continuity and Change in the Prehistoric Record from Southern Alaska

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Continuity and Change in the Prehistoric Record from Southern Alaska

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The Pacific Eskimo area has been occupied for 6000 years by maritime hunting cultures which are related in a complex fashion, which have contributed to the genesis of the ethnographic inhabitants, and which have been profoundly influenced by adjacent peoples. I propose a flexible taxonomic framework to describe this situation, designating an *Eastern Sector* of a *North Pacific Maritime co-tradition* to include the prehistory of the eastern Alaska Peninsula, Kodiak Archipelago, outer Cook Inlet and Prince William Sound *Branches*. Following Rouse, a co-tradition includes *several* cultural traditions with a *common ancestor*, in this case the 6000 year old Takli Alder/Ocean Bay I culture. Maritime adaptation is the revolutionary change which brought this co-tradition into being; purely terrestrial cultures should be excluded. The co-tradition concept provides a framework for the expression of cultural relationships without *a priori* assumptions of ethnicity.

The co-tradition occupies a homogeneous physiographic province characterized by high mountains rising abruptly from the sea, deep waters, complex coastlines short rivers, difficult access to the hinterland and moderate but wet climates. Rich intertidal invertebrate communities, marine salmon, fishes and resident sea mammals were significant.

The prehistory of this co-tradition is traced. Gaps occur in all sequences and only on Kodiak can closure with ethnographic peoples be documented. Chirikof Island is culturally marginal to the co-tradition while the environmentally marginal upper Cook Inlet area appears to have been utilized sporadically by North Pacific maritime peoples. The ancestry of the co-tradition is unclear.

Problems in correlating race, language and archeologically revealed cultural patterns are considered. Assertions that language changes are epiphenomena are rejected but assumptions equating one archeological culture with one language are equally undocumented. Ethnic boundaries do not correlate neatly with archeological discontinuities in the last 1000 years. Calibration of the

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correlation between material culture and ethnicity rather than further assertions and counter-assertions are recommended. [Archeology, North Pacific, Pacific Eskimos]

INTRODUCTION

“Their way of life seems to have been distinctive, as compared with that of other Eskimos; it is not simply a northern culture transplanted to the subarctic, but it had its own roots and history” (Frederica de Laguna [1956: 258] with reference to the Pacific Eskimos and Aleuts).

This paper focuses on the prehistory of the Pacific Eskimo area which extends from Prince William Sound on the southeast [BIRKET-SMITH 1953] to c. 159°W Longitude on the Pacific shore of the Alaska Peninsula on the northwest [DUMOND 1974a: 1]. Archeological research undertaken mainly since 1960 had demonstrated that maritime hunting cultures have flourished in this sector of the North Pacific for at least 6000 years [D. CLARK 1966a; G. CLARK 1977]. This area possesses striking physiographic unity and a rich and reasonably well understood archeological past. Bounded on the west by the Aleut, on the north by the Bering Sea Eskimos, on the east by subarctic interior Athapaskans and on the south by the Tlingit of Northwest Coast cultural provenience, the Pacific Eskimo area occupies a central position literally as well as figuratively in southern Alaskan prehistory.

Kachemak Bay in outer Cook Inlet shares with the Aleutian Islands the distinction of being the scene of quite sophisticated late 19th century archeological work [DALL 1877; JACOBSEN 1977: 198–199]. In late June, 1883, the professional collector of ethnographic specimens, Johan Jacobsen, spent a few days excavating at the settlement of Soonroodna (exact location uncertain). His published stratigraphic observations are useful [DUMOND and MACE 1968: 15] and in advance of his time. Forty-seven years were to pass before further scientific work was undertaken in the area. In 1930 Frederica de Laguna began a problem-oriented research program in Cook Inlet. Her publication [1934] outlined a sequence that still provides the backbone periodization of Kachemak Bay and Kodiak Island prehistory [CLARK 1978: 3]. Aleš Hrdlička's assault on the Uyak site on Kodiak Island between 1931 and 1936 [HEIZER 1956], while productive of fine specimens and an abundance of human skeletal remains, represented a regression to a primitive standard of excavation. Sixteen years were to pass between Hrdlička's concluding 1936 season at the Uyak site and Frederick Milan's excavation at Karluk on Kodiak in 1952 (published as a section in CLARK [1974a]). Work in the archeology of the Pacific Eskimo area and adjacent regions accelerated after 1960, with major projects on Kodiak Island [CLARK 1966a, 1974b], the Alaska Peninsula [DUMOND 1971] and renewed effort in Kachemak Bay after a lapse of forty years [K. WORKMAN 1977; W. WORKMAN 1974]. Recent fieldwork in the upper Cook Inlet area is just reaching the publication stage [REGER 1977a, 1977b]. There is now sufficient information available to attempt a preliminary

formulation of the prehistory of the ethnographic Pacific Eskimo area and its significance in a broader context.

In order to attempt this task it is necessary to provide an adequate taxonomic framework within which discussion can proceed in an orderly fashion. This framework should be suitably flexible to express close and more distant relationships, to accommodate new data as they accumulate, and to provide for the reordering of existing data through new interpretations. I believe that most workers in the area would accept the following general conclusions. Disagreements arise in attempting to specify, interpret and explain them:

- a) The Pacific Eskimo area has been occupied for many millennia by maritime cultures which contributed significantly to the cultural heritage of the ethnographic peoples;
- b) most, if not all, known cultural manifestations in the area are in some sense related;
- c) the prehistory of the area has been complex with significant regional variation, gaps in the record, truncated sequences and apparent periods of accelerated cultural change precluding the useful employment of unilineal sequences of cultures or tightly knit area-wide developmental schema culminating smoothly in the ethnographic cultures; and
- d) influences from adjacent areas have been significant, sometimes profoundly so, for at least the last several millennia.

Frederica de Laguna, the pioneer scientific worker in the area, established four periods of culture for Kachemak Bay in outer Cook Inlet [1934: 121ff]. The first three of these (Yukon Island or Kachemak I-III) are clearly developmental stages within a cultural continuum. The significance of the fourth, erected to accommodate the scanty remains of late prehistoric times is less clear [WORKMAN 1974: 15-17]. In a later publication she suggested that "the basic pattern of Kachemak Bay III, with local modifications, is represented by archeological finds in Prince William Sound, Kodiak Island, the Alaska Peninsula and the Aleutian Islands" [1947: 11]. In the same publication she tentatively suggests that the Kachemak sequence might be generalized to "Pacific Eskimo."

The leading student of Kodiak prehistory, Donald Clark, building upon de Laguna's earlier formulation, has recognized a *Kachemak tradition* incorporating over two millennia of the middle range of the prehistory of the Kodiak Archipelago and most of the known prehistory of Kachemak Bay. While recognizing some relationship, he excludes Prince William Sound and the Pacific shores of the Alaska Peninsula from the Kachemak tradition proper [1975b: 208, 213]. To Clark, a tradition is regarded "as a lifeway traced through time, and not simply as a technology... I have tried to incorporate assumptions of cultural continuity or ethnic identity into their definition." Continuity within a tradition implies continuity of languages and peoples; breaks imply new peoples or strong outside influences [1978: 16]. Clark has also recently suggested a Pacific-Alaska Peninsula co-tradition to include the Kachemak tradition, the Takli Birch phase on the Alaska Peninsula and a Western

Peninsula-Pacific component (Port Moller, certain Chirikof Island sites). Although differing in some significant details from the scheme presented here, Clark's conceptualization is clearly related to and antecedent to it.

Don Dumond has recently proposed the *Kodiak tradition* "to refer to all archeological remains of ground-slate-using peoples of the Eskaleut Pacific zone before about 1000 A. D." [1978a: 59]. The earlier stone-flaking technologies from which the Kodiak tradition apparently developed on the Alaska Peninsula at least are assigned to an Ocean Bay tradition. The Kodiak tradition is divided into two stages, the latter of which (the *Kachemak stage*) incorporates Clark's Kachemak tradition but adds the remains from Prince William Sound and the Alaska Peninsula which Clark would exclude. This formulation appears to me to depend too heavily on a single technological criterion (slate grinding) and does some violence to the Kodiak evidence by ignoring the fact that limited amounts of ground slate occur in a predominately stone-flaking Ocean Bay I context at the AFO 106 site [CLARK 1974b: 42-43, 1979: 98ff, 122]. It also puts into different traditions Ocean Bay I and II which are, ironically, most strongly linked by the ground slate industry [CLARK 1972: 18-19] and lumps Ocean Bay II with the later phases of Clark's Kachemak tradition, an interpretation for which there is little evidence at present [CLARK 1972: 27, 1979: 227-228]. In his monograph on the prehistory of the Pacific shore of the Alaska Peninsula, Gerald Clark established four periods of culture which affiliate at times with the North Pacific and at times with the Bering Sea region [1977: 91ff].

Obviously different scholars construct taxonomic entities of quite variable scope and specificity to suit their purposes and preferences [DUMOND 1974b]. Recognizing that quite different approaches to the same data may have validity depending on the purpose of the investigator, I propose the following flexible taxonomic framework rather than attempting to arbitrate between existing alternatives. Following Rouse's 1957 reworking of a concept originally proposed by Wendell Bennett, I suggest that we designate the archeological sequences from the Pacific coast of the Alaska Peninsula, the Kodiak Archipelago (Chirikof Island partly excepted), outer Cook Inlet, some of the available materials from upper Cook Inlet, and Prince William Sound as constituting the *Eastern Sector* of the *North Pacific Maritime co-tradition*. These geographic areas I propose to designate as *branches*. At present I would include no other areas within the co-tradition, but I propose the qualifier *Eastern Sector* in anticipation of future expansion as new areal sequences, which meet the criteria of membership as defined below, come to light or are recognized. Thus, for example, if Dumond succeeds in persuading his colleagues of the unity of North Pacific and Aleutian Island prehistory c. 6000 B. P. [1971: 49ff, 1977a: 77, 155-58], we could add a Western or Aleutian Sector, or if on some time level unity can be demonstrated with southeastern Alaska or adjacent coastal Canada we could add a Southeastern Sector.

According to Rouse [1957] a co-tradition is defined by the presence within an area of *several* cultural traditions which share a *common origin*. *Traditions* are taken to mean a series of phases of culture related in a clear ancestor-descendant con-

tinuum. Co-tradition relationships exist between *phases* of culture, not individual elements of culture. Although stemming from a common base, the traditions which are their constituent elements may diverge, converge or even merge. Co-traditions come into being through revolutionary cultural change, either internal or as a result of the merging of two or more pre-existing co-traditions or traditions. I believe that the co-tradition construct fits our present understanding of the prehistory of the Pacific Eskimo area quite precisely. I would further stipulate that the maritime adaptation constitutes the kind of revolutionary culture change of which Rouse speaks, thus I would exclude any purely terrestrial culture from membership within the co-tradition.

Another advantage of the co-tradition concept as it is defined by Rouse is that it refers to culture alone, not race or language (the latter, however, I recognize, as Rouse apparently did not, as a category of culture). The question of ethnic identifications in the prehistoric past is an important one to which we must return at the end of this essay, but I find it useful to deal with a construct which expresses relationships (primarily in material culture, to a lesser extent in social and intellectual culture) without built in assumptions concerning race or language. This construct appears to be flexible enough to handle one of the more striking features of the ethnography of the area, the acculturation of the Kachemak Bay Tanaina Athapaskans to Pacific Eskimo material culture and subsistence strategies [OSGOOD 1966]. I do not believe that we stretch Rouse's intent to the breaking point when we suggest that aliens may amalgamate to a co-tradition, providing that modification of their original culture in the direction of the co-tradition is profound enough. By focusing on the cultural content of the co-tradition rather than presumed ethnicity, we can use it constructively whether the ancient peoples of the Pacific Eskimo area turn out to have spoken Eskimo, Aleut, or something else—or even if we decide that we can never be sure on this point. The broad framework allows formal recognition of similarities while accommodating much diversity and permits varying realignments of the constituent parts to suit the research problem. For example, we can recognize the closeness of relationship implied by Clark's use of the Kachemak tradition concept, perhaps even accepting his ethnic correlations, while formally recognizing the relationships between the Kachemak tradition and other occupants of the ethnographic Pacific Eskimo area. Since present evidence suggests that the ancestral phase of culture demanded by Rouse's definition existed c. 6000 years ago in the Ocean Bay I and Takli Alder phases we inject through use of the co-tradition concept considerably more time depth than Dumond's broad-brush tradition approach allows.

I do not claim to have been the first to have sought a higher order taxonomic unit to express broader relationships while respecting local cultural diversity about the North Pacific. Clark's application of the co-tradition concept to North Pacific prehistory has been mentioned above. De Laguna recently used the term *co-tradition* without elaboration or specification [1975b: ix] while further to the south Fladmark [1974: 12ff] used the term *cultural pattern* to express what appears to be the same idea, the tracing of historical developments between related cultures without injection of specific ethno-linguistic identifications. MacDonald [1969: 244-245] employed the

co-tradition concept in his discussion of the prehistory of the Coast Tsimshian area. Application of the co-tradition concept to North Pacific culture history is of course provisional, to be judged useful only if colleagues find it so.

Although not demanded by Rouse's definition, I find it of interest that the Eastern Sector of the North Pacific Maritime co-tradition as defined above occupies an area of considerable physiographic and ecological uniformity, sharply set off from other environmental provinces to the south, east and north, less sharply distinguishable from the environment of the Pacific shores of the western Alaska Peninsula and the Aleutians (in which direction cultural connections may ultimately be proved to extend). This geographic province will be briefly described below. Then I turn to a summary of the known prehistory of the various branches, saving for last a culturally marginal area within the province (Chirikof Island at certain periods of its prehistory) and a geographically marginal area (upper Cook Inlet) which appears to have been utilized from time to time by North Pacific Maritime co-tradition peoples. Trends through time in material culture and subsistence strategies, intellectual culture, housing and settlement patterns, chronology and relationships with other branches within the co-tradition will be briefly considered. For descriptive purposes the taxonomic ordering of the original investigators will be preserved. To avoid bias, description will proceed geographically from the Katmai Monument on the northwest to Prince William Sound on the southeast. In the next section relationships over time between the North Pacific Maritime co-tradition and adjacent cultural spheres will be considered. This essay will conclude with a consideration of the origins of the co-tradition, the problem of ethnic identifications in the prehistoric record, and recommendations for future work.

THE ENVIRONMENTAL SETTING

Contemporary Environment

The area occupied by the North Pacific Maritime co-tradition largely corresponds with the northern Gulf of Alaska coast which extends from the Copper River on the southeast to the mainland of the Alaska Peninsula opposite Kodiak Island (Fig. 1). I take as the southeastern limit of our area the Copper River delta near the modern town of Cordova. South of the Copper River there is a long straight stretch of coastline with few bays and islands fronted by shallow water and backed by extensive lowlands and foothills [MILLER 1958: 19, 24]. The northwestern boundary may be drawn with somewhat greater difficulty in the vicinity of Mt. Martin on the Alaska Peninsula at c. 158°W Longitude, at which point the solid mass of the Aleutian Range breaks into more isolated peaks connected by low ridges and foothills [CAHALANE 1959: 7]. The area between is characterized by deeply embayed complex coastlines, numerous islands, high mountains rising abruptly near the shoreline and deep water immediately offshore. Reger [1977a: 51] has explicitly suggested that this topography correlates with a maritime adaptation equivalent in part to my North Pacific Maritime co-tradition. Rivers are short in such terrain and access to the interior is made diffi-

cult by dense vegetation and looming mountains, allowing little habitat for terrestrial game and focusing attention perforce upon the sea. The contrast between this and adjacent areas is great on the Alaska Peninsula, whose north shore shades off gradually into the shallow Bering Sea with its relatively even coastline. The land rises gradually inland to the rugged Aleutian Range [MURIE 1959: 3]. Just a few miles south across the Aleutian Range the typical North Pacific topography prevails. The contrast is perhaps even greater in Kachemak Bay, where the little utilized north shore has a straight coastline and a very different lithology from the complexly embayed and much utilized south shore [DE LAGUNA 1975a: 12].

Complexity of coastline is a recurring theme in the North Pacific area, where drowned valleys and islands create thousands of miles of coast and provide optimal sheltered habitat for human settlement. The Kodiak Archipelago, c. 13,000 km² (5000 square miles) in area, has about 1600 km (1000 miles) of coastline [CLARK 1975b: 206]. De Laguna notes that there is as much shore line on the involuted south side of Kachemak Bay as there is along the entire north coast from the head of Kachemak Bay to Chickaloon Bay in Turnagain Arm at the head of Cook Inlet [1975a: 12]. The islands and bays of Prince William Sound constitute c. 3200 km (2000 miles) of shore line [DE LAGUNA 1956: 1]. The tidal range is also great with a 6.6–7.5 m (22–25 foot) range reported in Kachemak Bay [DE LAGUNA 1975a: 12] and 5.7 m (19 feet) in Prince William Sound [DE LAGUNA 1956: 4–5]. This tidal range is in marked contrast to the situation in the shallow Bering Sea and even in the Aleutians. Expanded habitat for intertidal invertebrates is offset in part by the typical steeply plunging shore lines, although in some areas vast mudflats (more rarely sand or gravel beaches) may be exposed at low tide.

Even the lithology of much of the area has a certain unity. Thus geologically the 13 major islands of the Kodiak Archipelago are merely a continuation of the Chugach and Kenai Mountains which make up the backbone of the Kenai Peninsula and Prince William Sound. There is an elevation gradient from southeast to northwest, with the Chugach Mountains in Prince William Sound achieving an average maximum elevation of 2100–2400 m (7,000–8,000 feet) while the Kenai Mountains average 900–1500 m (3,000–5,000 feet) and the mountains of Kodiak average 600–1200 m (2,000–4,000 feet). These mountains consist of a thick series of bedded metamorphic rocks, among which greywacke and slate found numerous uses in the aboriginal tool kit [MILLER 1958: 21–23]. The area is less well endowed with flakable cryptocrystalline stone, but metamorphosed low grade cherts occur locally [KARLSTROM 1969: 26]. On the Alaska Peninsula an abundance of flakable volcanics such as basalt would have been available. McCartney has suggested [1974: 79] that the penchant of Gulf of Alaska people for grinding slate while the people of the western Alaska Peninsula and Aleutians flaked stone may be rooted in part in logistic considerations since slate is rare in the latter areas. Although this argument cannot be pressed too far (witness the chronological trend throughout the Eskimo world towards a stone inventory based on ground slate even in areas where flakable stone was abundant and had long been utilized), it is worthy of some consideration. Perhaps it is no accident

that the oldest North Pacific ground slate appears on Kodiak Island, where slate is abundant (literally under foot in many places) and flakable stone is rare and of low quality.

Presence of the warm North Pacific Drift current and high mountains directly behind the shore give the area a relatively warm and equitable but wet maritime climate with considerable cloudiness and fog. Except near the heads of some bays, the sea never freezes. Boat traffic and maritime hunting are theoretically possible throughout the year, although the aboriginal inhabitants were stormbound for long periods during the fall and winter. Temperatures seldom plunge below -20°C (c. 0°F) and the yearly range is not great by Alaskan standards. Weather records are of very uneven quality but the difference between the Bering Sea and Pacific sides of the Alaska Peninsula is reflected in the fact that the northern shore receives c. 635 mm (25 inches) of precipitation in the year while the Pacific shore receives c. 1270 mm (50 inches) [OSWALT 1967]. The Kodiak Archipelago is large and diverse enough to display considerable variation in precipitation. At Shearwater, on the Pacific side of Kodiak, 2850 mm (112 inches) of precipitation fell in one year, while the southwestern portion of the island, on Shelikof Strait, has received as little as 810 mm (32 inches). Kodiak town, where the records are most adequate, averages about 1575 mm (62 inches) in the year [KARLSTROM 1969: 22; see also CLARK 1979: 56ff]. Precipitation is also heavy in Prince William Sound, with 3330 mm (131 inches) a year reported at Cordova at the southern boundary of the area of our concern [DE LAGUNA 1956: 8]. Prehistorians may have paid inadequate attention to local variation in climate. As Clark notes for Kodiak, morale, subsistence, and storage activities suffer under wet and stormy climatic conditions [1975b: 207]. Perhaps in earlier times before population densities built up to their historic levels, winter village sites, fish procurement sites, and food drying localities might have been selected in part on the basis of such local climatic variation.

With the exception of much of the Kodiak Archipelago, portions of the Kenai Peninsula, and part of the Pacific shore of the Alaska Peninsula, the land vegetation of our area is dominated at present by the northern Sitka spruce-hemlock forest (the Sitkan Biotic Province [OSWALT 1967: 12-13; PÉWÉ 1975: 82]). This vegetal community simplifies as one proceeds northwest, with the forests of Prince William Sound being of more complex composition than those of the outer Kenai Peninsula, while only Sitka spruce have obtained a toe hold on a portion of the Kodiak Archipelago, and this in the relatively recent past (see below). This situation probably lacks cultural significance since Heusser's work [1960] has shown that the advent of the forest has taken place in part of this area since the advent of man and the forest appears to have been mainly of nuisance value in an area where utilization of driftwood appears to have been preferred to use of live timber.

Far more significant were the faunal resources which gave this area ecological unity. Significant among sea mammals in varying degrees were the harbor seal, sea lion, sea otter, porpoise, beluga, and other whales and, locally and late, the fur seal. With the exception of the northern fur seal these are littoral rather than truly pelagic

marine mammals. Many are year around residents in the area. Land animals ranged from fairly diverse and abundant in Prince William Sound and Kachemak Bay to insignificant on Kodiak Island, rendering a mature maritime adaptation a prerequisite for human settlement there [CLARK 1975b: 205; DE LAGUNA 1956: 7]. The Kenai Peninsula is endowed with moose and caribou which are absent in Prince William Sound. Eggs, sea birds and migratory waterfowl were also exploited. Deep-sea fishing for halibut and cod was significant as was a stream fishery for several varieties of salmon. Shellfish and other invertebrates, although possibly considered starvation fare [DE LAGUNA 1956: 6], occur in great abundance in typical midden sites, where they make up much of the matrix ranging at times from two to seven meters deep. Abundance of intertidal invertebrates is correlated with the absence of seasonally freezing seas. These humble but accessible resources may well have served as starvation insurance, thus being instrumental in the buildup of the large human populations for which the area is noted. Although there is some intergradation, the resources of the North Pacific, with the partial exception of salmon, are strikingly different from those of the eastern Bering Sea. There the walrus and bearded seal replace the sea lion and sea otter; shellfish are of only trivial importance and the larger whales do not approach land close enough to be exploited. As one proceeds out into the Aleutian Islands the distinction between the resources of the Bering Sea and North Pacific breaks down, but along the Alaska Peninsula, especially the eastern portion, quite different adaptations would have been required to thrive as marine hunters in the two areas.

Past Environments

Here we will consider only those facets of environmental history which were of possible significance to the human occupants or which influence the preservation of the archeological record and the discovery of sites. To be considered are glaciation, relations between land and sea, and the Holocene succession of plant communities.

It appears clear that our area was substantially free of late Pleistocene ice before we have any evidence of human occupation. The base of the Alaska Peninsula [DUMOND, HENN and STUCKENRATH 1976: 23], the Kodiak Archipelago, outer Cook Inlet and Prince William Sound [HEUSSER 1960: 180] were deglaciated by at least 9000 years ago. Fladmark has suggested the existence of extensive unglaciated refugia including much of Cook Inlet and Prince William Sound during the late Pleistocene [1974: 136]. Holocene glaciation was not a factor on the relatively low mountains of Kodiak and there appears to be little data available from the Aleutian Range or the Alaska Peninsula. In the Cook Inlet area there were glacial advances in the highlands throughout much of Holocene time [KARLSTROM 1964: 2; PÉWÉ 1975: 33-34]. Present active glaciers which approach the sea along the southern shore of Kachemak Bay and whose Holocene fluctuations thus may have had direct impact on human settlement have not been studied in detail. There is evidence, however, for episodes of increased sedimentation in the Homer area correlated with Tustumena II and III advances in the adjacent Kenai Mountains spanning the first

millennium B. C. [KARLSTROM 1964: 2, 47]. The Prince William Sound area has some of the largest active ice fields in the world. Although the evidence is incomplete, Holocene glaciation here probably had more direct impact than elsewhere in our area, at times actually displacing human settlements and presumably destroying evidence for earlier occupations. The peak of the Neoglacial in recent centuries possibly shifted settlement to the outer coasts and islands and the expansion of Portage Glacier in historic times appears to have cut off a much used land connection between the Sound and upper Cook Inlet [FLADMARK 1974: 185-86; DE LAGUNA 1956: 2-3]. Except in Prince William Sound the major impact of Holocene glaciation is likely to have been indirect. A possible correlation of increased sedimentation rates with negative impact on the intertidal resources of the littoral zone in certain areas should be investigated further.

The relationship between land and sea is of obvious importance to maritime peoples whose villages were usually located on the shore. To complicate an already complex situation engendered by isostatic rebound from the burden of past glaciation and eustatic changes in sea level, the North Pacific is a highly active area tectonically, as witnessed by the disastrous results of the earthquake of March 1964. With local exceptions, much of our area appears to be subsiding beneath the sea with drastic impact on the archeological record. The bases of several sites on southeastern Kodiak were at or below sea level before the 1964 earthquake [CLARK 1965: 15]; the Great Midden (SEL 001) on Yukon Island in Kachemak Bay in the 1930s had subsided at least 4.2 m (14 feet) since the site was first occupied c. three millennia earlier [DE LAGUNA 1975a: 28]; and the Palugvik site in Prince William Sound appears to have subsided at least 1.2 m (four feet) in the last 2000 years [DE LAGUNA 1956: 3]. Most of the area subsided several additional feet as a result of the 1964 earthquake, leading to immeasurable attrition of the archeological record by marine erosion [CLARK 1974a: 55].

Considering the Northwest Coast culture area, Fladmark has made a persuasive case that modern stream gradients which permit optimal salmon runs stabilized only after 5000 years ago. In that area large shell mound sites appear only from this time onward [1974: 10, 207, 253]. This argument cannot be generalized to Alaska, where physiographic conditions may have been different and where there is evidence of exploitation of salmon as far back as 6000 years on Afognak Island and where one shell midden on the Alaska Peninsula dates back 6000 years ago (see below) but it is a suggestion that should be considered in future work. In passing it might be noted that Fladmark's reconstruction of the "subclimax" northern Northwest Coast environment before 5000 years ago [1974: 216] seems very similar to the North Pacific area being described here, leading one to suspect that he may have overestimated the significance of extensive lowlands in attaining optimal biological productivity [1974: 341].

Heusser has published the pioneer (and to date the only) history of Holocene vegetation and climate for our area. His reconstruction [1960: 183ff] defined three gross vegetal/environmental periods. The Early Postglacial (9000-7000 B. P.)

witnessed climatic conditions cooler and moister than today. Sedge and fern were dominant with alder important in Prince William Sound. The Hypsithermal (7000–4000 B. P.) was warm and moist in the beginning, becoming drier later and closing with a return to moister and cooler conditions. Mountain hemlock was dominant with alder in Prince William Sound while alder and birch were dominant on the Kenai Peninsula and Kodiak. The earliest maritime cultures in our area flourished during the middle and later Hypsithermal time. The Late Postglacial (4000 B. P. to the present) witnessed cool and moist conditions with intervals during which the climate was more severe than it is today. Conifers invaded the Kenai Peninsula early in this period and the Sitka spruce invaded northeast Kodiak within the last 3000–4000 years.

Available evidence does not indicate significant widespread faunal shifts during the Holocene and Clark has suggested that for Kodiak at least these climatic changes may have been insignificant [1975b: 207–8, 221]. Since adequate faunal studies are in their infancy in our area I am not prepared to summarily deny the possibility of relatively minor but significant shifts in the availability of resources. Although North Pacific shellfish appear to tolerate a wide range of temperatures [FLADMARK 1974: 191], there is evidence at Cottonwood Creek (SEL 030) in Kachemak Bay for the virtual extermination of clams, presumably due to excessive siltation in front of the site since it was occupied c. 1800 years ago [DE LAGUNA 1975a: 13; WORKMAN 1977b: 1]. Work at Chugachik Island in 1977 indicated that the whelks which form an important part of the matrix of a 2000 year old archeological site are locally extinct today. Moose have replaced caribou over much of the Kenai Peninsula in historic times [LUTZ 1974]. Relatively minor changes of this sort and their possible relationship to climatic change should be examined further. In the same vein, past volcanism may have had impact on Kodiak and the Alaska Peninsula, although the present evidence that it did is not compelling [DUMOND 1978a; WORKMAN 1978b].

Changes in the relation between land and sea over the time our area has been inhabited have destroyed innumerable archeological sites and have made it difficult to find those earlier sites which may remain. Clark [1965: 18–19] has noted that both emerging and drowning coastlines are poor places to look for anything but recent sites. Older sites will be found perched on low bluffs, located behind or buried beneath the modern beach, inland, and in other unlikely and difficult to find areas.

In summary, while a reasonable amount of suggestive paleoenvironmental information has accumulated for our area, it has not yet been possible to articulate it meaningfully with the archeological record. I am personally convinced that certain problems in areal prehistory such as the apparent abandonment of rich Kachemak Bay by Kachemak tradition Eskimos during the first millennium A. D. are related to subtle environmental changes, but elucidation of such problems remains a task for the future.

THE ALASKA PENINSULA BRANCH

Research on the Pacific side of the Alaska Peninsula began in 1953 and 1954 with the testing of a site at Kukak and the excavation of a small site in Kafia Bay [OSWALT 1955]. Between 1963 and 1965 University of Oregon crews under the supervision of Don Dumond made more extensive excavations as part of a long-term research program on the Alaska Peninsula, where they succeeded in generating a 6000 year sequence of cultures [CLARK 1978: 5, Table II; DUMOND 1977b]. In 1975 a brief survey was made in the Chignik area further west, which appears to lie outside the North Pacific Maritime co-tradition culturally as well as geographically [DUMOND, HENN and STUCKENRATH 1976: 22-23]. Mention should also be made of excavations at Pedro Bay which yielded ancient material related to that of the Pacific [TOWNSEND 1970] although its position on Lake Iliamna puts it geographically outside our area. An earlier publication on this material incorrectly treated it as part of a recent assemblage with which it is in part mixed [TOWNSEND and TOWNSEND 1961: 25-58]. The prehistory of the Katmai National Monument area has recently been described in some detail [G. CLARK 1977].

The Takli Alder Phase (4000 B. C.-2500 B. C.)

This phase is known from components at three coast middens, two on Takli Island and one in Kukak Bay. Characteristic artifacts include a series of stemmed flaked stone projectile points, various stemless points (including bipoints), large flaked knives, heavy scrapers, gouge-like polished adzes and barbed darts with expanded bases rather than line holes [G. CLARK 1977: 30]. Ground slate is totally absent. An oval or round house about eight meters in diameter is suggested [1977: 32]. Sea otter, seal, sea lion and porpoise are the most common food debris and there are limited amounts of shell in the midden. There is some reason to suppose that the most intensive occupation occurred about 3000 B. C. [1977: 32].

The Takli Birch Phase (2500 B. C.-800 B. C.)

This phase is known from components at the same three coast middens which yielded Takli Alder material. Polished slate is introduced and features-elongate stemmed double-edged blades, some with minimal barbing. Notched ulus are also present. Contracting stem projectile points, other Alder flaked stone types, polished adzes and expanding base organic points continue. Tanged and tangless bone wedges, stone saws and massive notched and grooved stones are added. The ratio of chipped to polished implements is 1.8 : 1. Round to oval houses are suggested, with the best defined measuring 5 x 7 meters. Seal and sea lion dominate the small faunal inventory and shells are thought to have become more common in the midden. It may eventually be possible to subdivide the phase into earlier and later subphases with the former, featuring large slate thrusting implements, dating between 2500 and 1500 B. C. [G. CLARK 1977: 32-37].

The Takli Cottonwood Phase (200 A. D.-500 A. D.)

This small assemblage comes from one site. Organics are lacking. Thirty-five sherds of undecorated fiber tempered pottery (30 from one vessel) occur in this assemblage. There are small finely chipped stemless points and contracting stem points with sharp to rounded shoulders and a small nondescript series of barbed and unbarbed slate points. Drilling makes an appearance as a technique for hafting ulus and there is a knobbed (decorated) stone lamp. The ratio of chipped to polished stone is 1.5 : 1. One 5×6 meter rectangular house with a rock lined hearth was encountered [G. CLARK 1977: 38-40].

Kukak Beach Phase (500 A. D.-1000 A. D.)

This phase is recognized on the basis of three components, two at sites on Kukak Bay and one on Takli Island. Reversing a trend, flaked stone artifacts become more popular in relation to ground than earlier (2.5 : 1 chipped to ground). A large number of small stemmed and stemless points, the latter often having contracting stems and sharp or barbed shoulders, are found. Fiber tempered pottery and decorated lamps continue. Small notched stones and ground slate rods appear. The house type was rectangular, with the best preserved measuring 7×6.5 meters. Another house yielded evidence of a sunken entrance or cold trap. Sea otter and seal (mainly juvenile) predominate in the fauna, but the percentage of land mammals is higher than in earlier phases [G. CLARK 1977: 40-47].

Kukak Mound Phase (1000 A. D.-1500 A. D.)

This phase is recognized on the basis of material from one component at the Kukak site. The trend towards ground slate rather than flaked stone artifacts resumes, with ground stone predominating in a ratio of 2.2 : 1. Small flaked stemmed points continue, but some may have been displaced from the Kukak Beach phase component. Pottery is tempered with gravel rather than fiber and the ceramic lamp appears. Small flat notched stones continue but the large end-notched cobble form appears, as do triangular slate end blades with grooved bases. Two houses are known, the best preserved of which appears to have been c. 5 meters square. One has a definite cold trap entrance passage. Sparse faunal remains (16 minimal individuals) indicate that sea mammals outnumber land mammals in a ratio of 4.3 : 1 [G. CLARK 1977: 47-50].

Discussion: The Alaska Peninsula Branch

The Takli Alder and Birch phases are clearly and closely related, differing mainly in the appearance of ground slate in the Birch phase and the relative frequency of various artifact types. A hiatus of 1000 years intervenes between the Takli Birch and the Takli Cottonwood phases, contributing to a less striking similarity. The Cottonwood phase is difficult to evaluate because of the small sample and lack of organics. Pottery and small flaked points are significant additions, presumably of northern

provenience (see below). A total of 35 potsherds (30 from one vessel) in a series of c. 550 artifacts is thin evidence for a strong interest in pottery, however. Quite possibly nothing more than a trade vessel or two is indicated. Although realizing that the vagaries of collection criteria, ceramic quality, chipping practices and site geomorphology render number of potsherds per site a weak reed to lean upon, I have calculated the ratio between stone artifacts and potsherds in three North Pacific and six Bering Sea ceramic collections (raw data from Dumond [1971]). On the North Pacific side, *stone artifacts* outnumber sherds in ratios of c. 12 : 1 (Cottonwood); 15 : 1 (Beach) and 8 : 1 (Mound). In the two earliest ceramic phases from the Naknek drainage (Smelt Creek and Brooks River Weir) *sherds* outnumber stone artifacts in a ratio of c. 2 : 1; in the middle two phases the ratio of sherds to stone artifacts is about 1 : 1, and in the last two phases stone artifacts outnumber sherds in ratios of 2 : 1 and 6 : 1 respectively. Not altogether comparable data from two large pooled Koniag phase site collections on Kodiak [CLARK 1974c: 52, 115] yield a ratio of c. 1 : 1 between sherds and stone artifacts. Crude as they are, these data might suggest that the commitment of Alaska Peninsula Pacific peoples to the ceramic arts was something less than complete by comparison with their neighbors, even those to the south of them.

Ceramics and a number of other characteristics link the Takli Cottonwood phase with the succeeding Kukak Beach phase, but significant changes occur, especially the increasing frequency of small projectile points, presumably indicative of increasing northern influence on a basal North Pacific substratum [G. CLARK 1977: 71]. The small sample from the succeeding Mound phase differs strikingly from the Beach phase in ceramic type (gravel-tempered pottery appears) and the virtual disappearance of flaked stone projectile points, but enough continuity traits exist that Gerald Clark [1977: 72] places it within the regional continuum that extends back to the Takli Alder phase. There is a substantial temporal gap between the Mound phase and historic times.

Although faunal samples are small in most cases, sea mammals seem to have outweighed land mammals at all periods. Occupants of the Takli site had little direct access to caribou compared to the people at Kukak Bay [DUMOND 1978b: 7]. The early Alaska Peninsula Pacific peoples appear to have utilized the area north of the Aleutian Range on at least a seasonal basis until this hunting ground was preempted by Arctic Small Tool tradition peoples from the north c. 1900 B. C. [DUMOND 1971: 18; DUMOND, HENN and STUCKENRATH 1976: 22]. Presumably this displacement would have necessitated an adjustment in subsistence activities of the Pacific peoples that we have not yet been able to detect. Faunal analysis has demonstrated that the Kukak site (where Mound and Beach phase materials are present) was occupied throughout the year, while the Takli site (Alder and Birch) was clearly occupied during the warm months with no compelling evidence for a winter occupation [DUMOND 1978b: 13]. A deep-water halibut fishery is far better documented at Kukak than at the Takli site, although one cannot be sure that this observation is of cultural significance [DUMOND 1978b: 9-10].

Available evidence suggests that Takli Alder and Birch phase houses were large oval or rounded forms. The rectangular house appears in Cottonwood phase times and persisted thereafter, although the "typical" North Pacific form with a supplementary room appears to be very rare [see G. CLARK 1977: 26]. One wonders if this form might not have been derived from the somewhat smaller Arctic Small Tool tradition houses of the Bering Sea drainage to the north [DUMOND 1971: 8]. Large coastal villages at low elevation are first documented for the Kukak Beach phase, the earlier three Takli phases share a penchant for locations on promontories 4.5 m (15 feet) and more above high tide [G. CLARK 1977: 70].

It is surprising that to date very few human remains have been found in Peninsular Pacific coast shell mounds. In his Master's thesis Gerald Clark reports a single human humerus from a Birch phase context at the Takli site [G. CLARK 1968: 37] and he recalls one (possibly two) occurrences of human bones in Christian era contexts at other sites (Personal Communication 1979). Burial within the village shell mound is an ancient and otherwise universal trait of the North Pacific Maritime co-tradition as well as Aleut cultures, in sharp distinction to the separate cemetery areas that appear to have been the rule north of the Alaska Peninsula. Organic preservation is spotty in Pacific Peninsula sites, but one wonders if the peninsular peoples participated fully in the typical North Pacific burial pattern.

Mention should be made here of the mixed collection from Kaffia in which G. Clark sees Birch and Beach or Mound connections [1977: 83]. Interestingly, the older component at Kaffia contains slate shaped by sawing, snapping and scraping in a fashion characteristic of Ocean Bay II on Kodiak [OSWALT 1955: 46, Pl. 1-11]. Sawing, snapping and relatively coarse abrasion of ground slate is present in the Birch phase although it has not been emphasized in publication and the surface scraping appears to be less pronounced than is typical for Ocean Bay II on Kodiak [G. CLARK 1968: Table 40, 1977: 202, Personal Communication 1979].

We have already mentioned evidence for Peninsular peoples' penetration of the Bering Sea drainage of the Alaska Peninsula before c. 1900 B. C. Most interesting is the old component of the Pedro Bay site located on the northeast shore of Lake Iliamna at the modern village of Pedro Bay. For whatever reason, early North Pacific Maritime co-tradition people seem to have preferred to settle on islands lying offshore from larger land masses (Takli Island on the Peninsula; Sitkalidak, Uganik and Chirikof Islands in the Kodiak Archipelago discussed below). The Pedro Bay site, despite its inland setting, is no exception, for the excavator suggests that when occupied c. 4500 years ago the site lay on an island in Iliamna Lake which has only recently been joined to the mainland [TOWNSEND 1970: 1]. Ground stone tools outnumber flaked in a ratio of c. 2 : 1. The ground slate inventory features large double-edged points, some barbed or with serrated blades or stems. Stems are usually slightly tapered and many pieces have been coarsely scraped although sawing is not mentioned. Most flaked points are stemmed and drills and tiny endscrapers are common. Stone sinkers and lamps as well as evidence for structures are absent. The area abounds in terrestrial game, seals are available in the lake and rich salmon

runs likely were available in the Knutson River, at whose mouth the site is located [1970: 9]. The absence of structures might argue against cold season settlement. Townsend sees closest comparisons with Takli Birch and Ocean Bay II (here the question of presence or absence of the "saw and snap" technique becomes critical [1970: 6]) while G. Clark specifies an early Birch subphase on the basis of cross-comparisons of the large piercing points [1977: 83]. Donald Clark [1979: 222] notes that Pedro Bay slate is very similar to that of Ocean Bay II.

Influences from the Bering Sea cannot be ignored in a discussion of Peninsular Pacific prehistory. Both Dumond [1978b: 2-4, 14-15] and G. Clark [1977: 82] characterize the prehistory of the first millennium A. D. as demonstrating increasing influences emanating from the Bering Sea upon the North Pacific Peninsular people. To Dumond the Kukak Beach phase (500-1000 A. D.) is so similar to the contemporary Norton-related phase to the north that he decides in favor of an acculturated resident North Pacific population rather than seasonal incursion of actual Bering Sea people only on the evidence that the Kukak occupation was year-round rather than seasonal [1978c: 14-15]. G. Clark detects a certain individuality in Beach phase organics and slate [1977: 82] and suggests that virtual identity prevails across the Peninsula only after 1000 A. D. Strangely, this new "identity" corresponds with strong typological breaks with antecedent phases on both sides of the Peninsula, especially in the sudden rise to ascendancy of ground stone over chipped stone and in ceramics. Dumond reasonably attributed these innovations to penetration of the area by Thule tradition people of ultimate far northern provenience [1977a: 133ff]. Two pulses of influence seem to be involved, the earlier Norton and later Thule. Since a north-south age gradient seems established for Thule-related peoples of the Bering Sea [DUMOND 1977a: 133], one wonders if the Norton pressures (however expressed in cultural terms) on the North Pacific might not be a response in part to Thule pressures upon them yet further north.

Workers in both areas seem to agree that Takli Alder is very similar to Ocean Bay I on Kodiak [D. CLARK 1972: 25-26, 1975b: 208, 1979: 222; G. CLARK 1977: 78]. Basic differences are the presence at AFO 106 on Kodiak of a degenerate microblade industry, stone wedges, a modicum of ground slate, and presence in the Takli collection of large polished adzes. Takli Birch is different from "classic" Ocean Bay II (Ocean Bay II-B in his most recent formulation [CLARK 1979: 215, 224]) in a number of important respects however [D. CLARK 1972: 27, 1975b: 216; G. CLARK 1977: 77]. Basic differences include the presence of a mixed stone flaking and grinding technology in Takli Birch, presence of implements such as ulus which are only weakly indicated for Ocean Bay II, and lack of emphasis on the characteristic "saw-snap and scrape" Ocean Bay II slate technology. As D. Clark notes [1979: 224] much of Takli Birch postdates the Ocean Bay culture on Kodiak and some of the observed differences between them may be explained in these terms.

Comparison between the Peninsula and the Kodiak Archipelago during Kachemak tradition times are hampered by the presence of a substantial hiatus in the Kodiak record of the second millennium B. C., the likelihood that the earliest phase of the

Kachemak tradition (Old Kiavak) on Kodiak is not smoothly derived from the Ocean Bay tradition [CLARK 1972: 27, 1979: 227], the virtual absence of a first millennium B. C. record from the Peninsula and the small and impoverished nature of the Takli Cottonwood assemblage. Although many general traits of the Kachemak tradition are present in the Birch collection [compare DE LAGUNA 1975a: 121-129], many of the diagnostics are not. For example, small stone sinkers make a late appearance on the Alaska Peninsula, the end-grooved weight was never in vogue, and many other specific marker traits are missing. Dumond has suggested that as ties with the Bering Sea strengthen, ties with Kodiak lessen [1972: 35]. Donald Clark suggests that peninsular similarities with the Kachemak tradition may be due to trait diffusion rather than to close genetic connection [1975b: 221, 1979: 227-228] and Gerald Clark notes remarkably few specific connections between Old Kiavak on Kodiak and the Peninsula sequence [1977: 79]. He does suggest, on the basis of survey collections, that there might have been an occupation of the Pacific Coast similar to the Three Saints Bay phase on Kodiak and contemporary with and different from the Cottonwood phase discussed above [1977: 84]. He notes considerable similarity between the Kukak Mound phase and the Koniag phase on Kodiak [1977: 79, 98], suggesting that they fall within a single cultural area at this time. The case is complex, however, since certain link traits between the two areas (i.e. gravel-tempered pottery, triangular slate end blades) have a very wide distribution in this time range [D. CLARK 1974c: 180].

The record from Kachemak Bay is truncated on both ends by comparison with the Peninsula, although there are suggestions of a pre-Kachemak I occupation at a site in Halibut Cove [D. CLARK 1979: 222; DE LAGUNA 1975a: Pl. 32-8, 14, 19]. G. Clark sees numerous similarities between the late Birch phase and Yukon Island I and II artifacts and some cross-ties in the later material [1977: 79-80]. The differences parallel those pointed out above for Kodiak. He also notes that the major similarities with the Prince William Sound material are with the Kukak Beach phase (especially in bone projectile points), however several slate points in small collections recall early Birch phase specimens, suggesting an earlier occupation of the Sound than has yet been documented [G. CLARK 1977: 81].

THE KODIAK BRANCH

As Clark has noted [1966a: 370] the Kodiak Archipelago with a population of c. 8 people per mile of shoreline was the population center of the Pacific Eskimo world. Aleš Hrdlička literally mined the Uyak site between 1931 and 1936, paying little attention to the rudiments of archeological recording [HEIZER 1956]. Parties representing the University of Wisconsin Aleut-Koniag Prehistory project were active between 1960 and 1964 with the principle results being the refinement of Hrdlička's sequence, the addition of another 3,000 years to the known prehistory of the island, and an exhaustive study of Koniag ethnogenesis [CLARK 1966a, 1970, 1974c, 1978: 5]. Additional work on Afognak Island in 1971 threw new light on the two oldest

phases of island prehistory [CLARK 1972, 1979]. Work in the Uganik area of northwestern Kodiak in 1977 revealed the presence of most known Kodiak phases, including the oldest (Ocean Bay I) but excluding Ocean Bay II [NOWAK 1978].

The Ocean Bay I Phase (4000 B. C.–2500/2000 B. C.)

The oldest Kodiak culture, predating the rise to dominance of ground slate implements over those of flaked stone, was discovered in 1963 in the lower levels of the Sitkalidak Roadcut site located on an old shoreline of Ocean Bay [CLARK 1966a: 359, 1979: 5ff]. Survey in 1964 located another station of this phase of culture (AFO 106) in the estuary of the Afognak River on Afognak Island. This site was dug in 1971 [CLARK 1972: 7ff, 1979: 46ff]. Survey and limited testing on the south end of Uganik Island on northwestern Kodiak located one certain and one possible Ocean Bay I component [NOWAK 1978: 25–32]. None of these sites have yielded organic remains or features.

The Ocean Bay inventory is typified by a series of flaked contracting stem (and a few stemless) projectile points and bifaces (many unfinished). Crude microblade cores, stone wedges and an occasional boulder spall are present at AFO 106 but absent at the Roadcut site. The raw material favored is a relatively intractable chert available at a few localities in the archipelago [CLARK 1972: 8, 25; 1975b: 208–209]. Endscrapers are absent and simple stone lamps are known [CLARK 1972: 7, 1975b: 208–209]. Ground slate was not significant at the Roadcut site, but it is present throughout AFO 106 although there is evidence that it is more popular in the higher levels (microcores and stone wedges seem to be more strongly associated with the lower levels). Only (lance?) points and double-edged knives were found and many of the forms as well as the “saw, snap and scrape” technology of the upper levels are quite similar to Ocean Bay II. The upper levels at AFO 106 could be seen as transitional in a sense towards Ocean Bay II, but there are complications (see below) [CLARK 1972: 12–13, 1975b: 209–212, 1979: 71ff].

In the absence of organic remains, positional evidence suggests that AFO 106 was a summer salmon fishing camp although the frequency of projectile points also suggests substantial marine hunting. If conditions were roughly like those prevailing today, brackish water would have limited opportunities for the harvesting of intertidal invertebrates. The Sitkalidak Roadcut site faces the open sea rich in sea mammals (including whales) and there is a salmon stream nearby. The exposed sandy beach would be poor for littoral gathering [CLARK 1975b: 209, 1979: 44].

The Ocean Bay II Phase (2500 B. C.–1500(?) B. C.)

The Ocean Bay II phase is known from the upper levels at the Sitkalidak Roadcut site and from AFO 109 located across the river and about 150 m upstream from AFO 106 discussed above. The hallmark of the Ocean Bay II technology is the uniform application of a very distinctive slate working technology in which double-edged blades (knives and lances) are produced by sawing rectangular bars of slate from both sides, snapping them through the resulting septa, and coarsely scraping and

scratching the surfaces. Since there is a virtual absence of stone flakes and stone flaking, it is difficult to say how this intermediate step was achieved, but there is some evidence that boulder spalls may have been used for this purpose [CLARK 1979: 172-173]. Finished pieces are quite finely honed and smoothed. The sawing technique is known in later cultures, but never again does it reach the importance that it had in Ocean Bay II times [CLARK 1975b: 210-211]. I have informally designated this distinctive technology the "saw, snap and scrape" approach to slate implement fabrication. Single-edged knives or ulus are rare [CLARK 1975b: 211, 1979: 157-158]. The few excavated specimens from AFO 109 are not of classic ulu form. The sawed bar blank is ideal for the fabrication of large double-edged blades; much less suitable for ulus. Adzes are also very rare and notched cobbles and pebbles occur only in very small quantity late in this relatively short lived phase. Stems on slate blades are often serrated. Preforms, bars and unfinished pieces are so abundant at AFO 109 that a secondary site function as a workshop (one might almost say factory) seems clear [CLARK 1972: 23, 1979: 147ff].

We know little in detail about Ocean Bay II architecture, but at AFO 109 we encountered the very end of a substantial excavated pit associated with a post hole and another partially preserved pit structure which may well have been a house [CLARK 1979: 129-142]. No organics survive from Ocean Bay II times, but since both known sites occur atop or very near an Ocean Bay I occupation the remarks concerning probable subsistence pursuits made above apply here as well. Lance whaling using large double-edged blades that recall ethnographic whaling lances seems likely [CLARK 1975b: 209, 212, 220]. It seems to me that this ancient North Pacific technique, which does not involve securing a line to the wounded whale, would work best on a statistical basis where various communities, while losing a number of whales they struck, would receive "unearned" whales lost by others. This implies that efficiency would be reached only when a number of whaling communities existed in a circumscribed area. Some of the incised designs on Ocean Bay II slate blades may be ownership marks used ethnographically in this kind of hunting to identify the hunter [CLARK 1974c: 72]. One wonders if some of the "ornamental" grooves and pits might not have served to retain aconite poison.

The Old Kiavak Phase (1500 B. C.(?)–100 B. C.)

This phase, which is separated by a temporal hiatus of several hundred years from Ocean Bay II and from which it appears to represent a radical departure (see below), is poorly dated and only modestly defined at present. The single useful date of c. 1300 B. C. comes from the base of the main Old Kiavak occupation at the Kiavak 419 site [CLARK 1966b: 175-177]. Clark's estimate that the phase should be extended back to c. 1500 B. C. [1975b: 213] appears reasonable. Duration of the phase is indicated only by basal dates for the subsequent Three Saints phase.

The Old Kiavak phase is represented only by one modest assemblage of about 500 artifacts from the lower component of the Old Kiavak site [CLARK 1966a: 363]. Organic preservation at the type site was poor. Small Old Kiavak assemblages

appear to be present beneath later assemblages at the Monashka Bay site (KOD 223 [CLARK 1974a: 44-45]), at the Crag Point site in Anton Larsen Bay [CLARK 1970: 74], and in a beach collection (KOD 233) from the Uganik Bay area on north-western Kodiak [NOWAK 1978: 46ff].

Flaked stone artifacts, virtually absent in classic Ocean Bay II, make a modest comeback in Old Kiavak times. Phase diagnostics at present include large-plummet shaped end grooved stones (presumably deep sea fishing weights), large and medium-sized notched pebbles and possibly unifacially trimmed slate blades and stones grooved about the edges. Drilled holes in slate blades are rare [CLARK 1966a: 363]. The trait of stem serration persists from earlier times although the "saw, snap and scrape" technique does not, while some of the barbed slate projectiles foreshadow the distinctive "Three Saints Bay" style of workmanship. Many of the basic forms of later times (adzes, ulus, labrets, oil lamps, etc.) are present, but the phase inventory is defined to an undesirable degree by absence of specific later traits [CLARK 1966a: 363, 1975b: 213].

Neither houses nor diagnostic human remains are known. Clay lined basins and two slab lined hearths are reported from the type site [CLARK 1966a: 363]. The meager faunal assemblage is dominated by harbor seal, with considerable red fox and trivial quantities of other species [CLARK 1974c: 34].

The Three Saints Bay Phase (100 B. C.-1100 A. D.)

Phase chronology is again extended c. 200 years beyond the youngest known radiocarbon date in accord with the complex reasoning of Donald Clark's estimate [1970: 89, 1975b: 213]. Samples from the prehistoric component at the Three Saints Bay site and the main component at Crag Point in Anton Larsen Bay supplemented by portions of the large but poorly excavated Uyak site collection constitute the basic sample [CLARK 1970; HEIZER 1956].

In technology and such esoteric domains of culture as burial ceremonialism the Three Saints Bay phase is the cultural climax in the Kodiak area (CLARK 1975b: 219). Jewelry and items of personal adornment peak in popularity as measured by diversity of forms and abundance in this phase. Symmetry and careful workmanship characterize the ground stone and organic inventories, extending even to such humble tools of everyday use as stone adzes and bone wedges. Ground slate points and knives with square stems with or without serration and symmetric prominent barbs are characteristic. Flaked stone implements are rare. Abundant small notched pebbles and decorated stone lamps are phase diagnostics, as are a series of bizarre practices with the remains of the dead including dismembered burial, cut and drilled human bones, burial with artificial eyes inserted in the skull and probably cannibalism [CLARK 1975b: 214]. Fauna from Three Saints Bay and Crag Point indicate basic dependence upon harbor seal, with sea otter surprisingly rare (less than 2%) and red fox surprisingly abundant (21-27% [CLARK 1970: 86-87]). Burned plank structures of considerable complexity are known from Crag Point [CLARK 1970: 75, 88] but no Three Saints Bay phase houses have been completely excavated. Other features

include small clay-lined basins (a possible phase diagnostic) and rectangular slab hearths [CLARK 1970: 88].

The Koniag Phase (1100 A. D.-1763 A. D.)

The bulk of radiocarbon-dated Koniag phase material comes from the sites of Rolling Bay and Kiavak 418 on southwestern Kodiak, both of which postdate the late 15th century [CLARK 1974c: 167ff]. Additional significant material comes from the "upper levels" of the poorly excavated Uyak site [HEIZER 1956] and from other excavations in the vicinity of Kodiak town [CLARK 1974a]. The oldest acceptable date of A. D. 1350±100 (B-836) comes from near the base of a Koniag phase site on Kizhuyak Bay while dates of c. 1000 and 840 A. D. on seal fat char from pottery require adjustment because of the tendency for sea mammal residue to yield excessively old dates [CLARK 1970: 89, 1974a: 25]. The critical period of transition from the Three Saints to the Koniag phase thus appears to be rather poorly represented at present.

Much of the change between the inventories of the Three Saints and Koniag phases is on the stylistic level. Koniag phase artifacts as a whole are less carefully made than their predecessors. Bone and stone projectiles occur in fewer styles, barbing is uncommon on all but the largest slate blades and there are fewer ornaments, decorated items and art objects. Woodworking apparently was more important during Koniag times than it had been earlier, with more stone adzes and large bone wedges being found. The grooved (splitting) adze makes its appearance. Most of the exotic practices with the remains of the dead noted for the Three Saints phase disappear, as do the small notched stones. Burned rubble indicating introduction of the vapor sweat bath, incised slate figurines, large notched cobbles and (on southwestern Kodiak) plain gravel-tempered ceramics appear [CLARK 1974c: 159ff, 1975b: 219-220]. Clark has distinguished ceramic and non-ceramic variants of Koniag culture, with few absolute differences between them save the use of pottery. The failure of pottery to spread over the entire archipelago after its introduction early in the second millennium A. D. may indicate the presence of two social spheres during Koniag phase times [CLARK 1974c: 182, 1975b: 214].

No Koniag phase houses have been completely excavated as yet. Stone slab boxes, cists and fire hearths are known [CLARK 1974c: 153ff]. Burials were often in the living area, in the flexed position. There is some evidence for cairn burial and ethnographic data suggest mummification, cave burial and other practices not as yet documented archeologically. Most of the exotic practices typical of the Three Saints Bay phase are absent [CLARK 1974c: 143ff]. Koniag subsistence practices do not appear to have been greatly different from those of the Three Saints phase people, but foxes occur more rarely and the fur seal becomes surprisingly common in the final prehistoric and early contact period [CLARK 1974c: 30, 38ff; 1975b: 215].

Discussion: The Kodiak Branch

Clark has divided the prehistory of the Kodiak Archipelago into three sequent

traditions, Ocean Bay (I and II), Kachemak (Old Kiavak and Three Saints Bay) and Koniag. As noted earlier, he takes traditions as indicative of continuity of languages and peoples. Breaks between traditions imply a disruption of this continuity [CLARK 1978: 16-17]. While Clark favors the view that Ocean Bay I and II are related in an ancestor-descendant fashion [1975b: 216, 1978: 8, 16; 1979: 217] the relationships between them are not simple. It appears that AFO 106 and AFO 109 were inhabited by related but distinct peoples in the third millennium B. C., with stone flaking retained in the late AFO 106 inventory but lost at AFO 109 [CLARK 1979: 214-218]. The late material from AFO 106 (Ocean Bay II-A in Clark's bifurcating sequence model) is more similar to Takli Birch on the Alaska Peninsula than is "classic" Ocean Bay II (Ocean Bay II-B). Closest links between the two phases are found in the slate technology. Both cultures emphasize production of pointed piercing implements and a lack of interest in heavy wood-working tools. Pecked stone implements are of only minor importance [CLARK 1972: 19]. The Ocean Bay II obsession with the sawing and scraping of slate to the exclusion of stone flaking is unique in the area in this time range and may represent an extreme local specialization, or, conceivably, partial inventories or site specialization, although I do not favor this interpretation.

There may be as much as a 400 year hiatus between Ocean Bay II and Old Kiavak and this temporal gap is accompanied by sufficient typological change to render direct descent of the Old Kiavak people from Ocean Bay II unlikely [CLARK 1975a: 27, 1975b: 217-219, 1979: 227]. Although certain traits such as stem serration on ground slate points, simple stone lamps and cobble mauls continue [CLARK 1975b: 211ff] a host of new traits (notched sinkers, ulus, grooved weights, etc.) are added, the flaking of cryptocrystalline stone makes a modest comeback and the characteristic Ocean Bay II saw, snap and scrape slate technology is eclipsed. Present evidence, admittedly unsatisfactory, could be interpreted to suggest that Kodiak was abandoned for several centuries in the middle of the second millennium B. C.

Clark has grouped the Old Kiavak and Three Saints Bay phases on Kodiak with contemporary phases in outer Cook Inlet (see below) into a Kachemak tradition. The Old Kiavak phase is poorly dated and only modestly defined at present. With the exception of end grooved plummet-like weights and unifacially flaked slate blades, most of the traits distinguishing the Old Kiavak phase from the Three Saints Bay phase represent additions and elaborations in the material culture of the latter [CLARK 1966a: 365]. Nowak has recently reported a site (KOD 172) at the northern juncture of Spirodon and Uyak Bays with radiocarbon dates of c. 230 and 130 B. C. from the "middle levels" which may bear on the problem of the Old Kiavak-Three Saints Bay transition [1978: 33].

Clark has subjected the origin of the late prehistoric Koniag phase of culture on Kodiak to exhaustive analysis [1974c], although most of his material comes from sites postdating the 15th century and more data from nearer to the time of disappearance of the Three Saints Bay phase is badly needed. He concludes that the changes between the Koniag and Three Saints Bay phases are drastic enough that some alien influences, possibly including immigration of peoples, must be invoked but that there

is sufficient continuity to suggest that no simple population replacement was involved. Furthermore, influences from different areas (Prince William Sound, the Northwest Coast and the Bering Sea) entered to different degrees with continuity from earlier times to create the ceramic (southwest Kodiak) and nonceramic (northwest Kodiak) Koniag variants [1974c: 174-175, 183-184]. This elegant reconstruction, which partakes of the complexity of reality, cannot be briefly summarized.

As noted earlier, Ocean Bay I is very closely related to the Takli Alder phase on the Alaska Peninsula. Classic Ocean Bay II (Ocean Bay II-B) appears confined as a complex to Kodiak, although some cross ties with Lake Iliamna and possibly undated specimens from Halibut Cove in Kachemak Bay are noted by Clark [1972: 28]. The characteristic "saw, snap and scrape" slate shaping technique also occurs in undated context at Kafila [OSWALT 1955: Pl. 1-11]. The Ocean Bay II-A variant, with some flaked stone, is more similar to Takli Birch and, in a general way, to the subsequent Old Kiavak phase.

Clark has incorporated the Old Kiavak and Three Saints Bay phases on Kodiak with Kachemak II and III in Kachemak Bay into a Kachemak tradition which he sees as "a relatively local tightly defined line of development" [1970: 92]. Remains from the Pacific shores of the Alaska Peninsula, Chirikof Island and Prince William Sound are seen as related in some way but excluded from the Kachemak tradition *sensu stricto*. He notes that eventually we may see a series of interconnected local traditions in this area—a suggestion which anticipates the co-tradition concept utilized in this paper [CLARK 1974c: 181, 1975b: 222, 1978: 15ff]. I am inclined to agree with this judgement. Although further quantification and detailed analysis would be desirable, it appears that Three Saints Bay on Kodiak and Kachemak III in Kachemak Bay share a wider spectrum of traits than do the other areas in question. The problem of the origins of the Kachemak tradition is unresolved at present. On present evidence it cannot be smoothly derived from either Ocean Bay II on Kodiak or the undesirably long-lived Talki Birch phase of the Alaska Peninsula (see earlier discussion) but the pertinent archeological records are deficient in significant ways. Dogmatic exclusion of both of these possible sources leaves us with *no* plausible ancestor for this significant cultural entity.

The complexities attending the genesis of the late prehistoric Koniag phase [CLARK 1974c] have been alluded to above. Clearly second millennium A. D. Bering Sea cultures played a significant role but there are significant continuities with the Kachemak tradition and apparent influxes of important new ideas from the south as well [CLARK 1974c: 183]. Although admitting that the situation is complex, Dumond suggests that Bering Sea (Thule) cultural influences were strong enough on Kodiak to introduce the Eskimo language used about the Bering Sea to Kodiak at this time [DUMOND 1977a: 139]. Clark [1975b] has concluded that the same basic subsistence strategy has prevailed in the Kodiak Archipelago over its 6000 year history, persisting despite at least three major technological breaks.

THE OUTER COOK INLET BRANCH

Most of the information on which this section is based comes from Kachemak Bay, a large complex embayment near the tip of the Kenai Peninsula. Although the prehistory of this rich area appears to have been Pacific Eskimo for perhaps 2000 years, most of Kachemak Bay was occupied at the time of the coming of the Europeans by Tanaina Athapaskans whose presence and (among Athapaskan speakers) unique maritime hunting adaptation presents a self-evident problem for research [DE LAGUNA 1975a: 13-14, 1975b; OSGOOD 1966; WORKMAN 1974]. Jacobsen undertook brief excavations at a village (exact location unknown) within the bay in 1883 but the fundamental work was and remains that of de Laguna based on field work undertaken in 1930-1932 [1934, republished in 1975]. Further archeological survey was undertaken by Schledermann in 1964, by Reger and Pratt in 1973, by Cook Inlet Native Association personnel in 1975, by Lobdell in 1976 and by Zinck, Zinck and Sczawinski in 1977. In 1974 Lobdell and Workman began a long-term research program in the area with excavations at one of de Laguna's important sites, Cottonwood Creek [LOBDELL 1975, 1977, 1978a; WORKMAN 1977a]. During the same summer the SEL 033 site on Chugachik Island was tested [K. WORKMAN 1977], with full scale excavations there in 1977 [K. WORKMAN 1978]. Full scale excavations were undertaken in the summer of 1978 by Lobdell and Workman at a new locality adjacent to the Yukon Island Fox Farm site first tested by de Laguna in 1931. In March 1978 a symposium on the Anthropology of the Greater Cook Inlet area was held at the Fifth Annual Meeting of the Alaska Anthropological Association at which a number of papers were presented and an attempt was made to chart some obvious directions for future research [WORKMAN 1978a].

Early Prehistory (?—Second Millennium B. C. ?)

The known prehistoric record in Kachemak Bay is only half the length of that of the areas considered above, but isolated finds from Halibut Cove [DE LAGUNA 1975a: Pl. 30-14, Pl. 32-8, 14, 19] raise the possibility that the early maritime hunting cultures may eventually be found in Kachemak Bay. De Laguna has briefly discussed collections made by others from Halibut Cove that contained flaked stone artifacts, possibly microblades and a possible burin [1975b: vii]. She also indicates that many flaked stone pieces from Yukon Island I were neither illustrated nor studied in detail in her original report. The rolling uplands on the north side of the bay could have harbored interior hunting people through much of Holocene time. A notched point from Halibut Cove [DE LAGUNA 1975a: Pl. 30-10] strongly suggests non-Eskimo manufacture and at least a moderate antiquity.

Kachemak I (Second Millennium B. C. ?)

This phase of culture is known only from the lowest levels at the Great Midden site (SEL 001) on Yukon Island and testing in 1978 and 1979 at a previously unexcavated area of the Yukon Island Fox Farm site [DE LAGUNA and K. WORKMAN

1979: 9 and unpublished 1979 work]. A single radiocarbon date of c. 750 B. C. has been challenged with reason by de Laguna [DE LAGUNA 1962, 1975b: ix; WORKMAN 1977a: 32-33]. The stone inventory is dominated by flaked stone tools of rather nondescript form. Large stone weights grooved about one end are diagnostic, but the smaller notched stones so abundant later are absent. The organic inventory features a simple primitive, self-armed, open socket harpoon and slender barbed bone points [DE LAGUNA 1975a: 121-122]. The harpoons, which are fairly abundant (six occurred in a single cache), strongly recall Norton culture forms from Cape Denbigh [GIDDINGS 1964: Pl. 36-18, 20] and Nunivak Island [NOWAK 1974: Pl. 11-P-S, V-Y]. Other long-lived traits diagnostic of the local tradition but not the period include polished adzes, boulder spalls, ulus (usually notched for hafting), simple stone lamps, compound fishhook barbs (the shafts were presumably wood rather than rib as one finds elsewhere), labrets and naturalistic art [DE LAGUNA 1975a: 121-129]. A variety of land and sea creatures were harvested, prominent among which were harbor seal and porpoise, marmot and the lesser whales. A robust "Eskimo" dog was also characteristic [1975a: 31]. Nothing is known about burial practices and houses.

Kachemak II (?1200 B. C.-400 B. C.)

This period of culture is known mainly from excavations at the Great Midden on Yukon Island with lesser collections recovered from the Fox Farm site (SEL 041) on Yukon Island in 1932 and 1978 and, possibly, some of the older material from Chugachik Island (SEL 033) [DE LAGUNA 1975a: 27; DE LAGUNA and K. WORKMAN 1979]. The period has not been directly dated as yet unless a basal date of 2740 ± 75 radiocarbon years: 790 B. C. (UGa-2343) from the Chugachik Island site applies. Houses are constructed from stone and whale bone as well as wood, large notched stones and barbed slate points appear and stones grooved about one end and a flourishing flaked stone industry persist. Flexed burials with grave goods and disarticulated burials are known [DE LAGUNA 1975a: 122]. The faunal remains reflect basically the same food preferences as Kachemak I.

Kachemak Sub-III (400 B. C.-0 A. D.)

This is a period of elaboration and change in material culture in Kachemak Bay. Kachemak sub-III assemblages have been recovered from the Great Midden on Yukon Island [DE LAGUNA 1975a] and from Chugachik Island [K. WORKMAN 1977; 1978], although Chugachik overlaps with Kachemak III. A date on birchbark of c. 360 B. C. is available from the bottom of one part of the SEL 033 site on Chugachik Island while dates of c. 250 A. D. and 1475 ± 70 radiocarbon years: A. D. 475 (UGa-2344) come from near the top of the site [WORKMAN 1977a: 31]. The new basal date of c. 800 B. C. cited above suggests an earlier occupation not well documented typologically in preliminary studies [K. WORKMAN 1977, 1978]. An additional date of 1940 ± 90 radiocarbon years: A. D. 10 (UGa-2342) from well down in the midden deposit has recently become available.

In de Laguna's original periodization, prevalence of small notched stones and the advent of large weights grooved about the middle and over one end, the stone saw, the excavated hearth pit and flexed burial with artificial eyes, labrets and clay masks were considered diagnostic [1975a: 124-126]. On Chugachik (and to a certain extent on Yukon Island) a vigorous flaked stone industry utilizing a rather intractable red chert persists, with flaked stone points, bifaces and scrapers being significant throughout [K. WORKMAN 1978: 4-5]. Ground slate points appear only in the upper levels at Chugachik. Tanged bifacial scrapers also occur [K. WORKMAN 1977: 9] and notched adze heads were added to the inventory [K. WORKMAN 1977: 10]. Over 1000 small notched stones were collected on Chugachik Island, several in piles of 20-30. One retained traces of the fiber which bound it [K. WORKMAN 1978: 4]. Abundance of these small weights coupled with the abundance of birds (especially scoter ducks) and the virtual absence of any but bottom fish lead to the suggestion that nets may well have been used in fowling here.

No Kachemak sub-III houses have been completely excavated and no traces of semisubterranean houses were encountered at Chugachik, although numerous large post holes were found sunk into subsite deposits in one area. A cache of six multi-barbed arrow heads was found as well. Surprisingly, we encountered only one complete human burial there although we did find what appears to have been the intentional burial of a dog [K. WORKMAN 1977: 2].

On both Yukon and Chugachik Islands, harbor seal and porpoise were the most common game [DE LAGUNA 1975a: 31; K. WORKMAN 1978: 3]. Marmot was also very abundant, as were birds at Chugachik. As a rarity, snow(?) crab parts were found in the Chugachik midden. Preliminary analysis of the bird remains at Chugachik strongly suggests that the site was occupied in spring and early summer [YESNER 1977: 23].

Kachemak III (A. D. 0-500 A. D.)

Major excavations at the Great Midden on Yukon Island and at Cottonwood Creek (SEL 030) in 1931 and 1974 coupled with less extensive work at the Yukon Island Fox Farm have provided material for the definition of this period of culture. Two dates on structures at the base of the Cottonwood Creek site are close to 200 A. D. while a date near the top of the main occupation there is c. 400 A. D. [WORKMAN 1977a: 32] and a disputed date, presumably from the Great Midden site is c. 600 A. D. [WORKMAN 1977a: 33]. Although Kachemak III remains appear to be the most common in the bay it now appears that this occupation ended by or shortly after 500 A. D.

In its florescence of arts and crafts, personal adornment and a bizarre and diverse mortuary cult, Kachemak III largely duplicates the Three Saints Bay phase on Kodiak described above. Tiny notched stones, decorated lamps, exotic burial practices and ground slate rods or awls are characteristic [DE LAGUNA 1975a: 126-129]. Stone flaking declined markedly in comparison with slate grinding. Houses were of wood construction with sunken entrance tunnels. Locally available lignite was burned at

Cottonwood Creek [DE LAGUNA 1975a: 39]. Burials with abundant beads at Cottonwood Creek [DE LAGUNA 1975a: 99; WORKMAN 1977b: 10] and at the Great Midden on Yukon Island [DE LAGUNA 1975a: 29] suggest the possibility of differential wealth and status in Kachemak III society and a high position for (at least some) women. Data from a small series of skeletons suggest that women lived significantly longer than men (average for four women of c. 50 years vs. average for six males of c. 22 years [LOBDELL 1978a: 9-11]). Infant and child mortality was high, with 29% of the series representing individuals ten years of age or younger. Degenerative joint diseases were common in the older females but there were relatively few fractures [LOBDELL 1978a: 23]. One older woman apparently died of a rather rare bone cancer (probably malignant hemangioendothelioma [LOBDELL 1977, 1978a: 24-34]) which would have disabled her for some time before her death, indicating both that Kachemak III society had the resources to support the chronically infirm and that a late middle aged woman was considered worthy of such care. Growth arrest lines and enamel hypoplasia of the teeth, both interpreted as indicative of seasonal malnutrition, were common in the series with one adolescent male showing about as many episodes of growth arrest as he had years of life [LOBDELL 1978a: 36-37]. This somber reflection of the periodic hardship of what appears on balance to have been a reasonably prosperous and secure adaptation receives confirmation from the interpretation that Cottonwood Creek was a late winter-early spring hunger camp with shellfish a very important resource and mammal remains rare [DE LAGUNA 1975a: 38; WORKMAN 1977b].

Later Prehistory (500 A. D.-1785 A. D.)

During this poorly documented time span ancestral Kachemak Bay Tanaina replaced earlier Eskimo people, but at present little is known archeologically about this crucial event in areal prehistory. Oral tradition [DE LAGUNA 1975a: 14-15] raises the possibility that this event *may* have been late, perhaps predating the advent of the Russians by only a few generations. De Laguna originally recognized a Kachemak IV period of culture represented by small collections from the Great Midden on Yukon Island and elsewhere [1975a: 126] and recent work has added several other modest late prehistoric assemblages. Since the relationships between these small collections remain obscure, as do relationships (if any) with the antecedent Kachemak I-III continuum, I have chosen to discuss these assemblages as a chronological rather than cultural group.

De Laguna encountered native copper artifacts and two very small pieces of pottery in the uppermost level at the Great Midden on Yukon Island and she also recovered late prehistoric material on Passage Island [1975a: 16]. She excavated a house at the historic Tanaina site of Kustatan on the West Foreland of Cook Inlet. She suggested possible relationships with the Kachemak Bay Eskimo culture [1975a: 138-39] but position and inventory suggest that this site might well have been Tanaina. Firecracked rocks in quantity indicative of use of the vapor steam bath and sharply

defined housepits with supplementary rooms appear related to late prehistoric (possibly Indian) sites in outer Cook Inlet [DE LAGUNA 1975a: 19, 144, 162].

Excavations at Cottonwood Creek in 1974 revealed an as yet undated upper component separated stratigraphically from the main occupation [WORKMAN 1977a: 32, 1977b: 13]. Diagnostic artifacts in the small inventory include two stemless triangular slate end blades, an unusual bilaterally barbed bone point, a complex knife (?) handle, and a splitting adze. The artifacts represent a clear typological departure from the underlying Kachemak III deposits and doubtless are referable to a second millennium A. D. occupation which seems more likely to be Eskimo than Athapaskan Indian.

Excavations in 1978 on a high bluff overlooking the Yukon Island Fox Farm site yielded an interesting series of artifacts in good stratigraphic context. Although several subassemblages may be differentiated stratigraphically our preliminary interpretation is that one sporadic and seasonal occupation of several centuries' duration dating to the latter half of the first millennium A. D. is represented [WORKMAN and LOBDELL 1979]. Diagnostic artifacts include fairly abundant gravel-tempered pottery with simple rims, curvilinear surface decorations in some cases, and somewhat globular vessel form, a native copper bracelet, a vigorous flaked stone industry with frequent use of exotic cryptocrystalline stones and featuring a series of small weakly stemmed or unshouldered points, a few small bifaces, some sidescrapers and retouched flakes and stone wedges. Ground stone tools include several contracting stem slate points which recall the flaked forms in outline, ulus lacking the characteristic late Kachemak tradition hafting notches, ground slate rods and a ground stone burin. Organic preservation was good, but organic artifacts appear to be under-represented, although several nicely shaped bone points and a classic leister side prong are present. Although continuity with the Kachemak tradition can be seen in the ground slate rods, a medial labret, several well-made planing adzes, the plain stone lamp and the organic artifacts, the assemblage stands outside the Kachemak tradition developmental sequence as we now understand it. Close relationships with the Pacific shores of the Alaska Peninsula and a marked lessening of ties with Kodiak Island are evident. Three radiocarbon dates range from 1315 ± 205 radiocarbon years: 625 A. D. (UGa-2341) to 1090 ± 195 radiocarbon years: 860 A. D. (UGa-2339). Features include several large pits excavated to no clear purpose, probable emplacements for fish drying or smoking sticks, a small slab box and one relatively small rectangular house. The house and incorporated slab box and some of the artifacts may eventually be assigned to a somewhat earlier occupation.

Historic archeology in Kachemak Bay is confined at present to a few small collections which include trade goods and the complete excavation by Joyce Rabich of a 20th century cabin used seasonally by Taniana at Cottonwood Creek [RABICH 1978]. The inventory of this site is completely western in aspect although the cabin itself presents some interesting structural features [DE LAGUNA 1975a: Pl. 6, Pl. 58-c].

Discussion: The Outer Cook Inlet Branch

The origins of Kachemak I cannot be clearly discerned at present although there is some reason to suspect that antecedent North Pacific Maritime co-tradition cultures remain to be located in Kachemak Bay. If this prediction fails to be substantiated, colonization from Kodiak Island or the Alaska Peninsula would not be incompatible with the typological evidence. As de Laguna demonstrated long ago, Kachemak I through Kachemak III are related in a fairly smooth developmental continuum characterized by the gradual replacement of implements of flaked stone by ground slate counterparts, the innovation of large notched stones and their systematic reduction in size over time and the florescence of art, adornment and burial ceremonialism [1975a: 129-131]. Relative sample sizes must be kept in mind in making such judgements; existing collections date overwhelmingly from Kachemak sub-III and III.

Several anomalies with regard to internal relationships remain to be clarified. For example, radiocarbon dates suggest that the upper levels of SEL 033 on Chugachik Island and the base of Cottonwood Creek are contemporary, yet stone flaking is prominent throughout the deposit at the former site and virtually absent at the latter. K. Workman has suggested, partially on the basis of this evidence, that the florescence of Kachemak III must have been very rapid, following c. half a millennium of relative cultural stability [1977: 15]. More data is needed to substantiate this interesting suggestion, which incorporates mortuary ceremonialism and other realms of culture. De Laguna has suggested regional and seasonal variation in explanation of some of the same observed differences [1975b: viii].

As indicated above, the Kachemak sequence appears most closely related to Kodiak Island, with the correspondences between Kachemak III and the Three Saints Bay phase being especially close. This suggests significant inter-communication across the dangerous waters of Shelikof Strait via the Barren Islands, where intriguing sites are reported, as a mechanism. Although isolated Koniag phase markers occur occasionally [DE LAGUNA 1975a: Pl. 24-1), absence in Kachemak Bay of anything approximating the Koniag phase on Kodiak as an entity is both puzzling and interesting. On radiocarbon evidence it appears that Kachemak tradition peoples had withdrawn from Kachemak Bay by or shortly after 500 A. D., some 600 years before the end of the closely related Three Saints Bay phase on Kodiak. The Bluff site material of the latter half of the first millennium A. D. represents an incursion of ideas or possibly even people from the Pacific shores of the Alaska Peninsula and a break in long-standing close ties with Kodiak Island. A basic question in areal prehistory, one which we have had little success in answering as yet, is why a rich and stable cultural tradition in an apparently rich and stable environmental setting should have been vulnerable to disruption and replacement in its ancient homeland. Intelligent phrasing of this question must guide future research in the area.

Kachemak Bay archeology is related to, but far from identical with, the sequence as understood in Prince William Sound. Many of the diagnostic features of the

Kachemak tradition such as boulder spalls, notched stones, even a moderate interest in stone flaking, and the entire burial ceremonialism complex are rare or absent in the known prehistory of the Sound, justifying, in my opinion, Clark's exclusion of this area from the Kachemak tradition as he envisions it for Kodiak and Kachemak Bay.

Detailed study of the human skeletons from Cottonwood Creek and Chugachik Island have led Lobdell to conclude that the Kachemak tradition people in Kachemak Bay were Pacific Eskimos [1978a: 40-41]. As an admittedly small population they are most closely related to Prince William Sound Eskimos and are also fairly closely related to Kachemak tradition Eskimos on Kodiak but they are very different from the Koniag. The physical data coupled with the radiocarbon evidence which suggests that the Sound was occupied at roughly the same time as Kachemak Bay was abandoned have prompted him to the interesting but perhaps somewhat premature suggestion that late Kachemak tradition people abandoned Kachemak Bay and colonized the Sound [1978a: 42-44].

Karen Workman has cataloged traits which the Chugachik Island materials share with the Norton culture of the Bering Sea [1977: 14]. This new data provides further confirmation for significant connections between Norton and North Pacific peoples [W. WORKMAN 1969b] and may be related to Lobdell's observation that the Kachemak Bay physical remains are quite close to Bering Sea populations (southwestern Alaska) and to Ipiutak peoples in northwestern Alaska [1978a: 41]. Ipiutak burial ceremonialism includes use of masks, artificial eyes, and a shallow and dismembered burial [LARSEN and RAINEY 1948: 119-120, 123, 155]. Burials recovered at Cottonwood Creek lacked clearly defined burial pits and were in my opinion shallow burials, a hitherto unemphasized (and perhaps specious) correspondence with Ipiutak. Although very few Norton burials have been found, suggesting that they followed the northern pattern of extra-village cemeteries rather than burial in the village, one can confidently predict that Norton burial customs, when known, will provide the link between Ipiutak and the late Kachemak tradition.

Unquantified study of the faunal remains from Kachemak Bay suggests considerable uniformity of prey species over time, with major emphasis on porpoise, seal, marmot, birds and fish [DE LAGUNA 1975a: 31-32]. Detailed studies of bone refuse recovered in our recent excavations are being undertaken by John Lobdell, but an impressionistic summary suggests that de Laguna's data fits our material as well, even though our major sites have been located far up bay. Large whales never seem to have been significant by comparison with Kodiak Island and whale bone of any kind is very rare in our up bay sites. Identifications in de Laguna's original report of walrus (ivory excepted), polar bear and especially bearded seal badly need rechecking, as they are ecologically somewhat incongruous. New data should allow further evaluation of de Laguna's interesting observations on a shift over time from the large Eskimo to the smaller Indian dog [1975a: 32]. Our studies have quantified shellfish data. While this data has not been reduced as yet, it is clear that de Laguna was quite correct in suggesting virtual local extinction of formerly rich shellfish beds by

sedimentation at Cottonwood since the site was occupied [1975a: 41]. Since shellfish gathering appears to have been a basic activity here, site abandonment could be explained in these terms. On Chugachik Island whelks are significant in the midden deposits but locally extinct today. Changes of this order of magnitude do not appear adequate to explain attenuation of the Kachemak Eskimo grip on the bay. More refined investigations of ecological changes in the area await quantified faunal data.

THE PRINCE WILLIAM SOUND BRANCH

Although collections were made from burial caves in Prince William Sound by Jacobsen in the late 19th century and Meany in the early 20th century, the only scientific archeology done to date is that undertaken by Frederica de Laguna and her colleagues in a period of little under five months in the summers of 1930 and 1933 [DE LAGUNA 1956]. Major excavations were confined to the Palugvik site on Hawkins Island near modern Cordova near the boundary of the Pacific Eskimo area, although fairly intensive survey and limited testing were undertaken elsewhere. Some work in site identification and recording has been undertaken over the last several years on behalf of the local native corporation (Chugach Natives Incorporated), under provision of Section 14 (h) of the Alaska Native Land Claims Settlement Act, but this information is not generally available. Rumor has it that site erosion, vandalism and unscientific collecting continue apace in the Sound.

The Sequence

De Laguna recognized four stratigraphic units at the Palugvik site. The two oldest (Palugvik 1 and 2) she grouped into the older Prehistoric period [1956: 64] characterized by decorated (incised) slate plaques (p. 48), a preference for planing adzes and simple stemmed slate points (p. 60), socket pieces with bifurcated bases (p. 175), greater abundance of bone and shell beads (p. 175) and scarcity of fire cracked rock (p. 64). Units 3 and 4 were grouped into a younger Prehistoric period (p. 64) characterized by an abundance of fire cracked stone implying use of the vapor sweat bath, a few native copper artifacts, a greater emphasis on the grooved splitting adze and barbed slate points (p. 60), very small adze blades or scrapers (p. 118), small ground chisels (p. 122), and socket pieces with plain butts (p. 175). Minor excavations allowed her to define a subsequent Protohistoric period characterized by the addition of large blue trade beads (and presumably some iron) to inventories of late prehistoric aboriginal tools and an Historic period characterized by small trade beads ("Glacier Island type") and other trade goods, evidence of European disease and Christian burial practices [1956: 64].

A basal date of c. 200 A. D. for the Palugvik site, while questioned by de Laguna with some reason [1962, 1975b: ix], appears to be in moderate accord with her original correlation of the oldest known Prince William Sound material with Kachemak sub-III or III in Cook Inlet [DE LAGUNA 1956: 28, 1975a: 156; WORKMAN 1977a: 33]. Evidence for a broad spectrum of burial practices was recovered in the

Sound. This includes burials in village sites, cave burial (including mummification), some disarticulated burials and one possible cremation [DE LAGUNA 1956: 92-93]. The elaborate and bizarre late Kachemak tradition burial practices (purposeful dismemberment, artificial eyes, etc.) appear to be absent. An old female from Palugvik I was buried with an elaborate apron of over 800 beads, reminiscent of several Kachemak Bay female status burials discussed above (p. 216). Log or plank coffins and covering piles of stone are also known (p. 99). Sea otters dominate the only analyzed faunal assemblage, constituting over half the identified bones. This may reflect the position of the one major excavated site near good sea otter hunting grounds (p. 47).

Prince William Sound collections contain a wide variety of wood-working tools of diverse form (pp. 122, 139, 263). The personal adornment complex appears to differ somewhat from those described hitherto, with a greater variety and profusion of bone and shell beads and a simpler inventory of labret forms, although absence of the broad medial labrets may reflect sample error (pp. 207, 272). Several traits of southerly provenience find their northern limit in the Sound. These include double-pointed war picks (pp. 130-131) and stone pestles (pp. 141, 267). Alone among Eskimos, the Chugach made and used wooden dugout canoes as well as skin boats (p. 241ff).

Although the sample is modest, Prince William Sound inventories lack or do not emphasize a number of artifact classes significant elsewhere about the Gulf of Alaska. These categories include bone wedges (p. 111) and adze hafts (p. 117), flaked stone tools (p. 131), boulder spalls (p. 131), a variety of grooved stones (p. 135), arrowheads with slits for blades (p. 179), notched stones (p. 271), and decorated specimens of all kinds including stone lamps (p. 252).

Discussion: The Prince William Sound Branch

Present, admittedly meager, evidence justifies recognition of the Prince William Sound material as an independent branch of the North Pacific Maritime co-tradition and renders it difficult to uncritically accept Lobdell's suggestion based on skeletal data of Kachemak Bay colonial status for the earliest known material [1978a: 42-44]. The known sequence is too short by at least a millennium for long term comparisons with the other branches dealt with in this paper and continuity with the ethnographic Chugach, while plausible, is not demonstrated [CLARK 1974c: 181, 1978: 17]. De Laguna's preliminary periodization does not rest on enough sites or traits to inspire complete confidence and much needs to be learned about the dating of the sequence. Clark suspects that the bulk or all of the deposits at Palugvik *predate* the Koniag phase on Kodiak Island [1974c: 177], a position which, if well founded, would leave a very troublesome gap before the Protohistoric period. De Laguna has discussed at length the problems raised by the apparent low historic and prehistoric populations in this seemingly rich area [1956: 255ff]. Clearly further archeological work in this area is of high priority. Until such work is undertaken our treatment of this interesting material can only be considered most provisional.

UPPER COOK INLET: ECOLOGICAL MARGINALITY

Cook Inlet is a long narrow embayment bounded on the east by the Kenai Peninsula and on the west by the northern end of the Aleutian Range. North of Kachemak Bay the Inlet is bordered by steep eroding cliffs which form the edge of rolling lowlands that extend 50–60 km (30–40 miles) east to the base of the Kenai Mountains. Several large rivers and lakes are found here as are numerous swampy pothole lakes. Similar plains and piedmonts extend west of the Inlet to the base of the Alaska Range. Upper Cook Inlet is shallow, with extensive delta formation at its head where the Matanuska, Knik and Susitna Rivers annually dump vast loads of sediment. The coast is straight, virtually without islands, and exposed. The waters of the upper Inlet are turbulent, sediment-laden, and brackish. No significant shellfish occur north of Kalgin Island. The climate is more severe and drier than that of the areas discussed above, with 400–500 mm (15–20 inches) of precipitation annually at Kenai. Temperatures often plunge well below zero F (c. -20°C) in the Kenai-Soldotna area in winter [BARNES 1958: 43; DE LAGUNA 1975a: 11–13; REGER 1977a: 37]. As Reger has noted [1977a: 51] this topographic situation of low straight exposed coasts with shallow offshore waters flanked by broad river valleys and rolling uplands partakes more of the nature of the Bering Sea-area to the north than of the distinctive North Pacific topography described earlier in this paper.

Little is known of the prehistory of the west shore of upper Cook Inlet at present although de Laguna long ago undertook limited survey and some excavation there [1975a: 136–139]. The Kenai Peninsula is replete with well-defined house and cache pits of recent centuries but limited excavations there have yielded by and large disappointingly meager results. Minor surveys and excavations in the upper Inlet have recently been summarized by Clark [1978: Table II]. Here attention will focus on a limited series of recently excavated sites which have yielded significant data. Much of this work has been carried out by the Alaska State Archeologist, Douglas Reger, and his associates.

Beluga Point

This important multicomponent site is located on a rocky point projecting into the extremely turbulent and unpromising waters of the Turnagain Arm c. 27 km east of Anchorage [REGER 1977b, 1978]. The site has been cut in two by a bulldozer and the complex and abundant stratigraphy of the two remnants can be only tentatively correlated at present.

Component I at Beluga Point North has yielded microblades (average width 7.7 mm), several tablets from wedge shaped (Campus type) microblade cores, a re-touched blade and fragments of large blade cores and platform rejuvenation flakes, several possible grooved abraders, and a biface fragment. A number of the artifacts have been altered to a fragile chalky condition [REGER 1977b: 17, 1978: 5]. This component is not directly dated but the author suggests a plausible date of 6000–9000 B. P. on the basis of comparisons with Denali complex and related material in the

adjacent interior and core and blade material recently discovered by Dumond on the base of the Alaska Peninsula [REGER 1978: 9].

Beluga Point North Component II has yielded a respectable assemblage of parallel sided, contracting stem and round based lanceolate points or knives, large steeply retouched sidescrapers and a multi-stroke burin. Ground slate is absent. This assemblage also is not directly dated but apparent cross ties with the Takli Birch phase and possibly the Brooks River Gravels phase suggest a date of 4000-3000 B. P. [REGER 1978: 5-6, 9].

Component IIIb at Beluga Point North has yielded an unfinished slate point, flaked bifaces, chipped and ground adzes, an endscraper, a ground slate awl or whetstone, a large (6.0 cm) notched stone, a piece of native copper and a stone-ringed hearth. Although not directly dated, typological and stratigraphic considerations suggest a late first millennium A. D. date for this material [REGER 1978: 7, 9]. The excavator does not attempt detailed comparisons for this material, but the general North Pacific coastal cast of the inventory seems apparent. The function of the notched stone, usually interpreted as a net weight, at this tidal bore washed site defies surmise.

A large slate point with a square stem and prominent diamond shaped cross section, a large stemmed single shouldered biface, a small (2.55 cm) notched stone and a gravel-lined hearth were found in Component IIIa. The hearth has yielded a radiocarbon date of c. 1150 A. D. [REGER 1978: 6, 9]. No specific cultural affiliation is suggested but the point seems clearly related to temporally equivalent examples known from Yukon Island IV in Kachemak Bay [DE LAGUNA 1975a: Pl. 31-*I*], Kodiak Island [CLARK 1974a: Pl. 12-*K*, 1974c: Pl. 17-*W*], Izembek Lagoon near the tip of the Alaska Peninsula and elsewhere [MCCARTNEY 1974: 73, Pl. 6]. The sequence in the northern portion of the site is brought into the 20th century by an association of superficially emplaced mountain sheep remains and a can opener [REGER 1978: 4]. In the absence of other preserved organics (with the exception of some calcined bone associated with one of the hearths) the sheep remains may suggest a function for this somewhat improbably located site. If one assumes that present conditions reflect the past, marine hunting and fishing appear to have been out of the question. Although the site is located by the water's edge, extreme tidal range and turbulence seem to preclude maritime activities.

The southern portion of the site has been tested only briefly. A fire pit yielded a date of c. 2200 B. C. associated, unfortunately, only with an undiagnostic scraper and waste flakes. More interesting, albeit undated, is a small assemblage containing simple stemmed ground slate points, a small well-made projectile point and a ground burin, an apparent amalgam of Norton and North Pacific traits. Several other components, one of which contains a fishtailed and a straight based lanceolate point, should date to the second millennium A. D. on stratigraphic grounds [REGER 1978: 7-10]. Although long overlooked by archeologists traveling the adjacent highway, the Beluga Point site with its clear if complex stratigraphy and long history is one of

the most important sites in southcentral Alaska. Further work on the barely tested southern portion would be most desirable.

Sites along the Knik Arm

De Laguna was attracted to Cook Inlet in part by problems arising from the finding of a decorated stone lamp at Fish Creek along the Knik Arm in modern Tanaina territory [1975a: 7]. Although her investigations in this area were disappointing [1975a: 141-142], limited further work was undertaken there in 1966 [DUMOND and MACE 1968]. Several sites were tested, only one of which yielded significant results. An apparent Tanaina Athapaskan smokehouse superimposed upon features indicative of an earlier occupation was tested and yielded six gravel tempered potsherds, a hafted copper awl, a labret fragment, three ground slate scraps, a whetstone and other odds and ends. Pooling these specimens with the decorated lamp found long ago by a local resident and de Laguna's meager collection of 1930, Dumond presents a closely argued but perhaps somewhat ambitious scenario of ethnic succession which visualizes at least seasonal Eskimo utilization of the Knik Arm both before and after 1000 A. D., followed by the advent of the Tanaina Athapaskans between 1650 and 1750 [DUMOND and MACE 1968: 19]. In order to do so he is forced to make a number of decisions about which artifacts are probably associated with which ethnic group. All of his assignments are reasonable, but few are self-evident and, in my opinion, the evidence is perhaps insufficient to bear the interpretive load placed upon it.

Sites on the Kenai Peninsula

Large well defined houses, presumably Tanaina, have been tested and excavated with little profit near Ninilchik by VanStone in the 1950s, near Soldotna by Boraas and Workman in 1974, and at Kalifornsky Village by Boraas in 1976. Here we will discuss several sites that have yielded more encouraging results.

Building on work by a local resident, Reger in 1969-1971, excavated at the KEN 29 site located on a former meander channel on the left bank of the Kenai River about 14 miles from its mouth [REGER 1977a]. Stone artifacts were found in c. four feet of soil atop fluvial gravels. A mixed ground slate and flaked stone assemblage of coastal aspect was recovered. Ten ulus (some drilled, none notched), 19 hafted slate scrapers and a ground rod were found. Slate points were rare although one fragment had stem serration [1977a: 40]. Flaked stone included one bipointed and two stemmed projectiles, four drills, sidescrapers and endscrapers, biface fragments and retouched flakes [1977a: 43]. Two adze blades, numerous boulder spalls, various abraders, whetstones and grinding slabs, and a surprisingly large total of seven undecorated stone lamps were also found, as were almost 1500 notched stone weights [1977a: 44]. The notched stones become smaller as one proceeds upward in the site, a situation which Reger relates to the changing velocity of the slough on which the site is located rather than secular change over time [1977a: 47, 49]. In the absence of preserved organics, an unfired claystone human head and various concentrations

of ocher provide the only information on art and personal adornment [1977a: 47].

A round shallowly excavated house lacking internal fireplaces was found at the base of the site. Sparseness of artifacts on the floor indicates ephemeral use. A stone paved hearth (one of two recovered) was found right outside this house [1977a: 48]. A basal date of c. 300 B. C. was associated directly with the house floor, while a sample with an undesirably large margin of error (300 years) yielded an inverted upper level date of c. 600 B. C. The investigator trusts the basal date more than the upper date [1977a: 49].

Site location and inventory and the house with external fireplace suggest that this was a summer (June-August) fish camp [1977a: 48] although one might wonder why so many lamps would appear in an ephemeral camp in a wood rich area during the warmest and lightest portion of the year. Reger interprets the KEN 29 assemblage as related to both the North Pacific and Norton cultural traditions, with the ground slate and hearths recalling North Pacific practices and the flaked stone the Norton culture (especially the Smelt Creek phase in the Naknek drainage) [1977a: 49-50]. Closest ties with North Pacific inventories are seen with Kachemak III or sub-III, with the greatest number of similarities seen with the collection from Chugachik Island in Kachemak Bay, a conclusion reinforced by analysis of that collection [K. WORKMAN 1977: 15]. This report contains, to my knowledge, the first elucidation of the distinction between North Pacific and Norton culture topography elaborated in the present paper, with KEN 29 located in the latter physiographic province.

Moose River Site

Another important site with seven visible house depressions and three caches is located on a terrace at the confluence of the Moose and Kenai Rivers near Sterling Alaska [DIXON 1978, 1979]. Two rectangular semisubterranean houses lacking entrance passages, 8×10 m and 10×12 m, have been tested. One contained multiple floors and a bark and cobble lined multiple hearth. A small cache of notched stones and blanks and a cache of articulated fish bones have been found on one floor. Radiocarbon dates of c. 435 A. D. and 455 A. D. have been obtained from the site [DIXON 1979]. Flaked stone, while present, is subordinate to ground slate in the small site collections. Abraders, notched stones, greenstone adze fragments and moose bones complete the inventory [DIXON 1978: 7; REGER 1977b: 19]. A sharply defined 6×6×1 meter house with an entrance shed, while only briefly tested, appears to be later than, and unrelated to, the other houses at the site.

The notched stones, fish bones and site location suggest another warm season fish camp to me, but the fairly durable houses with their internal hearths are not completely in accord with this interpretation. The inventory recovered to date is compared by the excavator with Kachemak sub-III or III material from Kachemak Bay [DIXON 1979]. Two poorly preserved human skulls recovered in 1978 have been identified by Lobdell as young adults of Eskimoid stock [1978b]. The C-14 dates suggest contemporaneity with the (final?) Kachemak tradition in Kachemak Bay.

Discussion

On this somewhat meager but growing body of evidence we must base our discussion of the prehistory of upper Cook Inlet in relation to adjacent areas. Some connection with the Kachemak tradition of outer Cook Inlet appears clear although there seem to be several non-Pacific assemblages at Beluga Point. Little archeological data bear on the antiquity of the Tanaina Athapaskans in the area. Most students appear to agree that there was a Pacific Eskimo presence of some antiquity in upper Cook Inlet, perhaps on a seasonal basis [CLARK 1975b: 222, 1978: 17; DUMOND 1972: 39; DUMOND and MACE 1968: 19; REGER 1977b: 20]. Clark and Dumond appear to agree that the Tanaina advent was late, although evidence is, charitably speaking, not very good. Closest coastal connections are seen with the late Kachemak tradition of the outer Inlet but in evaluating this situation we must remember that the Kachemak Bay record is truncated and we have little idea what a second millennium A. D. Eskimo assemblage should look like there. Reger's suggestion, based in part on ecological considerations, that Norton influences evident in Kachemak Bay may well have flowed through the Iliamna area to the middle portion of Cook Inlet, hence to the outer Inlet (and Kodiak?) is worthy of serious consideration [1977a: 50].

With reservations based on certain traits unlike Kachemak Bay in the KEN 29 inventory and the presence of what appear to be cold season houses at Moose River, I accept the probability that Kachemak tradition Eskimos utilized the upper Inlet on a seasonal basis. The resourceless coast, rich salmon rivers and streams and severely cold winters of the Kenai Peninsula coupled with evidence that known sites served as fish camps (Beluga Point of course excepted) render this working hypothesis attractive. The major salmon resource of Kachemak Bay (which is not overwhelmingly endowed in this respect) is pink salmon which run during the wet month of August [ALASKA DEPARTMENT OF FISH AND GAME 1978: 14, Maps 51, 52]. Better salmon fishing and better conditions for preserving the catch could have been had by at least some groups moving up the Inlet on a seasonal basis, *provided there was little or no competition from others utilizing the upper Inlet area on a year-round basis*. A resident population moving into the upper and middle Inlet from other areas might have put pressure on this plausible pattern. To attenuate a hypothesis, it is possible that loss of access to the middle and upper Inlet in combination with other factors might have had significant impact on late Kachemak tradition adaptations in Kachemak Bay. This scenario might require movement of ancestral Tanaina into at least the middle and upper Inlet some centuries earlier than Dumond and Clark appear to want them there, an interpretation I am prepared to consider if not advance. While much of the foregoing is highly speculative, it does seem quite possible that a model explaining Eskimo withdrawal from much of Kachemak Bay may have to be based in part on data from adjacent areas and the upper Cook Inlet may have been significant in this respect.

CHIRIKOF ISLAND: CULTURAL MARGINALITY

Tiny Chirikof Island, the terminus of the Kodiak Archipelago, has yielded a nondevelopmental sequence of cultures spanning the last four millennia [WORKMAN 1966a, 1969a, 1969b]. This sequence, which is based mainly on seriation of a large collection of undated surface material from 28 sites, has been divided into three periods. About 140 artifacts from an excavated site associated with a radiocarbon date (regrettably based on a sample lumped without consultation by the radiocarbon laboratory) of c. 2000 B. C. have been assigned to the Old Islander complex of the Early period. Flaked and ground artifacts occur in roughly equal frequency, but ulus are lacking. Large and small flaked lance points or knives with weak shoulders and elongated edge-ground stems, thin stemless bifaces, massive flake unifaces, unbarbed ground slate points with rectangular stems lacking serrations, and tabular siltstone abraders are characteristic. This material is similar in a general way, in my opinion, to the Takli Birch phase of the Alaska Peninsula, much less similar to the contemporary Ocean Bay II phase on Kodiak.

Three related and presumably sequent phases make up the Middle period of Chirikof Island prehistory. The Anchorage complex, presumed to date around the time of Christ, features large stemmed and notched knives, numerous slender points with concave bases, numerous stemmed drills, frequent application of grinding to the faces of basalt points and other implements, and a minimum of ground slate implements. The Scree complex, thought to be of middle first millennium A. D. age, has ground slate forms (including points and knives typical of the Three Saints Bay phase on Kodiak) only slightly less significant than flaked stone forms and carries on some implement styles characteristic of the Anchorage complex. The Bluff complex, thought to date late in the first millennium A. D., is characterized by a large number of diminutive stemmed and stemless projectile point forms. Ground slate implements were significant, being outnumbered by chipped stone in ratios between c. 4 : 1 and 2 : 1, but the distinctive Three Saints Bay technology is barely suggested. Anchorage complex diagnostics are absent or largely absent. The late prehistoric and contact occupations of the Late period document a minor interest in this remote island by late prehistoric pottery-using Koniag Eskimos.

One would expect Chirikof, probably utilized only seasonally, to be closely tied to nearby Kodiak and, by extension, to the North Pacific Maritime co-tradition throughout its history. The Early and Late periods of Chirikof prehistory appear to fulfill these expectations and strong influence from the Three Saints Bay phase is noted in the Scree complex. The Anchorage complex and, to a lesser extent, the Bluff complex are quite alien to this tradition, however. The former appears to be a combination of certain Norton culture traits (drills, point forms, facial grinding) with others of Aleutian or at least western Peninsula aspect (massive notched knives, etc.). Comparisons might fruitfully be made with the Ugashik Lakes phase [HENN 1978: 45ff, 83], especially the Early Inland subphase dated to c. 200 B. C.–A. D. 400. Small projectile points recalling certain Bluff forms appear in the Late Inland subphase of

the Ugashik Lakes phase [HENN 1978: Pl. IX-w, x] and abundant diminutive points are also characteristic of the Kukak Beach phase in the Katmai National Monument [G. CLARK 1977: Pl. V]. It thus appears that for much of the Middle period, estimated to span over 1000 years, Chirikof was utilized seasonally by people from the Alaska Peninsula who cannot be included in even the flexible boundaries of the North Pacific Maritime co-tradition, although significant contact with the Kodiak Archipelago is suggested for the Scree complex. Middle period complexes seem to have had nothing to do with the origins of the Koniag phase.

ORIGINS OF THE NORTH PACIFIC MARITIME CO-TRADITION

The Takli Alder-Ocean Bay I base culture appears to have been fully maritime, appearing without local antecedents almost midway through postglacial time. Although no earlier cultures have come to light in the immediate area, early Holocene cultures are known from the Ugashik drainage to the west [DUMOND, HENN and STUCKENRATH 1976; HENN 1978], from Anangula Island in the eastern Aleutians to the west [AIGNER 1976 with references], from Groundhog Bay [ACKERMAN 1974] and Hidden Falls [DAVIS 1979] in southeastern Alaska, and from the Queen Charlotte Islands in British Columbia [FLADMARK 1975]. Detailed comparisons of these assemblages are beyond the scope of this paper, but, save for the occurrence of the bifacial flaking technique in the Ugashik material, the 9000 year old Ugashik Narrows assemblage and the c. 8000 year old Anangula assemblage appear to be significantly linked. Both in turn might be usefully linked at a rather high level of abstraction with other early Holocene material in northern and interior Alaska [DUMOND, HENN and STUCKENRATH 1976: 21-22]. A further suggestion that this early Holocene Paleoarctic tradition material is in some sense ancestral to all later manifestations in southwestern Alaska [DUMOND, HENN and STUCKENRATH 1976: 23], while appealing, in my opinion, goes far beyond the typological evidence and must therefore be considered premature. Only the very meager core and blade material from AFO 106 provides a possible specific link, but here connections with early Holocene microblade industries to the south and east appear at least equally likely [CLARK 1972: 30-31, 1979: 231].

A maritime adaptation and distinctive and abundant shouldered and contracting stem projectile points are diagnostic of Takli Alder/Ocean Bay I. Adaptation to the resources of the sea appears to have been occurring on a broad front along the North Pacific coast in the early Holocene [D. CLARK 1975b: 208-209, 1978: 16; G. CLARK 1979: 6-7; DUMOND 1974b: 53, 1978a: 85-89; FLADMARK 1974], and although some authors have suggested that these developments were linked, it is at least possible that there were a number of independent centers in which the requisite skills were developed. Stemmed points are known from the terminal Pleistocene of Kamchatka [DIKOV 1968] and Japan [CHARD 1974: 48-54], but these cannot be meaningfully linked with the mid-Holocene Gulf of Alaska forms at present. Stemmed points from the Ugashik Knoll phase to the west [HENN 1978: Pl. V] and from southern

British Columbia [CLARK 1972: 30-31] appear to be essentially contemporary with rather than antecedent to the Gulf of Alaska forms. It is possible that the Gulf of Alaska stemmed forms are an independent and localized invention.

I do not think the origins of the North Pacific Maritime co-tradition can be determined with the evidence at hand. Since the ethnographic peoples of the area were Eskimo-speaking arctic Mongoloids and since continuity of technology (on an area-wide, rather than a localized basis) is specified it would be convenient to link the origin of these peoples with the origins of the Aleut and northern Eskimos. Although there are significant connections between these areas in later times (see below) no unity of origin can be specified on purely archeological grounds. Although the distances involved, the presence of intervening quite dissimilar cultures, and lack of a clear time slope preclude further discussion here, an impressive number of correspondences can be seen between the earliest cultures of the Gulf of Alaska and those of southern British Columbia [CLARK 1972: 30ff; DUMOND 1978a: 85-88; FLADMARK 1974: 253-254]. It is possible that the ultimate roots of the North Pacific Maritime co-tradition may yet prove to be southern rather than northern.

CO-TRADITION RELATIONSHIPS WITH ADJACENT AREAS

Relations to the North

There is no significant typological similarity between the North Pacific Maritime cultures of c. 4000 years ago and the Denbigh Flint complex which appears on the tundra and cold coasts of Alaska at this time. By the time of Christ, abundant connections in many realms of culture including the esoteric are evident between North Pacific and northern coastal cultures [DUMOND 1975: 170, 1978b: 2-3; WORKMAN 1969b]. By the end of the first millennium A. D. the evidence suggests actual intrusion of some Bering Sea peoples onto the Pacific coast, although the mechanisms permitting this incursion into an ancient hearth of prosperous maritime cultures from an area of lower population density and cultural contour remain obscure [CLARK 1978: 18; DUMOND 1975: 175-177, 1977a: 136ff]. Two temporally contiguous but culturally discrete waves of northern influence (the earlier Norton and the later Thule) are involved. Dumond has long championed the view that this southward expansion brought the western Eskimo languages of ethnographic times to the shores of the Pacific [1977a: 151ff]. Recently McGhee [1976] and Clark [1976] have suggested that the Norton culture is of basically southern rather than northern derivation, thus attributing an ultimate North Pacific origin to all historic Eskimos. This attractive interpretation, based in part on linguistic considerations, has the effect of striking the Arctic Small Tool tradition from the immediate ancestry of the Eskimos. While Norton culture clearly represents a combination of northern (pottery, side blades, etc.) and southern ideas [DUMOND 1975: 170], this hypothesis cannot be verified with the available typological and chronological evidence. Connections between the Bering Sea and the Gulf of Alaska clearly have been fairly close over the last several millennia, despite the obvious environmental differences between

these two areas. Population movements, perhaps on an individual or family basis, may need to be invoked to explain some of these similarities. Trade, intermarriage and other traditional mechanisms less dramatic than conquest appear adequate to explain the mutual influence and acculturation visible in the archeological record.

Relations to the West

As noted previously, the Pacific coast of the northern Gulf of Alaska, the Alaska Peninsula, and the Aleutian Islands are environmentally very similar. These areas have long histories of settlement by maritime hunting cultures, creating a situation where one would anticipate considerable diffusion of useful ideas between them [CLARK 1975b: 223-224]. Such ancient ties probably explain the pan-North Pacific distribution of stone lamps, labrets, composite fishhooks, stone weights, preference for the barbed dart over the toggling harpoon, long rod-like barbed bone points and foreshafts, burial in village refuse deposits and lance whaling [CLARK 1970: 80-84; MCCARTNEY 1969: 9]. Prevalence of flaked stone implements rather than ground stone projectiles and knives in the Aleutians up until historic times may be rooted in the relative scarcity of slate in this volcanic archipelago [MCCARTNEY 1974: 79-80]. Several authors [DUMOND, CONTON and SHIELDS 1975; MCCARTNEY 1974: 80] have noted the existence of a continuum of culture, at least during recent millennia, between the Aleutians and the Pacific Eskimo area. One study of late prehistoric and contact period Kagamil Island Aleut and Koniag physical remains indicates that metrically the two series are quite close together [ZEGURA 1975: 273, 280], a conclusion apparently replicated in Lobdell's more recent study [1978a].

This intergradation appears to have increased markedly around 1000 A. D. [DUMOND 1974b: 48; MCCARTNEY 1974]. Earlier, the western Alaska Peninsula appears to have been occupied by peoples with a distinctive if as yet poorly defined lithic technology that appears to me to have combined certain Aleutian and Norton features [DUMOND, HENN and STUCKENRATH 1976: 22-23; WORKMAN 1969b: 5]. Dumond and others suggest the name Lower Peninsula tradition for this entity, which I accept as an improvement on my somewhat cumbersome if descriptive "Western Peninsular-Eastern Aleutian Flaked Stone Technology." The important Hot Springs Village site at Port Moller clearly belongs in this tradition [DUMOND 1974a: 3; DUMOND, CONTON and SHIELDS 1975: 57; OKADA and OKADA 1974; OKADA *et al.* 1976]. Earlier discussions of the affinities of the Port Moller material depended too heavily on a simplistic "Pacific Eskimo or Aleutian Aleut" implicit model [MCCARTNEY 1969; WORKMAN 1966b]. I believe that all parties would now agree to allow a certain amount of regional diversity to be expressed on the western Alaska Peninsula, although the human remains from Port Moller appear on the basis of a recent study to have been closer to Eskimo than Aleuts [OKADA and YAMAGUCHI 1975]. Despite demonstrable connections in material culture I would no more be inclined to include western Peninsular materials with the Eastern Sector of the North Pacific Maritime co-tradition as here defined than I would be to include the Norton culture of the Bering Sea in that taxonomic entity.

Before the time of Christ similarities between the Gulf of Alaska and the eastern Aleutians were not marked. The Takli Birch and Ocean Bay II cultures of c. 4000 years ago appear to have little in common with collections of similar age in the eastern Aleutians. This situation would support a simple model of convergence over time in the technology of peoples of different origin occupying contiguous and similar environments if it were not for clear evidence of earlier contacts between the Aleutians and the Gulf of Alaska. Laughlin has briefly described a collection from the Village site on Anangula Island (not to be confused with the Anangula Blade site) dated between c. 5900 and 4500 B. P. [1975: 513, Table II]. This material includes cores, blades and burins reminiscent of the 8000 year old Anangula assemblage to which have been added bifacially worked artifacts. These include a series of stemmed points clearly related to those of Takli Alder/Ocean Bay II [LAUGHLIN 1975: Fig. 11; unpublished field drawings shown me by the Soviet archeologist, Ruslan Vasilievsky]. While final conclusions would be premature, these finds indicate that Dumond's suggestions, originally based on much scantier evidence [DUMOND 1971: 49ff] of an Ocean Bay/Takli-like horizon unifying the Aleutians and the Gulf of Alaska c. 6000 years ago, must be taken seriously. It appears likely that contacts with mainland Alaska added bifacial flaking and contracting stem points to the indigenous Anangula core, blade and burin unifacial complex, although interpretations of this situation in ethnic and linguistic terms remain perilous. The possibility remains that we may ultimately have to recognize an ancient shared ancestry between Gulf of Alaska and Aleutian cultures. If this proves to be the case it might be desirable to add a Western Sector to the North Pacific Maritime co-tradition to recognize these relationships.

Relations to the East

With the exception of the probably early Holocene microblade component at Beluga Point in the geographically marginal upper Cook Inlet area and a contextless notched point from Kachemak Bay, there is little archeological evidence in our area for significant connections with the interior of Alaska to the east. As noted earlier, Tanaina origins cannot be discussed on archeological grounds at present. The later prehistory of interior southern Alaska east to the Copper River is poorly known.

Relations to the South

Evaluation of cultural relations between the North Pacific Maritime co-tradition and southeastern Alaska suffers from the fact that the archeology of Prince William Sound is incompletely known while few of the small number of excavated sites further south along the Alaska coast predate late prehistoric or protohistoric times. Available evidence suggests that the late prehistoric and contact period material culture of the ethnographic Eyak and Northern Tlingit areas was more similar to that of the Gulf of Alaska than were the social cultures and languages of these peoples [CLARK 1975b: 223].

Recent excavations at the Hidden Falls site near Sitka [DAVIS 1979] and at

Coffman Cove near Ketchikan [G. CLARK 1979] have uncovered lengthy Holocene occupations, as did earlier work at the Groundhog Bay No. 2 site on Icy Strait near Glacier Bay [ACKERMAN 1974]. Discussion of the Groundhog Bay assemblage has focused almost exclusively on the core and blade material, which I am in no position to compare systematically with the few microblade cores known from Ocean Bay I at AFO-106. The same is the case with the early Holocene core and blade material from Hidden Falls components I and II [DAVIS 1979: 3-4]. Preliminary assessment suggests that third millennium B. C. ground slate artifacts from both Coffman Cove and Hidden Falls demonstrate typological links with cultures of roughly equivalent age in both southern British Columbia and the Gulf of Alaska [G. CLARK 1979: 6-7]. In addition, the fabrication of preforms for slate implements by use of the saw and snap technology provides an interesting technological link between Coffman Cove (less certainly Hidden Falls) and Ocean Bay II and Takli Birch phases about the Gulf of Alaska [G. CLARK 1979: 3, 6]. While in need of further confirmation through continued excavation and analysis these preliminary interpretations are exciting in that they imply that it may ultimately prove possible to link the early stages of North Pacific Maritime co-tradition with other mid-Holocene cultures along the North Pacific coast. This new information appears to provide additional confirmation for suggestions that such linkages exist which were made without benefit of this new and geographically crucially located data [DUMOND 1978a: 89].

Further south, the archeology of the Coast Tsimshian area seems to offer some general parallels with the Gulf of Alaska. For example, flaked stone gives way to ground stone by 1500 B. P., and heavy wood-working tools (including the splitting adze) become prominent after 1500 B. P. [FLADMARK 1975: 7-8]. Although not familiar with this material, I suspect that on a typological and stylistic basis the suggested similarities would not be impressive. D. Clark has noted similarities between the Ocean Bay I and southern British Columbian materials, indicating that even more impressive similarities exist between the Marpole and Locarno Beach phases of the southern British Columbian coast and the Kachemak tradition. Intervening collections appear less similar, though, and evaluation of the significance (if any) of this split distribution of scattered similar traits awaits detailed evaluation [BORDEN 1962; CLARK 1972: 29, 31-32]. Ties to the south have probably been underestimated in the past but further fruitful research on this possibility awaits the construction of more firmly based sequences in Prince William Sound and southern coastal Alaska.

ETHNICITY AND THE ARCHEOLOGICAL RECORD

I take the study of the formation of ethnographically described peoples (the study of *ethnogenesis* in the useful Soviet terminology) to be a legitimate if difficult task for the prehistorian. Clearly, attempts to correlate variables such as race, language and culture is higher order synthesis. The first task of the archeologist is to interpret the archeological record in archeological terms. Reconciliations with

linguistic, biological and ethnographic data should be attempted only after the most elegant and plausible synthesis of the available archeological data has been achieved. Since our data is and will remain incomplete and since the genesis of most ethnographically known northern peoples is complex, anomalies and discrepancies in synthesis of information from various lines of inquiry should be expected. These should be noted, and may well suggest fruitful hypotheses for future work. They should not be taken as invitations to bend the archeological evidence or force it into some predetermined mold.

Dumond, one of the leading students of North Pacific prehistory, has long depended heavily on linguistic relationships as an aid in the interpretation of northern prehistory [1977a: 151ff]. He notes that whole assemblages, not merely isolated traits must be compared [1972: 37] and he freely admits that in discussing remote relationships, much depends upon the notions concerning elegance and parsimony held by the synthesizer [1974a: 5]. Viewing the cultural continuum that is said to prevail about the North Pacific in recent centuries, McCartney has recently been moved to wonder if inferences about language, physical type and material culture can be derived from each other [1974: 81-82]. Clark has also wondered if the ethnic diversity of the North Pacific at the time of the coming of the Europeans could be reconstructed on archeological evidence alone [1975b: 223], while Fladmark despairs of being able to separate the material culture of the ancestral Haida, Tsimshian and northern Tlingit [1974: 4]. On a more positive note, Zegura was able to assign approximately 91% of a sample of 609 Eskimo crania representing 12 series to the correct linguistic group on the basis of metric data, leading him to the conclusion that biological differentiation parallels linguistic differentiation [1975: 271-272].

While several investigators rightly urge caution, I think few would suggest that biology, language and culture are totally unrelated variables in the north. I know of no historically documented northern case in which a change in language was not accompanied by other rather profound cultural changes which should be detectable archeologically. The classic definition of a breeding population is a group of individuals more likely to breed with each other than with outsiders. I suggest that if hard data were available, most northern speech communities would meet this requirement. I suspect that ethnically distinctive attributes in material culture, if they exist, will likely be found on a rather subtle stylistic level and that broad-brush categories such as "barbed dart with wedge tang" or "stemmed slate knife" are too crudely conceived to be of value in this respect. I also believe that a speech community will share other ideas as well and that some of these ideas will be given material expression and enter the archeological record. Conversely, significant separation between two related languages must imply that barriers of some sort were maintained for a significant period of time. Such lack of communication should be reflected at some point in the archeological record if this record is studied in adequate detail.

The foregoing are assertions only. Surely there is sufficient material of known ethnic provenience in our museums to test these and other views about the relations

between material culture and ethnicity in the recent past in northwest North America. If subjected to suitably detailed study, such materials should allow us to test and calibrate our assumptions about the significance of continuity and change in the prehistoric past, or at least to establish the boundaries within which such discussions may profitably proceed.

To return briefly to a specific discussion of the ethnic identity of the North Pacific Maritime co-tradition peoples, it is generally accepted that most inhabitants of this area in early historic times were Pacific Eskimos. Future research may indicate that the Kachemak Bay Tanaina had effectively been amalgamated to the co-tradition by the time of the coming of the Europeans, but this cannot be documented archeologically at present. Most scholars seem to agree that the ancestors of the historic peoples we have concerned ourselves with here were Arctic Mongoloids rather than American Indians and spoke some variety, extinct or extant, of an Esk-Aleutian language [CLARK 1972: 36ff, 1978: 18; DUMOND 1977a: 151ff; LOBDELL 1978a]. Dumond further suggests that before 1000 A. D. the language(s) spoken on the Pacific coast were likely to have been closer to modern Aleut than western Eskimo, which in his opinion was brought into the area from the north at this time. This suggestion, while reasoned, is still open to question. It does appear that the sharp boundary between Aleut and western Eskimo is not well reflected in our sketchy knowledge of the archeology of the Eskimo-Aleut boundary area on the Alaska Peninsula [DUMOND 1974a: 4]. As Clark has noted [1978: 1] the antiquity of the Pacific Eskimos as an ethnic group and their role in the larger prehistory of the Eskimo world remain significant topics for future research.

SUGGESTIONS FOR FURTHER WORK

The various imperfections in the archeological record in our area have become painfully clear in the foregoing discussion and we will not dwell on the obvious need for further work. All major sequences have one or several gaps measurable in centuries, and clear closure with the ethnographic inhabitants is established for only one (possibly two) of the four major branches treated. We must determine through further survey and excavation if the prehistoric record in Kachemak Bay and Prince William Sound is as short as it now appears to be. The west side of Cook Inlet must be studied in more detail as well. All sequences discussed above should be considered provisional, subject to future refinement and revision.

More attention must be paid to features, especially the systematic excavation and reporting of house ruins. Other features such as hearths, pits, etc. must be viewed as potentially significant artifacts and made more accessible for comparative study than they are in the typical site report. Systematic comparative studies of artifact distributions must be made so that regional variation within the tradition may be properly appreciated [CLARK 1978: 10]. Most existing comparative studies (the present one included) are superficial and subjective. Only two systematic comparative typological studies with broad synthetic goals have been made in recent years

[DUMOND, CONTON and SHIELDS 1975; MCCARTNEY 1969]. Both have been confined to organic artifacts, admittedly a valuable domain of material culture but clearly not the only significant one. Dumond, Conton and Shields have fairly criticized McCartney's pioneer effort [1975: 54-56]. Their study, which leads to far-reaching conclusions, is also open to criticism on the grounds that the documentary table [1975: 64] is unquantified and crude to the point of illegibility, there is no documentation of which pieces in the collections are considered representative of the types so that independent judgments could be made, and temporal differences are ignored. One might also doubt that all the relevant typological variability expressed over more than 2000 years from Attu to Point Barrow can be adequately characterized by 169 types. It is easier to criticize such studies than to undertake them. Clearly, more rigorous work of this type is needed, but the results should be more adequately presented, at monographic length if necessary, so that those who are asked to accept the conclusions can fully evaluate the data on which they are based.

Noting that archeological research in the Pacific Eskimo area has been problem oriented since its inception, Clark has summarized some pertinent directions for future work [1978: 9ff]. We need information from sites other than large coastal middens, most of which probably were winter villages. Functional differences between settlements need to be explored and, if possible, we need detailed studies of contemporary interrelated sites in a limited area. We must realize that most large midden sites have already been impacted by marine erosion and that most of our samples are therefore biased. Better paleoecological information is also required, as is a better understanding of the details of Holocene environmental changes. It seems likely to me that many of the most promising leads for future research will stem from an appreciation of human cultures as part of a larger and ever-changing natural world.

In conclusion, something should be said about the future of the resource base upon which our understanding of the prehistory of the area depends. Most North Pacific areas containing significant archeological remains are endowed with considerable natural beauty; many are experiencing dramatic population growth; and large areas are presently reverting from governmental to private ownership. Private ownership *per se* does not constitute a danger to the archeological record, but increasing human utilization, access and commercial development does. Salvage measures seldom officially have been undertaken on a large and complex Alaskan North Pacific coastal site. I fear that such work would be beyond the resources of the developers and the present capabilities of the northern archeological community. Here we have much to learn from the experiences of our colleagues in British Columbia and further south along the Pacific coast. The alternatives and procedures that they have found useful should be studied before emergencies arise.

North Pacific coastal middens produce a variety of artifacts, some of striking beauty. These pieces, fortunately, have not yet achieved the popularity on the illegal and semilegal antiquities market that North Alaskan fossil ivory artifacts have, but it is only a matter of time until they do. Amateur collecting, in the worst sense of

the term, is today only a nuisance but the seriousness of this problem will increase with increasing populations and greater ease of access. Aggressive steps must be taken to cooperate with and further educate local residents and organizations who show some understanding of the historical significance of archeological materials before the problem of the amateur collector or semiprofessional treasure hunter grows to crisis proportions.

The most serious threat to the archeological record about the Gulf of Alaska at present arises from natural rather than human agencies. Most of the shore line in the area appears to be sinking in relation to the sea. This long-term process was dramatically exemplified in the 1964 earthquake. Since 1964, incalculable damage has been done to the record of human activity on Kodiak, in Kachemak Bay and in parts of Prince William Sound with virtually no effective mitigation [CLARK 1974a: 120-121]. Drowning shore lines render sites particularly vulnerable to marine erosion at a time when segments of the academic and bureaucratic communities espouse the cause of preservation archeology with the laudable purpose of leaving some remains intact for future, more sophisticated studies. We must search our consciences over the propriety of allowing fashion to dictate the consignment of the evidence about the past of the North Pacific maritime hunting peoples to destruction by the sea from which they derived their livelihood.

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