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of the  
**University of Alaska**



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Western American Arctic**  
A Symposium

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**April 1963**

**College, Alaska**

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EARLY MAN IN THE  
WESTERN AMERICAN ARCTIC

A SYMPOSIUM

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## FOREWORD

This volume marks the tenth year of publication of the University's Anthropological Papers. The symposium we present here, aimed at an interpretation of northern prehistory, forms, we believe, a highly fitting commemoration of the event. It will be interesting to observe how our thinking in these matters will develop in the next ten years.

As the reader will find, some papers deal more particularly with discrete cultural traditions or with more restricted areas. These papers are presented first. The second class of papers ranges more widely and touches upon that ultimate problem, the initial peopling of the New World. It seems appropriate that this second group conclude our volume.

The scholars whose papers are presented here have each an intimate knowledge of the material with which they deal; their interpretations should have a singular value for all interested in North American and northern prehistory. Each has agreed that there was a need for an assessment of current opinion and thought; that a theoretical framework was needed upon which to hang the findings of early man in the north. These needs have been translated into the present volume.

It has taken over a year to bring this work into being. The authors have suffered the various delays with commendable patience and for that and their contribution we of the staff of the Anthropological Papers are sincerely grateful. We hope they and our readers will consider the time well invested.

This issue is dated as of the time of its publication although, in following our normal sequence, it should be dated May, 1962. However, the inconsistencies in references within this volume that would be so created seemed a more important consideration than those that might arise in citing this issue which now is dated later than Volume 11, Number 1.

F. H. W.



## SOME ARCTIC SPEAR POINTS AND THEIR COUNTERPARTS

by

J. L. GIDDINGS

Stone projectile points have not long stirred the hearts of Arctic archeologists. Harpoon heads and engraving styles are still reluctant to move over to make room for the large bifaced flints presumed to have tipped one kind or another of spear; yet a good part of today's speculative writing is concerned with the forms and distribution of spear points on an intercontinental scale, and the Arctic is caught in the middle. Even though some of the implications of generic relationship that go with studies of points are of very doubtful value, one may perhaps play at the game of forms without doing permanent harm to his functional approach to typology.

Before attempting a survey of the larger projectile points of the Bering Strait region, however, I wish to make two points clear. First, I regard these objects as of less value as horizon markers than tens of other categories of artifacts that we find in Arctic sites. Data on houses, on the proportions of animals killed, on devices used in cutting and scraping skins, and on parts of the ancient archery complex, for example, are generally much more useful and definitive of cultural periods. Second, the large points of western Alaska probably have no bearing on the spread of one or another body of roving hunters of big game drifting northward from the Great Plains. They were made, instead, by indigenous peoples whose activities ranged widely within the several highly special environments of the region. Yet if we are going to compare sites of the Arctic with those of distant and warmer parts of the world, we shall have to do so on the basis of a few wide-ranging styles, rather than whole complexes of culture, for the Eskimos of the tundras were never the Sioux of the Plains.

The large points do exist in Alaska. They are always more prevalent, of course, at caribou interception places, where heavy spears are used, than in sites of the coast, but they appear often enough in all of the Arctic sites to show clearly the persistence of some forms and the successions of others. For the sake of brevity, we may refer to a chart (Fig. 1) of the sites and culture phases, most of them newly proposed and incompletely reported to date. They are arranged by locality in vertical columns and by relative order and estimated dating in horizontal correspondence with a column of pre-Christian dates. The points are identified by the names applied to similar forms in the central United States and Canada.

A brief summary of the columns follows:

*Column 1:* Dates in millenniums B. C.

*Column 2:* The stratigraphy and dating have been described in some detail for the type site at Cape Denbigh (Giddings, 1949, 1951, 1955; Hopkins and Giddings, 1953). The Denbigh Flint complex here was sharply separated from later deposits by sterile layers, including the indicated dated layers (Rainey and Ralph, 1959: 372-73; samples 104, 105, 108) of peat and peaty soil.

*Column 3:* The beach ridge archeology at Cape Krusenstern is the subject of preliminary reports (Giddings, 1960a, 1960b, 1961). Strong local continuity is present from the Lower Bench microblade site to the Denbigh Flint complex, to pre-Choris and on to Ipiutak; but the two Palisades manifestations and the Old Whaling culture appear to represent other traditions.

*Column 4:* The beach numbers refer to 114 identified beaches in series at the Cape on most of which were localized archeological sites that range in time from No. 1, which is the current ocean front beach where recent Eskimos have camped, to No. 105, which is the oldest upon which artifacts have yet been recovered, and on to No. 114, which represents, presumably, the first beach to form after sea level reached approximately its present height following Wisconsin glaciation. Because of unconformities where segments of old beaches were erased at several times, sites may not always be assigned a precise beach number.

*Columns 5 and 6:* The successions of cultures at Cape Prince of Wales and Cape Espenberg have been briefly mentioned (Giddings, 1960b: 13; 1961: 164). The two designated Singauruk sites and the Kugzruk site are located on stranded beaches remote from the sea, but not as far back as the one bearing Denbigh deposits.

*Column 7:* The succession at Choris Peninsula was described after the first season's work in 1956 (Giddings, 1957) and was further illustrated in a later report (Giddings, 1961: Fig. 9). The "Late Choris" entry refers to hearths (probably tent sites) two beaches forward of Choris houses, containing check-stamped as well as linear-stamped potsherds.

*Column 8:* The Battle Rock site has been mentioned (Giddings, 1961: 169-70) but not fully described. It is a sealing point a few miles north of Cape Krusenstern where several cultures and phases are represented, principally in the forms of burials.

*Columns 9 and 10:* The Onion Portage and other indicated Kobuk River sites are described together in a paper now published (Giddings, 1962). While the "upper middle" layers contain opaque obsidian and other artifacts unlike any other known phase of culture, the other layers above "Old Hearth" correspond strongly to Norton and Choris coastal phases. Old Hearth materials are again unlike those of the coast, but reminiscent of far inland sites of the Yukon drainage system. The Little

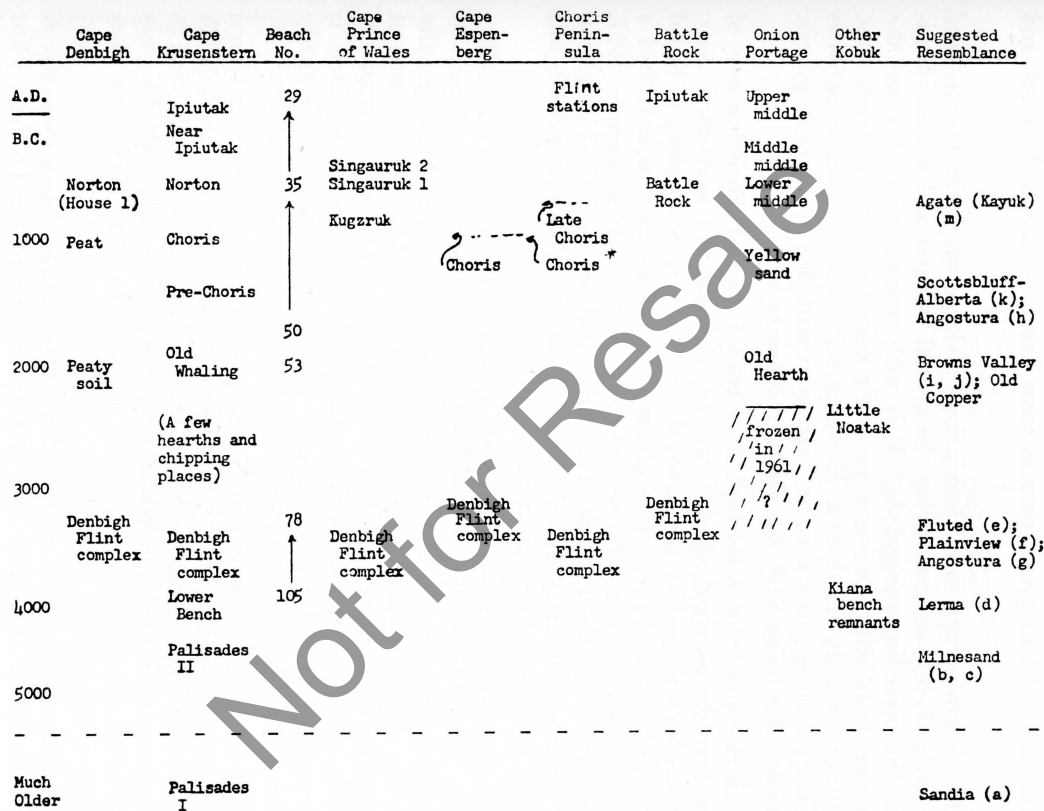


Fig. 1



Noatak site contains obsidian cortex scrapers as do the Old Hearth layer and Site KBR-8 (Kiana Bench Remnant). KBR-8 contains both microblades and stemmed and notched obsidian points, recalling those of Tuktuk site (Campbell, 1961*b*).

*Column 11:* The points described here are identified by figure numbers and the name of a suggested parallel form from sites far to the south and east.

The following are brief descriptions of large projectile points—and some knife blades—accompanying the several cultures and phases identified in the preceding paragraphs. It is with reservation that I use the terms associated with American projectile points of early Western sites. This usage is mainly descriptive. However, some resemblances, as between pre-Choris and Angostura points, are so remarkable as to raise generic questions. Beginning with the oldest, the points are:

1. A single-shouldered point broken at both ends and consisting now of the granular material which I can only describe as transformed chert. It has been shaped by the removal, evidently by percussion, of broad and rather deep flakes. This object (Fig. *a*) appears to have had a form similar to that of one Sandia type (*e.g.*, Wormington, 1957, Fig. 30, 1). As the Palisades I material need not be limited by glacial or periglacial activity during the whole of the Wisconsin period, this point could well be of great age.
2. The fragments of two spear points appear in the Palisades II collection. One of these (Fig. *b*), of chert, has a straight base and perpendicular edges. It is a thin object, presumably formed by diagonally flaking the more convex face of a large prismatic blade. Fragments of unaltered such blades are present in the site. The second fragment (Fig. *c*) of chert, also with a straight base and parallel sides, is narrower and thicker at the center—in the latter respect more nearly resembling Milnesand points from the type site (Sellards, 1955).
3. From Kiana Bench Remnant No. 8—part of a raised beach or lateral moraine on the right limit of the Kobuk River valley (Giddings, 1962)—was found the lanceolate brown chert point (Fig. *d*), nearly oval in cross-section, though the flaking tends toward the collateral. This has somewhat “laurel-leaf” proportions and calls to mind the Lerma form (Wormington, 1957, p. 97-99).
4. A doubly fluted point of chalcedony with parallel edges (one ear is broken away) (Fig. *e*). This occurred *in situ* in the Denbigh Flint complex layer at Cape Denbigh. At least three other small fluted points approaching the Folsom type have been found in the Brooks Range of northern Alaska, two of them in surface association with microblades (Thompson, 1948; Solecki, 1951*b*). Since these were all picked up on the surface, however, one may hold in reserve their

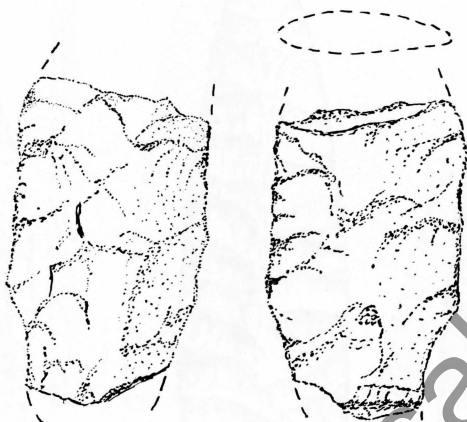


Fig. a

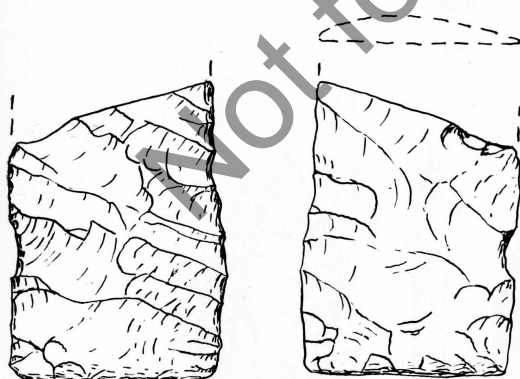


Fig. b

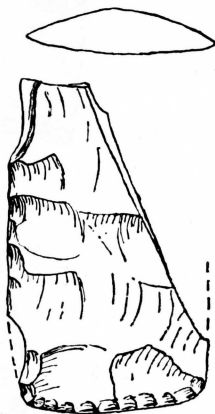


Fig. c



Fig. d

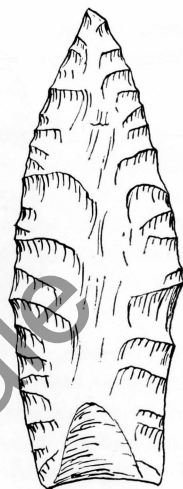
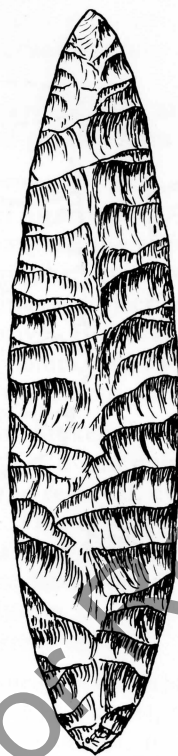


Fig. f

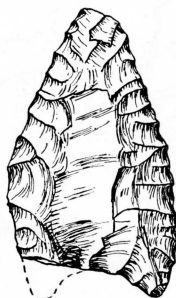


Fig. e

(Length of "d" 15.7 cm.)



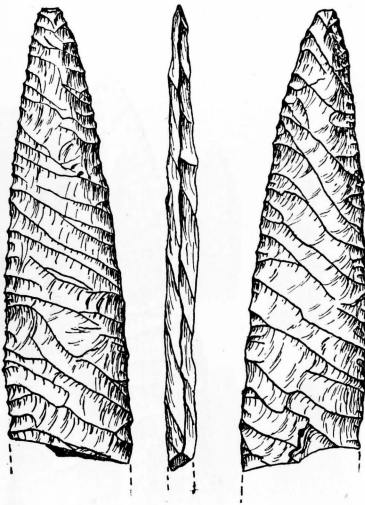


Fig. g

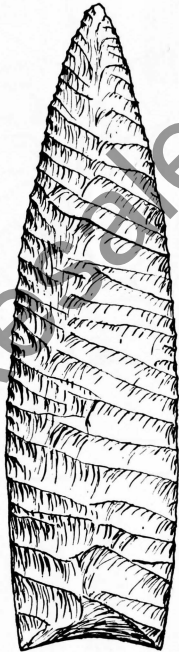


Fig. h

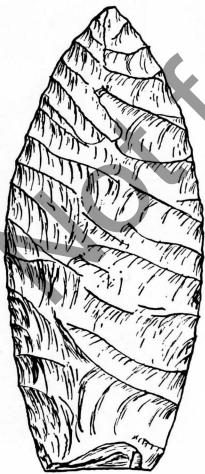


Fig. i

(Length of "h" 13.5 cm.)

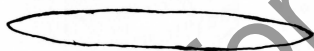
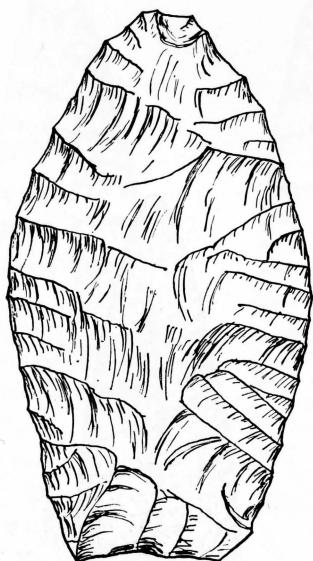


Fig. j

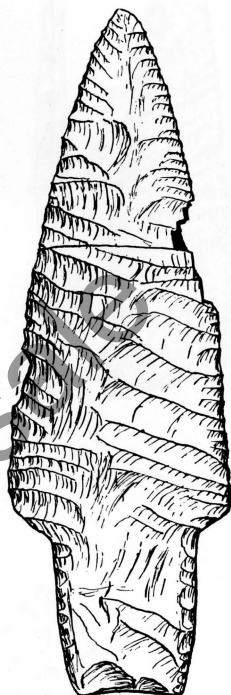


Fig. k

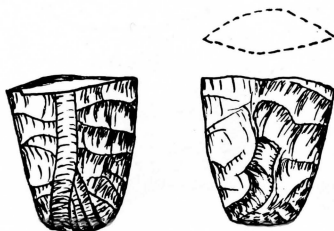


Fig. l

(Length of "k" 14.5 cm.)

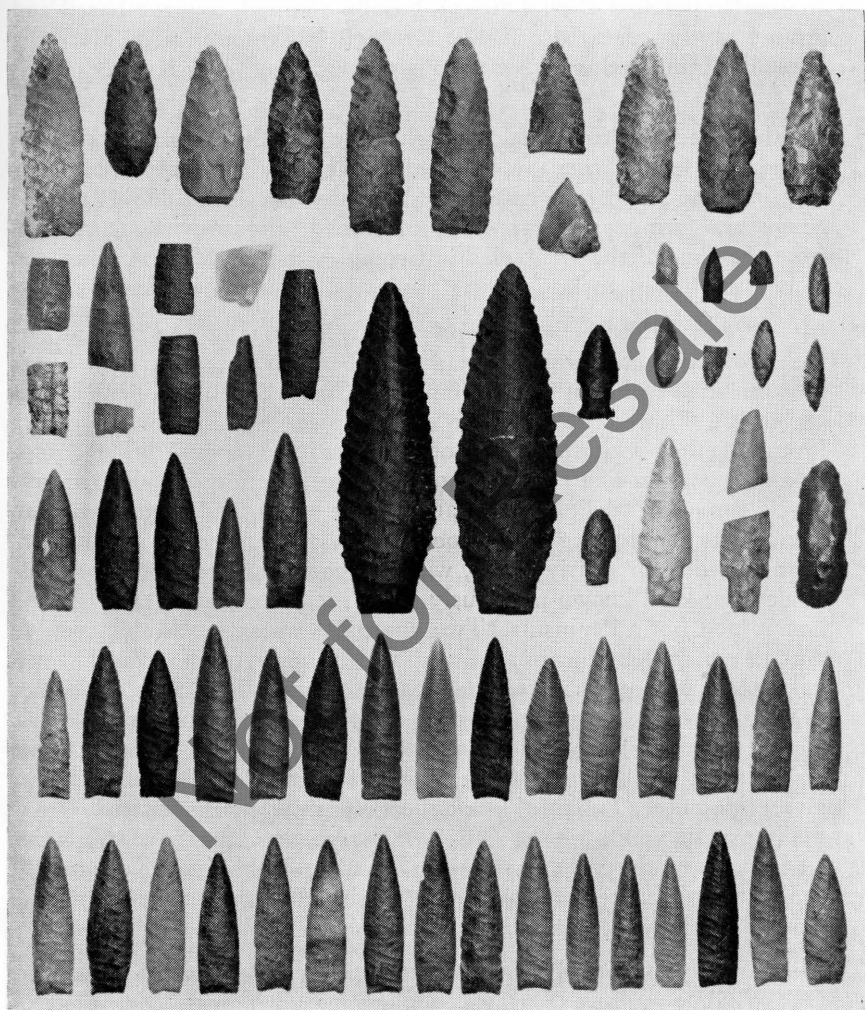


PLATE 1.



assignment to the Denbigh or another microblade culture, while at the same time remembering that fluted points have not turned up in this greater region in association with artifacts known to fall outside the microblade configuration.

5. A sizeable point of chert (Fig. *f*), basally thinned, concave-based and ground at the edges, also in the Denbigh Flint complex in place. It is readily compared with certain Plainview forms (esp. Krieger, 1947: Pl. 5, *1*).
6. Another specimen from the Denbigh Flint complex in place (Fig. *g*), along with several concave bases of presumably similar pieces. This falls into the Angostura category (Wormington, 1957: 138-41). The Angostura form appears to have continued, almost without change, from the time of the Denbigh Flint complex to that of pre-Choris and Choris, and even to late Choris phases of culture.

A remarkable cache, evidently the belongings of one man at one time was excavated from a small area beneath the crest of a beach between the beaches of Old Whaling and Choris culture proper. In this cache (Pl. 1) were 36 complete chert projectile points of Angostura form, together with fragments of 8 others, and several other forms. These Angostura-like pieces are oval in cross-section, usually concave based, sometimes delicately serrated at the edges, and treated with an overall diagonal flaking as fine, perhaps, as any on record. With them were 10 whole or nearly whole, wide, diagonally flaked spear or knife blades of a kind known previously from Trail Creek middle levels and houses at Choris Peninsula. Two enormous spear heads, between 18 and 19 cm. in length, are stemmed and provided with wide diagonal flake scars proportionate to the smaller ones of the knives. Included in the same cache were two broken, stemmed spear points (see below). These, but not the points of Angostura form, are edge-ground. Other points are a small stemmed one like those known from Choris culture and a side-notched point of black chert identical, except for its diagonal flaking, with points of the Old Whaling culture. Seven coarse, thick side blades of the inset variety (or small knife blades) made up the remainder of this remarkable cache. A single point of Angostura form from this cache is shown in the drawing, Fig. *h*.

7. The large collection of flint projectile points and knife blades from Old Whaling culture contains obvious parallels with long slender, notched points not commonly placed in the same categories with those of the early Plains. Referring to a plate of Old Whaling flints (Giddings, 1961: Fig. 7) and to archaic manifestations of the Great Lakes region, especially Old Copper forms (*e.g.*, Wittry and Ritzen-thaler, 1956: Fig. 71, O-T), resemblances between projectile points and scrapers become striking.

Besides notched points, however, the Old Whaling culture contains spear points more like those of early Plains varieties. In the Old Whaling plate just mentioned, the large point of chalcedony, in the upper right-hand corner, together with the chert point and the one of chalcedony shown in Figs. *i* and *j*, define, with others not illustrated, a form recalling that of Browns Valley.

8. The stemmed, diagonally flaked chert point, Fig. *k*, recalls one Scotts-bluff form (Wormington, 1957: Fig. 40, 7) or, because of its relatively long stem, the Alberta form of Plains point (*ibid*: 132-35). This and another like it were found in the above-mentioned cache (see Pl. 1). This object is ground at the edges, diagonally flaked with precision, and lightly serrated. It was found in two pieces, the notch on one edge of the blade representing series of burin blows struck after the break on each of the pieces. This use of broken spear points for makeshift burins is characteristic of Choris and the related Middle Trail Creek technology (Larsen, 1951: Fig. 14). Significantly, the same practice has recently been recognized by Dr. Jeremiah F. Epstein (personal communication, 1960) as a means of treating broken paleo-Indian, or Plano, points of Texas.
9. In the "middle middle" level at Onion Portage (Giddings, 1962) was found the base of a black chert point (Fig. *l*) which appears to be identical with those of some Kayuk points (Campbell, 1959: 98; Fig. 1). As the base of a somewhat contracted and slightly convex collaterally flaked spear point, this appears similar also to the more common type found at Agate Basin (Wormington, 1957: Fig. 46).

These specimens by no means exhaust the possibilities of correlation with forms of large projectile points from the Great Plains, but they perhaps suffice to show that parallels exist in the coastal zone as well as inland. The greatest numbers of close resemblances between the western Alaska points and the Plains, "Plano," or paleo-Indian points of the temperate zone fall within the period post-Denbigh and pre-Norton. Points of the pre-Choris beaches, taken together with those of Choris sites and their contemporary middle Trail Creek levels, show a remarkable variety of diagonally flaked forms.

As to what these correlations of form may prove to mean, I can only guess. It seems enough at this time to record their relative order, as a kind of warning to us all against too hastily assuming that projectile points of Plano forms are always to be crossdated with their counterparts 2,000 miles away. Preliminary reports on archeological sites are often at fault because they inadvertently give wrong impressions about what has been found. I seem to have misled some readers by saying too little about things found at Cape Krusenstern.

In his first footnote (p. 13), Collins observes that while a few animal bones occurred with Palisades II implements, bony material was lacking in the Denbigh sites. I neglected to say in previous publications that bone fragments in a better state of preservation than the six eroded deer bones from Palisades occurred just under the surface with microblades on the "Lower Bench" site, a lagoon-edge Denbigh-related site on the same hillside with the Palisades. The preservation of bone at both of the presumed older sites clearly depends upon the soil of locally disintegrated limestone in which the materials are buried. On the other hand, it is true that the Denbigh hearths lying just under the sod on the beach ridges at Cape Krusenstern yielded no bone except for a few charred fragments too small for identification, while the Old Whaling summer lodges, also just under sod, held all manner of animal bones in good shape for classifying.

On another aspect of the same subject, I find that Irving (p. 66) reads me as "contending" that Palisades II is different from the Old Whaling culture. I had thought that I was only reporting. This is the first time anyone has suggested to me that Palisades II is closely similar to Old Whaling. If others who have not examined the materials from Cape Krusenstern confuse the Old Whaling with the Palisades materials, perhaps a study of the scale of illustrations will help until I can offer more details in a full report on the beach ridge archeology which I hope to complete during this sabbatical year in Denmark.

In conclusion, let me point out that internal consistency exists between the several kinds of stratigraphy, vertical and horizontal, at Cape Denbigh, Cape Prince of Wales, Cape Espenberg, Choris Peninsula, Cape Krusenstern, and Onion Portage in the upper Kobuk River valley. While many questions remain to be answered in this coastal region, it seems wise to compare the unstratified sites of the interior as well as any other stratification in the general region first with the stratigraphy of the coast and only then with a hypothetical time scale based on tenuous typological threads between middle North America and Central Asia.

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# PALEO-INDIAN ARTIFACTS IN ALASKA: AN EXAMPLE OF CULTURAL RETARDATION IN THE ARCTIC

by

HENRY B. COLLINS

As radiocarbon dates are lacking for the pre-Athapaskan sites in interior Alaska, their age and relationship to Paleo-Indian or Plano sites in the High Plains containing similar types of projectile points are problems for the future. Rather than speculate on the relative ages of these widely separated sites it will be more rewarding, for the purpose I have in mind, to restrict attention for the moment to the coastal Arctic sites with similar inventories recently discovered by Giddings in Kotzebue Sound. I wish particularly to comment on the significance of the enormous time difference between the Arctic coast sites, some of which are radiocarbon dated, and the Paleo-Indian sites of known age far to the south.

Giddings (this volume) draws attention to the occurrence of Paleo-Indian and Archaic type projectile points at a number of Alaskan sites he has investigated. At Cape Krusenstern alone the long succession of old beach lines and the Palisades area beyond have yielded many examples of early forms of projectile points which were deposited there over a period extending roughly from 4,500 to 1,000 B.C. Omitting the questionable Sandia attribution for a single crude bifacial point from Palisades I, the Krusenstern sites contain projectile points that may be equated, typologically, with Milnesand, Angostura, Scottsbluff, Browns Valley, and Old Copper.<sup>1</sup> Of particular significance is the remarkable cache of 36 complete and 8 broken points which in shape, size and flaking technique are clearly to be identified as Angostura (Wormington, 1957: Figs. 45, 71), differing only in that the tips are more narrow and tapering. This cache was excavated from a beach (labeled Pre-Choris on Giddings' chart) between the Choris beaches and those of the Old Whaling culture. A series of radiocarbon dates of from 688 to 286 B.C. for the Choris

<sup>1</sup> The Old Copper side-notched points on Giddings' chart are those of the Old Whaling culture (2,000 B.C.) found on Beach 53. However, the much older Palisades II (estimated at 4,500 B.C.) also has side-notched points, a short stubby variety closely similar to Durst Stemmed, a late Archaic Old Copper type from Wisconsin. The occurrence of a late Archaic type of this surprising antiquity in the Arctic, and its presence near the base of the Krusenstern sequence while Plano-type points are associated with later stages of the sequence, raise a question as to the age attribution of Palisades II. So does the presence of a few animal bones just beneath the surface in association with the Palisades II implements, whereas the Denbigh sites of supposedly later age contain no trace of organic material (Giddings, 1961). The Krusenstern sequence would seem more reasonable if Denbigh were placed earlier than Palisades II.

culture (Rainey and Ralph, 1959) and from 2,000 to 1,500 B.C. for Old Whaling (Giddings, 1961: 164) indicates a date no earlier than 1,500 B.C. for the Angostura implements, the place assigned them on Giddings' chart. Moreover, a house at the Choris site itself, which Giddings places at 1,000 B.C., contained several fragments of large diagonally flaked Plano-type points (Giddings, 1957: Fig. 9), from which Giddings concludes (this volume) that the Angostura type "appears to have continued, almost without change, from the time of the Denbigh Flint complex to that of pre-Choris and Choris, and even to late Choris phases of culture."

The possibility that the Angostura points at Cape Krusenstern are much older than their "beach number" would indicate, and more nearly contemporaneous with similar artifacts from the Plains area, is virtually excluded in view of Giddings' demonstration of periodicity of beach formation and their sequential occupation by different groups of people from the time of the Denbigh Flint complex to the present. As I have remarked elsewhere (Collins, 1962), the location of archaeological sites on a series of old beaches all at the same elevation, as here at Cape Krusenstern, is a reliable indication of relative age. The determining factor is the distance of the sites from the present beach. At Cape Krusenstern, as at Gambell on St. Lawrence Island (Collins, 1937: 33-34, 252) the oldest sites are on beach lines far back from the shore. As there is no reason why people dependent on the sea would choose so inconvenient a location, it is obvious that the beaches have built up since the sites were abandoned.<sup>2</sup> We may, therefore, accept the evidence of the Krusenstern beaches, namely that projectile points of the same form as those used by big game hunters in the Plains 7,000 to 9,000 years ago were used by caribou hunters on the Arctic coast of Alaska as late as 3,500 years ago, and that they were deposited on a beach that was probably not even in existence 4,000 years ago.

The fact that Plano-type projectiles occur as normal components of a series of culture stages at Cape Krusenstern that are susceptible of relative and absolute dating, gives point to Giddings' insistence that it is necessary first of all to establish a full chronology for coastal sites. With such a chronological framework, based on the rich content of Arctic habitation sites, it will be possible to understand the local meaning and functional significance of typologically ancient artifacts in known cultural

<sup>2</sup> This is in contrast to the situation in the central Arctic where the beaches lie at different elevations due to isostatic changes in sea level. There the elevation of a site above sea level may or may not be indicative of its age, for in some cases an old elevated beach may be chosen as a dwelling site by recent or prehistoric Eskimos because the elevation in itself offered certain advantages. At Resolute, Cornwallis Island, for example, one old beach was found to contain sites of different ages (late Thule, early Thule, Dorset), and sites of exactly the same age (late Thule) were found on very recent and much older beaches (Collins, 1951a, 1955).

assemblages of known age. No such chronology is presently available, or perhaps possible, for the shallow, unstratified, undated interior sites yielding the same types of artifacts. It does not follow, however, that the age of the interior sites is to be automatically determined on the basis of the coastal chronology. They could be contemporaneous with, younger or older than those on the coast.

One possibility would be that the Plano-type implements of the Brooks Range indicate continuous occupation of the mountain-forest-tundra areas of central and northern Alaska since Pleistocene time. It is true that as yet there is no unequivocal evidence of Pleistocene man in Alaska. I venture to suggest, however, that some of the artifacts described by Rainey (1939) reportedly found in gold dredging operations near Fairbanks may actually have been of this age. They are said to have been found near the base of the frozen silts overlying the gold-bearing gravels at depths of 12 to 20 meters below the surface in association with mammoth, mastodon, bison and horse bones. These discoveries have been largely ignored because they were not made by trained archaeologists and their reported association with extinct mammals could not be proved. Also, a few typical modern Eskimo artifacts reportedly found at the same sites (Rainey, 1939: Fig. 10, 1, 2; Fig. 11, 2) were obviously intrusive and a cause for suspicion. The fact remains however that several of the artifacts are definitely of Paleo-Indian type and that they were discovered by Alaskan gold miners before most of the early western types had been described and published. One of them (Rainey, 1939: Fig. 9, 5) has the size and shape of an Angostura point (the flaking not clear from the photograph). It should be noted that this point was found in 1933, before even the Clovis type had been described in print by Howard and Cotter. The other (Rainey, 1939: Fig. 10, 4) has the straight base, tapering stem and general outline of some of the wider forms of Agate Basin. It was discovered in 1936-37. Some of the accompanying artifacts are equally noteworthy. Thus, it may be more than coincidence that one of the artifacts from the Goldstream muck deposits is a thin, lozenge-shaped blade resembling the Solutrean laurel leaf form. In the same deposit were found two long slender bone points like those so common at Palaeolithic sites in Europe. Similar bone points, but with beveled instead of conical lower ends, were found associated with mammoth bones at Clovis and at early sites in Florida and Oregon. Cotter (1962) has recently, and rightly I think, emphasized the importance of this type of bone artifact as a connecting link between the early American and Upper Palaeolithic cultures of the Old World.

In short, the nature of these stone and bone artifacts leads me to believe that they may well have been found, as claimed, deep in the frozen muck in association with a Pleistocene fauna. If so, they would be the only Alaskan finds that could be as old or older than those from Paleo-



Indian sites in the south. The possibility that the undated Brooks Range and other interior Alaskan sites with Plano-type artifacts could be part of a local cultural continuum extending from a Pleistocene base in Alaska itself should warn against premature acceptance of the presently prevailing view that big game hunters of now extinct animals moved up from the Plains to become caribou hunters in the north.

I will return now to the question stated at the beginning of this paper, namely the great disparity in age between the coastal Alaskan sites containing Plano-type artifacts and the western Plano sites themselves. How is this to be interpreted? Are the Arctic manifestations to be disregarded because they are at least 5,000 years later than those in the south? Those interested only in strict cross dating of identical implement types or complexes, or in determining the ultimate origins of only the oldest complexes, might be so inclined, possibly falling back on the time-honored, easy and overworked explanation of independent invention. But if viewed in broad perspective, the later history of a culture unit or complex is as meaningful as its beginning, and it is precisely this record of subsequent distribution, duration, and assimilation that sheds light on culture process. From this point of view the long persistence of typologically ancient implements on the Arctic coast of Alaska is in itself as important as the determination of their exact relationship to similar forms elsewhere.

The relative recency of Plano-type artifacts on the Arctic coast should have come as no surprise. Actually, they provide only another, striking example of what should be recognized as a generalization of Arctic archaeology, the phenomenon that might be called "Arctic retardation." It is no novel idea that the Arctic should have been a refuge area, if for no other reason than its marginal position geographically. I have discussed elsewhere the cultural, historical and environmental factors that have fostered stability and uniformity in Eskimo culture without inhibiting culture change (Collins, 1940: 535, 537-540). But it is the later discoveries in Alaska, Canada and Greenland that have provided the most striking evidence of the truly marginal character of Arctic cultures, both Eskimo and pre-Eskimo (Collins, 1943: 232; 1951b: 440, 460; 1953a: 38; 1953b: 200-202; 1957a: 520; 1962). To summarize briefly: The stone industry of Ipiutak (A.D. 300) is in large part a continuation from Denbigh, with many delicate end blades that are also closely similar to those from Neolithic sites in Siberia. More important, Ipiutak bone and ivory arrowheads and lances with inset side blades have direct parallels in the early Siberian Neolithic and the Mesolithic of northern Europe; side blades were also used on harpoon heads (Okvik-Old Bering Sea, Birnirk, Ipiutak) and lances (Dorset). A single Dorset site, T1 on Southampton Island (675 to 100 B.C.) yielded an impressive array of early implement types: Microblades,



burins, burin spalls, end blades, oval and rectangular side blades, and triangular-sectioned knives similar to Paleolithic backed blades but struck from the outer edges of prepared cores. Burins, several thousand years later in the American Arctic and Siberia than in Europe, were used by Dorset Eskimos as late as 100 B.C., and the burin tradition, through a series of changing forms, continued into modern Eskimo culture. In short, culture patterns in the Arctic, once established, tend to persist over long periods of time, and at any stage of their development reflect technics and practices previously discontinued in other parts of the world. Thus, the Arctic Small Tool tradition is in large part an American variant of the much older Eurasian Mesolithic. And the later Eskimo cultures to which it gave rise continued to exemplify a Mesolithic way of life, not only in their general configuration but in the specific types of Mesolithic implements which they employed. And now, on an earlier time level, we see that ancient American types of implements like those used thousands of years earlier in the Plains and Southwest remained part of the equipment of Arctic hunters as late as 1,500 B.C.

Culture lag and retention in the Arctic are primarily phenomena of culture. Only in the broadest sense can they be explained as due to the peculiarities of the Arctic environment. In an area where hunting is the only possible basis of life, it is obvious that traits and influences entering it must conform to this particular pattern. But while the Arctic environment sets limits on the basic form of the economy it does not prescribe the precise form an implement is to take. Although others have argued differently, I can see no reason for invoking environment in explanation for such traits of Arctic culture as those we have been considering. The occurrence of similar types of burins, microblades, side-notched and lanceolate blades, and chipping techniques in such widely different Arctic environments as the sea coasts, inland tundra, mountain and forest is enough to dispell the idea that particular implement typologies in some way reflect the particular environment in which they are found.

Of all man's handiwork art would probably be acknowledged as least subject to the dictates of environment. It may be that we have here a final example of the perpetuation of ancient culture patterns in the Arctic. As it involves a more subjective evaluation than the other examples cited above, I would not mention it here if it were not for a highly important discovery in one of the Trail Creek caves on Seward Peninsula. In discussing the history and origins of Eskimo art I have suggested that there were significant resemblances between the earliest forms of Eskimo art and that of the Upper Paleolithic and Mesolithic—that the simple, linear, geometric motifs and designs of Okvik, Dorset and early Aleutian art were actually closer to those of the Paleolithic and Mesolithic than to any later styles either in America or Eurasia (Collins, 1937: 294-296; 1940: 585-586; 1959). In a paper presented

at the meeting of the 34th International Congress of Americanists in Vienna in 1960, Helge Larsen described and illustrated a bone artifact bearing a typical Maglemose decoration which he had excavated at one of the Trail Creek caves in 1949. The discovery of Mesolithic art at this pre-Eskimo site in association with Plano-type stone artifacts and typical Mesolithic bone points slotted for side blades, tends greatly to strengthen the probability of a relationship between Eskimo and Mesolithic art, and reinforces previous indications of the Mesolithic origin of Eskimo culture.

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Not for Resale

# THE BURINS IN THE ESKIMO AREA<sup>1</sup>

by

HANS-GEORG BANDI

Since Frederica de Laguna suggested that the so called "boot creasers" of the Dorset culture, well known too from O. Solberg's description of the "Stone Age" in West Greenland (Solberg, 1907) "would correspond in function to the chipped stone 'burins' or 'gravers'<sup>2</sup> of the Upper Paleolithic of Europe" (de Laguna, 1946: 139) it has become obvious that real burins and related implements occur in different levels of the Eskimo culture from Alaska to Greenland.

The most important step on the way for recognition of the Eskimo burin was made when J. L. Giddings in 1948 discovered the Denbigh Flint Complex and described burins and burin spalls as typical elements of this culture (Giddings, 1949, 1951, 1956). The question was further discussed by J. Meldgaard (1952), H. B. Collins (1953) and W. Irving (1955). More and more sites were published where the flint material included burins and related artifacts, from interior Alaska (Solecki and Hackmann, 1951; Irving, 1951, 1953; Campbell, 1959), from Arctic Canada (Meldgaard, 1952, 1955; MacNeish, 1954, 1956; Collins, 1955; Harp 1958; Lowther, 1960)<sup>3</sup> and from Greenland (Knuth, 1952, 1954, 1958; Larsen and Meldgaard, 1958; Mathiassen, 1958).

It has been stated by different authors that the burin in the Eskimo area is similar to the Eurasian burin of Upper Paleolithic and Mesolithic Age. However, Collins distinguishes between "genuine burins and others with rubbed edges, which may have functioned as burins but were made differently" (Collins, 1953: 36). Concerning the true burins, he emphasizes that "the upper end has been chipped to a rather thin knife-like edge, so that in use the blade would have been moved back and forth in the plane of its width, and not transversely like the European burin"; and he further says that "the American burins also differ from

<sup>1</sup> I am obliged to F. Hadleigh-West for encouraging me to write this paper and helping me to translate it.

<sup>2</sup> Some of the authors in the field of Eskimo archaeology refer to the description of this type of tool by M. C. Burkitt (1920; 1949: 59 ss.) and G. V. Noone (1934). There the term "burin" is identified with that of "graver." Actually this may be correct as today an engraver does not use only needle-shaped, pointed but also chisel-shaped graving tools, the latter having more or less the characteristics of a stone age burin. But in prehistory the term "graver" should be used for pointed artifacts only.

<sup>3</sup> I don't include the "burins of central or convex type" which MacNeish mentions from his British Mountain Phase (1959: 44 and Pl. 1/6) because I think that if this cultural phase is actually as old as the author thinks and if the artifact in question is really a burin—the illustration is not clear enough—we could not connect it with the burins and related implements discussed here.

Paleolithic examples in being more carefully shaped and more extensively chipped on the surface." Meldgaard in discussing the Sarqaq burins, collected by Hans Mosegaard, mentions that "a single burin can . . . be described as an 'ordinary' or chisel burin." The other burins of the Sarqaq culture have an "oblique, sharp or rounded front edge" from which "one or more 'burin-blows' are struck" (Meldgaard, 1952: 223). Irving points out, that the burins "in certain instances, and particularly at the Alaskan sites, . . . are accompanied by other implements typologically similar to Old World Paleolithic and Mesolithic forms; elsewhere, they are found in complexes that may be more distinctively American" (Irving, 1955: 380).

As the term "burin" becomes more and more general in the publications on early Eskimo cultures, I think it is necessary to fix what is actually meant. It can be seen from the above mentioned observations about Eskimo burins, that Collins and Meldgaard distinguish different kinds of burins and burin-like implements; they have also noted that there are certain differences from the Eurasiatic burin.

It may be useful to reconsider the definition of the Upper Paleolithic and Mesolithic burin in the Old World.<sup>4</sup> Based on a formulation recently proposed by F. Felgenhauer (1962), I would describe it as follows: The burin is a stone implement with a chisel-shaped cutting edge (German: *Stichelkante*) which always runs in a right angle to the plane of the implement. This cutting edge is formed by the meeting of two rather narrow facets. At least one of these facets must be formed by one or several "burin-blows." If the other facet is not made in the same way, it may be formed by retouches, fracture or be unworked.

We therefore have central-burins, left-angle-burins and right-angle-burins which all may be formed by blows on both sides or by blows on one side and retouches on the other. Only on the angle-burins may one of the facets be formed by the breaking of a blade or flake before this has been transformed into a burin by striking off one or several spalls on one side (Fig. 1).

One often reads that burins have been resharpened after having been used sufficiently long so that the cutting edge had become dulled. This may have happened occasionally but I think that not infrequently during the initial preparation of a burin several spalls must have been struck off. The reason is probably that in many cases the first blows from the thin end of a blade produced only a point or a very narrow cutting edge. The following blows resulted in forming the needed cutting edge of some millimetres thickness (Fig. 2).

In this connection we have to note that most of the burin spalls

<sup>4</sup> See footnote 2.

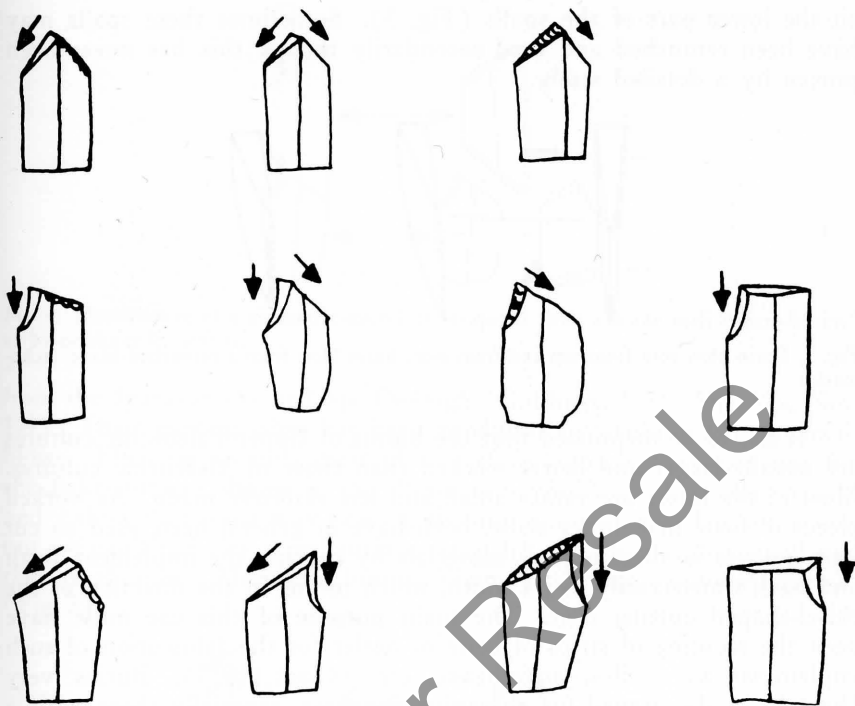


Fig. 1. Central burins (upper row), left-angle burins (middle row) and right-angle burins (lower row); from left to right: blow/retouch, retouch/retouch, retouch/blow, angle-burir (schematic)

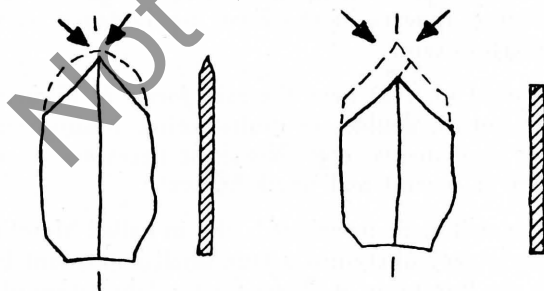


Fig. 2. Manufacture of a burin from a blade: striking of the first and the following blows (schematic)

found in Upper Paleolithic or Mesolithic cultures in Europe have a very typical form. The cross-section of their upper part differs from that of their lower part. If the edge of the blade or flake from which the spall has been struck off was already retouched, we find some of these retouches

on the lower part of the spalls (Fig. 3). Sometimes these spalls may have been retouched and used secondarily though this has never been proven by a detailed study.

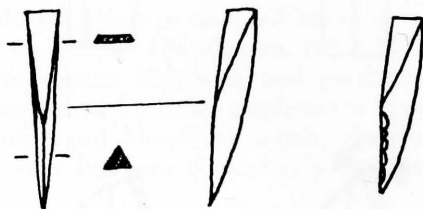


Fig. 3. Burin blow seen from top and from side; burin blow from a retouched blade (schematic)

It has to be mentioned that the burins of Upper Paleolithic cultures are usually larger and better worked than those of Mesolithic cultures. Most of the latter are rather small and less skillfully made. As worked pieces of bone and antler show, both have in general been used to cut long grooves in these organic materials by moving the implement forth and back transversally to its width, which means in the direction of the chisel-shaped cutting edge. The main purpose of this use must have been the securing of strips of bone or antler for the fabrication of such implements as needles, arrowheads, etc. (Clark, 1953). Burins very likely have also served for engraving purposes, especially those with a narrow cutting edge for drawing figures and ornaments on organic material, eventually also for carving purposes.

Most of the Old World burins are not retouched on their surfaces. However this feature appears in the East, for instance on some Mesolithic burins from Hokkaido.

There is no need to treat here the rare forms of burins: polyhedral burins, prismatic burins, double- or multi-burins, burins combined with scrapers or other implements, etc. Nor is it necessary to describe the different subtypes of central and angle burins.

One point has still to be mentioned: the so called Mesolithic "micro-burin" in Eurasia is very likely not a true small implement but simply a by-product from the fracturing of blades for the fabrication of geometrical microliths (triangles, trapezes)<sup>5</sup> (Fig. 4).

There obviously are burins from the Eskimo area which correspond to the definition of Eurasiatic burins. We may mention some examples

<sup>5</sup> In fact it would be better to use the term "pseudo-micro-burins" for these by-products so that very small real burins could be called micro-burins (I think that J. L. Giddings, [1951: 195] used the term in the second sense). But as G. R. Lowther has pointed out, it is probably too late to make a change (Lowther, 1960: 11).

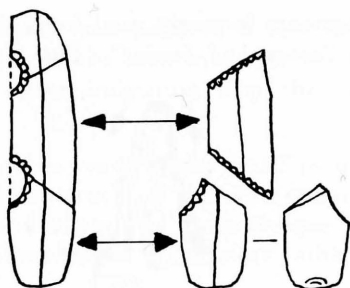


Fig. 4. Manufacture of a geometric microlith (trapeze) from a blade with "micro-burins" as by-products (schematic)

from the Iyatayet site at Cape Denbigh (Giddings, 1951: Fig. 59a, Nos. 1-4). Their cutting edge has been produced by striking two or more blows. There is no indication of a surface retouch (at least not for the flake-surfaces shown in the illustration; Giddings' Fig. 60a, Nos. 8 and 9 show that some may bear on the opposite surface a few retouches, but we can't call this a real surface retouch). By their rather small size they recall mostly Mesolithic burins. We may call them "ordinary burins" (Fig. 5).

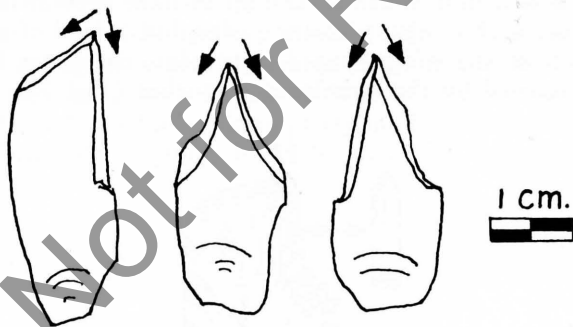


Fig. 5. Ordinary burins from the Denbigh Flint Complex at Iyatayet, Cape Denbigh (after Giddings 1951, Fig. 59a, nos. 1, 3, 4)

A second, more numerous category of burins from the Eskimo territory still have the typical cutting edge. But they are separated from the first category of burins by the fact that they have a complete or partial surface retouch on one or both of their surfaces. Some have been published by Meldgaard from Sarqaq and Disko Bay (1952: Fig. 78, Nos. 2, 9, 10). There would be no problem to use these artifacts like an ordinary burin. It is difficult to understand why these artifacts were retouched before the spall was struck off; the only reason I can see is that this should facilitate the hafting. I don't think that they have often been



made from other implements formerly used for a different purpose. We may call these burins "*retouched burins*" (Fig. 6).

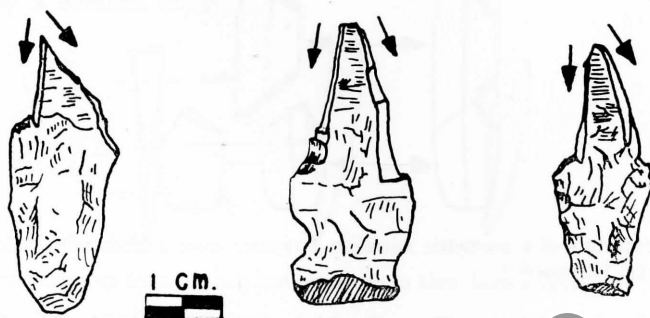


Fig. 6. Retouched burins from Sarqaq and Disko Bay (after Meldgaard 1952, Fig. 78, nos. 2, 9, 10)

Furthermore, there is a group of implements which in the field of Eskimo archaeology are also called "*burins*." Their form can be seen on a schematic drawing published by J. L. Giddings (1956: Fig. 1). Its basis is a well prepared blade (Giddings' example shows only large retouches on all the edges, but often this type bears surface retouches on one or both sides), from which several spalls have been struck off. This did not produce a chisel-shaped cutting edge, but a kind of point on the outermost part of the wedge-shaped front edge, the latter having been primarily sharpened by the mentioned retouches (Fig. 7). Solecki and

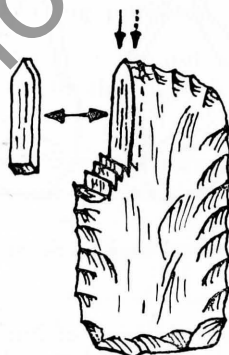


Fig. 7. Pseudo burin and spall (schematic drawing after Giddings 1956: Fig. 7)

Hackman even think that "these artifacts were originally side and end scrapers, showing attritional wear on one or more edge sides" (Solecki and Hackman, 1951: 88). This is the reason why H. B. Collins pointed out that in use such blades "would have been moved back and forth in the plane of its width" though he ranges them together with the true burins (1953: 36). I propose to call them "*pseudo burins*".

These artifacts, which thus differ in a very distinctive feature from the Eurasiatic burin, may have been made for the same purposes as real burins. But there is some indication that they may have had other functions.

First, mention may be made of the small pseudo burins from which so many spalls have been struck off that the remaining part of the front edge is very narrow and sometimes quite oblique (Collins, 1953: Fig. 3 k-p). The use as a "plane burin" is therefore rather improbable (Fig. 8).



Fig. 8. Pseudo burins, probably used as cores, from a Dorset site at Frobisher Bay, Baffin Island (after Collins 1953, Fig. 3 n-p)

Secondly, there is the fact that the spalls of this type have a special importance as J. L. Giddings has shown (1956). They are four-sided and their upper edge may bear the traces of the retouching on the blades from which they have been struck off.<sup>6</sup> It is certainly strange that a sharpened edge was used as striking platform. On the distal end of most of these spalls a very fine retouch can be seen (Fig. 9). Giddings points

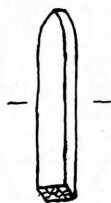


Fig. 9. Spall burin (schematic)

out that "there is no doubt that the retouched areas result from use or from some shearing process, as in pressing the working edge against bone or antler" (Giddings, 1956: 234). Giddings suggests that these spalls could have been shafted engravers, though besides a few antler objects from Cave 2 at Trail Creek (Larsen, 1951: 74) which might be related

<sup>6</sup>It seems that the burin spalls figured by Meldgaard (1952: Fig. 78, no. 5) and Knuth (1958: Fig. 4, no. 10-13) are of this kind and not like the burin spalls from Eurasia; the same is true for some Sarqaq burin spalls from Disko Bugt, West Greenland, published by Larsen (Larsen and Meldgaard 1958: Fig. 19).

to the Denbigh Flint Complex (Larsen and Meldgaard, 1958: 69), we don't know much about carving and engraving technique of this early culture. He also says that "even though the burin of the Denbigh Flint Complex was probably used primarily for grooving, it must have been regarded by its makers in many cases as a core for the production of excellent burin spalls" (Giddings, 1956: 236).<sup>7</sup> I therefore suggest that it would be more accurate to call these spalls "pseudo burin spalls" or, if a secondary use as a burin can be proven, "*spall burins*."

Finally, we must mention a category of implements from Greenland and Arctic Canada originally named "boot creasers" or "drill points", which in the recent literature are called "three-sided drill points" (Meldgaard, 1952: 228 s.), or "*burin-like implements*" (Collins, 1950: 25; Larsen and Meldgaard, 1958: 17, 61). Collins suggests that "they are specialized forms of burins, later probably than the true burins, but used in the same general way" (Collins, 1953: 39). These implements again show a surface retouch but their working end is mostly three sided and ground. The wedge-shaped front edge, different from a real burin but similar to the pseudo-burin, runs in the plane of the width of the artifact (Fig. 10). Larsen suggests that these burin-like implements were not used as "boot creasers"<sup>8</sup> but for cutting grooves in antler, ivory and



Fig. 10. Burin-like implement from Disko Bay (after Meldgaard 1952, Fig. 78, no. 16)

<sup>7</sup> In fact the difference between these and the wedge-shaped cores like those from the Campus Site is not very great, though there the spalls are not struck from the sharpened edge but in direction to it. This means that the spalls from wedge-shaped cores have the bulb not, like the spalls from the burin-like cores, on the pointed end but on the wide end.

<sup>8</sup> I don't know if the original identification as boot-creasers was based on ethnographic evidence. Boot-creasers are usually made of antler or ivory (Nelson, 1899: 108).

bone. He thinks that they may represent a later development of the true burin (Larsen and Meldgaard, 1958: 61).

It seems to me that the appearance of the different burins, pseudo-burins, and burin-like artifacts in the Eskimo area might have some chronological and chorological meaning. I don't think that the ordinary burin and the retouched burin belong to different levels of the American Arctic, because both these types are present in early Mesolithic cultures of the Old World: For instance on Hokkaido at Shirataki Locality 33 (Sugihara and Tozawa, 1960: 18). But I should not be surprised if in the oldest groups of the "Arctic Small Tool Tradition" (Irving, 1957: 47) the ordinary and retouched burins should be predominant whereas the importance of the pseudo-burin and consequently also of the spall-burin would have increased during the subsequent development of this group of early cultures. The fact that the Campus Site at College in Central Alaska (Rainey, 1939) with its wedge-shaped (also boat-shaped) cores<sup>9</sup> has some specimens of ordinary burins<sup>10</sup> but only one doubtful example of a pseudo-burin (Irving, 1955) which could also be a side-blade, may indicate that this industry is older than that of the "classic" Denbigh Flint Complex, where pseudo-burins are as well represented as ordinary burins and retouched burins. Furthermore, mention may be made that R. S. Solecki reports on two sites of the Arctic Small Tool Tradition from the Kukpowruk and Kokolik area: One of them (site no. 121) yielded wedge-shaped cores, the other (site no. 65) rather large polyhedral cores (Solecki, 1950: 67, 1951). It would be important to know more about burins of these two sites.<sup>11</sup> It may be that the pseudo-burin and the spall-burin technique are an American invention. At least I was not able to find similar examples in Asiatic industries; though

<sup>9</sup> Befu and Chard (1960) give to this type which is also represented in Japan the following comment: "The special form of probable burin . . . which the Japanese archaeologists often call 'Shirataki engraver' (and which we have renamed 'Shirataki core burin') is often produced by a particular method which Yoshizaki has labeled 'Yubetsu technique'." It is true that these artifacts give sometimes the impression of having been used as core burins, though I prefer to call them cores and to not include them in my burin list of the Eskimo area.

<sup>10</sup> A review of the material showed that besides the one true burin mentioned by Irving (1955: Fig. 1) there are two others of about the same (poor!) quality plus two which are more doubtful (on one the cutting edge is so narrow that it could also be called a graver).

<sup>11</sup> Though it seems that J. L. Giddings has recently found on Cape Krusenstern, northwest Alaska, flints like those from the Campus Site on beaches which are a little younger than those with traces of the "classic" Denbigh Flint Complex (personal communications to F. Hadleigh-West), on the other hand we must note that these kinds of cores are characteristic for early (preceramic) groups of the Japanese Mesolithic (Befu and Chard, 1960; Sugihara, 1960). And we find almost the same type of core in the Independence Culture of northern Greenland (Knuth, 1954: Fig. 103/5 and 104 a). I therefore think that this type of the Arctic Small Tool Tradition must have reached Alaska rather early.

we don't yet know very much about the burins on the opposite Siberian coast (Chard, 1955: 167). It would also be of interest to know if and what kinds of burins are represented in the "microlithic" industries of the Amur region, mentioned by C. S. Chard (1959: 47).

I have already mentioned that Meldgaard described only one of the Sarqaa burins collected by Hans Mosegaard as "ordinary," all others are pseudo-burins. The same appears from the publications of Larsen and Meldgaard (1958) and Mathiassen (1958) to be the case for Sermermiut and other Sarqaa sites in the Disko Bay area. Larsen states that the partly ground Sarqaa pseudo-burin (in my terminology!) may have developed in Greenland, "possibly on account of the abundance of angmâq which lends itself better to grinding than flint and similar materials" (Larsen and Meldgaard, 1958: 57). Furthermore, we may note that Collins (1953: Fig. 3 m-p) and Meldgaard (1952: Fig. 78/12, 13) illustrate exclusively pseudo-burins from Dorset sites.

If the burin-like implement which is especially characteristic for the Dorset Culture in Greenland, but appears also elsewhere and later (Larsen and Meldgaard, 1958: 62) is actually connected with the development of burins and pseudo-burins, it must be the latest offshoot.

This of course is only an hypothesis. There is no possibility of quantitatively verifying it through the literature as long as large reports including statistical analyses of the stone material are so scarce in Eskimo archaeology. It is certainly interesting to get the preliminary reports about the newest discoveries of each season of field work and to know the hazardous theories about the origin and development of Eskimo culture based on them. But besides this "arctic small paper tradition" we need more extensive reports too, where not only some type-specimens but if possible all or at least a large part of the artifacts found on one site are described and illustrated.<sup>12</sup> Only this will enable us to consolidate our knowledge about Eskimo-prehistory.

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<sup>12</sup> It would be very useful if the flint implements could, for the most part, be drawn. The photographic reproductions are usually so poor that often an exact identification is impossible.

# ANCIENT ALASKA AND PALEOLITHIC EUROPE<sup>1</sup>

by

JOHN M. CAMPBELL

Previous proposals for early American derivations from Eurasia have treated various culture-time horizons in widely scattered regions of the Old World and have suggested a variety of ways in which traditions, cultures, or traits may have reached these shores (see, for instance, Bushnell and McBurney, 1959; Chard, 1959; Collins, 1951, 1962; Gjessing, 1944; Griffin, 1960; Irving, 1962; MacNeish, 1959b; and Wormington, 1957). The literature gives me the impression that a majority of recent writers interpret the Paleolithic record to mean that (1) one cannot yet speak with much certainty of the direct Old World derivation of any sizable, coherent constellation of early American traits, (2) on the other hand, certain specific, discrete, early American traits were directly derived from the Old World, and (3) while, in certain instances, early American traits (specific core and blade techniques, for example) probably reached the Americas from remote sources, on the present evidence there is no reason to look beyond Asia for origins. Despite its title, this paper is not intended as a minority report, but rather, using the Brooks Range as a point of departure, as a review of recent archaeological and ecological evidence bearing on the possibility of Paleolithic connections between Europe and America.

Elsewhere (Campbell, 1961a, 1962b) I have described in part the Kogruk complex, discovered in 1959 on a kame terrace at the summit of Anaktuvuk Pass in the central Brooks Range. In 1961 my associates and I further excavated the Kogruk site and, in addition, found another early lithic assemblage in Anaktuvuk Pass, which I call the Naiyuk complex. Descriptive and comparative summaries of those complexes are pertinent to the present discussion.<sup>2</sup>

The original Kogruk series of rude flake and blade artifacts recovered from just below the present ground surface in an area of 125 square feet, was supplemented in 1961 by additional specimens, found concentrated beneath the sod in an area of less than 50 square feet, about 75 yards from the first finds (Plate I illustrates selected Kogruk artifacts from both the 1959 and 1961 collections). The second collection contains a much larger proportionate number of unused, unretouched flakes than the first; but, in addition to further examples of several of

<sup>1</sup> I am grateful to my colleague, Professor Patrick Gallagher, for critically reading the first drafts of this paper.

<sup>2</sup> The Kogruk and Naiyuk sites were discovered during explorations supported by the Arctic Institute of North America; the Office of Naval Research, United States Navy; and the National Science Foundation.

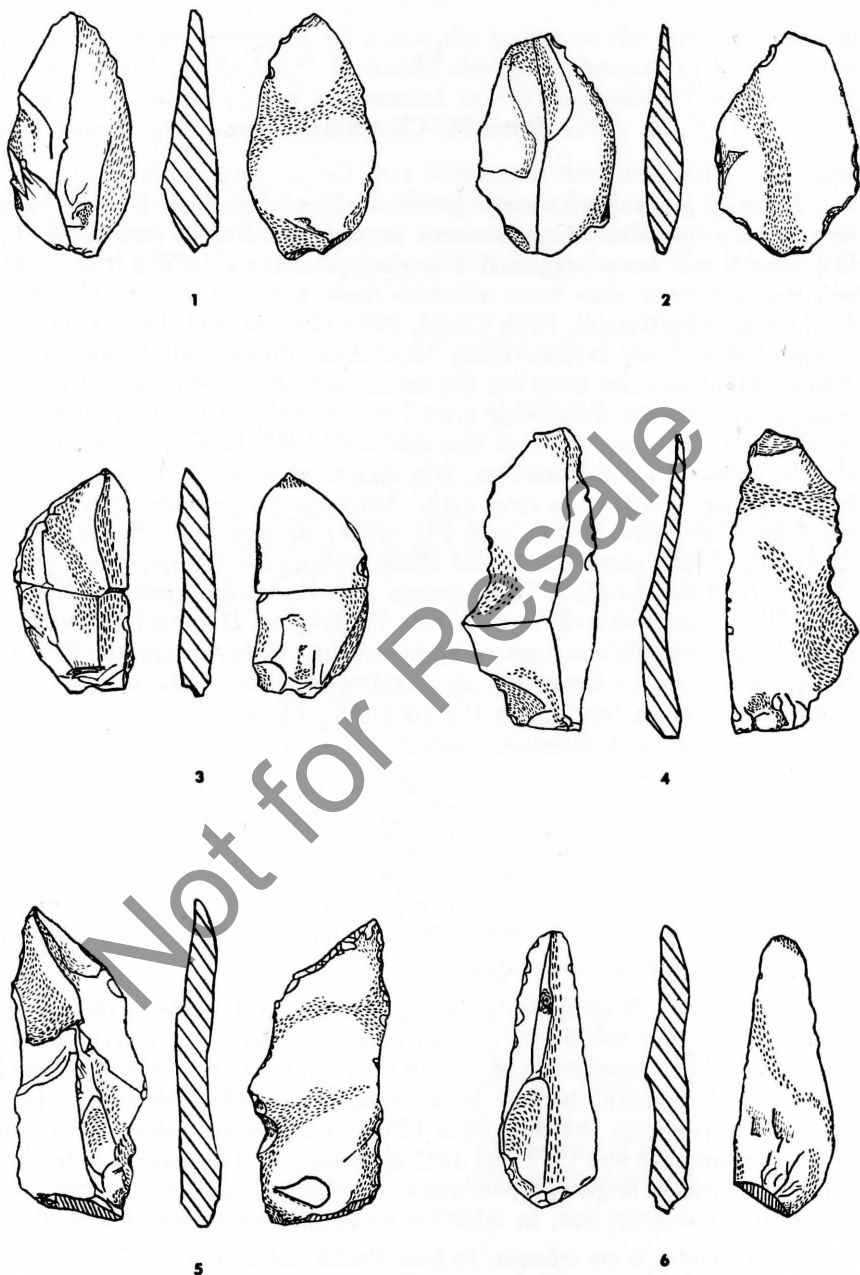


Plate I. Kogruk flake and blade artifacts. 1, flake, slightly retouched on bulbar surface; 2, flake, slightly retouched on both surfaces; 3, blade, retouched on non-bulbar surface; 4, 5, flakes or blades, slightly retouched on bulbar surfaces; 6, flake, retouched on non-bulbar surface. To scale, length of 1,  $2\frac{1}{2}$  inches.



the implement types recovered in 1959, it also contains types absent from the 1959 assemblage (most notably, perhaps, a single-edged flake scraper).

Implement types of the total series include "points" or "end blades" (both flake and blade examples); various, slightly retouched flake and blade knife-like tools; large, thick flake bifaces (perhaps knives), at least two types of flake scrapers; flake graters; a single example of a flake "saw"; and choppers fashioned from massive flakes ("flake-core" implements).

A single, unworked obsidian spall in the 1959 collection is probably intrusive. A few unworked spalls and two well retouched flake implements of chalcedony in the 1961 collection perhaps also do not properly belong to Kogruk. With those exceptions all of the specimens are of dull gray chert, probably quarried from a single deposit, of a sort which I suspect occurs in the immediate area of the Pass. A further, perhaps more telling, homogeneity is reflected in the Kogruk implement categories. All of the tool types share several major characteristics. Only a few manufacturing techniques were used in fashioning Kogruk tools, and those techniques bind the several typological elements in a distinctive, cohesive assemblage. Whatever the history of Kogruk "culture" may have been, the homogeneous Kogruk complex suggests a technological tradition of considerable antiquity and relative isolation. There is nothing in Kogruk that reflects development beyond relatively very simple flake, blade, and biface techniques, and nothing that speaks of a blending of diverse culture ways.

In previous discussions of the series collected in 1959 (Campbell, 1961a: 14-17; 1962b: 41-2) I noted resemblances between some Kogruk artifacts and European Paleolithic implements, as well as similarities between Kogruk specimens and some of those from the Levallois-Mousterian levels at Et Tabun Cave, Mount Carmel, Palestine (Garrod and Bate, 1937), certain artifacts from the Mal'ta site, northeast of Lake Baikal (Bonch-Osmolovsky, 1953), and from the early British Mountain phase at Engistciak, on the Firth River, northernmost Yukon Territory (MacNeish, 1956, 1959b). To these might be added the caves of Teshik-Tash, southeastern Uzbekistan (Okladnikov, 1939, 1940; Movius, 1953) and Ust'Kanskaia, in the Ob River watershed (Rudenko, 1961), probably the site of Afontova Gora, in the Yenisei valley (Bonch-Osmolovsky and Gromov, 1936; Gromov, 1945), and a series of open sites in Patagonia. (I shall further note the latter in a discussion of the Naiyuk complex.) The total Kogruk complex does not closely equate with the total collection (or total phase) from any of the sites noted above. There are enough similarities between Kogruk and British Mountain to suggest that both are closely related members of the same flake tool genre, but

resemblances between Kogruk and the others are somewhat more obscure, if not fewer. All, however, appear to share a constellation of tool making techniques which together carry the stamp of the European Paleolithic. Specifically Kogruk claims membership on the basis of types of flakes struck from unprepared, or roughly prepared cores, apparently with batons of wood, bone, or antler; resolved retouching of some flakes and blades; flake and rude blade "points" of various shapes and thicknesses, which retain bulbs of percussion and remnants of striking platforms; a type of thick, single-edged scraper with a rather steep, roughly flaked working edge; and a general restriction of retouching to the edges of implements.<sup>3</sup> Several of these Kogruk traits are also present in the much more heterogeneous and sophisticated Naiyuk assemblage which, typologically, is the closest Kogruk relative in the long Anaktuvuk sequence.

The Naiyuk complex (Pl. II) is from a site adjoining the Tuktu site area (Campbell, 1961b) on a kame terrace four miles north of the summit of Anaktuvuk Pass. Naiyuk flake and blade artifacts of various types of stone occurred in a gravel matrix to a maximum depth of about 10 inches below the dense sod surface. Implement types, which were directly associated in the site, and which appear to represent a single phase, include large, well retouched blades ("points") retaining striking platform remnants; large end scrapers and side scrapers on blades; large, flake end scrapers and side scrapers (including large "Mousterian" *racloirs*); large, bifacial knives; large, thick flakes, slightly retouched to form cutting or scraping tools; a single thick, percussion flaked "hand-ax"; and finely worked lanceolate points, most of which are characterized by thin lenticular cross sections, parallel sides, transverse flaking, straight or slightly convex bases, and edge grinding. Flake scars on a few artifacts possibly represent burin blows. And on at least one specimen there is a *Chapeau de Gendarme* striking platform.

A preliminary analysis of the total collection suggests that the complex incorporates elements of at least two supposedly different traditions. On one hand, the lanceolate points typologically belong to what has been termed the "Plano" (formerly "Yuma") tradition (Edwards and Jennings, 1948; Griffin, 1962), represented by numerous complexes in western and northwestern North America (MacNeish, 1959a, 1962; Wormington, 1957). Except for one or two broken points which appear similar

<sup>3</sup> The observations of Drs. H. M. Wormington, Henry B. Collins, Hans-Jürgen Müller-Beck, and Ralph S. Solecki (all of whom are personally acquainted with European Paleolithic materials) have been of more than ordinary importance to comparative evaluations of Kogruk and Naiyuk. Dr. Wormington briefly examined the first Kogruk collection, and Drs. Collins, Müller-Beck, and Solecki have seen both the Kogruk and Naiyuk assemblages. In view of the stated aim of this paper, it is only fair to say that while their comments cause me to look more directly toward Europe for early Brooks Range analogues, none of them have proposed a direct connection between the Anaktuvuk complexes and European industries.

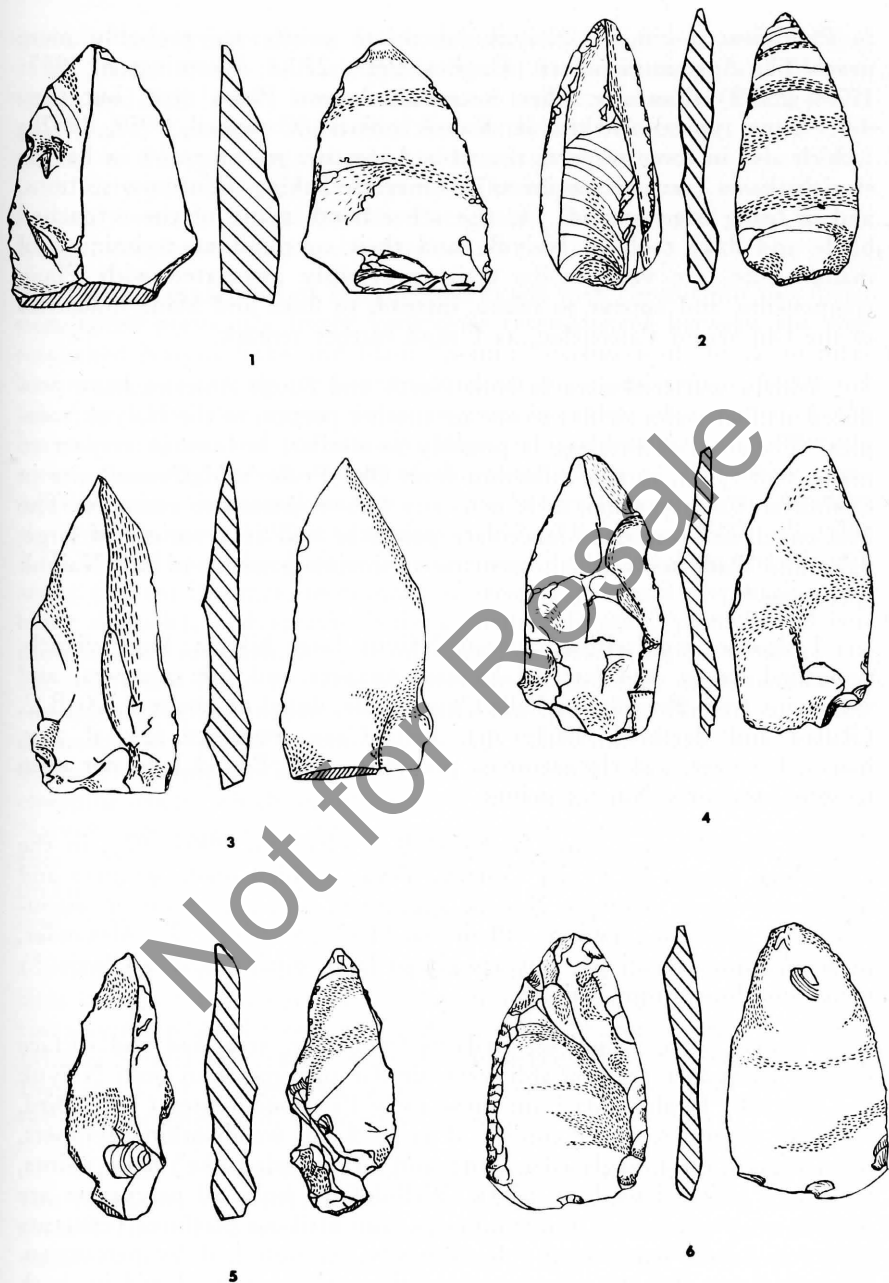


Plate II. Naiyuk artifacts. 1, thick flake, scarred on bulbar surface; 2, blade, retouched on non-bulbar surface; 3, flake or blade, unretouched; 4, 5, flakes or blades, slightly retouched on both surfaces; 6, flake or blade, doubled-edged side scraper. To scale, length of 1,  $2\frac{1}{4}$  inches.

to Plainview specimens, Naiyuk lanceolate points are probably more nearly like Angostura points (Hughes, 1949: 270-4; Wormington, 1957: 137-8, 268-9) than any other commonly known Plano type, but they differ from typical Anaktuvuk Kayuk points (Campbell, 1959, 1962b; [which also in some respects resemble Angostura specimens]) in having straight bases (several specimens), transverse flaking, thin cross sections, and in being edge ground. On the other hand, many of the retouched blade and flake tools of Naiyuk, and their concomitant techniques of manufacture, are very unlike traits previously associated with Plano components, and appear to relate, instead, to flake and blade industries of the Old World Paleolithic, as I shall further remark.

Widely scattered sites in both North and South America have produced artifact series similar to one or another portion of the Naiyuk complex. The total assemblage is possibly as similar, at least in respect to major tool types, to the collection from Olaf Prufer's McConnell site in Coshocton County, Ohio, as it is to any known American complex. The McConnell site contained lanceolate points as well as a variety of large, flake and blade tools which seem to approximate many of the Naiyuk specimens.<sup>4</sup>

I also see similarities between Naiyuk large bifaces, large slightly retouched flakes, and large flake end scrapers and side scrapers, and specimens from Period I of Fells Cave, Chile, dated at about 8,700 B.C. (Rubin and Berthold, 1961: 96). Fells Cave contained few, if any, blades, however, and the stemmed points from its Period I do not even remotely resemble Naiyuk points.

An early horizon, dated at 8,000 B.C. (Epstein, 1960: 97), in the Levi Rock Shelter of Travis County, Texas, yielded blade scrapers and flake tools which resemble Naiyuk specimens, either in form or manufacturing technique, and a "Plainview-like" point (H. L. Alexander, personal communication), but associated large burins, and a Clovis(?) point are absent from Naiyuk.

Finally, in the Americas, artifacts from open, stratified and surface sites in Patagonia are probably very similar to some from both Naiyuk and Kogruk. Implements from those early Patagonian sites (J. B. Bird, personal communication) consist of large flake, woodworking scrapers, often dressed on a single edge only; and "Mousterian-like" flake points, unifacially chipped on both edges. Well-defined bulbs of percussion are present on nearly all of the specimens, and striking platform remnants occur on some. Retouching was primarily accomplished by percussion. It would seem that major elements of the complex ranged widely, both

<sup>4</sup> Dr. Hans-Jürgen Müller-Beck has generously given me access to his detailed drawings of as yet unpublished materials from the McConnell, Levi, and Fells Cave sites.

spatially and temporally in South America (see Lanning and Hammel [1961] for a review of early lithic South American sites; and Mayer-Oakes and Bell [1960] for a discussion of artifacts from the El Inga site, near Quito, Ecuador, which Bird [personal communication] thinks are related to the open site assemblages noted above, as well as to artifacts from early periods in Chilean caves). The importance of a possible connection between the old, rude Patagonian industry and the Brooks Range complexes is not to be overlooked.

Gross comparisons of Naiyuk tool types with those from the Asian sites noted previously imply very close resemblances between the well retouched Naiyuk flake and blade "points," exclusive of the Angostura-like examples: cutting implements; and scrapers; and central Asian and Siberian Paleolithic types. It is noteworthy, also, that some of the Naiyuk scrapers, and particularly, large, bifacial cutting or penetrating tools apparently are like types of the more advanced Paleolithic stage represented at Verkolenskaia Gora, on the Angara River (Bonch-Osmolovsky and Gromov, 1936; Okladnikov, 1959: 73; Petrie, 1927: Pls. XI, XIII). And specialized ways of stone working reflected in the Naiyuk series (as, for instance, techniques of striking platform preparation and blade retouch), and specific Naiyuk artifact forms ("points" and certain *racloirs*, for example) are identical, or nearly so, to those of the European and Near Eastern Mousterian. It must be emphasized that the thin, bifacial, Angostura-like lanceolate points of Naiyuk are most dissimilar to "points" from any Asian Paleolithic stage, and various distinctive implements, including types of thick discoidals, cores, and chopping tools, which occur in early Eurasian sites, are absent from Naiyuk (and Kogruk as well). But, again, as in the instance of Kogruk, there appears to be a common sharing of important tool forms and tool making techniques between Naiyuk, the old central and north Asian complexes, and some of the Paleolithic industries of Europe.

Kogruk and Naiyuk, then, and at least a few other complexes from sites scattered the length of the Americas contain traits which unquestionably resemble elements in the Paleolithic of Europe and in the Paleolithic of Siberia and central Asia. Are these resemblances fortuitous, or do they stand for a Paleolithic genetic connection of one kind or another between America and, ultimately, Europe?

William C. Sturtevant (1960: 8-10) has recently summarized (under two categories of criteria, *viz.*, "analogy vs. homology" and "distributions") the methodological requirements for determining genetic relationships from trait comparisons. These criteria, most pertinent to the present problem, are—the traits compared must be of sufficient complexity; they must be sufficiently similar; the effect of similar natural environments must be ruled out as must independent invention and the

principle of limited possibilities; they must be shown to actually occur in different places, i.e., their attributed distribution must be shown not to be spurious; and finally, the traits must have a continuous spatial distribution.

Sturtevant's cautionary summary is, of course, necessarily and ultimately important to the present problem, but at the moment it is not possible to strictly measure much of the data reviewed in this paper against most of his criteria. For in the absence of highly detailed comparisons, first, among the American collections and, second, of the American materials with the several Old World complexes, the importance in this instance of, for example, possibly spurious similarities of traits, remains unknown. And much the same can be said regarding the practical applications here of most of the rest of those methodological criteria. The most outstanding exception is the requirement of continuous spatial distribution of traits. In archaeology, obviously, known discontinuous distributions do not always stand for actual discontinuities and I shall note that the geographical gap between Siberian and Alaskan Paleolithic sites does not negate any proposition that the sites are related. The spatial gap between the appropriate North American and South American sites seems more important; not primarily because of the distances involved, which are impressive, but because of the variety of ecological zones which have lain for uncounted millenia between the areas in which the sites occur. But, since those zones were successively transgressed by man, and since it is generally held that South America was largely populated during a relatively few thousand years, even the question of close relationships between early northern North American and southern South American cultures must presently remain in argument.

Thus, on the comparative artifactual evidence any case for Paleolithic cultural relationships between Europe and the Americas must presently be stated something as follows: Resemblances of technique and form between some Paleo-Indian and some Paleolithic European artifact assemblages appear too many, and, in several instances, appear too specific to be dismissed out of hand as fortuitous. Therefore, the artifactual data, inconclusive as they may be, raise the distinct possibility of a genetic connection. ("Genetic" is used broadly here to mean historical contact of one kind or another. For a discussion of applications of the term in American archaeology see Willey and Phillips [1962: 29-38]). I conceive that one or more of three major genetic mechanisms were involved in any early contacts between Europe and America: (1) the passing of traits across cultural boundaries without, necessarily, accompanying population shifts, (2) emmigration, the movement, and permanent resettlement, of a people from one locality to another; emmigration is a rapid process and implies, consequently, relatively little time lag between the departure of a population from one locality and its

occupancy of another, although sequential emigrations within a single population may extend through several or many generations, (3) population spread of the type discussed by Giddings (1952), which is not precisely emigration (nor is it migration), but is instead the slow colonization of new lands by a population which gradually extends its territorial boundaries in response to changing cultural and/or ecological variables; this process, when it results in the eventual shifting of a population to a region greatly distant from its locality of origin, invariably implies considerable time slope. As I shall further note, if there were early genetic connections between Europe and America, one or both of the latter two processes appears most likely to have been the principal mechanism involved.

In view of the new Brooks Range finds, and on the Eurasian record, at least one such possible connection seems reasonable. It is generally agreed that the Paleolithic cultures of Siberia (some of which also appear to have incorporated traits diffused northward from the chopper-chopping tool tradition of south and southeast Asia) derived major elements directly from Europe (see, for example, Clark, 1961; Griffin, 1960; Okladnikov, 1959). From as early as Mousterian times successive European Paleolithic industries contributed traits or constellations of traits to remote north Asian localities. Some of those influences reached eastward at least as far as the Lake Baikal region and the upper Lena River, areas lying considerably closer to Bering Strait than to Europe. A consequential portion of the necessary geographical link between Europe and America is thereby provided by the Siberian Paleolithic.

No absolute dates are available for the early Siberian materials. James B. Griffin's recent interpretation (1960: 802) implies that European traits reached the Baikal (Mal'ta site) and Lena localities as early as 10,000 to 15,000 B.C. He also suggests (1960: 806) that populations from those regions, in response to environmental change, may have moved northward and eastward across Bering Strait between 13,000 and 8,000 B.C. Griffin's estimates are not presently susceptible to verification, but his dates, in conjunction with the known or postulated ages of the American sites or site components in question, provide a plausible way of explanation for an American-European connection.

The radiocarbon dates of about 8,700 B.C. and 8,000 B.C. for the pertinent levels in Fells Cave and the Levi Rock Shelter, respectively, are the only absolute dates for any of the American assemblages treated here. The presence of "Plano" points in the McConnell and Naiyuk complexes does not necessarily mean that they are younger than 8,000 B.C. (see Griffin [1962: 154-5] for a summary statement of the spatial and temporal characteristics of the "Plano tradition"), but the comparative general technological sophistication of the Naiyuk collection as a



whole, implies that the Naiyuk complex, at least, is not as old as the South American, Levi Rock Shelter, Kogruk and British Mountain assemblages. The ages of the Kogruk and British Mountain phase are not precisely known, but on the basis of typology and geological associations of artifacts, I have estimated that Kogruk should be no younger than 6,000 to 8,000 B.C. (Campbell, 1961a, 1962b); and MacNeish (1959a), for similar reasons, thinks British Mountain dates to perhaps 7,000 B.C. The early, open Patagonian sites also lack absolute dates. However, for typological, and in some instances stratigraphic reasons, artifacts from these several components should be as old, if not older, than remains belonging to the 8,700 B.C. level in Fells Cave (the earliest dated level in the southern South American sequence [Jelinek, 1962; 464-5]). Keeping in mind the vagaries of radiocarbon dates, and the weaknesses in the sorts of relative age estimates and postulated cultural relationships offered here, it is perhaps more than coincidental that these several American complexes, which seem to share certain specific cultural characteristics, also seem to group rather closely in time. Further, if the far northern and far southern American sites are indeed related, and if their estimated and absolute ages are even approximately accurate, then it is axiomatic that their antecedents were in the New World at a time respectably earlier than 8,000 or 9,000 B.C.

Griffin's speculation that there may have been an eastward and northward movement of Siberian populations (possessing European traits) into America as early as 13,000 B.C. (and, I would add, if not earlier) is therefore given support by these New World finds. The presence of constellations of European traits, rather than single elements, in several of the American sites more likely indicates population movements than occasional or limited borrowings across cultural boundaries.

The question of access to America from the interior of Siberia during the appropriate time interval has been adequately settled by Chard's summaries (1958, 1961), which note the Bering land bridge, and describe a route of travel along the arctic coast of Siberia from the lower Lena River to Bering Strait, a pass between the mountains and the sea which was probably ice-free during the whole of the Fourth Glacial Stage.

Of more consequence, therefore, than the problem of access itself, is the absence of reported finds of Paleolithic sites, along that route, of the kind which would connect the Baikal and Lena localities to Alaska. That enigmatic gap of more than 2,000 miles presently defies a conclusive explanation. Perhaps, as Chard (1958: 58) has suggested, most of the old sites now lie under the sea, but it is also likely that the answer has to do with the practical problems of conducting adequate archaeological surveys in the area.

Thus, to somewhat embellish Griffin's remarks, the present evidence

suggests that beginning as early as Middle Paleolithic times, successive populations of European hunters moved eastward over the open lands of northern Asia. By as early as 15,000 to 18,000 B.C. (and perhaps earlier), some of those populations had penetrated east to at least the longitudes of the Baikal region and the upper Lena River. Along the way there was probably some mixing with other populations, but much of the land over which they traveled was very probably previously uninhabited, and for those who traversed the more northern regions it is likely that few, if any, men were there before them. That travel through unoccupied terrain would largely serve to explain the strong persistence in eastern Siberia of sizeable, cohesive, constellations of European traits in spite of the distances and generations involved, and perhaps also implies that European physical traits, in considerable strength, reached far eastward across northern Asia.

By at least as early as 13,000 B.C. cultural descendants of those industries reached North America, where, again, the artifactual data, while not as strongly European as those from the Siberian localities, nevertheless reflect considerable cultural integrity through time and space. (It is perhaps possible to avoid the trap of confusing race and culture, and at the same time to suggest that the material culture elements accompanied some European physical traits.)

What were the subsequent histories of those European trait constellations? The new data imply that they achieved wide spatial distribution in the Americas, which further suggests that they influenced later cultural developments in several New World areas. I have previously noted here J. B. Bird's belief (personal communication) that the old industry from the open, Patagonian sites is related to early South American complexes occurring northward from Patagonia as far as Ecuador. If I understand him correctly, he also holds that the old, wide ranging industry was a part of a South American culture base which contributed heavily to at least some of the later lithic cultures of that continent, including those represented by the El Inga assemblages, and successive periods in Fells Cave.

For North America, there are some intriguing, if puzzling, possibilities. The associations in the pertinent level of the Levi Rock Shelter prompt the speculation that there is a connection between Paleolithic Eurasia and the Fluted Point and Plano traditions. And, while the Levi Rock Shelter level is too young to be antecedent to Clovis Fluted, it nevertheless recalls Byers' remark (1959: 235) that an industry "of a general late Levallois-Mousterian order" was possibly ancestral to Clovis Fluted and to the American Archaic.

A stronger relationship, of one kind or another, between the Old World and an early American tradition is implied by the presence of

both Eurasian and Plano elements in the Naiyuk, and probably also the McConnell, complex. Since, with few exceptions, the numerous Plano sites in North America do not contain the Eurasian traits of Naiyuk, and since the maximum possible ages of the earlier Anaktuvuk Pass sites are in question, there is no clear evidence for claiming that Naiyuk represents a developmental stage between the Old World industries and the Plano complexes. (The age of the last major glaciation of Anaktuvuk Pass is doubtful [Detterman, Bowsher, and Dutro, 1958; Porter, 1959], but the most recent local geological investigations indicate the last great glacier may have occupied the Pass until as late as 6,000 B.C. [Stephen C. Porter, personal communication]. If that date marks the melting of the glacier, and if I am correct in thinking that the Naiyuk complex is younger than the Kogruk complex, Naiyuk is obviously younger than 6,000 B.C.) Nevertheless, the Naiyuk complex quite decidedly appears to stand for a relationship of some kind between the Plano complexes and Eurasian industries. Perhaps Naiyuk testifies to a blending of two traditions, but this does not rule out the possibility that, on earlier levels at least, several American hunting cultures were ultimately rooted to Europe. The postulated dates of arrival in North America of European traits do not have to be pushed backward very far in order to place them in the New World well before Clovis Fluted, for instance. And in view of the predominant artifact types contained in the American fluted and lanceolate point assemblages, types which must speak for flake or blade origins, it seems not unreasonable to derive them from European technologies; particularly in the absence of convincing alternative descriptions of the progenitors of those distinctively American complexes.

This does not mean that the presently assigned dates for the recent American finds discussed here must necessarily be pushed further down the time scale, since, as I said before, there is reason to think that none of them mark the earliest arrival of the European traits in question, and there is no present way of temporally measuring the survival of those traits in the Americas.

With the possible exception of the rude Patagonian assemblages, the British Mountain and Kogruk complexes typologically relate more exclusively to Eurasia than any of the rest. Both the Kogruk and British Mountain sites lie nearly on the edge of an area which was ice-free during the length of the Wisconsin, but which was absolutely isolated by glacial ice from most of the rest of North America for perhaps several thousand years following. (See Detterman, Bowsher, and Dutro [1958], and Flint [1957: 307, Pl. 3] for descriptions of the Alaska regions which remained unglaciated during the Wisconsin, and Campbell [1962a] for an archaeological evaluation of the area noted above.) That isolation, one might logically suspect, left its mark on early North Alaskan cultures, and British Mountain and Kogruk may well represent relatively late

arctic survivals of industries long resident in the Americas. Naiyuk poses a further question. If, as they appear, the Plano complexes originated to the south, the Naiyuk complex possibly expresses far northern survivals of European traits until such times as Plano influences reached northward from the interior of North America; but this speculation is perhaps contradicted by the McConnell complex. I would suggest that accurate definitions of the ages of these two assemblages, and the relationships between them are of major importance to both the central problem of this paper and the problem of the history of the Plano tradition.

A remaining question deserves comment. What is the testimony of the total ecological record, if it be granted, on the artifactual record, that there may have been a Paleolithic connection between Europe and America, and that a European Paleolithic base may have influenced the development of Paleo-Indian hunting cultures? Geographical distances and long existing geographical features, such as mountain masses, are of general consideration. More specifically, in view of the estimated age or ages of the postulated connection, summaries of the intercontinental climatological and paleontological records during the last glacial age are pertinent.<sup>5</sup>

The distance across Asia, between Europe and America, is not of particular consequence one way or the other. Granted that it is about 6,000 air miles between Europe and Bering Strait, and keeping in mind R. S. MacNeish's wise counsel (offered several years ago in a paper read at the annual meeting of the Society for American Archaeology) to the effect that one should never confuse air miles with "walking miles," neither air nor land miles are, in themselves, of great importance; note, again, the colonization of both of the Americas in what is commonly held, if perhaps inaccurately, to have been a relatively few thousand years.

More important, of course, is the lay of the land. On the latitude of the Arctic Circle, the Anadyr Range, which trends from southeast to northwest across the Chukchi Peninsula, contains rough terrain, but that Range is full of low passes, several apparently less than 1500 feet above sea level. Further to the west there are similar, if somewhat higher, passes through the north-south trending Cherskiy and Verkhoyansk ranges, the latter of which bounds the valley of the Lena. (The inhibiting effect of mountains on the movements of food collectors should not be overemphasized as it commonly is. Because they sometimes separate a productive natural environment from an impoverished one, or because they sometimes conveniently divide two mutually hostile societies, mountains may mark cultural boundaries. But at least among hunters, in the

<sup>5</sup> I thank Caroline McD. Bierer, Joyce Heller, Anne D. Shinkwin, R. H. Eney, and A. S. Stancioff, graduate students at The George Washington University, for assembling and evaluating sources relative to upper Pleistocene ecology. I assume responsibility, however, for selecting the climatological and paleontological interpretations used here.

absence of extensive mountain glaciers or ground so steep that it cannot be traveled, excuses are usually found to see what is on the other side. In fact, in some areas, because passes constrict the movements of game herds, mountains become the more favorable places of settlement. In the Brooks Range [as massive and as high as the Anadyr, Cherskiy, and Verkhoyansk mountains] nearly all of the major passes were historically occupied by hunters in order to intercept migrating caribou; the same animal [*Rangifer*], incidentally, which has long been resident in the eastern Siberian ranges. My point here is that while the arctic coastal corridor described by Chard [1958, 1961] was probably the only route across the top of northeast Siberia which remained open at all times during the last glacial age, it was only one of several practical routes during times of reduced glaciation. And, for the reason noted, it should be remembered that those Siberian mountains may well have encouraged, rather than inhibited, the early exploration and settlement of far north-eastern Asia.)

Eastward, from the Lena valley to Europe, there is relatively little high ground. Directly to the east of the Lena, the Central Siberian Plateau contains few, if any, elevations higher than 1600 feet above sea level. Beyond the Plateau, the Siberian and East European plains, divided by the low, narrow Urals, are lower, most of the land lying less than 700 feet above sea level. Some of the Central Siberian Plateau is hilly, and some of it is broken; the Siberian and East European plains are flat or rolling. That broad reach, from the Lena River to Eastern Europe, contains no large bodies of water, nor other extensive barriers, such as deserts; indeed, historically, it has represented a nearly continuous grassy prairie. Some parts of it consist of extensive areas of tundra marshes, lakes, and streams, which during the warm season variably affect, according to species, the movements of large game, but which greatly restrict human overland travel. That those sorts of wet arctic and subarctic areas provide excellent traveling for man and beast alike during three-fourths of the year, however, is sometimes overlooked. Physiographically then, and in spite of the distances involved, the north Eurasian traverse is not a difficult one at present.

It is not my intention to minimize the physical difficulties of mountain and steppe-tundra travel, nor am I unaware of those psychological hazards which persuade man to stay at home, be he primitive or otherwise. Wormington (1957: 251), in reference to the present geographical area of discussion, quotes Rainey's statement (1953: 46) that "North-western America and northeastern Asia, under present climatic conditions, together form one of the most formidable barriers to human communication one can find anywhere in the world." And she further comments (1957: 251) that "to the primitive the unknown and the unseen are strange and terrifying, and primitive man does not willingly depart

from known familiar things to face the unknown. Only some strong compulsive force, such as the need for food, will cause him to make a drastic change."

I am willing to accept Wormington's remark, keeping in mind that there have been enough "strong compulsive" forces to cause primitive man to explore practically every nook and cranny of every continent but Antarctica. But Rainey's statement is misleading. As I have noted, for those parts of northeastern Asia treated here there are no mountain, desert, or sea barriers. (The same is true for far northwestern North America.) Rainey (1953: 46) refers to the barrier of climate in both northern forest and tundra. But the literature on tundra or steppe-dwelling peoples and my observations in north Alaska, make me think he has taken a far too pessimistic view of the latter ecological zone. As in the instance of mountain ranges, the northern cold season is not in itself a barrier to man, at least not to the more recent species. On the contrary, in much of the arctic, winter is a highly advantageous time of year.

For example, it is about 150 miles via the John River from the summit of Anaktuvuk Pass southward to the Koyukuk River. More than two-thirds of the way the river is bordered by swampy, pond-filled thicket and forest. In winter a man in a reasonable hurry, walking the river ice, can travel from the summit of the Pass to the Koyukuk in four or five days. If he resorts to a dog sled, it will take him 24 to 36 hours. In summer, if he walks, the same journey takes ten days to two or three weeks, depending upon the conditions of tributary streams he must ford, and what luck he has eating along the way. One further example: For all practical purposes it is impossible during the warm season for a man afoot to traverse the long and wide Arctic Coastal Plain of north Alaska because of its uncounted thousands of lakes. But from October to June he can go afoot in any direction across it at a rate of 20 to 30 miles a day, and if he can keep a compass heading, he can travel it in a straight line, for there are no terrain features which he must avoid. If primitive man is to live at all in the cold regions, he must learn to live in them the year around, and I suspect that in the open lands of the north, Paleolithic Europeans as well as Nunamiut Eskimos learned to exploit the advantages of winter. (As I shall further remark, the barrier of the subarctic forest, where the hunting is poor and the winter snows lie deep, is far more formidable during the season of cold than the arctic mountains or prairies.)

This does not mean that the northern summer is prohibitively formidable either, although mid-summer for some far northern hunting societies is a time of relative want. But in many far northern regions warm season overland travel is severely inhibited, and I am thereby led



to the conclusion that the long winters and short summers of the arctic and subarctic were nearly essential to the earliest explorations and colonizations of much of northern Asia and northern America.

Returning, momentarily, to present day physiography, and turning to the American side of Bering Strait, low lying prairies stretch with few interruptions from the Chukchi Sea eastward to Hudson Bay. There are few essential physiographic differences between this reach and that across northern Eurasia, and the general physiographic (and total ecological) requirements of living and traveling in both are historically similar.

But at the present time there is no such continuity between far northwestern North America and the more southern interior of the continent; more specifically, there are no good overland approaches between, for instance, northern Alaska and the Great Plains. A possible route from the area of Bering Strait lies north around the eastern end of the Brooks Range; eastward across the top of Alaska to the Mackenzie River (the Arctic Coastal Plain, between the northwest corner of Alaska and the mouth of the Mackenzie, is good walking in winter, but, as noted, literally impassable in summer. The Arctic Slope, which parallels the Arctic Coastal Plain and lies between the Plain and the northern scarp of the Brooks Range, is an open, gentle, east-west highway at all seasons [Campbell, 1962a]); and thence southward in the Mackenzie valley to the area of Great Slave Lake and drainages which lead on southward toward the Plains. An alternate approach is southward from the northwest Alaskan coast to the Yukon valley, and thence east and south to the head of the Yukon River (about latitude 59°N.), where passes lead out through the Rockies in the direction of northwest or west-central Alberta.

However, while no "absolute" physiographic barriers occur along either passage, much of both lie through a water-filled boreal forest. This means (according to the testimony of both the ethnographic and ecological records) that in order for human communities to successfully live (and travel) in these immense forest wildernesses they must be highly proficient in the ways of (1) water transportation, and (2) deep snow transportation, and, in addition, they must primarily base their economies on something other than large game mammals. Again, in reference to the relationship between hunting societies and climate, this leads to the conclusion that early explorations and colonizations of some northern hemisphere areas (including, very possibly, the Great Plains of North America) were accelerated by cold intervals (retreating forests), and slowed or prevented by warm intervals (advancing forests). This proposition is hardly new, but it should be kept in mind that it does not contradict the theory that encroaching forests dislocate hunting societies, thereby causing them to seek new hunting territories. It simply means



that the greater the open lands, the greater the potential ranges of hunters who occupy them, and, here, it suggests a review of recent interpretations of the last glacial stage with an eye for ways in which glaciations may have encouraged, rather than inhibited or prevented, early discoveries of North America and the subsequent spread of populations on this continent.

In North America, the Wisconsin glacial stage, generally thought to have ended about 8,000 B.C., apparently spanned 50,000 years or more (Dreimanis, 1960: 113, 116; Frye and Willman, 1960: 5) and reached its maximum advance 16,000 to 18,000 B.C. (for radiocarbon dates of the Wisconsin maximum see Flint and Rubin [1955], Horberg [1955], and Suess [1956]; see Karlstrom [1955] for correlations of interior Alaska localities). According to the recent classification of Frye and Willman (1960), major preceding events in the life of Wisconsin ice included the Farmdale interval, which perhaps spanned from 20,000 to 25,000 B.C., and the Altonian substage, a long lived advance, which extended from about 25,000 B.C. to the beginning of the Wisconsin.

During the maximum it seems likely that all of North America north of the southern Canadian boundary was ice-covered except for a very large area in the lowland interior of Alaska, Alaskan coastal areas from about Kuskokwim Bay around the top and eastward to the mouth of the Mackenzie River, the Arctic Coastal Plain, and portions of the Arctic Slope. Wisconsin maximum ice completely covered all of New England and also invaded portions of all those states that adjoin the southern Canadian boundary (see Flint's summary map [1957: Pl. 3]). There is no reason to think that at any other time during the Wisconsin stage glacial ice was as extensive as it was 18,000 or 20,000 years ago, although during the Altonian substage very large areas of northern North America were ice-covered, and, of course, there was much glacial ice in the north for varying periods before and after advance or readvances.

In Siberia, the Zyrianka glacial stage appears to have begun about 63,000 B.C. and to have lasted for 55,000 years. According to recent Russian interpretations it contained three major advances: the early Karaul and the slightly later Nyapan, which together spanned 33,000 years, and the youngest, Sartan, which perhaps reached its maximum at 8,000 B.C. The very short Kargin interval of about 2,000 years duration separated the Nyapan and Sartan advances (Ravsky and Alekseev, 1960: 159-61; Sachs and Strelkov, 1961: 61, 65-7). There is also at least one interval implicit in the available descriptions of the Karaul-Nyapan advances, but apparently Russian geologists have not defined its length or given it a name.

In general there appear to be good correlations between major Wisconsin and Zyrianka events (Ewing and Donn, 1961; Gromov, Kras-

now, Nikiforova and Schanzer, 1960: 15). It is noteworthy, however, that the maximum extensions of Zyrianka ice occurred during the Karaul advance, early in the Zyrianka glacial stage rather than late, as in the Wisconsin and, while recent Russian work indicates that there was more glacial ice in Siberia during Zyrianka times than was previously believed, Zyrianka maximum ice was never as proportionately extensive as was that of the Wisconsin maximum. During the Zyrianka maximum, ice covered a large land area lying between the Kara and Laptev seas, but it extended southward only to the Arctic Circle. Further east, a large multi-lobed glacier reached from the Lena valley nearly to the Sea of Okhotsk, and southward on the mainland to about the latitude of 60°N. Even during that early, maximum advance, however, there were large ice-free areas in Siberia north of the Arctic Circle; for example, there were tens of thousands of square miles of open ground between the Cherskiy and Anadyr ranges, and with the exception of portions of the previously noted multi-lobed glacier and glaciers on the Kamchatka Peninsula, all of eastern Siberia was ice-free south of the Arctic Circle (see Ewing and Donn [1961], Ravsky and Alekseev [1960], Sachs and Strelkov [1961], and Vaskovski [1959] for temporal and spatial descriptions of the Zyrianka stage).

In Europe, except for Alpine ice, the maximum glaciation during Würm times extended south beyond the Scandinavian Peninsula only about as far as present Breslau, Germany. That ice coalesced with a western Siberian glacial sheet which reached eastward to the eastern side of the Taymyr Peninsula. South of the Arctic Circle, however, its easternmost limit lay at about 83°E. (Flint, 1956: 5; Tsapenko and Makhnatch, 1960: 110).

As reviewed by Movius (1960: 358-64), the Würm glaciation in central and northern Europe spanned from about 68,000 to 8,000 B.C. Major Würm phases included the Early Würm stage, from 68,000 to 40,000 B.C.; the Gottweig interstadial, from 40,000 to 29,000 B.C.; the Middle Würm stage, from 29,000 to 12,000 B.C. (which contained two phases separated, between 25,000 and 23,000 B.C.; by the Paudorf oscillation); and the Late Würm stage, from 12,000 to 8,000 B.C., and I have omitted some subsequent "retreats," "oscillations," and "readvances."

These summaries show that there are good correlations between the beginning and terminal dates of the last major glacial stages in North America, Siberia, and Europe, and that there are also some internal parallels. Of particular consequence here, however, is the discrepancy between the age of the Zyrianka maximum and those of the Würm and Wisconsin, for the early retreat of the Zyrianka maximum appears to have subsequently left the top of Asia ice-free from the Chukchi Sea to the Taymyr Peninsula. Some of that corridor may have been occupied,

at one time or another, by sea or lake waters, but the apparent fact of its long existence, together with the known glacial geography of the rest of Siberia, and of Europe and North America suggest that glacial barriers were never great enough to have prevented man from traversing the breadth of Eurasia to Alaska at any time since the beginning of the Third Interglacial. Nor, except at the time of the Wisconsin maximum, did ice barriers completely block the open lands of far northwestern North America from the rest of the continent.

During times of glaciation the wide corridors, of course, changed direction and dimension according to the movements of the glaciers; but that for long periods these routes were variously bounded by ice, raises the question of how generally suitable they were for human settlement and travel, and, more specifically, what subsistence resources they contained. In North America, long, severe winter, and tundra biomes (conditions of glacial climates) unquestionably opened the boreal forest barrier for long intervals before and after the Wisconsin maximum, and, on both continents provided the sorts of terrain necessary to northern hunters. The presence of those biomes also implies the potential presence of certain mammalian food resources.

It is not presently possible to discuss specific Asian or North American faunal assemblages in relationship to specific Fourth Glacial corridors or other ice-free areas within the glaciated regions, nor do the data permit faunal descriptions according to short, in sequence, time intervals. But the literature illuminates two or three noteworthy general characteristics of faunal distributions in the geographical areas under consideration (since economies based on land mammal hunting typically require open lands species which are numerous, large, herbivorous, and gregarious, with few exceptions only forms which most obviously meet those criteria are noted here).

For central, unglaciated Alaska, the Wisconsin or late pre-Wisconsin megafauna included, among others, mastodon (*Mammuthus americanum*), woolly mammoth (*Mammuthus primigenius*), probably several horses (*Equus* sp.), at least one camel (*Camelops* sp.), several bison (*Bison* sp.), at least one caribou (*Rangifer* sp.), and more than one muskox including, at least, the genus *Ovibos* (Flint, 1957: 471; MacGowan, 1950: 119; Rainey, 1940: 304-7; Scott, 1962: 185-6). In view of the supposedly preferred habitats of those forms listed above which are now extinct, and on the basis of radiocarbon dates, it is quite certain that many of them survived in the tundra regions of Alaska, and elsewhere in northern North America, until 10,000 to 6,000 B.C. (see Hester [1960] for pertinent radiocarbon dates).

For northern Eurasia, the summaries of Colbert (1937: 179-80), Flint (1957: 449, 474), Hay (1924: 25, 176-7), Loukashin (1937: 331-2),

and Sauer (1944: 539-40, 549), among others, show that several forms nearly identical to those of North America ranged the width of that continent during Third Interglacial and Fourth Glacial times. Old World elephants and bison spread over northern Eurasia, and early in the Pleistocene had reached North America. American horses and camels colonized northern Eurasia even earlier. The Old World *Rangifer* (reindeer and caribou) has had wide, abundant, inter-continental distribution since at least the beginning of the Fourth Glacial Stage. These data mean that during the last major glacial stage a large, homogeneous fauna occupied the northern regions of North America and Eurasia, and that it persisted essentially intact from long before the beginning of the Fourth Glacial until 8,000 or 10,000 years ago. In other words, during the last glacial stage big game, in abundance, occurred across Eurasia and in the open lands of North America, and, with few exceptions, the same or similar forms occurred everywhere within that range.

This is the gross picture. It is certain that from time to time during the past 60,000 or 70,000 years encroaching glaciers displaced that fauna from large continental areas. Is it likely, also, that during or near times of maximum extensions of glacial advances, when ice-free areas were greatly reduced in size, increasing cold and increasing proximities of glaciers in one way or another drove the game herds from even the remaining northern corridors and other open ground localities? On the basis of some archaeological and ecological observations, I think not.

First, the Kogrük site at Anaktuvuk Pass appears to have been inhabited by hunters during a time when glacial ice may have occupied portions of the Pass floor, and when very little, if any, vegetation existed on the kame terrace upon which the site is situated (Campbell, 1962a). It is possible that the Kogrük hunters camped there for purposes other than hunting, but more likely, I think, they were there to intercept large game traveling through the Pass, from one open grazing area to another.

Second, there is a noteworthy characteristic about the ranging habits of the West Greenland caribou which inhabit the area about Søndre Strømfjord, on the Arctic Circle. In summer, I have found herds of them grazing 200 yards from the massive western front of the ice cap, and, while in that region there are thousands of square miles of open ground lying well away from the glacier, many of the caribou prefer to stay relatively close to the ice the year around. In winter, Eskimos from the coast must travel to the head of the fjord and beyond (5 to 20 miles from the glacier front but more than 100 miles from the sea) in order to hunt them. Excavations, in that region, of a far inland Eskimo winter camp show that the caribou have maintained this ranging pattern for several human generations, at least (perhaps several centuries); ap-

parently, therefore, the caribou preference for the pastures lying close to the glacier has nothing to do with recent European or Eskimo activities. These observations are not conclusive, but they do support the contention that a glacial climate or the immediate proximity of glacial ice does not discourage large, cold-adapted mammals. The combined climatological and paleontological evidence may thus be interpreted to mean that at no time during the last glacial stage were there intercontinental environments of the kind which would have excluded man from living in the northern regions.

A final question concerns the water gap presently separating northwestern North America from northeastern Asia. A number of anthropologists have discussed the importance of a former Bering land bridge to early contacts between America and Asia, and Chard (1958, 1961) has specifically commented on its possible role as a route of access for peoples moving into America from Asian areas lying far south of Bering Strait. It is sufficient here to note that recent geological studies (Haag, 1962; Hopkins, 1959) indicate that during the last glacial stage lowering sea levels at least twice created bridges (during the Altonian substage, and again at the Wisconsin maximum); broad, flat valleys which extended generally north and south for probably several hundreds of miles. The Wisconsin maximum bridge, apparently a grassy, tundra plain which remained for some time following the advance, very possibly attracted the herbivores which were followed by the hunters with which this paper is concerned.

In summary, while the question of Paleolithic connections between Europe and the New World is hardly settled, the presently available data suggest the possibility that (1) eastward expansions by European hunters, which began at least as early as Mousterian times, eventually resulted in colonizations of the New World by peoples whose technological inventories contained constellations of European traits, (2) that some subsequent American flake and/or biface industries, including the Fluted Point and Plano traditions, at least in part developed directly from that European Paleolithic base, and (3) that while European populations or cultural influences could have reached America, via northern Asia, at practically any time during the Fourth Glacial Stage, the colonizations in question most likely occurred shortly after the Wisconsin maximum.

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# LEAF-SHAPED POINTS IN THE WESTERN ARCTIC

by

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Thanks largely to work being done in coastal areas there is beginning to emerge a relatively coherent picture of the prehistory of northwestern-most North America. Even now, however, one might echo the sentiment expressed fourteen years ago by Skarland and Giddings for our knowledge of the prehistory of the vast interior region is still distressingly meager (Skarland and Giddings, 1948: 116). To be sure, the picture is not as dark as it was in 1948, yet we are still largely dealing with material from open sites and with finds accidentally discovered. Granting the limitations of such data, interpretation of them is not altogether ruled out. Accordingly, it is my purpose here to record and describe several recent finds from central Alaska and to try to relate these to finds of similar material elsewhere in the north.

As has been noted by a number of authors, leaf-shaped, Lerma, or Lerma-like points are widely distributed in the Americas (Wormington, 1957: 95-99 and elsewhere; MacNeish, 1956: 95-97; 1959a: 5-6; 1959b: 46-47; Butler, 1961: 1-6 *et passim*; Harp, 1961: 52-56). While the cultural significance of the total distribution may be questioned, it appears probable that on a more restricted scale significance does inhere in these resemblances.

The artifacts described below were selected because, of the miscellaneous collections turned in to the University Museum in the course of the past twelve years, this type has been the most frequent in occurrence.

## *Recent Finds from Interior Alaska*

(A) This specimen is 7 cm. long, 3 cm. wide at a point below mid-section, and 0.9 cm. thick. The material is opaque obsidian of good quality. As with all following specimens the implement is bifacial. The flaking is irregular and the edges are retouched. It retains the flake characteristic in being plano-convex in cross section. The edges are dulled from use about 2 cm. down from the point on both sides. The latter attribute suggests use as a knife. This piece was picked up on the surface at the Fort Egbert airfield at Eagle.

Figure 1 shows the approximate locations of this and following finds. The specimens themselves are shown in Figure 2.

(B) This specimen was found with the one above. The basal section is missing but the incurving of the sides toward the base suggest

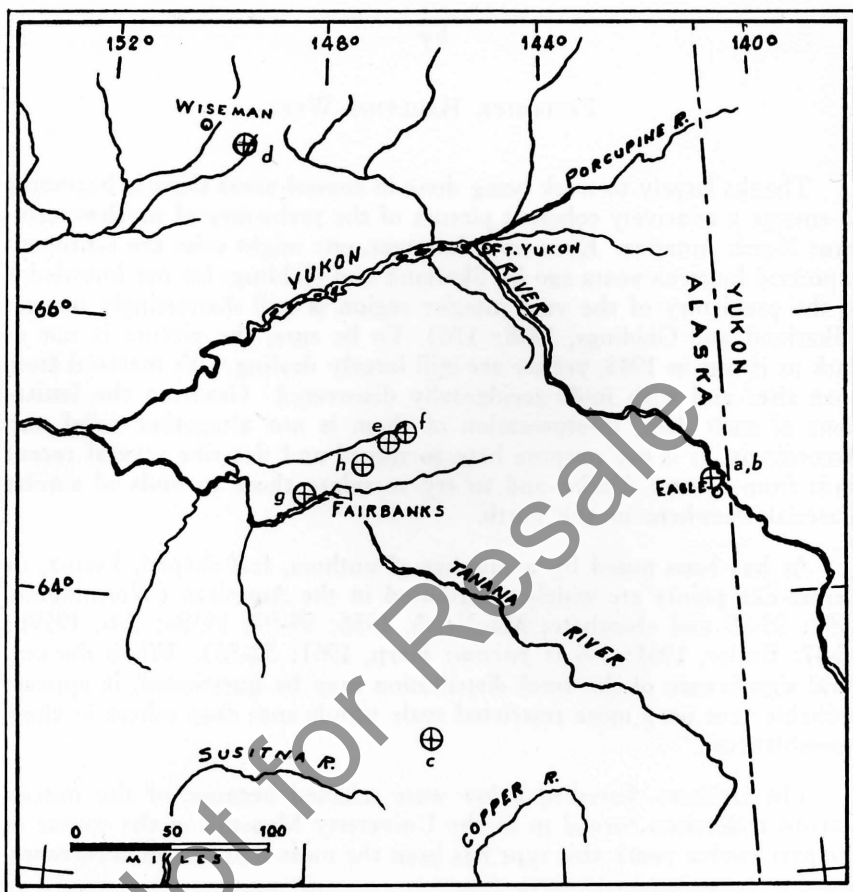
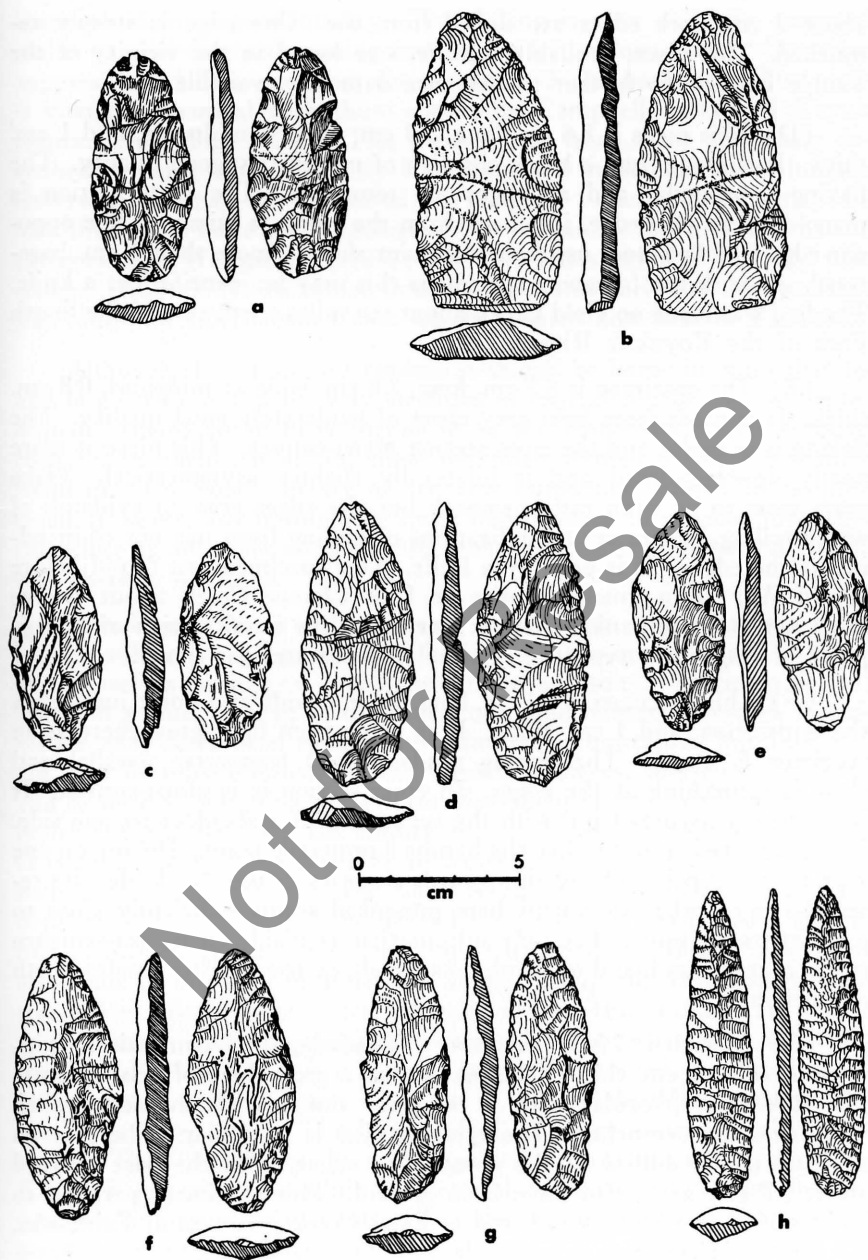


Figure 1. Locations of finds described in this paper.

that it likewise was rounded. As found, the piece is 9.2 cm. long but the probable former length was 10.7 cm. It is 4.4 cm. wide at midpoint and 1.2 cm. thick. The cross section is lenticular. It is made from a bluish-grey chert which is badly veined and of rather poor quality. The flaking is irregular and the edges retouched. This specimen is slightly asymmetrical bilaterally with one edge more flattened. The opposite edge is dulled from use from the point about 3 cm. baseward. This was probably a knife.

(C) Specimen C is 6.2 cm. long, 2.8 cm. wide at midpoint, and 1 cm. thick. It is made of black cherty siltstone of poor quality. The piece is bifacial, and the flaking irregular and rather crudely executed. It is plano-convex in cross section. From the point downward a distance of



*Figure 2.*

about 2 cm. both edges are dulled from use. One edge is steeply retouched. This piece, probably a knife, was found in the vicinity of the Tangle Lakes. No further provenience data are available.

(D) This piece is 8.6 cm. long, 3.4 cm. wide at midpoint, and 1 cm. thick. It is made from a black obsidian of moderately good quality. The flaking is irregular and all edges are retouched. The cross section is plano-convex. One edge, just back from the point, is missing. The opposite edge is dulled from use from the point slightly more than 1 cm. baseward. As with the foregoing specimens this may be identified as a knife. The find was made on Gold Creek about ten miles northwest of the South Fork of the Koyukuk River.

(E) The specimen is 6.7 cm. long, 2.8 cm. wide at midpoint, 0.8 cm. thick. It is made from light grey chert of moderately good quality. The flaking is irregular and the cross section plano-convex. This piece is more nearly double-pointed and is bilaterally slightly asymmetrical. Flake scars seem to be worn rather smooth but the edges give no evidence of water rolling. There are no indications of dulling from use nor of grinding at the edges. It is possibly a knife. This specimen was found before World War II in muck deposits at Last Chance Creek about twelve miles north of Fairbanks. With it was found the basal section of a large point of Angostura type (i.e., lanceolate with straight base).

(F) This specimen is 8.1 cm. long, 3.3 cm. wide at a point just below the midsection, and 1 cm. thick. It is made from light grey chert as in specimen E above. The flaking tends toward transverse parallel and there is retouching at the edges. In cross section it is plano-convex. It is bilaterally asymmetrical with the suggestion of a shoulder on one side. In appearance it is not unlike the Sandia I projectile point. Dulling on one edge from the point 1.8 cm. downwards suggests its use as a knife. Its resemblance to other specimens here presented seems sufficiently close to warrant its inclusion. The only information available on its provenience states that it was found on Fairbanks Creek, or ten to fifteen miles north of Fairbanks.

(G) Specimen G is 7.8 cm. long (tip missing), 2.7 cm. wide at midsection, and 1.1 cm. thick. The material is a grey chert of poor quality. The flaking is irregular with a tendency towards transverse parallel. The edges are retouched. The cross section is lenticular. There is no evidence of use dulling at the point. The edges, from the base upward about 2.7 cm. appear to have been ground. This specimen, perhaps to be identified as a knife, was found at Ester Creek just west of Fairbanks. No further information is available.

(H) Specimen H, decidedly more lanceolate, is 9.5 cm. long, 2 cm. wide at a point below the midsection, and 0.9 cm. thick. It is made from

black obsidian of good quality. The flaking is very skillfully executed and is parallel diagonal running from upper left to lower right. One edge appears dulled from use from the tip about 3 cm. baseward. The piece is virtually identical with those shown by Campbell as typical Kayuk points (1959: Fig. 1 b-g). This piece differs from those previously described in being more distinctly lanceolate and in the flaking technique. Otherwise, it may be suggested as related. Functionally it may be identified as a knife and typologically it seems to fall into the Lerma category (cf. Wormington, 1957: Fig. 71, 3rd specimen; Fig. 46, plus Krieger, 1958: 973). Accession information states only that the specimen was found on Goldstream Creek which is north and west of Fairbanks.

Although these finds are random it should be borne in mind that by and large truly out-of-the-way localities of central Alaska are not represented. Among those finds turned in to the University which seem to conform to particular styles, these described seemed to be significantly frequent. The total number of artifacts found and turned in is quite small, however, and it would be quite unwarranted to suppose that anything like an adequate sample of the prehistoric cultures of central Alaska was thereby obtained.

It is impossible to assign ages to these pieces. For whatever value such a subjective judgment may have, only specimens E and F seem of themselves to suggest any considerable antiquity. Specimen E was found in a muck deposit in the course of a gold mining operation. Specimen F may have been found under similar circumstances but this cannot now be substantiated. Of the remaining pieces, specimens A, B, C, and D were all found on the surface. Specimen H was found by a placer miner but whether from the surface or in muck is not known. Specimen G is supposed to have occurred under 60 feet of muck. The nature of such discoveries, however, i.e., as a result of hydraulicking out muck deposits, leaves so much to be desired that it is best considered a surface find. (Two other artifacts were found with specimen G and since they are made of identical material the association of the three seems relatively firm. Both these pieces are quite crude. One displays an outline approximately like the specimen described except that it is distinctly shouldered below which is a tapered stem. The second associated specimen appears to be a point. It is broad, gently shouldered and with a broadly tapered stem. The length of all three specimens is about the same.) There is undoubtedly some significance in the fact that specimens E and F appear to be made of identical material. Of further interest was the finding with specimen E of the basal section of a lanceolate point apparently of *Angostura* type.

There is, to be sure, a rather wide degree of variation within the class here described. This is especially notable in the case of specimen H.

Nevertheless, all seem to be variations upon a basic theme. All are essentially round based and lenticular in outline. Of interest in this connection is the functional identification of six of the eight specimens as knives. Formally the most aberrant piece in the collection, specimen H, apparently also was a knife rather than a projectile point. This specimen conforms in every respect to those described by Campbell as Kayuk points from the Kayuk site in Anaktuvuk Pass. It seems likewise to have a logical place among the artifacts described here. Furthermore, it and Campbell's Kayuk specimens are readily encompassed by the Lerma type. Nevertheless, in recognition of the distinctiveness in the north, at least, of these Kayuk specimens perhaps it would be appropriate to speak of them as the Kayuk subtype or variant of the Lerma type.

Five of the eight specimens (A, C, E, G, and H) easily fit the Lerma category. Specimens D and F appear to be so close to the type description and so similar to four of the "typical" five that it appears wisest to include them. Specimen B because of its large size perhaps should not be termed a Lerma, however its outline and its inferred function suggest relationship to the smaller specimens.

That four of these northern knives were found in the Fairbanks area may be seen as simply reflecting the fact that Fairbanks is a population center and that there has been a great deal of activity in the surrounding countryside. The occurrence of the remaining pieces at Eagle on the Yukon border, at Tangle Lakes on the south slope of the Alaska Range, and at the South Fork of the Koyukuk River on the south slopes of the Brooks Range is perhaps sufficient to suggest a widespread distribution in central Alaska.

#### *The Distribution of Northern Lerma Points*

Figure 3 suggests the distribution of leaf-shaped points or knives in the north—that is, northern Lerma points. One should be particularly cautious in viewing this map since the nature of the mapping procedure followed gives as much weight to localities from which one or two finds are reported as to those from which there are multiple finds. Furthermore, scale difficulties have made it necessary in a couple of instances to employ one symbol to denote multiple finds from a region. This applies for the Thelon River area and for the Fairbanks vicinity. The data, however, are altogether too sparse to allow any sort of quantitative mapping.

To date, the most important finds of northern Lerma points are those reported by Harp from the Thelon River west of Hudson Bay (Fig. 3: 1) (Harp, 1961), the Klondike site (Fig. 3: 2) (MacNeish, 1959a), the Engigstciak site on the Yukon Arctic Coast (Fig. 3: 3) (MacNeish, 1956, 1959b) and the Kayuk site of Anaktuvuk Pass in the

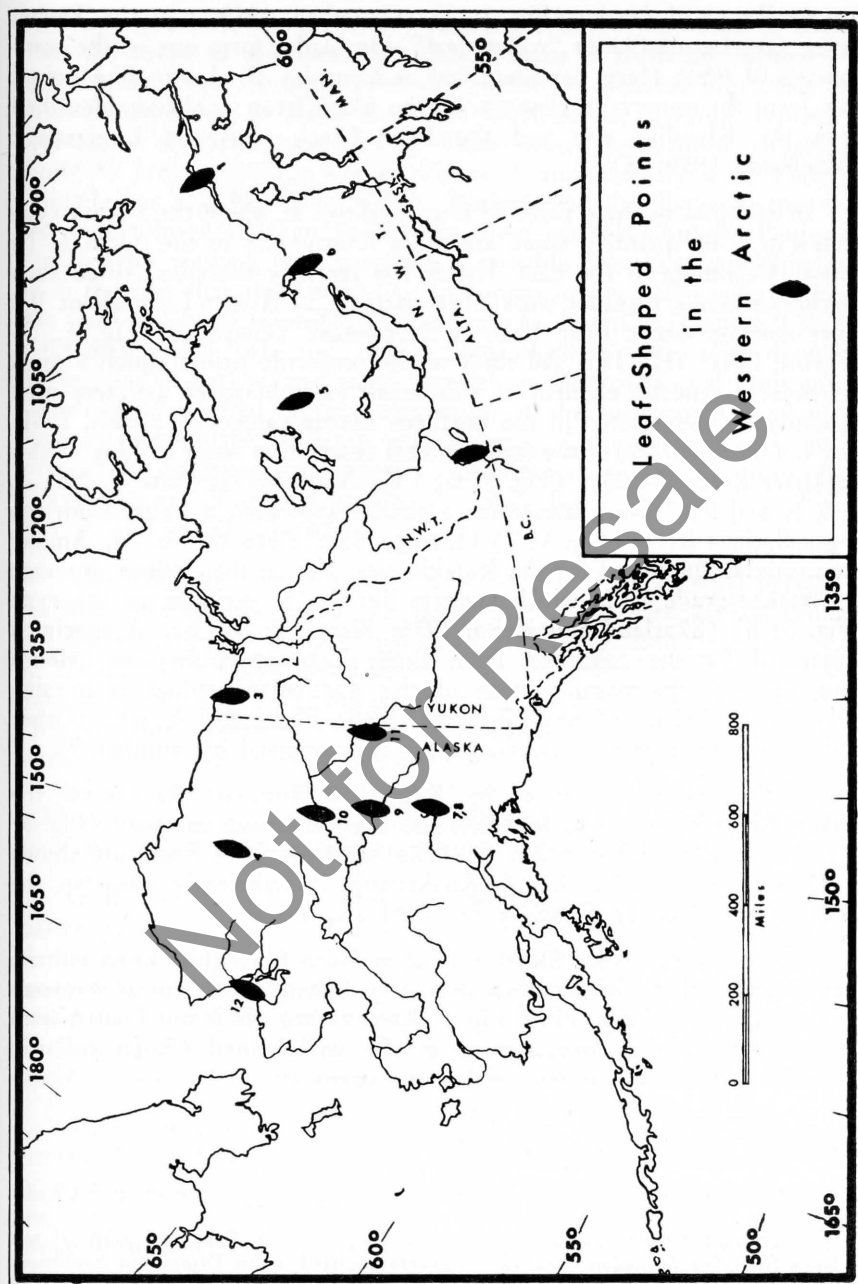


Figure 3.

Brooks Range of Alaska (Fig. 3: 4) (Campbell, 1959). In the Thelon River sites Lerma-like or "willow-leaf" side blades form one of the components of what Harp has identified as Complex B. Lerma-like points also form an important element of the Cordilleran tradition identified from the Klondike site and the Flint Creek phase at Engigstciak (MacNeish, 1959a: 5).<sup>1</sup>

In addition to these three or four localities at which the Lerma type occurs in some quantity there are other occurrences in the north to be noted. Beginning in the east, Forbis has recently described three such specimens found, together with other artifacts, at Acasta Lake about 100 miles east of Great Bear Lake in Northwest Territories (Fig. 3: 5) (Forbis, 1961: 112-113). All three of the projectile points which formed the most diagnostic element of this small assemblage of artifacts may be easily accommodated in the northern Lerma category (Forbis, 1961: Fig. 1, a-c). Artifacts of the same general description occur in MacNeish's Lockhart River Complex (Fig. 3: 6) (MacNeish, 1951: Plate V, Nos. 2, 4, 6, 8, and 9). Irving illustrates a similar specimen, a knife, from the upper Susitna River (Fig. 3: 7) (Irving, 1957: Plate II, No. 7). Among the material illustrated for the Ratekin site, also in the Susitna drainage is a rather crude knife which appears likewise to conform to the type (Fig. 3: 8) (Skarland and Keim, 1958: Plate IV, No. 6). A specimen illustrated for the collection from Birch Lake probably also belongs here although the basal portion of this particular artifact is missing (Fig. 3: 9) (Skarland and Giddings, 1948: Plate XV A, q). (Other finds of the general Fairbanks area are encompassed by number 9).

In the material collected by Rainey at Rampart Rapids on the Yukon River is a small knife which also fits the Lerma category (Fig. 3: 10) (Rainey, 1939: Fig. 6, No. 5). The two finds from Eagle are shown as 11 of Figure 3. Number 4, Anaktuvuk, is sufficiently close to the locale of specimen D of above to stand also for it.

A recently published illustration of artifacts from the Choris culture reveals another specimen which may also belong in the present group (Fig. 3: 12) (Giddings, 1961: Fig. 9, lower right). It is not known with what frequency this form occurs in the well-defined Choris culture; presumably there are other similar specimens.

### *Some Old World Resemblances*

Attention may be directed to the Lake El'gytkhyn site on the Chuk-

<sup>1</sup>Through a serious oversight on my part, Harp's Dismal Lake area material was excluded from this discussion. Leaf-shaped points occurred in his Dismal-I:a component and in his Kamut Lake collection. Figure 3 should carry a symbol in that area south of Coronation Gulf indicating these occurrences. (See Harp Jr., Elmer, "Prehistory in the Dismal Lake Area," *Arctic*, Vol. 11, No. 4, February 1959.)

chi Peninsula (Okladnikov and Nekrasov, 1959). A number of objects from the cache at this locality, although some of them are termed possible blanks, compare quite favorably with the artifacts previously discussed. Moreover, to judge from the illustrations, marginal retouch is present on some of these pieces. Those which seem most closely resemblant are numbers *a* - *g* of Figure 3 and possibly *a* of Figure 5 (Okladnikov and Nekrasov, 1959). Rather than the distance separating the westernmost Alaskan finds from these on the Chukchi Peninsula, a reason for viewing with suspicion a possible genetic relationship may lie in the fact that the Lerma-like specimens in the cache seem to be at one with the total assemblage of bifaces as shown in Figures 2 and 3 (Okladnikov and Nekrasov, 1959). Some of these pieces seem distinctly rectangular in outline and range through an elongated oval form to the round based pointed objects suggestive of the northern Lerma point. Such an assemblage, at least on the basis of present evidence, seems foreign in northwestern America. Additional specimens from Lake El'gytkhyn are illustrated by Chard (1960: Fig. 5, Nos. 1, 2, 3; Fig. 6, Nos. 2, 3; Fig. 10, No. 4).

The following formal resemblances gleaned from a casual perusal of the literature may be noted. In Japan there have been several finds of leaf shaped artifacts. At the Tachikawa site in Hokkaido there was found at Locality II a round based knife which in outline conforms well with those discussed above (Yoshizaki, *et al*, 1959: Plate 16, 4 and end chart). This particular specimen, however, is unifacial. More closely similar is an artifact from Locality III which is bifacial (Yoshizaki, *et al*, 1958: Plates 18 and 19, No. 6). Similarities were also noted in two other Japanese publications dealing with sites on Hokkaido. It has not been possible however to have the appropriate sections translated.

In the southern Trans-Baikal at the Botoiskaia Pit were found two rather crude, generally leaf-shaped implements which bear some resemblance to Lerma points (Okladnikov, 1960: Plate 6, lower). These are grouped with Paleolithic finds of this region. At the late Paleolithic cave site of Ust'-Kanskaia, what appears to be the only bifacial implement of the entire assemblage bears some resemblance to the class of artifacts under consideration (Rudenko, 1961: Fig. 15, h).

All of the sites, including Botoiskaia Pit, described by Okladnikov for the Trans-Baikal are termed Upper Paleolithic (Okladnikov, 1961: 493). Yoshizaki places the Tachikawa sequence in the final Pleistocene and early Recent (Yoshizaki, 1959: 62-64). The specimens mentioned above occur in the second and third stages delineated for the site. Perhaps it may be concluded, therefore, that these date from the latter stages at Tachikawa, although just what that may mean in terms of years ago is not clear. The Ust'-Kanskaia cave site is far earlier than any of the



foregoing. Rudenko dates the occupancy of the cave in terms of a "warm phase that preceded the last glaciation in the Altai" (Rudenko, 1961: 213). Such a dating tallies well with the artifact assemblage which generally has a Mousterian stamp (Rudenko, 1961: 209).

What relation, if any, these Old World occurrences have with the New World Lerma form is not at all clear.

### *Conclusions*

In view of the probable genetic relationship between Lerma-like points in northern North America, it is proposed that those here discussed and those found in the future be termed Northern Lerma points. This would give recognition to possibly important regional distinctions but more importantly would readily reveal relationship to the Lerma type.

Age determinations for northern assemblages containing leaf shaped, Lerma-like points or knives are few but of considerable importance. Harp, in his discussion of the Thelon River sites suggests that human occupation of the region came about after 3,000 B.C. (Harp, 1961: 55). MacNeish dates his Cordilleran tradition, of which the early Flint Creek phase at Engistciak and the Klondike site at Fort Liard are members, at about 6,000 B.C. (MacNeish, 1959a: chronological chart). It seems unlikely that any guess dates for surface collections in which these artifacts occur would place them any earlier (cf. Irving, 1957: 47; Skarland and Keim, 1958: 81). If these age estimations are approximately correct, it would appear that Campbell's recent suggestion of six to eight thousand years ago as an age for the Kayuk Complex must err somewhat on the early side (Campbell, 1961a: 3). If, as suggested here, the Kayuk projectile point is simply a specialized variant of the more generalized Northern Lerma, then it is strongly suggested that it must be later than many or most of the other finds considered here. Perhaps the Kayuk subtype represents nothing more than a fusion of the diagonally flaked, lanceolate tradition with that of the lenticular Lerma tradition.

Taking what appear to be the earliest dates for Lerma points in the north, and we hope this may be subject to revision in the direction of precision, it would seem that they appear no earlier than 7,000 B.C. This, of course, is considerably later than their occurrence in the Pacific Northwest and elsewhere (Butler, 1961). Having once arrived, to show up in the earliest portions of the Flint Creek phase, there is the further suggestion that the style lingered for quite a long time. This is borne out by the occurrence of Lerma forms in the Choris culture of approximately 1,000 B.C. and probably into later horizons as well. As suggested above, and freely admitting the limitations of such a judgment, only two of the eight recent finds described for central Alaska appear ancient.

The total number of Lerma finds in the north is probably not great, but then, excepting coastal areas, the total number of finds of any other one artifact type is not great. Population densities in the past were probably always as low, or lower, than those recorded ethnographically. It cannot be expected, then, that archaeological remains either in terms of numbers of sites, or in terms of quantity of material from any one site, would be great. This being the case, then, distributional data are apt to play a more important role in our reconstructions than might be the case elsewhere. As suggested by Harp for the Thelon River area of the Canadian Shield, so it appears in the west, that as glacial conditions ameliorated, areas recently glaciated came to be occupied and utilized by nomadic hunters (Harp, 1961: 55). This move apparently took place earlier in the west than in the east. It would appear that the Lerma knife or point was among the earliest cultural materials thus brought into those areas.

As Butler has shown, leaf shaped or Lerma-like points occur in considerable numbers and in great diversity in the Pacific Northwest (Butler, 1961). Moreover, there is convincing evidence that leaf shaped points make their appearance in that area as early as 10,000 B.C. (Butler: 63-64). Without having any reference then to the occurrence of Lerma points farther south or eastward in the Plains, it may be suggested that the likely source for this tradition in the north was the Pacific Northwest. The relative chronologies of the two areas do not appear to support the hypotheses of Butler and MacNeish (MacNeish, in Forbis, 1961: 113) that the move of the Lerma tradition was north to south, but rather the reverse—from south to north. Another point to be borne in mind in this chronological question is that some of the earliest-appearing contexts in which Lerma is found in the north are in areas that could not possibly have been occupied much before 8,000 B.C. as prior to that time they were under ice.

While reversing the direction of movement obviously leaves the question of the ultimate origins of this tradition dangling, the time differences do seem to make a conclusion of this sort inevitable. Future investigation, indeed, may reveal the Pacific Northwest as the origin point for the Lerma tradition throughout the New World. Certainly at the present time primacy seems to belong there.

The appearance of these points and knives in the far north suggest the northward withdrawal of people already adjusted to the environment of tundra and taiga. Such an adjustment could have been worked out to the south (Pacific Northwest) in response to periglacial conditions there. The subsequent movement into the north would then represent a logical expansion into newly created areas of similar ecological aspect. This is not, obviously, to suggest that there is some necessary correla-

tion between periglacial conditions and Lerma points, but simply that this was one item of equipment used by peoples who, in these areas at least, had worked out the requisite adaptations in other aspects of their culture.

Somewhat in the same vein the northern evidence does not seem to lend good support to this as a part of a Cordilleran culture. Indeed, in cultural terms, the implications of such a label are rather nebulous. In any case, the association of northern Lerma points with mountainous areas does not seem supported. If we were dealing with a clearly defined culture instead of one element the situation might be different—if the association of the culture type and a particular kind of physiography were present. However, in this instance we obviously have to deal with an element which could and did cross-cut cultural differences and which persisted for a long time.

In brief, the evidence thus far does not support an Old World origin for Lerma points. The mere fact of their occurrence in the north as well as to the south, cannot of itself be made to read this way. In view of the chronological differences, such a suggestion seems to turn the problem on its head. It is certainly not the writer's intention to erect a wall at Bering Strait—that was long ago beaten down. In fact, it is quite possible that the Lake El'gytkhyn leaf-shaped points are the result of diffusion of the trait from America.

Future investigation of this problem may disclose that the ultimate source for American leaf-shaped implements is in Central Asia with the Ust'-Kanskaia cave site as one of its earliest manifestations. Ultimately too, perhaps the Szeletzian and Solutrean leaf forms and the other *blattspitzen* of Europe will be found to have been derived from Central Asia—in which case we may end up with the conclusion that *all* leaf-shaped points in America and northern Eurasia are genetically related. Long before such a conclusion is reached, however, a great deal of further work must be done; leaf shaped points would have to be found in the north in contexts sufficiently early to suggest a parental relationship to those farther south. At the present time and with the present evidence it appears we must view Lerma points as a peculiarly American development.

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# NORTHWEST NORTH AMERICA AND CENTRAL UNITED STATES: A REVIEW<sup>1</sup>

by

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This is by no means a thorough review of these areas; it deals with certain correspondences between non-ceramic complexes in the Mackenzie and Yukon drainage basins and others in the central parts of the United States and southern Canada. To the writer, these typological correspondences when placed in a chronological framework suggest historical relationships in the form of cultural exchanges between the two areas. However, the ways in which these exchanges took place is not yet clear.

In the far northwest, it is still impossible to designate discrete archaeological cultures outside the Eskimo area. However, in some cases traits and specialized industries, and even whole complexes, can be traced widely in space and time with some assurance that these continuities reflect the sharing of technical knowledge by people quite remote from one another. It is useful at present, in fact it is the only expedient open, to try to organize these "tracers" into abstractions like traditions, area co-traditions, diffusion spheres, and so forth, and to try to draw their geographical and chronological boundaries. MacNeish (1959a), Giddings (1961) and the writer (1962) have tried to do this with varying degrees of lucidity and conviction. One of the main difficulties encountered, it seems to me, results from the too-great readiness of authors and readers alike to endow with abiding historical reality these abstractions which can never be more than expedients devised for the solution of particular historical problems.

In the present paper I shall be concerned mainly with traits and complexes that appear to be common to the far northwest and the central part of the continent. This means that the Arctic Small Tool tradition need be considered only insofar as it bears on the chronology of less well-known manifestations, for its distinctive types of burins, microblades, and minute biface implements seem never to have been adopted by dwellers of the northern forest. It is known in its earliest form in the Bering Strait—North Alaska region, where it was present prior to 3500 B.C. (Giddings, 1961). By 1000 B.C. or earlier its distinctive features had begun to merge with the stone technology of some of the earliest recognizable Eskimoid cultures.

The Northwest Microblade tradition (MacNeish, 1959a) is a remarkably variable phenomenon. It is known best from sites in the Yukon

<sup>1</sup> Revised version of a paper read at the American Anthropological Association meetings in Minneapolis, 1960.

Territory, Mackenzie District, and interior Alaska, most of which are small. All of the collections have microblades and most of them have tongue-shaped or wedge-shaped microblade cores, derived without much question from prototypes in the Far East (Nelson, 1937; Irving, 1955, 1962). Most have at least a few projectile points of medium size, with side notches which have been ground or rubbed smooth. There are also side-notched points without such grinding, and lanceolate points or knife blades of various forms. With these are found large, rough bifaces, some of which resemble chipped ulus, others of which are more like scrapers. In most of the collections there is a rather large number of flakes which have been modified to serve as scrapers, knives, or engraving tools. Most of them have, in addition, simple burins made on broken bifaces or truncated flakes. MacNeish, in defining the tradition, lists a number of other types, and notes that "many of its components are seen as coming from widely different sources" (1959a: 7).

In discussing the Callison site in southwest Yukon Territory, MacNeish (1960b) outlines a sequence based on a large number of very small sites found in various soil horizons for which he and other students propose a regional chronology. For the Little Arm complex, the oldest one in which microblades occur, he suggests a date of 3000 to 5000 B.C., on the assumption that the pink soil matrix marks the first post-glacial advance of the forest into the area and that this occurred during the climatic optimum. Side-notched points do not show up until the next succeeding complex, called Gladstone. They are found together with microblades in this and the later Taye Lake complex, which MacNeish correlates with the N. T. Docks complex of Great Bear Lake. A number of dates have been reported for C-14 specimens thought to represent the N. T. Docks complex (MacNeish, 1956a). Those most recently accepted by MacNeish (1959a) are 5000 and 4100 B.P.; the determinations were made by the acetylene method. For a somewhat similar inventory far to the south in British Columbia, Borden (1952) announced an age of 2400 years, gotten by means of the carbon-black method. The Taye Lake materials—the latest members of the Northwest Microblade tradition in MacNeish's sequence, underlie an ash horizon thought, on the basis of C-14 dates obtained prior to 1951, to have been deposited around 430 A.D.

The data reviewed thus far show that the Northwest Microblade tradition was present in the northwestern boreal forest prior to 3000 B.C., and that it lasted there for a considerable length of time, perhaps until as late as the beginning of the present era. The geographical and chronological distributions of some of its elements extend far outside the limits of the tradition as it is tentatively identified here, and present both historical clues and perplexing problems.

At the Callison site the earliest microblades are found in the Little Arm complex associated with lanceolate, rather than with stemmed or side-notched points. These MacNeish described as Milnesand-like and Agate Basin-like. A still earlier complex at the same site and some others in the area, called Champagne and ascribed to the 4000-6000 B.C. period, has similar points and some described as Plainview-like, with a meager inventory characterized by absence of microblades and dearth of other implements. Support for the dating of the Champagne complex comes from the very similar Franklin Tanks component found on Great Bear River stratigraphically below the N. T. Docks complex mentioned above; N. T. Docks apparently dates from 2000 or 3000 B.C. The deplorable use of type names from other areas need not distract us from noting the early presence in the area of lanceolate points that resemble some from the Plano complex, and the subsequent appearance first of microblades and then of notched points.

However, the picture is complicated by sites far to the north. At Cape Krusenstern Giddings (1961) has described the Palisades II assemblage characterized by several varieties of side-notched points but not by microblades, which he thinks dates from well before 3500 B.C., perhaps in the 4000-6000 B.C. range (*ibid.*: 161). His dating is based on the apparent absence of Palisades II types from the long, possibly continuous, beach ridge sequence at Cape Krusenstern. Giddings compares his points with others found without microblades in interior Alaska, and suggests that "side-notching first appeared in the circumpolar region at the time of Palisades II and spread immediately as far as a population then existed, then later eastward," to the Central Area and northern Greenland. He considers Campbell's (1961b) Tuktu complex from the central Brooks Range some 300 miles east of Krusenstern to be later than the Palisades II assemblage. There are both side-notched points and microblades in Tuktu. The microblades Giddings apparently considers derived from the same source that gave the trait to the Denbigh Flint complex (part of the present writer's Arctic Small Tool tradition), which he thinks post-dates Palisades II.

We thus have a sequence of events proposed for northern Alaska in which microblades appear after side-notched points, instead of before them as seems to have happened in southern Yukon Territory. This discrepancy is a serious one. As a problem, it seems to me that it can be resolved into two parts. One is the question whether the microblades and cores in the Tuktu complex are related to those of the Denbigh Flint complex or not. I am inclined to think that they are not, because not a single Denbigh type was found with them (I have outlined elsewhere reasons for thinking that the microblade industries of the Northwest Microblade tradition and the Arctic Small Tool tradition have no common predecessor in North America [1955, 1962]). If this is the case, then



Tuktu is not to be dated by correlation with the Denbigh Flint complex, and Tuktu can be placed in the Northwest Microblade tradition, where it might have an age somewhat greater than the 3000 or 4000 years Campbell has suggested for it.

This leaves us with the Krusenstern notched points to consider. Were it not for Giddings' contention that Palisades II is different from the Old Whaling culture of the same locality, which also lacks microblades, and which dates apparently from between 1000 and 2000 B.C., I would lump the two together on the basis of published photographs of projectile points. An alternative is to consider the Krusenstern sequence of Palisades I—II—Old Whaling as having been conservative, independent of influence from the Northwest Microblade tradition, and furthermore uninfluenced by the Arctic Small Tool tradition which showed up in force at Krusenstern between the times of Palisades II and Old Whaling. In any case, the source of the Old Whaling culture, with its predominantly maritime economy and its side-notched points and stemmed and notched end scrapers reminiscent of the Archaic of the northern Middle West loom as some of the most perplexing enigmas in the far northwest.

This digression, in addition to working over local problems, brings out the fact that the Northwest Microblade tradition cannot yet be considered a concrete cultural unit. At the same time it leads to a discussion of extensions of parts of the tradition into areas outside those considered so far.

In the Barren Grounds west of Hudson Bay, Harp (1961) has proposed a sequence which shows interesting parallels to that outlined above for the northwestern boreal forest. The initial occupation, Complex B, brought with it an inventory that includes Keewatin lanceolate points similar to the Agate Basin and Milnesand types of the Plano complex (Harp, 1961: 53). They are accompanied by round-based bifaces, discoidal knives, snub-nosed end scrapers, and other, similarly undiagnostic forms which Harp thinks are "basic to the technology of all (sic.) prehistoric cultural adaptations to the interior northern regions of the New World," (*ibid.*: 54). He goes on to say that "With the grafting of specialized traits or trait complexes onto this base, for example microblade technology or lanceolate points, the culture might be shifted to meet changed ecological or environmental conditions" (*ibid.*). The latter view is consistent with that of MacNeish with respect to the origins of the Northwest Microblade tradition; I would take exception only to the extreme generality of Harp's first statement. Harp notes that the country was open to occupancy following glaciation and marine transgression "at least as early as 3000 B.C." (*ibid.*: 55), but in his summary states that "The Thelon area was not inhabited until some time after 3000 B.C." (*ibid.*: 70).



In Harp's sequence Complex B is followed by Complex A which he relates to a late stage of pre-Dorset and dates to about 1000-700 B.C. (*ibid*: 52). There is little about this complex that is both distinctive and held in common with Complex B, or with Complex C, which postdates Complex A. Complex C includes, along with members of the basic kit, corner-removed and side-notched points as well as large lanceolate forms, and chipped adzes. Harp describes it as being related to the Late Archaic and compares it, with reservations, with the Larter and other foci in southeast Manitoba, whence he apparently takes his estimated date of later than pre-Dorset (after 700 B.C.) (*ibid*: 58).

Harp's absolute dates are derived from a consideration of glacial geology which suggests that the country first became habitable some time between 5000 and 3000 B.C., and correlation with the closest available regional sequences. It is possible that they will be changed and the chronology of complexes related to southern interior traditions will be revised downward. In any event, it is interesting to note that Harp sees historical connections in two periods between the Barren Grounds and the Prairie, and further that he relates his B and C Complexes to some of the very complexes in the northwestern boreal forest that belong in or grade into the Northwest Microblade tradition. The relationships are intricate and, apparently especially in the more westerly sites, inventories vary greatly in detail from one site to another. However, the early appearance of complexes with lanceolate points apparently derived from the Northern Plains or some adjacent region, followed by the introduction of somewhat different complexes with side-notched points, is a sequence common to both the Barren Grounds and the northwestern boreal forest.

Several other traditions might be set up in the far northwest, for instance, probably more than one on the northwest coast and southwestern Alaska, and some probably earlier blade industries in the interior which are at present very poorly known (MacNeish, 1959a; Campbell, 1961a—Kogruk). For the present, the one that concerns us comprises a number of sites which are characterized by rather large, well-made lanceolate points and a very limited number of other types. In some cases these appear to be associated with microblades, as in the case of the Little Arm complex, so there may be some continuity with the Northwest Microblade tradition. However, this is probably not the case at the Kayuk site in the Brooks Range (Campbell, 1959, 1961b—Tuktu). Because of its large size and distinctive character I would take this collection as being representative of a special taxonomic group, which approximates MacNeish's Yuma tradition. Unlike MacNeish, I would prefer to leave the sites with microblades out of it, and probably those with burins; these sites can be just as conveniently left as intergrades or complexes of indeterminate status. Some writers would call the whole series Plano complex. But this, to me, implies too much uniformity

within what is really a very diverse group. The notion of Plano complex may indeed be a valid one, but if it is made to include all the unnotched, stemless unfluted points found between Point Barrow and Pali Aike, some term other than complex should be devised for it. It is clear, in any case, that subdivisions must be picked out if the notion is to be a useful one. For the present, we should deal with the Yuma tradition of the far northwest, and the somewhat similar Plano complex of the Great Plains.

In that part of North America which used to be known to Alaskans as "Outside" and which is now sometimes referred to as "the lower states" there is much more information available and the picture is in some respects clearer. I shall refer mainly to the northern High Plains, west of the 98th or 100th meridian, and to the area stretching eastward from this boundary in the direction of Lake Michigan and Illinois. Southern Saskatchewan and Manitoba are included; they seem to have affiliations with both of these southern areas. Students in these areas seem to have gotten by fairly well without using traditions; the archaeology here is organized mainly in terms of individual sites, larger periods or stages, and what are locally known as complexes.

The Plano complex, which I take to be represented by such sites as Agate Basin, Angostura, and the Finley site—and the Aqua Plano of Great Lakes fame—seems to have occurred throughout much of this area between 8000 or 9000, and 4500 or 5000 B.C. Perhaps north and west of the Great Lakes its derivatives lasted somewhat later (cf. Harp, 1962; and earlier in this paper).

It seems to be pretty generally accepted that the Yuma tradition in the far Northwest is closely related to the Plano complex sites in the Plains, or at least to some of them. It is also, and I think gratuitously, assumed that the far northern correlatives of Agate Basin and Angostura points, and also some that resemble Eden, Scottsbluff, Milnesand and Plainview points—all of which are reported to occur in Alaska or the Yukon—were made by refugees from a catastrophe in the Great Plains. The known or suspected catastrophes are the somewhat enigmatic altithermal drought and the clearly demonstrated extinction of large forms of bison, events which may be related to one another. Wheeler (ms) and Mulloy (1958), working in Wyoming, have found archaeological evidence which seems to reflect these events in the form of a hiatus between, roughly, 4500 and 2500 B.C., following which the Plano complex was displaced by other cultures.

The refugee line of reasoning would require, then, that the Plains-derived types made in the far northwest date from some time after 5000 B.C. But most of the points do not resemble those from the latest pre-Altithermal period in the Plains, such as those from the Horner site; rather, the majority of them resemble Agate Basin or Angostura points,

and others look like Eden and a few like Plainview, all of which are most numerous in the Plains in sites dated around 6000 B.C. or earlier. It will be recalled, furthermore, that there is some local evidence in the far northwest for thinking that some, if not all, of the Yuma tradition (or Plano complex) sites are older than the Northwest Microblade tradition, and hence at the very least older than 3000 B.C. Therefore, the case for the refugee hypothesis seems a little weak, so I would propose another in its place: The entire range of bison in the plains and the western part of the northern forest—which at the Firth River during Flint Creek times came within 20 miles of the Arctic Coast (MacNeish, 1956)—was occupied between 8000 or 9000 and 4000 or 5000 B.C. by *related* cultures in a single diffusion sphere (perhaps some would call it an area co-tradition). Whether or not the common forms found in Wyoming and Alaska can be used as horizon markers remains to be seen. At present this doesn't appear to be likely, but will be necessary to build up regional sequences and similar taxonomic units than Plano complex before this problem can be dealt with.

After the Altithermal hiatus in the central and northern plains, in the time interval there designated as the Middle Prehistoric Period which runs from about 2500 B.C. to the introduction of pottery, or evidence of contact with pottery-using cultures, the Plano complex is but weakly represented, if at all. The same holds true in the country east of the hundredth meridian, although here there is no indication of an hiatus, and here the change in character may have taken place earlier. The histories of the two areas should be considered separately, but both are characterized during this period by complexes which show certain resemblances to the Northwest Microblade tradition.

This is an unwieldy set of data, because in all of the areas under consideration there was in this period little emphasis on good workmanship in making stone implements, and therefore little uniformity within types. Most of these collections can be described as being of low characterization. However, some common features seem to bind them together. The most striking of these is the prevalence of medium-sized projectile points with notches and more or less straight bases on which, in earlier periods, grinding is fairly common. Widespread within these areas, but not so common in all of them, are side-notched points with concave bases, points with short, expanded stems and convex bases, and rather broad thin points with bases like fish tails. There are very close resemblances between such types as Wheeler's Kolterman Point from Wyoming and those from Fisherman's Lake near Fort Liard (MacNeish, 1954); between points from an intermediate level in the Mortlach (Wettlaufer, 1955) site in southern Saskatchewan and others from the Ratekin (Skarland and Keim) site in central Alaska, and between Durst stemmed points from Wisconsin (Wittry, 1959) and some of those from Pointed

Mountain near Fort Liard (MacNeish, 1954). The Middle Prehistoric period of the northern Plains also has a number of large, ovoid biface and uniface implements which resemble forms in the Northwest Microblade tradition, and relatively long, thick end scrapers occur in both cultural units. No microblades have been found in the central U.S. older than 2000 years.

MacNeish's suggestion that the Northwest Microblade tradition formed as a result of the amalgamation of an Asian microblade industry with some indigenous American industries which include side-notched points, seems borne out. However, the traits I have discussed are simply tracers which in some cases record the flow of culture in one direction or another, but which for the most part simply show that in post-Altithermal times just as in the earlier period north-central United States and the far northwest were part of a single diffusion sphere. The picture is not greatly clarified by this revelation, but it does permit the formulation of certain problems. Cultures of the Middle Prehistoric Period in the Plains are thought to have moved into the area from the northern Great Basin. At the same time, they are generally somewhat younger than most of the Northwest Microblade tradition sites appear to be. This suggests that the connecting links will be found in the Plateau and along the cordillera. Quite likely this will be proven one way or another by Cressman's<sup>2</sup> and Borden's current work at 5 Mile Rapids and the Frazer Canyon site. On the other hand, connecting links along the eastern Plains-forest border are also indicated; this is an extremely interesting possibility, if only because this route is a likely one for the transmission of ceramic traits between the far northwest and the eastern Woodland, during the time period being considered.

I've left the question of cultural boundaries until last, because it is most difficult to deal with, and in some respects, most important. There seems to be a boundary between the high plains and the prairie east of the 98th or 100th meridian during the Middle Prehistoric Period. Another may be found somewhere in the Plateau, which will delimit the southern extension of microblade industries—but defining the southern limit of the Northwest Microblade tradition viewed as a set of associated types, may be more difficult. At present, there is even less clarity about boundaries east of the Rocky Mountains and north of Colorado and Nebraska.

In conclusion, I would observe that this review has turned up very little evidence for migrations except on a relatively local scale as in the case of the Middle Prehistoric Period cultures which may have come from the Basin. In general, neither in the Plano complex nor in the

<sup>2</sup> I have not yet studied thoroughly Cressman's 1961 report in this connection, but at present see little trace of the projectile types common to the far northwest and the central U.S. in the 5 Mile Rapids material.

later cultures are there clear geographic boundaries south of the northern treeline. Certain types occur throughout a vast area, but this raises, rather than settles, problems of taxonomy, for the uniformity of culture that this might be taken to imply in a small area is difficult to accept for such large parts of North America. The main point that emerges from the foregoing is the evident fact that some specialized aspects of technology were shared by the central and far northwestern part of North America. These may be clues that will lead to the recognition of other, more significant cultural exchanges between these two areas.

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Not for Resale

# THE EARLIEST ALEUTS<sup>1</sup>

by

W. S. LAUGHLIN

The Aleutian Islands are unique in being the home of two species of tool-using mammals, sea otters and humans. Though both of them ate enormous quantities of sea urchins, the Aleuts cramped the symmetry of this nutritional triangle by eating the tool-using sea otters as well as the sea urchins. In fact, the Aleuts added insult to injury by using the bones of this small tool-using mammal for making tools, thus insuring their position at the apex of this triangle. The nutritional scheme involving these three forms reflects the richness of the intertidal zone in the Aleutians. The abundance and accessibility of foods in this zone reflects in turn the general absence of winter sea ice. The absence of winter sea ice in turn permitted the elaboration of kayaks and year round pelagic hunting. Both the intertidal zone and the pelagic zone were accessible to the earliest Aleuts who entered the chain by boat, necessarily, and have continued to shape and reflect the physical and cultural evolution of the Aleutian Islanders for some four thousand years. The ecological base explains in large part the long, continuous and rich development of this old division of Eskimo-Aleut stock.

An inventory and objective description of the earliest skeletons, associated artifacts and faunal remains is considerably enhanced by an interpretation utilizing contemporary data. Such contemporary data can be reliably used where there is demonstrable evidence of: a) continuity in the presence and habits of the sea mammals, birds, fish, and of the foods secured in the intertidal zone; b) maintenance of generally similar physiographic conditions; c) continuity in the physical characteristics of the human population; d) continuous occupation as witnessed in the successive strata within archaeological sites and between contiguous sites on the same bay; e) continuity in the artifactual record with only minor alterations, involving no significant additions or deletions indicating a significant change in the way of life or exploitation of any ecological niche; and f) simplicity or rigorously limited alternatives for origins, direction of migration and, correlatively, absence of contaminating influences from unknown quarters. It has been possible, under these con-

<sup>1</sup> This paper has been read by Christy G. Turner, II, project supervisor of the 1962 excavations in Chaluka. Though these materials have not yet been analyzed there will likely be no major revisions though there will be some interesting additions. Dr. R. F. Black, Department of Geology, University of Wisconsin, notes that the site rests upon an ashfall on the 2-3 meter terrace of the post-glacial thermal maximum. The Anangula lamellar flake industry lies under four ashfalls of which the youngest is the Chaluka ash. Its antiquity may therefore be extended considerably whereas the oldest occupation of Chaluka cannot exceed some 5,000 years ago.

ditions, to excavate the earliest skeletons without exhuming notions concerning inland origins of Arctic Mongoloids and their marine culture. From the linguistic data it has been possible to infer time depth (some 4600 years to the separation of Aleut and Eskimo from a proto-Eskimo-Aleut base) and to see the westward direction of migration in the movement of the central and eastern dialects. Two radiocarbon dates from 60 cm and 85 cm above the native sterile floor of Chaluka yield confirming dates of  $3750 \pm 180$  and  $3600 \pm 180$  respectively. Close genetic affinities with Eskimos and other Mongoloids, rather than with American Indians, are attested in the serological data as well as in the dental and other morphological facts. Methods of hunting and the kinds of gear used, derived from ethnological studies has been combined with zoological studies of the behavior of sea mammals to interpret the remains of such mammals in the middens, i.e., the fact that sea lions haul up in rookeries and were hunted in different ways, with larger harpoon heads than sea otters, or the fact that whales were wounded with small harpoons, or spears. The uses of many excavated artifacts such as wedges for splitting driftwood, or the image of the diety, *kaadargaadar*, is reliably inferred from the surviving uses of such artifacts. Contemporary studies therefore have borne much relevance to forming an integrated interpretation of the first inhabitants, their way of life and their affinities. The employment of contemporary data (1741 to 1961) has likely been more meaningful and realistic in the Aleutians than in continental or less circumscribed areas owing to the various continuities, the restricted entryway for genetic and cultural traits, and the linear distribution of some one hundred occupied islands and the Alaska Peninsula.

#### DELIMITATION AND CHARACTERIZATION OF THE ALEUTIAN AREA

In summarizing our knowledge of early events in the Aleutians and of their relationship to other areas inhabited by genetically related people, the physiographic and ecological aspects are of primary importance. The natural environment provided the anvil on which each group of immigrants had to hammer out its mode of adaptation. The Aleutians are correctly seen in three aspects: 1—as an appendical area for the movements from the Alaska Peninsula, 2—as a filter for sea mammals, birds and fish moving between the Pacific Ocean and the Bering Sea, and 3—as a zoological garden of considerable variety and relatively long term stability. Using this evidence, with the genetic and linguistic, we have confirmed the Alaskan origin of the Aleuts and ruled out any direct Asiatic contact, excepting of course the convenient “vanishing boatmen” who are periodically conjured from some Asian shore bearing some particular trait, i.e., pots, red hair or an ornamental design, which they dutifully tended a conveniently receptive group and then obligingly vanished, whether in an orgy of hybridization, mass murder or homesickness re-



mains equally intangible. In fact the authors of Aleutian culture are tangible and well represented in skeletal remains.

The Aleuts were sealed into their 1250 mile appendix by the Konyag Eskimos of the Alaska Peninsula and Kodiak Island. They adjoined each other on a line running across the Peninsula from Port Moller on the north to Kupreanoff Point on the south. Where the line of separation lay in earlier times is not now known though the presence of winter sea ice and shallow depths in the Bering Sea which occur near here may have contributed to the differentiation of Eskimo and Aleut. The absence of whales in the shallow eastern Bering Sea, the presence of greater numbers of walrus on the ice, and the necessary adaptations for winter ice hunting are among the obvious differences. The Aleuts, in contrast, occupied an area of deeper waters with little or no winter sea ice, an abundance of resident sea otters, sea lions, many whales and a richer more accessible intertidal zone. The Konyag Eskimos, though morphologically and serologically very similar, present many cultural differences such as the manufacture of pottery and kneeling in their kayaks. Archaeological evidence indicates the earliest Konyags did not have pottery, but their peculiar method of kneeling in the kayak cannot be excavated nor inferred from contemporary evidence.

At their western extremity the Aleutians are separated from the Commander Islanders by 180 miles of deep water. These islands, Bering and Medni, in turn are separated from the Kamchatka Peninsula by 90 miles with no intervening reef systems. No pre-Russian occupation of the Commander Islands has been discovered in spite of a fair degree of examination by Steller and other members of the *St. Peter* stranded there in 1741, by L. Stejneger in 1882-83 and in 1895, by N. Grebnitski, a governor of the islands, by A. Hrdlička in 1938, nor by the Aleuts resident there since 1826. Instead, Bering Island was lavishly endowed with a remarkably diverse fauna including large flocks of eiders (*Anas stelleri*), ptarmigan (*Lagopus lagopus*) and the flightless, spectacled cormorant (*Phalacrocorax perspicillatus*) which provided food in generous quantities; sea otters (*Enhydra lutris*) quite unafraid of the arrivals; fur seals (*Callorhinus ursinus*) arriving at their rookeries the following spring; sea lions (*Eumetopias jubata*); blue fox (*Alopex lagopus*) whose burrows they enlarged for house pits; harbor or hair seals (*Phoca vitulina*) and the unusual sea cow (*Hydrodamalis gigas*, Zimmerman) which provided the best meat supply for them and for many succeeding Aleutian expeditions. Annual runs of salmon and a rich supply of other fish also reflected the ecological wealth of Bering Island.

Steller was convinced by the fearlessness of the sea otters, who had approached his boat, and of the blue foxes who sniffed and snapped at the newcomers, that he had come to a land where the animals had not

yet made the acquaintance of man (Stejneger, 1936: 317). The existence of two unique species, the herbivorous, lethargic sea cow and the flightless spectacled cormorant, large enough, "so that one single bird was sufficient for three starving men," (Stejneger, 1936: 351), is equally telling. The sea cow was exterminated in only 27 years, and the cormorant about the year 1850. It seems likely that if any of the people who have inhabited the coasts of the Bering Sea had found these two islands they would have exterminated the sea cow with equal promptness, or have established a balance so that both would have survived. The nature of the Commander Island fauna is formidable evidence against occupation by humans, either from Kamchatka, the Kuriles or the Aleutians prior to their discovery in 1741. Attu Island was the blind end of the Aleutian appendix.

As a filter the Aleutians channeled the movements of two major sources of food, fur seals and whales. Each spring some 1,200,000 fur seals swam through the Aleutian passes and again in the fall, with an additional 600,000 born on the Pribilof Islands. There is tentative evidence that some fur seals were resident in the Aleutians as well as passing migrants (Murie, 1959: 307). Use of this convenient food supply is well attested in the middens from the lowest levels. The islands were also ideal shooting stations for whales. Our knowledge of whales was considerably enhanced by the excellent study of Chamisso (1824) who spent several months on Unalaska in 1817 and procured wooden carvings of the whales hunted by the Aleuts and information concerning their food and fabrication uses. They were familiar with the Pacific Right whale (*Eubalaena sieboldii*), the Bowhead (*Balaena mysticetus*), the Gray whale (*Eschrichtius glaucus*), the Finback (*Balaenoptera physalus*) the Sei whale (*Balaenoptera borealis*), the Blue whale (*Sibbaldus musculus*) the Humpback (*Megaptera novaeangliae*), the Sperm whale (*Physeter catodon*), the Pacific killer whale (*Grampus rectipinna*) and other *Delphinidae* and *Ziphiidae*. It seems clear that the Aleut hunters preferred small whales to large ones, and young rather than old. The Humpback whale was extensively hunted, especially the calves. However, the Aleuts enjoyed the dividends of a large and complex coastline and secured many stranded whales. Whales were utilized extensively from the earliest times forward, but there is no certain way of distinguishing those who died of natural causes from those that had been wounded or killed outright by the Aleuts. Many of these whales, possibly most, were stranded after wounding. Often a wounded whale drifted up in the exploitational area of another village than the one from which the hunters had come. This retrieval by other villages was a very important source of 'unearned increment' and distinguishes the Aleutians from most other Eskimo areas with more sparse population and greater space between villages.

Viewed as a zoological garden the Aleutians were lavishly endowed with large numbers of many species and equally important, with a year-

round distribution that insured against starvation. Beginning with the reef system, characteristic of all major villages, there were, and are, sea urchins, limpets, whelks, mussels, chitons, fish, octopus and algae easily accessible to women and children as well as the aged of both sexes. Driftwood and clams, the latter found on sandy beaches, may also be enumerated among the products of the intertidal zone. Salmon, of four species, filled the fresh water streams each summer. Cod fish and halibut were usually caught with compound fishhook. Owing to the use of boats halibut and other deep water fish could be taken at all times of year.

Among the sea mammals the sea otter demands special attention owing to its habits and therefore availability to the earliest inhabitants. It can breed the year round, it usually inhabits the kelp beds close to shore and climbs up on land during storms. As a consequence it could be clubbed on land as well as harpooned at sea and caught in nets. Sea otter bones comprise some twenty per cent of all mammal bones in the lower levels. They were a very important source of food, clothing and material for bone tools. Harbor seals were always important and are well represented in the archaeological remains. Perhaps more important, considering their greater size, was Steller's sea lion. The larger harpoon heads with stone end blade were used on these and in fact, one specimen, the left humerus of a large male, has been found with the broken obsidian point embedded in the internal tuberosity. Fur seals were killed in quite large numbers. Skull fragments, especially temporal bones, of the seals are common and suggest no serious observance of the practice of throwing the heads back into the sea. The fact that many animals were immature and the skull consequently became disarticulated, and that the brains were frequently removed, has likely suggested a deficient number of skulls. The sea lions hauled up in rookeries where they could be clubbed as well as harpooned. They appear always to have been a mainstay of Aleutian life.

Some twenty species of birds have been identified from the Chaluka midden. One man living in the modern village of Nikolski provided the names and identification of 104 species of birds. The earliest Aleuts clearly utilized large numbers of cliff nesting Murres and Puffins. These, with the Shearwater, the Glaucous-winged Gull and the Yellow-billed Albatross comprise a majority of the species identified. Use of eggs may be reliably inferred. These were taken in large numbers until recently. For this reason small offshore islands constitute an important part of the local habitat.

#### *Artifacts and Technology of the Earliest Aleuts*

Drawing primarily but not exclusively on the contents of the lower two-fifths of the old village midden of Chaluka, Umnak Island, the basic

artifact inventory can be described. Differences between large and permanent winter village sites with many burials as opposed to summer fishing sites generally show a smaller inventory in the more limited summer sites, though they were often used to some extent for winter habitation by a few people. Style variations are characteristic of different regions within the Aleutians as well as different time periods. The ivory carving of the western and central Aleutians, for example little figures or animals, is distinctive, as are the long serrated thrusting points of Kiska.<sup>2</sup> A greater proportion of toggle head harpoons may have been employed in the Near Islands but this comparison can not now be made on a quantified basis and a generalization for all the islands would be premature. What does stand out is that all the ecological niches were exploited from the earliest times to the present. There is no variation in the artifact record which would permit the inference that the way of life had changed. There are many style changes within the same site and between sites. Aside from the obvious relationship to the principal products of the area, more fish and fewer birds or mammals at certain sites, there has been no major deletion or addition in the instrumentation for exploiting the rich ecological base. The variety of niches required a variety of weapons and most of these were partially or wholly made of bone. Most of this bone is whale bone and attests in itself the extensive utilization of whales by the first occupants. The use of whale bone in burials, sometimes simply a skull placed between two whale ribs, indicates a high regard for whales. It is not possible to identify whale bone from a harpooned whale as opposed to one that died of natural causes and subsequently stranded. The amount of whale bone, the varied uses of whale bone including its use in burials, and the well known whaling of the later Aleuts provides strong grounds for inferring the practice of whaling. Many of the harpoon heads, and of the projectile points, are eminently suitable for whaling though no single class can be definitely identified with whaling. In the case of sea lion there is, in addition to extensive skeletal remains, one left humerus with an obsidian point embedded in it. This kind of point was inserted in the harpoon heads with end slot and provides excellent proof of actual harpooning.

Listed by major classes the artifacts are:

*Stone*

bolas  
net sinkers  
projectile points  
thrusting points  
ulus, chipped stone

*Bone and Ivory*

Compound fish-hooks  
spearheads (including three  
pronged bird spear)  
harpoon heads (including toggle-  
heads)

<sup>2</sup> Mr. Alan G. May has accumulated excellent records, with drawings and photographs of regional variation in the Aleutians, based on three seasons with the Smithsonian field parties and one with the Peabody Museum, Harvard, Aleutian Expedition.

tanged knives	foreshafts
choppers	two-piece sockets
non-lamellar scrapers and graters	wedges
lamellar scrapers and graters	awls, pins, etc.
drills	sea otter bone tools
adze-blades	flakers
pounding, grinding and polishing stones	labrets
paint metates, rubbing stones and red ochre	image of the deity
lamps	adze-heads
pots (stone dishes or bowls)	bone dishes
house wall stones	root diggers
lamps	needles (including eyed)

From this general inventory we can synthesize several characteristics of the manufacture of the artifacts and of the technological system. The latter becomes meaningful when the faunal remains are correlated.

#### 1—Techniques of stone working:

Though some polishing may be seen on adze-bits, the result of use primarily, the practice of shaping cutting edges by grinding does not appear until the arrival of the Neo-Aleuts and then is associated most clearly with ground slate blades. Chipping was the predominant manufacturing technique. Scrapers and graters made on prismatic flakes struck from polyhedral cores are an important characteristic of the earliest occupation. Of 69 lamellar graters and scrapers 77% were found in the lowest two-fifths of the excavation at Chaluka. In proportion to other stone tools, projectile points, knife blades and adze blades, they constitute 31 per cent of the total in the lowest one-fifth and 23 per cent of the total in the next fifth of the deposits (Laughlin and Marsh, 1956). Polyhedral cores have been found, along with lamellar flakes ranging in size from micro- through meso- and macroblades, at a manufacturing site on nearby Anangula Island (Laughlin and Marsh, 1954). Throughout the Aleutians a relationship between size and form of stone artifact and the nature of the stone used can be seen. Some artifacts, such as the green stone points and scrapers, appear to be limited by the small size of the original pebbles and cobbles from which they are derived. Thinner and smaller lamellar flakes are made of harder materials (chert-cherty shale, basalt and basalt andesite, and obsidian) whereas thicker and longer flakes are more often made from softer materials (limy chert and cherty shale). An interesting association between tool type and material observed at Chaluka was the increase in chipped knife blades from bottom to top, most of these being made of basalt. Obsidian appears to

have been more commonly used in the earlier periods. To date it appears that all the obsidian in the Aleutians comes from a site inland from Cape Chagak (named after the Aleut word for obsidian) on the northwest end of Umnak Island.

## 2—Heavy wood-working industry:

The first people to enter the chain had a well developed heavy wood working industry. The adze blades, whalebone heads and the pounding stone or mauls, together with the abundance of whalebone wedges, indicate extensive use of driftwood. This agrees with the fact that seasoned, straight-grained wood was needed for boats, (presumably both kayak and umiak). The insular habitat happily permits reliable inference of boats. Sixty seven per cent of 45 adze blades were found in the lowest two-fifths of Chaluka. Other uses of wood, as shafts for the spear heads and harpoon heads, are satisfactorily indicated but no osseous or lithic remains permit the same strong inference of wooden dishes and planks which were common and important at the time the Aleuts were discovered. Wooden hats of two types and also the large masks might be inferred from contemporary distribution but the archaeological evidence is clearly lacking. The first migrants undoubtedly found a large supply of accumulated driftwood. Ethnological sources suggest that in some areas, related to coastline and number of villages, there was a dearth of driftwood. Population size was obviously important here as elsewhere to the collection and utilization of natural resources.

## 3—Trends in harpoon and spear heads:

The earliest occupants showed a clear preference for harpoon heads with end slots for straight based points. In this case there is good correspondence between the chipped points, the harpoon heads, and the sea lion bones. Tanged projectile points with square butt in the middle two-fifths of Chaluka comprise 62 per cent of the points of this style. Corresponding to this 77 per cent of the harpoon heads of style H-3, detachable, fluted, with end slot, are found in the same levels. The manufacture and decoration of harpoon heads is characterized by precision and careful finishing. A circle and dot design appears before the level marked by the 3,018 yr. carbon-14 date, approximately one meter above the floor of the site, in the lowest fifth of the Chaluka site. Surface design more often consists of a few parallel incised lines. Interestingly no socket pieces large enough to accommodate the slotted harpoon heads of styles H-3 or H-4 have been found in the lower levels. The possibility that they were inserted directly into a reinforced wooden shaft must be considered. The earliest style of three pronged bird spear carried especially long side prongs, often made of ivory.

The early Aleuts arrived with a wide variety of weapons suitable for birds, fish, pinipeds, sea otter and whales. Their success in hunting these is well indicated in the abundant faunal remains. Styles changed but the basic categories apparently did not.

#### 4—Houses:

Excavations in a number of sites, though limited in scope, do not provide the well marked stratigraphic dislocations associated with the excavated, semi-subterranean houses known to be in use at the time of Russian conquest in 1741. Oval rings of large flat stones, standing on end, suggest a radically different kind of house, possibly a tent. Complete excavation of such oval rings and the area about them must be completed before their identification is satisfactory. At this time it is also possible that such features represent the inner border of sleeping platforms.

#### 5—General characterization of the early technology:

The critical elements identifying the earliest assemblages as those of a generally Eskimo material culture are: 1—harpoons, (toggling and simple detachable), 2—fish spears, 3—pronged bird spears, 4—chipped stone ulus, tanged knives, 5—lamps, 6—labrets (medium to large medial labrets), 7—fishhooks and, 8—bolas. Skin boats and throwing boards may be inferred. Many other items, such as the use of red paint, bone clubs, lamellar flaking, and the wood working industry are also characteristic but not diagnostic of an Eskimo material culture.

#### *Absences:*

Pottery, sleds, burins, bladder nozzles, and equipment associated with ice hunting (ice picks, etc.) are missing. It is possible that pottery was traded to a major village center such as Unalaska, but there is no evidence that pottery was ever manufactured in the Aleutian Islands. The ice hunting equipment and sleds were of no utility in the islands though the sled may have been used on the Alaska Peninsula within the Aleut area. The dog, however, was introduced by the Russians. Inflation nozzles for skin floats appear only in the later deposits along with the ground slate blades, late style shallow stone lamps, the long single-piece sockets, the small sea-otter points and the throwing board with ivory engaging pin. Ear plates of the wooden hats, have not yet been found archaeologically.

#### *Correspondences in Faunal Remains:*

Two noteworthy characteristics of the Aleutian occupational sites are the abundance of faunal remains, actually composing a major portion of the old village sites, and a correspondence between the excesses or de-



ficiencies of particular bones of certain animals and their fabrication into tools. For inventory purposes all the ecological niches are represented. The ecosystem was not only rich and complex, but exploited with thoroughness of which the large series of mammal, bird, fish and mollusc remains are the tangible evidence. Whalebone is common from the earliest time, but species identification, except in the case of sperm whale teeth, has not been possible on the basis of the utilized or fragmentary remains. Dr. W. G. Reeder has identified, in addition to the expected hair seal, sea lion, fur seal, sea otter and porpoise, a large series of birds. Among these the albatross, especially the short-tailed albatross, is of particular interest owing to its southern distribution. Dr. Karl Kenyon, of the U. S. Fish and Wildlife Service, has also reported an unusually large number and proportion of albatross bones from sites on Amchitka Island. Shearwater, puffins, cormorants (including the Asiatic cormorant), ducks, gulls and eagles were the principal birds hunted. Sea urchins, limpets, whelks, mussels and clams are generally abundant in approximately this order. Chitons probably belong near the end of this list.

Likely examples of correspondences which may prove to be very useful when confirmed and extended by further analysis have been found in the deficiency of sea otter fibulae and in the excess of hyoid bones of the hair seal and the sea lion. Of 287 sea otter bones excavated in 1961 at Chaluka, there were 33 femora, 39 tibiae, and 2 fibulae. Other portions of the skeleton were well represented with the exception of the foot. Owing to the fact that the foot was not utilized, unlike that of the sea lion, it was likely discarded where the sea otter was butchered. The difference in numbers between the femora and the tibiae does not seem significant, but the paucity of fibulae does. Recognizing the fact that the fibula is a relatively slender bone, that it might more often be broken and the fragments not recovered, the number still seems much too low. There is no known butchering technique that separates the tibia from the fibula, the limbs most often being disarticulated at their joints. A possible explanation lies in the known use of the sea otter fibula as an awl, of which some identifiable specimens have been recovered, with the inferior or distal articular surfaces remaining.

Similarly a possible explanation for the excess of hair seal and sea lion hyoids lies in the extensive use of the oesophagus of these particular animals for rain proof parkas (*kamleika*) and pants. An alternative explanation is the dietary use of the tongue with a butchering technique that removed the hyoid with the tongue.

There is slight, tenuous indication that larger sea otters were killed in later periods. If this difference becomes statistically significant when larger numbers have been measured (the femora are currently being used) the intriguing question of an evolutionary change in the size of the sea otter or a cultural preference for larger or more mature sea otter will

remain. The possibility that a system of conservation was practiced constitutes an intriguing question.

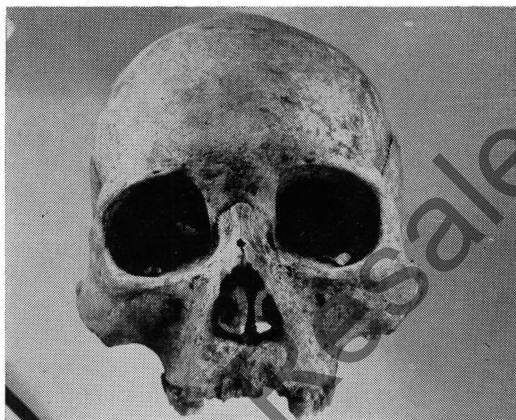
Preliminary investigations of the faunal associations indicate that the earliest Aleuts secured everything that was edible, from whales to whelks, and that their basic dietary interests and the technological system they employed to satisfy them, has not changed appreciably in four thousand years. Variation in numbers between sites and fluctuations over time are certainly present but these reflect the immediate habitat and not the ecosystem as a whole. Of the four easily secured foods: eggs of a wide variety of birds, algae, molluscs and stranded whales, only the mollusc shells and whale bones are registered in the archaeological remains. Bird eggs were very important in the diet and had the further advantage over some other food sources in that eggs collected from laying birds, cormorants and sea gulls for example, were replaced by the bird so that the population of birds did not suffer in consequence but produced a greater number of eggs. Additionally, eggs were stored for long periods and thus could be used when wanted and at especially judicious times. The 18th, 19th century and continuing use of bird eggs can be inferred into the past, as can the use of algae. The bird bones found in the sites and the inferred use of eggs can be usefully related to another archaeological fact, the absence of foxes. Thus, one important predator of eggs and young birds was not competing with the earliest Aleuts for this choice food supply.

#### SKELTAL CHARACTERISTICS

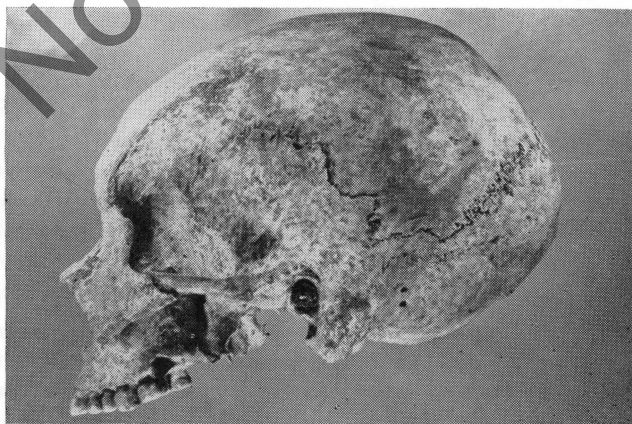
The earliest skeletons (Paleo-Aleuts or pre-Aleuts of Hrdlička) are easily recognizable as Mongoloid, differing much from the various central and eastern Eskimo types, but with some marked similarities to the Ipiutak people and to the Paleo-Konyags. Similarities to Alaskan Indians can not yet be elucidated owing to the paucity of early Tlingit or Athabaskan skeletons. The possibility that the earliest Aleuts and Konyags, as well as other early southern and western Eskimos show more similarities with early American Indians than do the later populations in the same areas could, if true, reflect incipient or partial differentiation between the Mongoloid Eskimo-Aleut stock and the American Indians. That differentiation has increased with time is likely but such an observation must await further evidence. There is no area within the distribution of this Mongoloid stock which has remained constant for as much as one thousand years.

Those traits which identify the Paleo-Aleuts as Mongoloid include the large cranial capacity, high frequencies of the mandibular torus, palatine torus, dehiscences of the tympanic plate, tendency toward round and tubular auditory meatus with absence of exostoses, shovel shaped incisors, Y-5 pattern on the first lower molars, broad medial and lateral incisors, large face, simple sutural patterns, high orbits, separate neural arches and

short tibia. The Paleo-Aleut cranium is characterized by dolichocrania or low mesocrania. The range of cranial index for sixteen crania from the older eastern portion of Chaluka, males and females, is 64.95 to 76.44. Recovery of the male Paleo-Aleut shown in Figs. 1, 1a, 1b, with a cranial index of 71.14 places the mean for eight male crania close to 73. Easily seen is the marked occipital protrusion with an especially marked crista



*Fig. 1.* Paleo-Aleut male from upper levels of eastern end of Chaluka. Burial included red ochre on skull, harpoon heads and two-piece sockets. Cranial length 194 mm., breadth 138 mm., cranial index 71.14.



*Fig. 1a.*

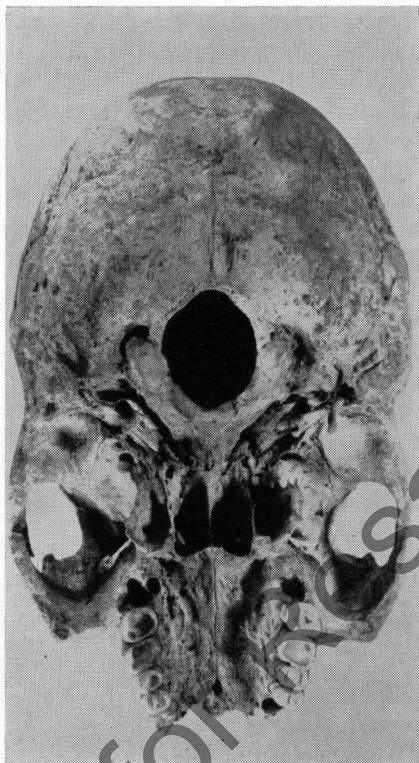


Fig. 1b.

occipitalis externa dividing the nuchal plane into distinct halves. This trait appears poorly developed in the later Neo-Aleuts as is the occipital protrusion.

The cranial index offers a quick summary of stability and change in the Aleutians:

*Sequence of Cranial and Cephalic Index*

	n	Male		n	Female	
		range	mean		range	mean
Eastern Aleuts (cephalic index of living)	17	81.0 - 89.0	84.62	17	78.0 - 91.0	84.32
Kagamil mummies	11	75.8 - 85.2	81.41	9	79.4 - 86.9	83.41
Chaluka: west end	6	74.4 - 85.1	78.8	4	75.1 - 87.1	80.9
Chaluka: east end (earliest)	7	69.8 - 76.4	73.8	8	64.9 - 74.2	71.3

Two interesting points stand out in this sequence table. First, there is a substantial difference between the earliest inhabitants of Chaluka, beginning below the 3,000 yr. carbon 14 level, and the present inhabitants.

Second, the time span represented in the eastern end of Chaluka, most likely some three thousand years or more, indicates the persistence of the Paleo-Aleut physical type through a number of changes in artifact types culminating near the surface with a male burial containing two-piece sockets and harpoon heads of type H-8. The west end contains both Paleo- and Neo-Aleuts that could likely be sorted out morphologically with accuracy, but may represent a mixing of populations that took place in the later occupation of this site. Burials with diagnostic artifacts would constitute the most useful evidence bearing on the question of evolutionary change within the Aleutian Island population continuum as opposed to the arrival of migrant Neo-Aleuts who had evolved into their *pronouncedly brachycephalic and low-valuted form farther to the east*. The evidence from one site, moreover, is insufficient to deal with such a question for a conservative village group might well be deviant from neighboring groups. The skeletal material from Krugloi Point, excavated by Dr. A. C. Spaulding, indicates presence of a predominantly Paleo-Aleut group. The lower levels of this site were dated at 2,630 B.P. (Spaulding, personal communication).

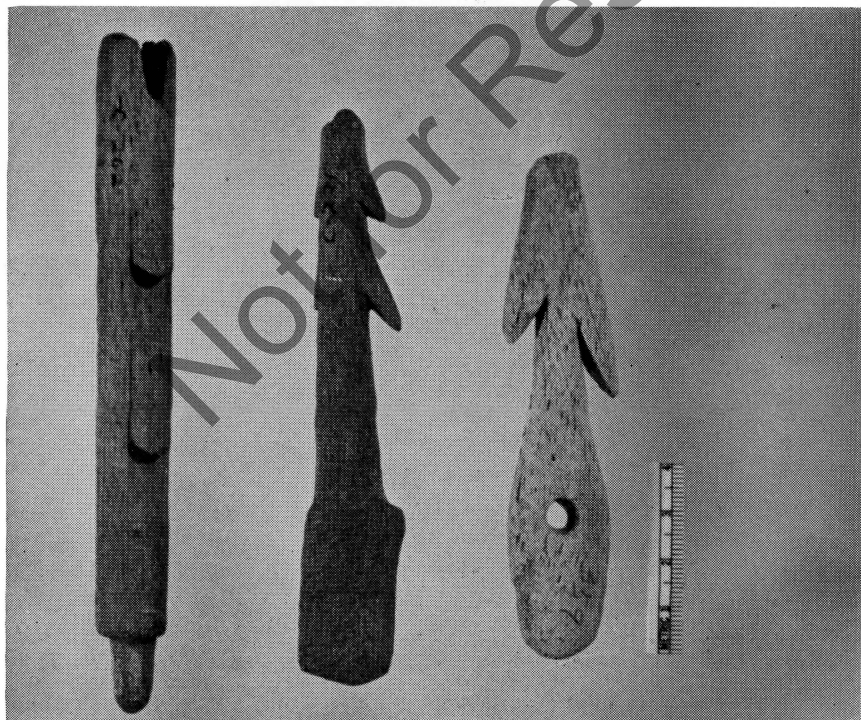
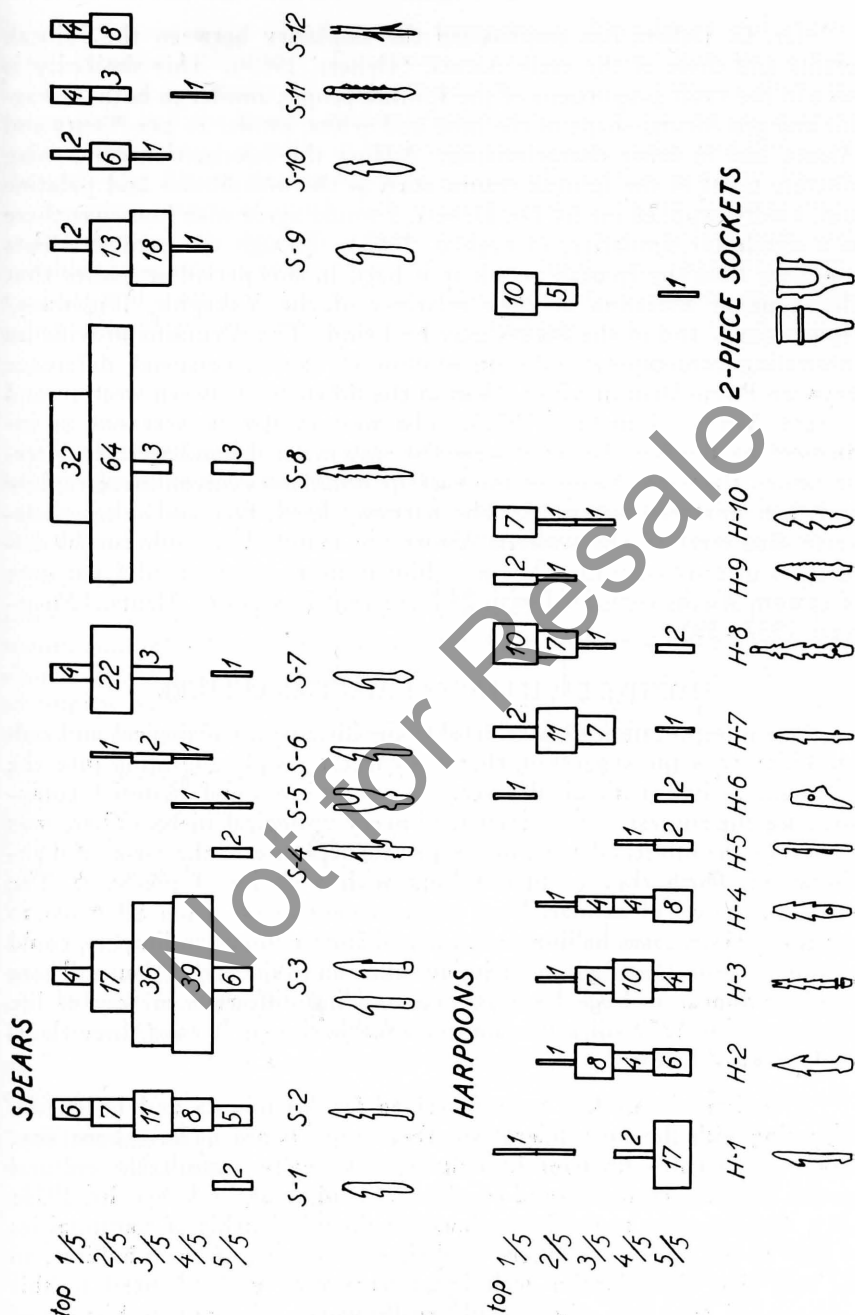


Fig. 2. Harpoon heads: (left to right) H-3, H-2, H-4. From lower levels of Chaluka, eastern end.





Dr. G. Debetz has emphasized the similarity between the Ipiutak crania and those of the early Aleuts, (Debetz, 1959). This similarity is seen in the vault proportions of the Ipiutak people, similar to both Yukaghir and pre-Aleuts; shape of the nose and orbits, similar to pre-Aleuts and Aleuts, and in other characteristics. Adding the information concerning discrete traits of the Ipiutak crania, such as the mandibular and palatine tori, kindly supplied me by Dr. Debetz, I would agree with him that there is a significant similarity, (Laughlin, 1962). Though the earliest Aleuts are older than the Ipiutak people it is back in this period or earlier that the common ancestors or close relatives of the Yukaghir, 'Tigarians,' 'Ipiutakians,' and of the Aleuts may be found. The Aleutians provide an interesting contemporary documentation of the successional difference between Paleo-Aleut and Neo-Aleut in the difference between western and eastern Aleuts, (Laughlin, 1951). The western Aleuts were not as influenced by the Neo-Aleuts as were the eastern, or depending upon interpretation, the early Aleuts in the eastern Aleutians evolved more rapidly and then migrated westward. The narrower head, face and other transverse diameters of the western Aleuts are matched by substantial differences in discrete traits. The mandibular torus occurs in 61.4 per cent of eastern Aleuts compared with 25.7 per cent in western Aleuts, (Moorrees, 1957: 59).

#### ADAPTIVE EXCELLENCE OF ALEUTIAN CULTURE

One interpretation of considerable significance for biological and cultural history is the suggestion that the earliest people migrating into the Aleutians arrived with all the necessary techniques and material equipment for the successful exploitation of every ecological niche. There was no part of the intertidal zone, of the pelagic area, nor of the terrestrial environment which they could not hunt with a choice of methods. The entire size range of animals from whales to sea otters, from albatross to humming birds, from halibut to trout and from octopus to limpets, could be handled with the adaptive techniques known to the early Aleuts. There does not appear to have been any outstanding difference in way of life over the entire 1250 miles, nor any remarkable change in over three thousand years of history.

A similar picture has been described for Micronesia and Polynesia. Beginning with the early migrations there appears not to have been any, really "remarkable changes in culture, any really remarkable cultural growth comparable to those of continental land areas," (A. Spoehr, 1953: 143). Spoehr offers as partial explanation the relationship of communities of men to the limited resources of their endowment, of their habitat, to the fact that the adaptive techniques were very well adjusted to this habitat, and that few others would really work. The culture history of the Aleutian Islands appears to have followed a somewhat similar course.



In order to enter the islands it was necessary to have boats and a generally complex technology. The record of faunal remains indicates a persistence and continuity of exploitation. The cultural remains show no major shift and the human skeletal record indicates a population increasing in numbers and possibly in longevity, with a discernible morphological change. The Aleuts, having adapted successfully to this rich and diverse environment, expended much of their energy and interest in oral literature, aesthetic interests (especially well displayed in their polychrome and lavishly decorated wooden hats and visors; masks and basketry; ceremonials and games), in a well articulated empirical science with considerable sophistication in anatomy and medicine.

#### SUMMARY

1—The recognition, but not classification, of two successive populations in the Aleutians was accomplished by Dr. Aleš Hrdlička (1945). At the conclusion of his 1938 field season he expressed the view that the evidence for distinction between pre-Aleut and Aleut was unimpeachable.

2—It is likely that the population succession, a general event for all of southern Alaska for which data is available, is the result of evolution within southern Alaska, with local migrations and local refugia imposing sharp contrasts at various sites, as at Chaluka. Larger samples, especially of burials with diagnostic artifacts for dating, might reveal a gradual change from the earlier Paleo-Aleut into the Neo-Aleut.

3—Formal classification of the earliest Aleuts can not be definitive until more contiguous groups have been sampled. They are Mongoloid, they share a number of features with the Ipiutak people described by G. Debetz, and may be considered another variant within the polymorphic Eskimo-Aleut stock.

4—The excavations by a number of workers within the last twenty-five years has added to the picture of local variety within a systemic uniformity. These include the excavations of Helge Larsen at Dutch Harbor, Unalaska; Albert C. Spaulding at Krugloi Point, Agattu; Philip Spaulding at Tigalda; and W. S. Laughlin and colleagues at Chaluka, Anangula and other sites on or near Umnak.

5—The possibility of still older occupations than those now known, perhaps in zones comparable to the Kodiak Island refugium, can not be dismissed.

6—Constant exploitation of the environment is reflected in the faunal remains and in the artifacts. There do not yet appear to have been any remarkable changes in the way of life though there are many style changes. The abandonment of manufacture of the lamellar blades and

polyhedral cores has as yet no demonstrable consequences in ecological adaptation.

7—Regional variation within the 1250 mile range of the Aleuts is as yet poorly quantified. The distribution of a number of the basic harpoon and lamp styles characteristic of the earliest Aleut occupation on southern Umnak is not known. The authors of this local cultural expression, the Paleo-Aleuts (pre-Aleut of Hrdlička) are known to have occupied the entire area. Comparison of samples from a 1250 mile range with those from single sites or more localized cultures presents some theoretical problems not yet dealt with and relevant for both biological and cultural evidence.

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ADDENDUM: EXCAVATIONS AT  
ANANGULA ISLAND, 1962

(The information below, suggested for inclusion by Dr. Laughlin, was abstracted from a letter dated April 2, 1963 from Laughlin to the editor.)

Surface collections from Anangula (off Umnak Island) were reported in 1954. The material consisted most largely of polyhedral cores and the lamellar flakes or blades derived from them. Excavations undertaken in 1962 succeeded in locating an occupation horizon with these materials in place. Two radiocarbon dates have been obtained for this stratum:  $7,660 \pm 300$  and  $8,425 \pm 175$  years ago. At that time Anangula was joined to Umnak Island. Until at least 11,000 years ago Umnak was the end of the Alaska Peninsula. The pass between Umnak and the westward Islands of Four Mountains has always been open. At that time the Bering Sea Platform was far out in the Bering Sea. Nunivak, the Pribilofs, and St. Lawrence islands were inland hills. Because of the availability of marine resources it is likely the earliest and major migrations followed the edge of the platform.

Dr. M. Yoshizaki has examined the material and offers these observations: (1) Three burin spalls recovered from the Anangula site differs from burin by-products of the Arctic Small Tool Tradition, both in form and technique. (2) This kind of burin spall and burin are predominant in later stages of the preceramic cultures of Japan and northeast Asia (e.g., the Sakkotsu Micro-Brade Industry of Hokkaido and Budun site of Siberia of ca. 13,000 to 9,000 B.P.). (3) Radiocarbon dates indicate the Anangula stone industry is older than the Arctic Small Tool Tradition. The date and the burins suggest the possibility that the Anangula industry

was under heavy influence from the aforementioned preceramic Asian stone industries.

Although there is a time gap between Anangula and the lowermost levels of Chaluka there is a strong suggestion of some cultural continuity between the two.

The Paleo-Aleuts were probably the first people who moved down along the Bering Sea Platform arriving at its corner (Umnak) where they remained and prospered owing to the unusual wealth of faunal resources. Deglaciation proceeded from west to east; thus, some of the migrations and the gene flow was from Umnak eastward.

The general similarities between the Paleo-Aleuts and the Old Bering Sea and Ipiutak people are commensurate with the geographical separation and the greater antiquity of Umnak. The existence of substantial differences between Paleo-Aleuts and Paleo-Konyags suggest that more than one variant of Mongoloids came across on the Platform. A recent examination of five skulls from the Okhotsk culture reveals a number of similarities to Aleuts and western Eskimos. These similarities with those of Anangula to the preceramic industries of Japan do tend to enhance the likelihood of migrations from the Japanese area around the Bering Sea and out to Anangula Island. The proto Eskimo-Aleuts probably migrated in this manner. The bulk of the Indians had probably come over earlier following different routes, thus insuring the geographic separation necessary for differentiation of Eskimos and Indians.

Dr. R. F. Black who has conducted geological studies at the Anangula site thinks that the radiocarbon dates may be too young. Soil profiles and several overlying ash layers suggests greater antiquity.

# THE EARLY PEOPLING OF THE NEW WORLD

—as seen from the Southwestern Yukon —

by

RICHARD S. MACNEISH

Having just completed a first draft of a large manuscript concerning the archaeology of the southwest Yukon Territory, and having a personal inclination to quickly publish preliminary reports on my research, the request for a paper concerned with early relationships in Northwest America arrived at an opportune moment. Further, the opportunity to discuss some of my conclusions and speculations in print with my colleagues may very well enhance and necessitate beneficial changes in the final draft of the larger monograph.

In this article I shall briefly define the area of research, mention the sites discovered and gloss over the stratigraphic excavations. A drawing and two charts shall implement this meager data. Details on the above subjects will eventually be available in the monograph entitled "Preliminary Archaeological Investigations in the Southwest Yukon." Here, mention will only be made of the archaeological complexes and their artifact contents. The final part shall compare these southwestern Yukon archaeological complexes with those from surrounding areas and shall endeavor to bring the data to bear upon the problem of the peopling of the New World. This section, clearly labeled as speculations, I hope will foment discussion.

By definition, this volume is to be concerned with Early Man in the Western Arctic. By Early Man I mean nothing later in time than "Paleo-Eskimo," in other words before 1500 B.C. Exactly what is meant by Western Arctic was not well defined in our instructions. However, a glance at the various authors' use of the term would seem to define the area as somewhere west of the Mackenzie River and somewhere north of the 60th parallel in the New World. Basically, the problem is the peopling of the New World. I shall endeavor to approach the above subject and problem from the standpoint of my investigations in the Southwest Yukon Territory.

The part of the southwest Yukon investigated is that encompassed by a line from Burwash Landing to Carcross to Mayo to Dawson City and back to Burwash. Within this region 129 archaeological components have been discovered (MacNeish, 1958: 9 or MacNeish, 1960b: 591 for definition used below). Forty-two of these, for one reason or another, we are unable to classify as to cultural complex. Of the remaining classifiable sites, 62 came from single period sites. Only four of these were

briefly excavated. Eighteen of these single period sites were represented by large samples of artifacts that could be determined as coming from definite soil zones; nine sites with smaller samples came from well determined soil zones while the soil zones of four sites with large samples could not be determined; 27 sites with poor samples and no determinable soil zones were most hesitatingly classified as to cultural complex. Twenty-five components came from five excavated stratified sites and most of these had large samples of artifacts.

The *Gladstone Creek site* (JhVq-1) had artifacts that could be classified as belonging to the Kluane complex in the stratum under one with Gladstone type artifacts that in turn were under a stratum with a few Aishihik artifacts. The *Pelly Farm site* (KfVd-2) had two superimposed floors with artifacts of the Champagne phase under a floor with Little Arm, Gladstone, and Taye Lake complex artifacts, respectively. The *Little Arm site* (JiVs-1) had Little Arm materials under those of Gladstone which were in turn under those of the Taye Lake phase which lay below Bennett Lake remains. The *Canyon Creek site* (JfVg-1) had eleven superimposed floors or soil zones with a few artifacts in each. Some of the top floors seemed to have been of the Aishihik complex while the lowest one might be Gladstone but the others seem to have been Taye Lake. The *Taye Lake site* (JfVb-4) had Taye Lake remains under those of the Bennett Lake phase. About 5,000 artifacts came from these investigations of which about 4,000 came from 64 components of five phases or complexes that seem to have existed before 1500 B.C.

Analysis of the excavations and artifacts has revealed a sequence of seven cultural complexes or phases. The artifact types and complexes will be discussed in detail in the larger monograph. I shall, therefore, briefly mention but some of the salient features of the five earlier ones (of the relevant time period in this article).

The earliest complex, *Kluane*, is represented by only one component (Zone G) of JhVq-1, and only 19 artifacts occurred. However, the Lerma-like points, scraping planes, pebble choppers, split pebble choppers, and crude prismatic blades struck from polyhedral cores are distinctive features. The *Champagne* phase that follows is known from 13 components, only two of which were excavated yielding large samples of artifacts. Distinctive artifacts were Agate Basin-like points, and Pelly points (Mohave-like points) and points made from buffalo-rib bones, split pebble choppers, prismatic blades, end-of-blade scrapers, and keeled end scrapers, graters, Ft. Liard flake burins, and burins made on artifacts (either projectile points or end scrapers), and buffalo fibula awls. Their economy seems to have been based on big game (buffalo hunting). Following the Champagne complex and represented at 14 components is the *Little Arm* phase. Three of the excavated components netted over 1,200 artifacts.

FIGURE 1 - The Identifiable Components both from survey and stratigraphic excavation in the Southwest Yukon (underline broken considered possible components; solid underline probable components; others pure components)

Phase or complex	STRATIFIED SITES					Excavated probable or pure components	Probable components-- determined soil zone	Probable components-- no determined soil zone	Possible components associated with soil zones	Possible components not associated with determined soil zones	Pure components	Probable components	Possible components	TOTAL COMPONENTS
	JhVq-1 Gladstone site	KfVd-2 Pelly Farm site	JiVs-1 Little Arm site	JfVg-1 Canyon Creek site	JfVb-4 Taye Lake site									
BENNETT			Level 1-2		Level 1	JhVf-4	JhVf-9 JkUs-1 JbUq-1	JiVi-1 KeVd-1	KfVd-3 JbUq-5 JbUq-2	JhVf-3 JbUq-5 JbUq-2	2	6	5	13
AISHIHIK	Zone C			Floor 1 Floor 2 Floor 3			JiVi-3 JiVs-3 JhVf-5 KeVd-2			JaUe-1 JbUq-1		4	6	10
TAYE LAKE		Floor 1	Level 3	Floor 4 Floor 5 Floor 6 Floor 7 Floor 8 Floor 9 Floor 10	Level 2-3	IeSh-1	JiVs-5 JfVb-7 JfVb-5 JfVb-1 JfVb-4 JfVq-2			KiVc-1 KkVa-1 KfVb-1 KbVa-1 HjRv-1 JcVa-1 JcUq-1	3	10	12	25
GLADSTONE	Zone F3	Floor 2	Level 4	Floor 11?			JgVp-1 JeVc-1	JfVg-3	JiVj-5 JiVi-5	JiVj-3 JhVf-1	2	4	5	11
LITTLE ARM		Floor 3	Level 5			KkVa-2 LaVk-2	JeVi-1 JiVs-2		JiVi-2 JeVg-1	KeVd-3 KaVa-1 KjTx-1 JiVf-2 JhVh-1 JeVc-5	3	3	8	14
CHAMPAGNE		Floor 4 Floor 5					JeVc-3	KfVe-1	JiVj-4 JiVs-4	JhVf-6 KjTx-3 JeVd-1 JfVc-2 JbUq-6 JbUq-4	1	3	9	13
KLUANE	Zone G												1	1
TOTALS	3	5	4	11	2	4	18	4	9	27	11	30	46	87

Some artifacts that continue from the previous horizon are artifact burins, flake burins, split pebble choppers, gravers, keeled end scrapers, prismatic blades, and Agate Basin-like points. However, the Milnesand-like, Plainview-like, and small triangular points with an asymmetrical tang, multi-burins made on flakes, unifacial drills, serrated scrapers or saws, neatly chipped large plano-convex (turtle shell) end scrapers, burins made on microblades, and microblades made from tongue-shaped or conical polyhedral cores are diagnostic of this phase. Another big change from the previous horizon is that the subsistence now seems to have been based as much on lake fishing as on big game hunting and trapping.

This way of life (Northwest Microblade Tradition) and many of the artifacts continue into the next phase called *Gladstone*. This complex of artifacts was found at 11 components. Characteristic of this Gladstone horizon are: netsinkers, chitho scrapers, flat-topped and ovoid end scrapers, spokeshaves, retouched microblades, made not only from the cores mentioned previously but also from tabular cores, uni-barbed bilateral antler fish spears, as well as a number of new projectile point types. These include straight and contracting stem types (Destruction and Morhiss), side notched types with convex (Lockhart) or concave (Besant) bases, corner notched points with convex bases (Anderson), and a small lanceolate type with a concave base (Whitehorse).

Evolving out of the Gladstone phase is the *Taye Lake* phase. Although it starts perhaps as early as 2000 or 3000 B.C., it lasts for a long period of time and the later stages are after anything that can be considered "Early Man." Many of the Taye Lake traits continue from the Gladstone horizon. They include most of the projectile point types, the scrapers, the netsinkers, chitho and microblades. However, there are many differences because the tongue-shaped cores, Agate Basin-like points and most of the burin types are absent. Also, large crude blades outnumber the microblades; and tabular cores; crude bifaces, crude bifacial choppers and large rough plano-convex end scrapers are very prevalent; and half-moon side blades, notched end scrapers, beaver-tooth gouges, straight stemmed points with deep convex bases (Taye Lake points), antler hammers and perhaps ground three-quarter grooved adzes are new unique traits. Further, although the economy is still mainly based on lake fishing, river fishing appears and sites, generally speaking, are larger. The complex was found at 25 components and this is our best represented assemblage.

The final two phases of the southwest Yukon, *Aishihik* and *Bennett*, occurred within the last two thousand years and are not relevant to this paper.

While the chronology of the region is based on good solid stratigraphy, the dating of the sequence is more complicated. In fact too complicated to be dealt with in any detail in this summary statement. The details will be given in the final report on the southwestern Yukon. For the moment let



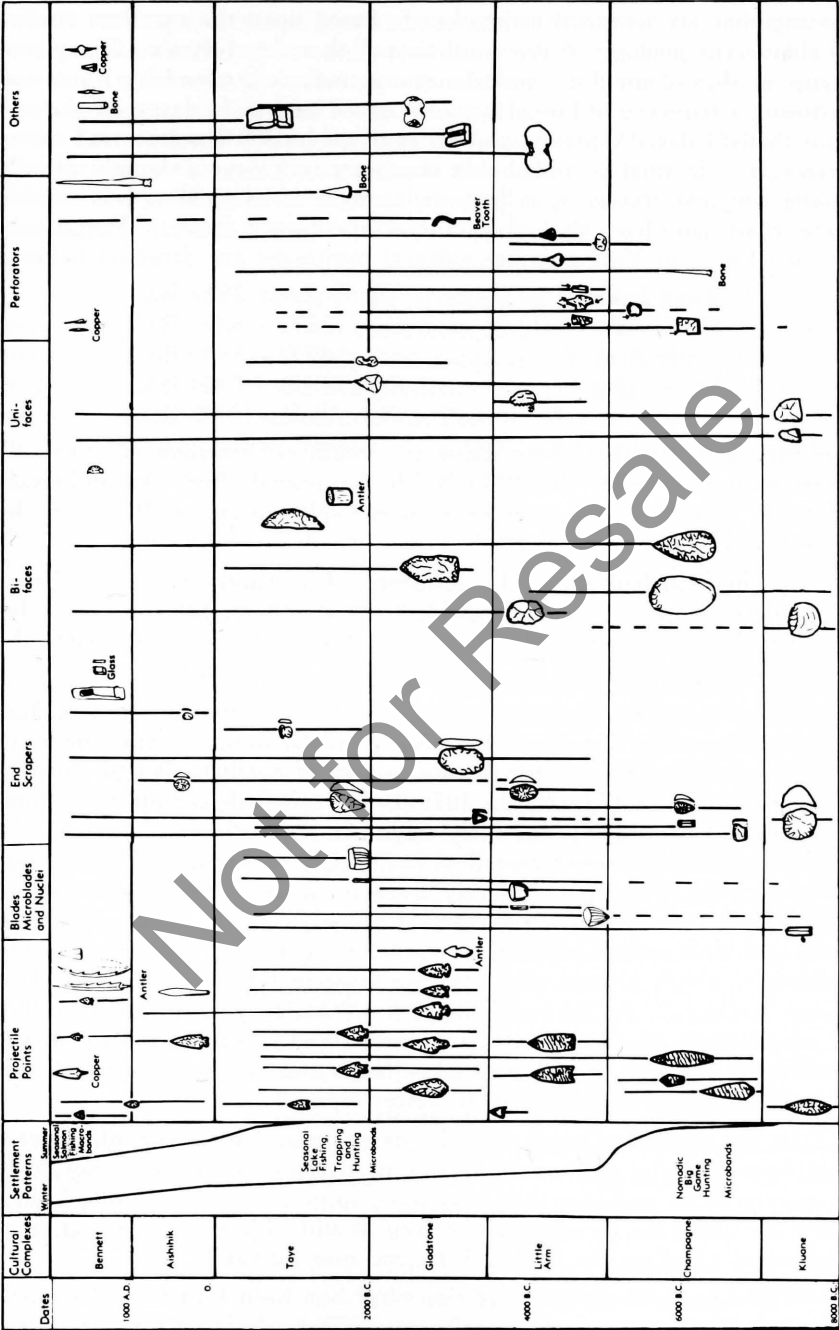


FIGURE 2.

me say that my temporal estimates are based upon the excellent studies of the recent geology of the southwest Yukon by Johnson, Derry and Raup; studies of the floral and climatic periods determined by Raup and Johnson; a sequence of faunal remains; seven carbon-14 dates, cross-dates to carbon-14 dated remains; and series of about 300 obsidian rind measurements. (It must be added that the latter technique although initially giving coherent results is, at present, thought of as yielding less reliable dates than those from the other methods mentioned above.) Tentatively the southwestern Yukon earlier cultural complexes are dated as follows:

Taye Lake .....	0 to about 2500 B.C.
Gladstone .....	2500 - 4000 B.C.
Little Arm .....	4000 - 5300 B.C.
Champagne .....	5000 - 7000 B.C.
Kluane .....	before 7000 B.C.

Let me warn you that these dates are tentative; moreover 27 years of experimentation with the "MacNeish Estimated Age Determination Method" reveals it has a tendency to err (plus or minus 10%) on the conservative (too recent) side!

Having touched upon the sequence of cultures in the southwest Yukon let us see if it is not possible to relate them, present their relationships in an understandable manner, and apply this information to the problem of the process of the peopling of the New World.

It is my opinion that the various relationships may be more coherently presented by the use of the concept of tradition. I have made an earlier attempt to do this for the entire area of northern North America at all time periods (MacNeish, 1959a). Here I shall confine my efforts to a consideration of only the early traditions in Northwest America. My previous efforts have been described flatteringly as daring and courageous (Larsen, 1961: 12). Quite frankly, even for a more limited part of the region and a more limited time period the gaps in our sequences are so great, the time estimates based on such flimsy evidence, and most of the cultures so poorly known, that I believe my attempts (at best) should be called "reckless". Be that as it may, if we are to get any clear picture of relationships in the area and any understanding of the process of the peopling of the New World, such hypotheses must be made—even if it is only to stimulate others to create better ones.

In the following pages I shall present the comparison of cultural complexes and the derived traditions in terms of how they may have come into being and how they may have spread. In other words, I shall speculate about the peopling of the New World. Thus having never been accused of treading like an angel, let me rush forward.

The seemingly earliest tradition that has been found in the north is called *British Mountain* (MacNeish, 1959b). It is at present poorly

defined and as yet no component has been excavated in a stratigraphic context that allows one to estimate its (very great?) antiquity with any degree of accuracy. Chemical change in the flint materials at the three Kogruk sites in the Brooks Range (Campbell, 1961a) as well as change in the flint of the British Mountain complex along the Firth River hint that these are the earliest remains in these areas. Obsidian rind determination at a Kogruk site in the Brooks Range, faunal association and stratigraphy at the Engigstciak site (albeit the badly solifluxed part) tend to show a similar picture.

It was unfortunate that the artifacts of this tradition were first recognized at Engigstciak and came from 13 places where there were conditions of complex soil folding and slipping. With further excavation, analysis, and study of the soil problems the definition of the complex, of course, changed (MacNeish, 1956a, Plate 1; MacNeish, 1959a, Plate I). Nevertheless, a recurring complex of artifacts was found not only here but at another single occupation along the Firth River, NbVI-2 (MacNeish, 1959a), at the Kogruk site in the Brooks Range (Campbell, 1961a), and at the Katakturuk River Lookout site on the north slope of the Brooks Range (R. Solecki, personal communication). Thus, in spite of the circumstances in which it was originally found, evidence of its existence elsewhere means it cannot just be dismissed. The recurring complex of traits that define the tradition include: pebble choppers, scraping planes or unifacial choppers, and flakes that were utilized as side scrapers, knives, and spokeshaves with adhering striking platforms that were struck from discoidal cores. These occurred at all components mentioned above. Hooked graters, blade-like flakes, end-of-blade scrapers, and unifacial projectile points occurred only at Kogruk and along the Firth River while central burins occurred only at Engigstciak. As yet, this complex of traits (or tradition) has not been found near Bering Strait (the so-called Palisades I complex does not have this recurring complex of traits in spite of Giddings claiming a relationship to British Mountain [Giddings, 1961: 159]) but similar artifacts do occur in the Paleolithic of eastern Asia such as at Malta-Buryet (Bonch-Osmolovsky and Gromov, 1936; MacNeish, 1959a: 46), Ordos, and elsewhere (Okladnikov, 1961). Nevertheless it is still too soon in our research to even speculate about how this culture came into being or how it spread in the New World.

It is only when we come to the next tradition called *Cordilleran* that we can do such. This tradition is known from various components at different places in the north but the sample of artifacts from each one is not large. Perhaps the best component is that from the unsolifluxed buffalo pit at Engigstciak which was dug mainly during our second and third seasons of 1956 and 1958. The Flint Creek components from most of the other parts of the Engigstciak site may be mixed due to solifluction and were unearthed during our first season. This, of course, meant a far

better definition of the complex in the second Firth River report (compare MacNeish, 1956: Plate I with MacNeish, 1959a: Plate II). The Klumne complex of the southwest Yukon (see this report) and the material Rainey found at Rampart Rapids (Rainey, 1939: 378), although found under good stratigraphic conditions, are very limited. The material from the Kayuk complex in the Brooks Range is numerous, but the stratigraphic situation poor (Campbell, 1959). The number of artifacts found at the five sites in the survey along the Firth River is small. The materials from the Klondike site near Fort Liard, Northwest Territories are also limited. Farther south, a number of much better components are known. They would include the earlier components from the deeply stratified site excavated by Borden at Fraser Canyon, British Columbia (Borden, 1960), as well as a number of sites from Idaho, Oregon, and Washington such as Lind Coulee (Daugherty, 1956), Five Miles Rapids (Cressman, 1960), Indian Wells (Butler, 1961), and the others. Survey by Leechman in north-central British Columbia hints that this tradition exists in the area between our northern and southern representatives (National Museum of Canada files).

Now let us try to interpret this contextual data concerning the Cordilleran tradition. Because representatives of this tradition occur in northwest mountainous areas and as one of its components is Kayuk in the Brooks Range I would surmise it came into being in the general western Brooks Range area near Bering Strait. I would speculate that this tradition had its origins between 9,000 and 12,000 years ago when glaciers still existed in the mountains, when the vegetation was mainly tundra (with willow and shrubs in the valley flanks) and when the big game of the Pleistocene was still roving the north.

It seems probable that the British Mountain tradition or a descendant thereof was already in the area where a coalescence of traits gave rise to the Cordilleran tradition. This newly developing tradition maintained certain of the older British Mountain elements such as pebble choppers, thick and thin side scrapers, bifacial knife blades, bone awls, spokeshave-like scrapers, end-of-blade scrapers, and perhaps the use of conical polyhedral cores. Gradually fused with these older elements, and in some cases replacing older similar tools were a number of traits brought from Asia such as scale scrapers, lenticular (Lerma) projectile points, slab pebble choppers, pebble pendants, needles, Ft. Liard flake burins and perhaps scraping planes. (I might add that these Asiatic increments seem to occur mainly in the Trans-Baikal area of interior Siberia, so one might suspect that they flowed from this area via the Asiatic Arctic coastal region to Bering Strait [MacNeish, 1959a: 47]). Certain elements such as snub-nosed end scrapers may have been derived from cultures already in existence further south in the New World. The collateral and ripple flaking technique, found seemingly late in the Cordilleran tradition,

may have come from a similar source. The unilateral multi-barbed antler fish spear or leister of the Cordilleran complex may have been a new World invention based upon Asiatic concepts involved in the bilateral multi-barbed fish spears. The Flint Creek multiburins may have been based on concepts in the Asiatic derived flake burins. The narrow antler spatula and antler bi-pointed fish gorge seem to be original New World inventions. All these elements from a variety of sources did, however, coalesce and form a tradition. One might speculate that this tradition was well adapted to semi-glacial mountainous environs (in exactly what manner we do not fully understand). However, camps in such an environment seem to have been established in mountain valleys, on terraces, along the narrows of streams where big game could have crossed, where fish might have been easily caught, and where alder and willow were available.

The distribution of sites in this tradition (with two near Anaktuvuk Pass, nine in the Firth River region, one at Kluane Lake, one near Fort Liard, one at Fraser Canyon, and others in Washington and Oregon) seem to be in the same sort of ecological niche and seem to show the route by which this tradition spread.

In parts of the north following the Cordilleran tradition is the *Northern Plano* tradition, formerly called Yuma (MacNeish, 1959a). In the southwest Yukon, the Champagne phase is a typical representative of the tradition; it is known from 13 components. Elsewhere, there are two components of the Sandy Lake complex in the Simpson-Liard region of the Northwest Territories (MacNeish, 1954: 248-249 and Fig. 68), the Great Bear River component at the west end of Great Bear Lake (MacNeish, 1956a: 73-74 and Plate VI), about 30 sites of the Artillery Lake complex in the Barrenlands of the Northwest Territories (MacNeish, 1951: 33-34; Giddings, 1956a; Harp, 1959, 1961), two components of the Nayuk complex of the Brooks Range (Campbell, 1962b), and perhaps others from central interior Alaska (Raine, 1940; Skarland and Keim, 1958). Earlier dates for similar materials in the more southerly Plains-Prairie region and the lack of newly derived Asiatic traits suggest it formed in the Great Plains to the south and then spread northward replacing the Cordilleran in parts of the northwest. From the Cordilleran tradition that Northern Plano was replacing in the north or perhaps from a similar culture that had formed in the south it may have acquired the pebble chopper, split pebble chopper, blades, side scrapers, end-of-blade scrapers, snub-nosed end scrapers, Ft. Liard burins and ovoid bifaces. Traits that originated in the south and were an integral part of the tradition are the Agate Basin points, keeled end scrapers, buffalo fibula awls, graters, bifacial choppers, flake end scrapers, pebble hammerstones, and perhaps Pelly points (often called Mohave points further south). Local adaptations might be the artifact burins, rib-bone projectile points, and perhaps aberrant Agate Basin variety points.

Basically I see the Plano tradition as having a way of life and subsistence adapted to buffalo hunting in a Plains-Prairie environment. It originated in the south perhaps between 5000 to 7000 B.C. as the glaciers were retreating. As the glacier retreated the grasslands (with its faunal assemblage) crept into parts of the north replacing the tundra, willow and alder environment. Also, moving southwest was the Northern Plano tradition which replaced the Cordilleran tradition by migration, amalgamation, and diffusion. In areas such as Fraser Canyon, British Columbia, the Brooks Range, and the Firth River where the new environment did not penetrate, the older Cordilleran tradition may have continued. Except for the diffusion of certain elements like ripple flaking and the Agate Basin points, Plano did not appear to reach Bering Strait and only indirectly affected a developing tradition there which was receiving a steady flow of people and ideas from Asia.

Following the short-lived Northern Plano tradition in Alaska and the southern Yukon (but in part contemporaneous with its representatives to the east) was that tradition called *Northwest Microblade*. In the southwest Yukon there are three stages or phases of this tradition: Little Arm, Gladstone and Taye Lake. These phases are well represented with 14 components for Little Arm, 11 components for Gladstone, and 25 for Taye Lake (MacNeish, 1960a). The earlier stage (like Little Arm) is not well represented in surrounding areas although there are hints of its existence in Central Alaska (Skarland and Giddings, 1948; Johnson, 1946). The second stage (like Gladstone) is more widespread with the Campus site in Central Alaska (Raney, 1939; Irving, 1955), Tuktu in the Brooks Range (Campbell, 1961a), perhaps Palisades in the Kotzebue region (Giddings, 1961), Pointed Mountain (MacNeish, 1954), and others in the Simpson-Liard region of the Northwest Territories (MacNeish, 1959), and perhaps some sites in British Columbia and southwest Alberta. The final stage (like Taye Lake) is found over an even wider area with Tyone site (Irving, 1957), and others of central Alaska, seven components of the Fisherman's Lake complex in the Simpson-Liard region (MacNeish, 1954), the Nataalkuz component of central British Columbia (Borden, 1952), the many components of the Lockhart River in the Northwest Territories (MacNeish, 1951; Harp, 1961), the N.T. Docks complex at the west end of Great Bear Lake (MacNeish, 1956b), and perhaps even some of the microblade sites of southwest British Columbia and Washington State.

Based upon the above archaeological information, I would surmise that perhaps even as the Plano tradition spread into the Northwest, Asiatic traits (or other traits and adaptations) were being acquired at or near Bering Strait. Thus by the beginning of the post-glacial optimum (when the boreal forest was becoming dominant in much of central Alaska and the Yukon) an accumulative cultural process culminated in the establishment of a new tradition—*Northwest Microblade*.

This coalescence probably occurred somewhere in southwest central Alaska at about 5500 B.C. The Northwest Microblade tradition had acquired from the resident or neighboring populations (such as Cordilleran) such traits as conical polyhedral cores and blades, end-of-blade scrapers, pebble choppers, split pebble choppers, split bone awls, Ft. Liard burins, Flint Creek multiburins, side scrapers, and ovoid bifaces. Perhaps a few of the above items came from the Plano complex. Certainly the bifacial chopper, Agate Basin point, fibula awl, flake end scraper, pebble hammer, keeled end scraper, artifact burin, and graver were derived from Plano. The flow across Bering Strait from Asia (and here I suspect ultimately from the north China-Mongolia-Japan general region—see Maringer, 1950; Yoshizaki, 1959) contributed such items as the unifacial drill, the tongue-shaped polyhedral core (of two variants) and microblades, notched microblades, pointed microblades, microblades with rounded ends and microblades with one or two edges retouched, Anaktuvuk microblade burins, spokeshaves and perhaps the asymmetrical tanged small triangular (arrow?) point. More recent manifestations of the Plano complex gave the Milnesand and Plainview points as well as the square based bifacial knife. Invented locally, but based on older concepts were the ovoid, flat-topped and neatly chipped turtle-back end scraper and the serrated side scraper or saw. Original inventions were the chitho and the netsinker (and inferentially the gill net) and perhaps later the netsinker with a chipped end that could be used as an adze or axe.

The *Northwest Microblade* tradition, which had a subsistence based on summer lake fishing and winter hunting and trapping, was somehow well adapted to the boreal forest. The gill net for lake fishing and the adze for tree cutting are examples of forest adapted tools. After its initial stage in the central Yukon it spread into the Anaktuvuk Pass, the Liard and upper Mackenzie valleys, northern British Columbia and perhaps even northwest Alberta. By its final stages it extended as far south as the State of Washington and as far east as the Barrenlands of the Northwest Territories. In both cases it probably was replacing remnants of the Cordilleran and Plano traditions as well as taking on new traits from adjacent areas (such as projectile point types in Lockhart River that may have come from the eastern Archaic).

The next tradition that formed in northwest America was the *Arctic Small Tool* tradition (Irving, 1953). Manifestations of this tradition in the Arctic are extremely numerous. These would include over 50 components from the Kotzebue region belonging to the Denbigh, Late Denbigh, Old Whaling or Battle Rocks periods (Giddings, 1957, 1961); the Denbigh site itself from Norton Sound (Giddings, 1951); a number of sites from around Onion Portage in western Alaska (Giddings, 1961); a number of sites reported by Cressman from near the mouth of the Yukon River (Cressman, personal communication); five or six sites from the

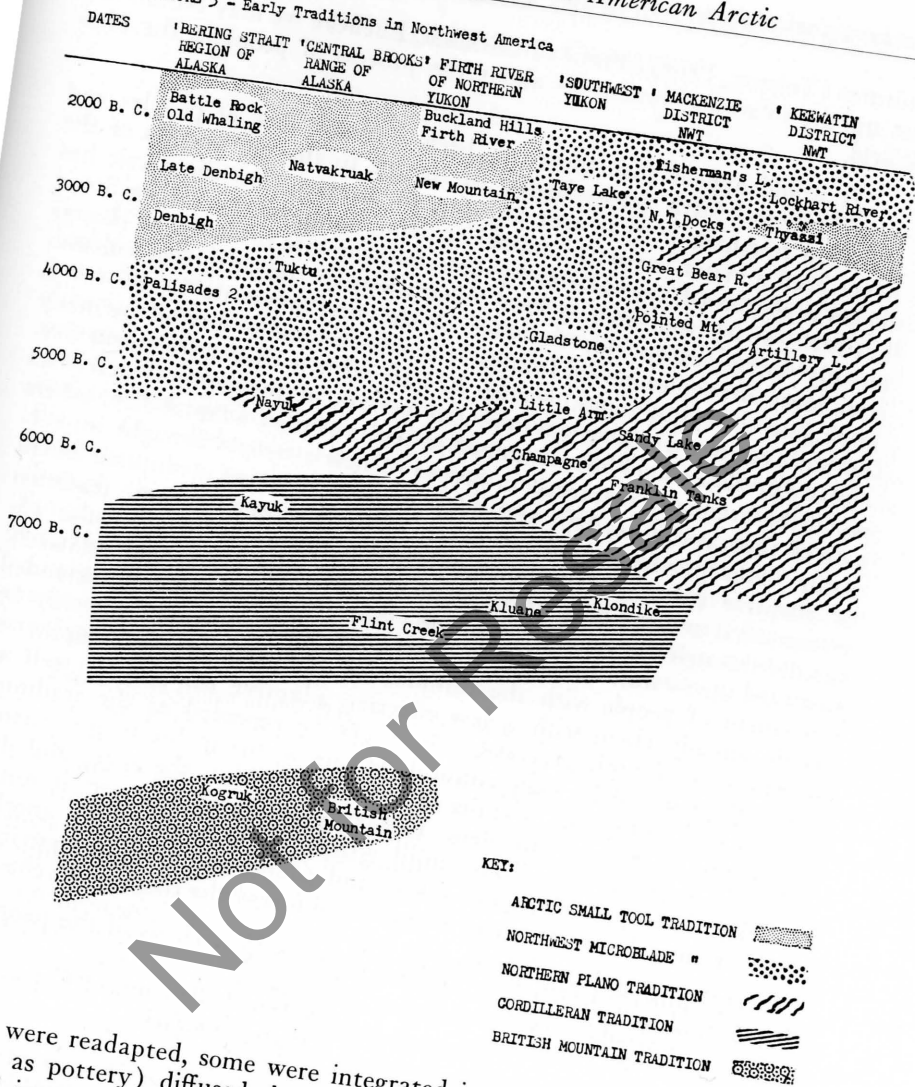


Brooks Range, and about 25 from the Firth River area. These examples exclude many sites from north-central Canada, the Canadian archipelago, Ungava and Greenland which are outside of our area of discussion.

I believe the *Arctic Small Tool* tradition came into being at about 4000 B.C. in the tundra region, near Bering Strait on either the American or the Russian side. This tradition acquired from the Northwest Microblade peoples, already in the area, such items as: Ft. Liard flake burins and burins on microblades, microblades made from tongue-shaped or conical polyhedral cores, flat-topped end scrapers, side scrapers, ovoid bifaces, chithos, netsinkers, Agate Basin points, the ripple flaking technique, antler hammers, fish gorges, and sinew stones. This new tradition acquired from Asia (perhaps from interior northeast Siberia from the so-called "Neolithic" culture—see Tolstoy, 1958) such items as: the rectangular side blade, triangular end blades (either as an arrow point or harpoon end blade), lenticular, lanceolate and incipient stemmed arrow points, pointed antler flakers, chipped adzes, antler mattocks and perhaps some sort of semisubterranean house structure. The basic form of the Denbigh type burin was probably derived from Siberia, but it was revamped into a variety of new forms. Many of these various forms reveal that a multitude of spalls were struck from burins; and perhaps the Arctic Small Tool tradition invented the burin spall tool. The cuboid core seems to be a readaptation of either older forms or was derived from the Siberian Neolithic. Half moon side blades, that are so prevalent in the Arctic Small Tool tradition perhaps were their own adaptation of the Asiatic rectangular side blade. The antler arrow seems to be their own invention as well and perhaps the chipped stone drill bit. Two other items must be mentioned even though the evidence for their use as an integral part of the tradition is insufficient. One is the small shallow stone lamp. This may have been an Arctic Small Tool invention but it is strangely lacking in western manifestations of the tradition. The other item is the toggle headed harpoon. Chipped triangular points in the west and toggle harpoons in the east suggest it is a trait of the tradition. If so, this was most certainly acquired from Asiatic cultures of the Pacific coast.

The Arctic Small Tool tradition seems to have been somehow adapted to tundra region within the Arctic drainage. Animal bones and site distributions suggest a subsistence that was basically caribou hunting, while the harpoon, seal bones and coastal site locations suggest this economy was supplemented by exploitation of some of the ocean resources. Its big movement across the Canadian Arctic seems to have started about 2500 B.C. and by 1500 B.C. the tradition was well established in Ungava and Greenland. Again the easterly moving group adapted new traits, while the western ones were receiving a steady flow of items from Asia, such as pottery, bifurcated base antler arrows, semi-subterranean house types, antler spoons, combs, male harpoon types and others. Some of

FIGURE 3 - Early Traditions in Northwest America



these were readapted, some were integrated into the tradition and some (such as pottery) diffused through the culture and were perhaps integrated into another tradition (such as the Eastern Woodland?). This terminates my speculations about the early peopling of the New World's Northwest. From the above information it seems possible that a series of American traditions have spread over large areas of North America in terms of certain ecological zones. Comparison of Old World and New World traits by Tolstoy and others have revealed that similar traditions do not seem to exist in the Old World although certain elements of each of our New World traditions were derived from Asiatic

cultures (Tolstoy, 1958). From all this data, I believe we may tentatively set up the following hypothesis about the process of peopling the New World.

It would appear that there has been a steady flow of peoples and ideas back and forth across Bering Strait due to the movements of the rich food resources in that area and due to the fact that the Strait has never been a major barrier to animal or man. As far as the Bering Strait region is concerned, the ideas and peoples moving into it needed to change but little, apart from making local adaptations to the culture or cultures already there (except for the case of the first migrants!). However, once ideas or peoples moved from that ecological zone to any of the many impinging ecological zones, changes had to occur if they were to survive. To survive in their new environment certain of the cultural activities already present would be maintained in terms of their adaptability, others would be gradually discarded in favour of new concepts brought in, certain of them would readapt and a few original adaptive inventions would occur. This process would ultimately develop a new cultural tradition or adaptive cultural complex that would be adjusted to particular environmental zones. Then this complex would start to spread relatively rapidly through the whole of the zone (that probably but barely extended eastward up to western Alaska). In this spread there would not only be movement of people with the complex but diffusion of the complex to people already there with a less effective adaptive complex as well as combinations of both processes. As might be expected as the tradition spread there would be some cultural changes within it due to inventions, cultural drift, adapting of traits from peoples within the zone, and diffusion into or through the zone. Generally speaking, however, it would maintain itself as a tradition, until either it was replaced by another tradition developed in a similar way and adapted to the same environment, or until the environment changed and forced the tradition to change.

This process I call the Adaptive Complex Hypothesis of the peopling of the New World.

National Museum of Canada  
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# THE PALEO-INDIAN AND MESO-INDIAN STAGES OF ALBERTA, CANADA<sup>1</sup>

by

H. M. WORMINGTON

It is generally agreed that, until watercraft and navigational skills had developed sufficiently to permit oceanic travel or the traversing of very difficult waterways, entry into North America must have been from Siberia by way of Bering Strait. During glaciations ice sheets would have impeded movements out of Alaska, but during interglacials and interstadials men could have moved along the low northern coastline of Alaska and reached the Mackenzie Valley, thus gaining access to the Northern Plains. One of the most likely migration routes for those who reached the Mackenzie lies to the east of the Rocky Mountains, going directly through the Province of Alberta. Due to the strategic location of the Province there has been a strong hope that it might provide valuable data relating to migrations. Unfortunately, nothing yet found has served to justify this hope, and, with increased knowledge of prehistoric developments in Siberia and in the New World, the great complexity of the problems involved becomes increasingly apparent.

For many years there has been incontrovertible evidence that man was present in the Western Hemisphere during the terminal part of the Wisconsin. At present, dates in excess of 15,000 to 20,000 years ago for the coming of man to the New World are not universally accepted. Recent discoveries have, however, convinced an increasing number of archaeologists that it is necessary to think in terms of considerably greater antiquity than this.

Of primary importance are two sites that have been dated by the radio-carbon method. A discoidal scraper was found at Tule Springs, Nevada with bones of Pleistocene animals and with charcoal that produced a date in excess of 28,000 years ago (26,000 B.C.) (Harrington and Simpson, 1961). At a site near Lewisville, Texas, artifacts were found

<sup>1</sup> Portions of this report have been excerpted from a paper entitled "Prehistoric Cultural Stages of Alberta, Canada" which appeared in the Festschrift offered in homage to Dr. Pablo Martinez del Rio, published in Mexico in 1961 under the editorship of Dr. Ignacio Bernal and Dr. Luis Aveleyra A. de Anda. We are indebted to them for permission to reprint this material.

Basic data concerning Alberta were obtained in the course of reconnaissance and studies of Alberta collections during the summers of 1955 and 1956 under the auspices of the Glenbow Foundation of Calgary. Some information relating to Siberian materials was obtained in the course of a two month visit to the Soviet Union in 1958, which was made possible through the assistance of the Academy of Science of the U.S.S.R. and the Wenner-Gren Foundation for Anthropological Research. Further data were gathered during a trip in 1961 sponsored by the Milwaukee Public Museum.

in a deposit that contained twenty-one hearths, which provided an age determination in excess of 37,000 years ago (35,000 B.C.) (Crook and Harris, 1957). A Clovis point found there cannot be of this age, and it is probably intrusive, but the appearance of a chopper and scraper which were recovered would be compatible with such an age. Finds in scattered localities in the western United States, in Mexico, and in South America, have provided tantalizing clues that suggest greater antiquity for man than is now commonly accepted, but fully satisfactory evidence is lacking. The writer thinks it probable that, with further work, acceptable evidence will be found.

In order to evaluate finds in the Americas some knowledge of what was available for export from Siberia at various times is essential. Only if we have this knowledge can we hope to determine how much of our American material shows close ties with Asia and how much represents the results of indigenous development in this Hemisphere. The Siberian data have been well summarized in the paper by Chester Chard. The writer is in basic accord with the hypotheses which he has offered, although there are some minor differences of opinion. He is absolutely right in his belief that the chopper-chopping tool tradition must have influenced the New World cultures; and there seems to be good reason to believe in two early movements into the Western Hemisphere. There appear to have been no further population movements from Asia until the introduction of the small tool tradition about 5000 or 6000 years ago.

Chard's suggestion that in Würm I times there was a movement along the Pacific shore that brought from the Far East a tradition characterized by choppers, bifaces, and amorphous flakes, is a new and exciting idea that deserves very serious consideration. It is the writer's belief that in Würm II, or early in Würm III, a second movement from the interior of Siberia brought in not only the Levallois-Mousterian tradition and elements of the chopper-chopping tool tradition, but a crude blade technique, and bifacially flaked leaf-shaped points. Such points were found at the Irkutsk Military Hospital site, which is believed to predate Mal'ta. The latter contains East Gravettian elements that are lacking in the New World. Bifacial flaking was unimportant in the Siberian Palaeolithic, but it increased in importance in the New World, and, in the course of a long period of indigenous development, sophisticated weapon tips such as Clovis, Folsom, and the parallel flaked types developed here.

Even in America, however, bifacial flaking was not the dominant element that we have been led to believe on the basis of evidence from kill sites where only projectile points are represented. Evidence from habitation sites, some still unpublished, indicates that an overwhelming percentage of Paleo-Indian tools was unifacial. Also of interest is the fact that more recent studies have shown that such early types as Sandia, Clovis,

and Hell Gap, were produced by controlled percussion, not by pressure flaking. The latter technique apparently developed independently in the New World.

It seems reasonable to assume that some of the early migrants passed through Alberta as they moved southward. Will we, however, ever find traces of their passage? It is possible, but by no means certain. Since they were hunters or gatherers they cannot have traveled in very large groups, they cannot have stayed long in one place, and they had few possessions to leave behind. Furthermore, evidence left before the ice retreated for the last time would in many cases have been lost as the result of glacial action.

There are also problems posed by present conditions in Alberta. The nature of the terrain and the vegetation makes it extraordinarily difficult to find the buried sites that alone can provide us with much of the knowledge that we need. Even in the southern part of the Province where, during the disastrous drought of the 1930's, there was erosion that revealed and destroyed many ancient sites, vegetation now conceals the evidence of prehistoric occupation that may remain, and the plant growth found farther north provides even greater difficulties. Nowhere is there the deep erosion and arroyo cutting that has revealed the presence of so many ancient sites in more arid regions. Neither are there caves where good stratigraphic records might be preserved.

No early sites that would lend themselves to excavation have been found and there are, of course, almost insuperable difficulties in dating surface finds. If we are correct in attributing a very great antiquity to man in America, the artifacts left by the first migrants were probably rather crude, but the finding of isolated specimens that resemble Old World Palaeolithic types means nothing, since similar artifacts were being made in the Plains in the eighth millennium B.C. and probably later. Only if assemblages of such specimens are found under conditions that will enable us to obtain reliable dates will we be on firm ground.

Burins and micro-blades present special problems. It is only recently that burins have been recognized in North America outside of the Arctic. Some have been found in Oregon in an occupation zone dated at about 9000 B.C. (Cressman, 1960) and some have been found in Texas associated with Paleo-Indian and Archaic points (Epstein, 1960). A few of these are present in the Russell A. Johnston collection from southern Alberta, and it is probable that more will come to light in this area as they are sought for, but nothing is known of the distribution or chronological position of these tools in the Province. A very few true micro-blades have been recognized in Alberta collections, but this provides no help in determining how or when this trait could have spread from Siberia,

where it was present from Upper Palaeolithic times and reached areas to the south. Perhaps as early as 7000 or 8000 B.C. micro-blades were being produced as far south as the highlands of Ecuador (Bell, 1960). This could be the result of independent invention.

With certain traits we may consider the possibility of movement from south to north through Alberta, although proof is lacking. It has long been the fashion to attempt to derive all common traits from Asia, but in some instances we could be dealing with a two way traffic. By about 8000 B.C. certain American Indians were producing unfluted lanceolate points, shaped through the removal, by pressure, of flakes parallel to each other. The same technique is found in Siberia, but it does not appear to have been in use on the Asiatic side of the Strait until some thousands of years later. In view of this difference in age the Asiatic forms can scarcely be ancestral to the American, and we must consider the possibility of independent invention in the two areas, or, perhaps, diffusion from North America to Siberia, as Tolstoy (1958) has suggested.

Despite the many problems that still remain regarding the pre-history of Alberta, it is at least possible to provide a rough outline of probable developments. In other western Canadian Provinces and in the United States quite a number of prehistoric complexes have been defined and dated and there are certain diagnostic artifacts which are known to have been made during certain periods. Similar types are found in Alberta. We are not in a position to say that they are of the same age or older or younger than the dated specimens, but at least we have some idea of the approximate age, and it becomes possible to develop a tentative relative chronology.

There are three broad cultural stages that pre-date the Historic, which are recognized here and in the United States. There are, unfortunately, serious problems regarding terminology, for many different names have been applied to these stages. Here the terms Paleo-Indian, Meso-Indian, and Neo-Indian will be used (Smith, 1957). The Paleo-Indian is the earliest stage and is characterized by well made lanceolate points which were used in the hunting of big game, largely of species now extinct. The name Meso-Indian is given to the stage, frequently called the Middle Prehistoric or the Plains Archaic, during which large notched and stemmed points were commonly used and, in the Northern Plains of the United States, there was greater emphasis on the taking of small game and the gathering of plant foods. Neo-Indian is used to refer to the final prehistoric stage when most projectile points were small, light arrowpoints, bison, of modern species, were commonly hunted, and pottery came into use among some groups. Only the first two stages will be considered here.

Some of the best evidence for occupation during the Paleo-Indian



stage comes from the southern half of the Province, particularly from sites in the general vicinity of Cereal, Red Deer, and Edmonton. Of special importance is the meticulously documented collection of Russell A. Johnston, gathered in the Little Gem area during the 1930's when intense droughts led to erosion which uncovered many ancient sites. In the Johnston collection are a few specimens that may legitimately be classified as Sandia points. Whether these represent later manifestations of the Sandia Complex found in the United States, which has an estimated age of the general magnitude of 12,000 to 15,000 years, or whether they may be earlier we do not know. The removal of a few flakes from the side of one of the leaf-shaped points, which presumably provided the base from which American forms developed, would produce a single shouldered Sandia. No one knows where this type, which is distinctively American, developed. It could have been in the north, perhaps in Alberta, or it might have been much farther to the south, and these specimens may represent a later northward movement from the place of origin.

Fluted points are also quite rare. A Clovis point has been found near Edmonton, and a few Folsom points have been found in southern Alberta and adjoining portions of Saskatchewan. Most evidence suggests that this tradition began in the Plains or the Southwest. Fluted points found in western Canada probably mark the arrival of makers of fluted points, moving from south to north, and may be more recent than those found in the Plains. There appears to have been no intensive occupation of Alberta by people of the Llano or Folsom complexes.

Makers of parallel flaked points, produced by pressure, however, were very well represented here and in western Saskatchewan. Again, it is impossible to give exact dates for the complexes characterized by this technique in Canada, but in the United States most of them fall in the general period of 9000 to 7000 years ago (7000-5000 B.C.), although some are still older. Makers of Plainview and Meserve points were present in Canada, but apparently not in large numbers. From the numerous examples of Eden and Scottsbluff points and Cody knives found in collections it may be deduced that there was intensive occupation of the southern part of the Province by the people of the Cody Complex. In a number of collections are also found broad points with well marked shoulders and long stems, probably variants of the Scottsbluff type, which are now called Alberta points.

There were also some hunters who utilized points of the Agate Basin and Hell Gap types. The latter is a type recently found in a stratified site in Wyoming (Agogino, 1961). The occupation zone that produced Hell Gap points has a radiocarbon date of  $10,850 \pm 550$  years ago (8890 B.C.). This is a percussion flaked lanceolate form with so marked a basal constriction that it may be considered stemmed though unshouldered.

Bases are straight or slightly convex. Some Hell Gap points have been found near Cereal.

Scottsbluff and Alberta points also occur farther to the north, notably in the Grande Prairie area, but not in such large quantities. One fragmentary Eden was found near Peace River. It is not known whether the paucity of specimens reflects less intensive occupation or is the result of lesser erosion and less collecting. Probably all factors were operative.

Certain other specimens found in the Peace River drainage may belong to the Paleo-Indian stage, but their age cannot be determined on the basis of present evidence. Among these are doubly pointed specimens which resemble early Siberian types. Similar forms have a wide distribution in the Americas, having been found in early contexts not only in the United States, where they are most common in the Northwest, but in Mexico, in Venezuela, and as far south as Argentina. In the Peace River area are also found large lanceolate points reminiscent of the Browns Valley type but which lack parallel flaking.

Turning next to the Meso-Indian stage we find certain interesting differences. It may be noted that there is a marked change in the choice of lithic materials used. Most Paleo-Indian points were made of fine grained siliceous materials, many of which came from quite distant sources. This, perhaps, reflects the fact that materials that were locally available were largely pebbles, rarely over two inches long. The use of this material would have necessitated a considerable reduction in size of projectile point. Also, it does not flake very well. It seems probable that not only size but quality of material was an important consideration for the early people who were master craftsmen. The later people, on the other hand, used smaller points and were content to produce weapon tips that were perfectly serviceable but which reflected no particular aesthetic drive. They made extensive use of the small black pebbles that were readily available.

During Meso-Indian times developments in Alberta closely paralleled those in the Northern Plains of the United States during the period that began some 5000 or 6000 years ago (3000-4000 B.C.). There are, however, some extremely interesting differences. Perhaps the most significant is the extreme scarcity of implements used in the preparation of plant foods. Sites in the Plains area of the United States have provided evidence of so great a dependence on plant foods and small game that the term "Foragers" has been applied to the people of this stage. In Alberta, however, the dependence continued to be on hunting. It seems quite possible that climatic conditions may have varied in the two areas and that the Altithermal, which farther to the south was characterized by aridity and desiccation, was in Alberta truly a climatic optimum, and

big game continued to be available and provided the chief basis of the economy.

Projectile points were somewhat smaller than those found in Wyoming and Montana, but this is probably due to the nature of the raw material that was most easily obtainable. Basal grinding, found occasionally on Montana specimens but not on those from Wyoming, was very common on Alberta specimens. They also exhibited a somewhat greater tendency toward deliberate thinning through the removal of longitudinal flakes. McKean Lanceolate and Hanna points are well represented in collections from the southern half of the Province, but there is a surprising scarcity of Duncan points (types as defined in Wheeler, 1954). There is also a much greater percentage of large points with concave bases and conspicuous, rounded, ear-like projections. These occur only in small numbers in the United States sites, but are very common in southern Alberta, and many have been found in Saskatchewan. Some extremely large specimens with similar shapes found in the Edmonton area may have served as knives. In Alberta there are large numbers of hafted spoke-shaves, a type which is present but not common in Wyoming and Montana sites. Farther to the north in the Grand Prairie and Peace River sections there are some of the eared points, but the most common type is a longer and more slender straight based point with side notches.

All collections contain many snub-nosed scrapers, which were used in all stages. Vast quantities of bifacially flaked objects, ovoid to piriform in outline, which probably served as cutting implements, are found in all parts of the Province. Some of these may be of Paleo-Indian age, but many undoubtedly belong to the Meso-Indian stage, and some may be still younger. There are a few polished animal effigies, thought to have been used as atlatl weights, which are probably of Meso-Indian age.

There are some artifacts that are of interest although, on the basis of present knowledge, they cannot be attributed to any particular period or developmental stage. Among these is a unique type of axe, produced by flaking, and with a notch on each side. There are also crude objects that resemble coup-de-poings that occur in collections and which were found in some quantity by Dr. Douglas Leechman (personal communication) in the Lake La Biche area. Some are almost certainly of Meso-Indian age, but some could be older.

In the Peace River area a number of farmers, in the course of plowing, have found curious caches of large, bifacially flaked, ovoid specimens. Some pieces are as much as ten inches long. They cannot be regarded simply as blanks since many of them show definite marks of usage along the edges, but their function and the reason for their concentration in caches is unknown. There is no way of estimating their chronological position.

In view of the location of the Province one might expect the prehistoric cultures of Alberta to show some Arctic affiliations. Some of the earliest migrants into the New World who moved through the Arctic must have traversed this area, but we have found no evidence of their passage. Paleo-Indian traits, such as fluting, which are occasionally found in the far north probably had a western Canadian source. In general, however, the basic orientation of prehistoric Alberta cultures was toward the Plains rather than toward the Arctic.

Denver Museum of Natural History  
Denver, Colorado

Not for Resale

## THE OLD WORLD ROOTS: REVIEW AND SPECULATIONS

by

CHESTER S. CHARD

In 1959 I wrote (Chard, 1959) that it had been the general assumption that all of the oldest New World cultures were direct importations from Asia—more specifically, from Siberia—and that the prototypes for their distinctive features must be sought in this latter area. I think this notion has now been sufficiently dispelled and needs no further comment. I then surveyed prehistoric northeast Asia to see what was available for export on the appropriate time horizons, and offered some conclusions suggested by the evidence at hand as of then. In general, I was led to view early American culture as an independent development from very simple beginnings, and this overall picture I still believe to be essentially correct. More specifically, I pointed out the conspicuous division of northeastern Asia into two major culture areas: the Pacific coastal zone and the interior. Since the earliest American cultures seemed to antedate the oldest interior sites then known, I came to the conclusion that the primary New World roots must lie in the Pacific coastal zone, and postulated a single movement from the Manchuria-Amur region early in Wisconsin (Würm II) times of a people with a simple stone industry in the chopper/chopping-tool tradition as the sole basis for all subsequent New World developments down to about 5000 years ago, when a period of considerable cultural interchange in both directions seems to have begun which might have included some population movements as well. At the time, there seemed no evidence for other migrations since the original settlement. This meant, of course, that the American projectile points were local inventions, and in particular that the distinctive fluted point tradition was a purely indigenous development. The nature of the available migration routes through northeast Asia indicated that such a movement was feasible only during times of lowered sea levels associated with glaciations. None of these routes were blocked during Wisconsin times, and favorable hunting conditions prevailed over much of Alaska, which in many respects should more correctly be viewed as part of Asia at this period. Lastly, it was pointed out that the vast majority of remains left by any early migrants are most likely under water at the present time. (The problems of migration routes were discussed more specifically in Chard, 1958, 1960b.)

In the light of new finds, some aspects of the tentative conclusions sketched above require modification, as was envisaged, and it is the purpose of this paper to briefly review such data and to formulate hypotheses suggested by them. First of all, we may say that there is as yet no essen-

tial change in the picture presented by northeastern Siberia: we still have no early remains from this strategic area. The new evidence comes rather from the Asiatic heartland. In the Altai Mountains, the Ust'-Kanskaia cave site (Rudenko, 1961) clearly antedates the well-known Siberian Palaeolithic sites and contains an industry of general Mousterian type including an unspecialized percussion-flaked bifacial point. From a consideration of all the aspects of this site, I would suggest a date in the second half of the Würm I/II interstadial, roughly 35-30,000 B.C. An apparently comparable early Upper Palaeolithic site characterized by Mousterian technological traditions is represented by the lowest horizon of a Palaeolithic settlement excavated in 1960 by A. P. Okladnikov near the old Mongol capital of Karakorum in Outer Mongolia (Chard, 1962a). The same investigator has also announced the discovery of what he terms a Levallois-Mousterian site at Ottson-Maintl on the Sino-Mongolian frontier—the attribution being evidently on typological grounds, though details are lacking (*idem*). Of considerable interest for our purposes is the shift in Soviet archaeological opinion toward assignment of a greater age (15-20,000 years) to the early stage of the classic Siberian Palaeolithic as exemplified by the famous Mal'ta site. Despite some divergent opinion (see Chard 1962b) this is best viewed as representing a blend of genuine Mousterian traditions with a major East Asian chopper/chopping-tool contribution plus an infusion of Gravettian elements from the Upper Palaeolithic of the West. Just where the amalgamation of these disparate ingredients took place is not certain. A generally similar assemblage occurs at Shuitoungkou in the Ordos region of Northwestern China (Movius, 1955: 280) which on faunal grounds has been compared with Ust'-Kanskaia (e.g. by Okladnikov in Rudenko, 1961) and thus may antedate the Siberian Palaeolithic sites. On the other hand, Ust'-Kanskaia represents a relatively "pure" site of one of the ingredients in Siberia itself on a suitable time level, while an early occupation by chopper/chopping-tool people may be reflected at Malyi Kot in the Angara valley, which still awaits investigation (Chard, 1962b).

Also relevant is our greatly increased knowledge of the Japanese Palaeolithic (Serizawa and Ikawa, 1960; Befu and Chard, 1960, 1961). It has been suggested that industries of general hand-axe type may have been present in Japan by Würm I times, and crude blade industries at a date corresponding to the Würm I/II interstadial.

In North China, the Middle Palaeolithic Fenho complex (Chang, 1960, n.d.), from a series of localities in the Fen River valley of as yet uncertain but possibly 3rd Interglacial age, fills the previous hiatus between *Sinanthropus* and the Upper Pleistocene Ordos and Upper Cave remains. "Basically, the Fenho Complex is in the so-called 'Clactonian' tradition, containing a high percentage of choppers and chopping-tools and bifacially flaked bifaces made on cores as well as flakes" (Chang, 1960: 50).

There is evidence of Levallois technique in the sense of prepared core surfaces and faceted striking platforms; there are also discoidal cores and parallel-sided flakes—embryonic blades (Chang, n.d.). (It should be mentioned that evidence of step flaking has been noted by some observers.) Its special interest lies in the fact that it could provide, at last, a possible source for such putative early New World assemblages as the Manix Lake Lithic Industry of southern California with its hand-axes, choppers and “Clactonian” flakes (Simpson, 1960). It could also represent an east Asian source for the Levallois-Mousterian technique.<sup>1</sup> Of interest also is the discovery of two Upper Pleistocene fossil men of definite Mongoloid type at Tzeyang and Liu-Chiang in China, establishing the presence of the basic New World racial stock in the Far East at an earlier period than had been known previously (Chang, 1960).

There continues to be general agreement that the small tool (“micro-lithic”) industries of Japan and adjacent East Asia are late in time. Although certain morphological similarities can be pointed out with comparable industries of northern North America, direct historical relationships have yet to be demonstrated.

Data on racial history must also be taken into consideration. 1959 field work among the Yukagir confirmed previous opinion that this group is genetically unrelated to the Arctic Mongoloids and belongs rather with the Tungus and other peoples of the Baikal-Lena area. They are widely viewed as descendants of the ancient population of interior northern Asia. The Arctic Mongoloids, comprising the Chukchi, Koryak, Kamchadal and Eskimo, are regarded as one of the major racial groupings of northern Asia. They are clearly set off both from all other Siberians and from American Indians. Soviet scholars believe that this type was originally formed in the general Bering Sea area. In the overall sense it is alien to the New World and evidently a late intrusion there which introduced blood group B for the first time. Some time depth is indicated by crania of Old Bering Sea age from the Uelen cemetery, which are of essentially modern Eskimo physical type.

Finally, we may note the latest views of the distinguished Soviet physical anthropologist G. F. Debets on the peopling of the New World (Chard, 1962b). He believes that this was not a protracted process extending over millennia but was on the contrary simultaneous and brief, taking place most probably 25,000 years ago. All or almost all of the basic New World population, in his opinion, stems from one small ethnic group, and any subsequent infiltrations from Asia did not significantly affect the fundamental situation.

Certain comments on this new material are appropriate. It should be

<sup>1</sup> The Ottson-Maintl site (above) not far to the north in Mongolia shows much in common with the Fenho complex (V. E. Larichev, personal communication).



noted that there is still no trace of pressure-flaking in Asia on any early level, nor any clear ancestors for the distinctive early New World artifact types—particularly fluted points. Crude blades are present in East Asia during the Upper Pleistocene, and there is no necessity for invoking the western Upper Palaeolithic to account for the suggested presence of blade technology in Palaeo-Indian cultures. The early stage of the classic Siberian Palaeolithic contains Gravettian elements that do not occur in the New World. Although recent Alaskan finds of significant antiquity sometimes display scattered similarities to the Siberian materials (Campbell, 1961a; MacNeish, 1959b), there is no overall correspondence; no complex can be paralleled in the Old World. The same applies to the small tool industries, as noted above. Despite the considerably earlier dating now in vogue for the interior Siberian Palaeolithic, and the evidence (or suggestion) of still earlier occupation in certain areas, the fact remains that man has a far longer history in the Far East. It is current dogma that only men with a highly-developed, specialized technology could pass through the Arctic barrier, and that only professional big-game hunters would be inspired to—hence the tendency in many quarters to feel that the classical Upper Palaeolithic hunters of the West must somehow be involved. We were apt to forget that way back in the time of *Sinanthropus* the population of Pacific northeast Asia was able to cope with a quite severe climate and to base their economy on the hunting of large and sometimes dangerous game animals with the aid of the most rudimentary technology imaginable. Moreover, as Haag (1962: 123) has pointed out, the animals that are known to have crossed the Bering land bridge are *not* typically cold climate forms but those that would prefer warmer interglacial times. Geographical factors favor the Far East as the most likely source for New World migrants, and the greater length of time during which men were available for export here, as compared with interior Siberia, would seem to enhance the probability.

The division of northeastern Asia into two cultural spheres—Pacific coastal and interior—is still apparent, with its correlate that any flow of peoples and cultures from either toward the New World would be channeled, respectively, along the Pacific shore or down the Lena and thence east along the Arctic coast. Nothing has affected the previous conclusion that any such movements must have occurred during periods of lowered sea level. With a drop of 300 feet, a level plain up to 1,000 miles wide would have extended north and south from Bering Strait. "Giving full weight to the biological evidence, it seems amply demonstrated that a bridge wider than present-day Alaska joined the Old and New Worlds during a large part of the Pleistocene" (Haag, 1962: 123). When one compares the favorable topography of this vast land mass ("Beringia") with the rugged terrain of the small portion of northeast Siberia still above water, it is only too obvious that the great majority

of Pleistocene human inhabitants of this region would have been concentrated in the area now submerged.

This is the picture as of December 1961 of northeast Asia in pre-ceramic times, viewed from the standpoint of New World origins. What deductions do these data suggest? Firstly, the classical Siberian Palaeolithic, although probably older than suspected, is still not ancestral to any American culture; it follows that any movement to the New World from interior Siberia must have occurred at a time antedating the early (Mal'ta) stage, with its Gravettian elements. Occasional analogies in north-western North American sites must be attributed to diffusion of basic techniques and types, or common participation in the last gasp of a broadly similar technological tradition. Byers (1959: 235) postulates a New World cultural base whose bearers "possessed skills in flint working of a general late Levallois-Mousterian order—an industry on the verge of blade making but not yet capable of the fine work of the Solutrean craftsmen". Industries of this type would seem to be represented in the Altai region (Ust'-Kanskaia) in Okladnikov's new Mongolian sites and apparently in the Fenho complex of North China, and offer a possible source for this technological tradition, including bifacial flaking and the subsequent development of points, which in Europe arose in a similar milieu. Certainly one of the major problems we face is the possible relationship between bifacial flaking in the Old and New Worlds. Although it may be feasible to derive our bifacial flaking from Siberia in the light of the Ust'-Kanskaia find, still this raises many questions. Even if bifacial points do occur there at sufficiently early time levels, they are still the exception in lithic assemblages, whereas everywhere in the New World they are the dominant feature. Nor do any real prototypes for our distinctive forms occur. This makes it seem likely that at the most what could have diffused would have been the basis for this technique—the technological trends, not the points themselves; the latter are a New World development. The absence of this tradition on the Pacific coast would necessitate envisaging a spread direct from interior Siberia at the requisite time level, via the Lena and Arctic shore. It would seem hard to believe that such a minor element in the Siberian assemblages could so strongly influence distant America and yet make such a very slight impression in its own homeland—where it continues to be the exception until Neolithic times. Strange, too, that its influence was not felt first on the Pacific coast of Siberia, right next door, before it crops up on the other side of the world. Finally, we are faced with a significant problem in cultural dynamics that demands attention: namely, what condition here in the New World led to this efflorescence of points that never occurred in the Old?

But even if some elements of early New World culture did originate

in interior Siberia, this does not necessarily represent the initial settlement.

We think too much in terms of Siberia, which was not the only possible source, or even for long periods a possible source at all; we need to devote equal attention to the Far East, a much older hearth of human culture. The evidence of Pleistocene geography grants higher probability to the Pacific coastal route to America—one which was always open. I still believe that it is here that we must look for the roots of the earliest New World cultures; what went into their formation will be determined by what was available for export in this part of Asia, and hints of this are provided by the Fenho Complex and the early finds in Japan. It could have included the beginnings of a blade industry. Whatever factors impelled these heirs of the chopper/chopping-tool tradition to move north-westward in late glacial times and contribute so heavily to the formation of Palaeolithic culture in Siberia might equally have impelled them to move northeastward up the Pacific coast toward Beringia.

The racial picture suggests that Pacific northeast Siberia and coastal Alaska formed a single circum-Beringian ethnic area, with the ancestral Eskimo as simply the eastern half of this genetic bloc. Linguistic data also hint at such a unity, as Shimkin has suggested (Shimkin, 1960). It is tempting to correlate the bearers of the "microlithic" industries with the original appearance of this group. In the light of this situation, the numerous and often striking cultural parallels between Alaska and northeastern Siberia on later time levels would seem to represent diffusion back and forth along the Arctic shore between the Lena and the Mackenzie, but with no concomitant population movements of any significance. Those who postulate a late migration from Asia of the Athabascans or any other non-Eskimo New World group will find no support in the Siberian data.

In conclusion, I would offer the following hypotheses on New World origins which seem suggested by the foregoing discussion. I think we may discern perhaps two basic early movements from two different Old World reservoirs. The initial movement was from the Far East, along the Pacific shore, bringing an industrial tradition of choppers, bifaces, amorphous flakes and probably the Levalloiso-Mousterian technique—perhaps in Würm I times, say 40,000 years ago. Men of Mongoloid stock may have been available this early or soon thereafter. It is conceivable that a secondary movement from interior Siberia brought a further increment of the Levalloiso-Mousterian tradition of flint working, a crude blade technique and possibly the germ of bifacial flaking, traveling via the Lena-Arctic coastal route most likely in Würm II (classic Wisconsin) times, when the route would have been more feasible, say about 25,000 years ago. I think it more likely, however, that any such secondary

movement at this time came again from the Far East along the Pacific coast, bringing an embryonic blade technique well established by then in East Asia. I do not think there is any basis for postulating subsequent population movements until the appearance of the Arctic Mongoloids, perhaps 5000 years ago, who may or may not have had some connection with the small tool traditions. Considerable recent cultural diffusion both ways has taken place subsequently through the medium of this circum-Beringian population bloc.

There remains only to comment on the alternative hypotheses offered by Bushnell and McBurney (1959). "In seeking the ultimate origins of the Palaeo-Indian hunting cultures," they write, "we are still inclined to attribute a dominant role to the great events of Upper Palaeolithic spread between the 25th and 20th millennia B. C. rather than to possible survival of primitive indigenous traditions of the Far East." In view of the presence of crude blade industries at an earlier time in the Far East and in the Altai, as well as the absence of Upper Palaeolithic analogies in the New World, I find no justification for this attitude. These authors further state that in central and eastern Europe, pressure flaking is a product of the cultural fusion of East Mousterian and early Upper Palaeolithic, and go on to postulate that these same elements gave rise to the technique in Central Siberia, whence it was exported to the New World. There is no basis for such a view, since there is no trace of this technique in Siberia until very late times. Furthermore, recent expert opinion holds that the early New World points are not pressure flaked at all, and that the technique did not achieve prominence here until tens of thousands of years after its European beginnings. Finally, Bushnell and McBurney allege that the chopper/chopping-tool tradition was confined to Lower Palaeolithic times and subsequently gave way in the Far East to industries of more western types; hence it is unlikely to have exerted any influence on the New World. This is erroneous. It played a major role in the late Palaeolithic cultures of Siberia and Mongolia and persisted into postglacial times in the Vladivostok area. There is clear evidence of its survival in nearly all the Pleistocene assemblages turned up in China itself. No cultural transmission from East Asia to America at any time level could have escaped its influence.

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