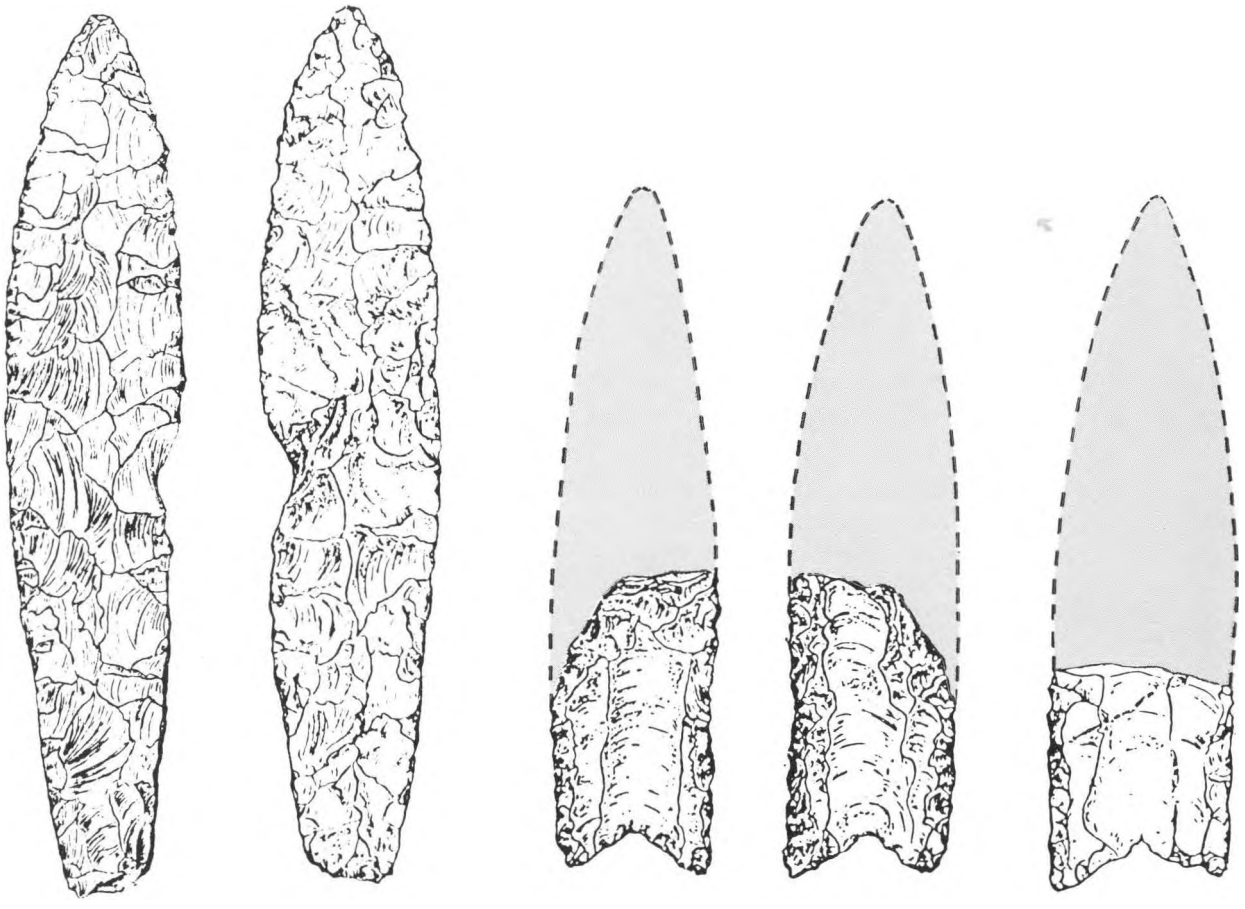
PUTU

A FLUTED POINT SITE IN ALASKA

HERBERT L. ALEXANDER



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PREFACE

"Fortune seems to come to those who climb hills."
Cornelius Osgood
The Chinese

The Putu site is an early campsite located on a knoll high above the Sagavanirktok River in Alaska's Brooks Range. The following is the initial report on that site.

The Putu site was discovered during archaeological survey of the Alaska Pipeline under contract between the Trans-Alaska Pipeline System and the University of Alaska. This contract was initiated in the early part of 1970 with John Cook and I co-directors of the project. During the summer of 1970, while Cook was at Healy Lake teaching the University's archaeological field school, I had overall field supervision of our survey crews, one of which, the crew based at the Galbraith Lake camp, was under my direct day-by-day supervision. I chose to direct the crew at this place due to its central location and because I had spent three field seasons surveying and excavating along the Atigun. At the end of the 1970 field season I left the University of Alaska to take up my appointment at Simon Fraser University and was no longer associated with the pipeline work. In 1973 a grant from the Canada Council (S72-2185) provided funds for further work in the Sagavanirktok and Atigun valleys, specifically to continue excavation of the Putu and Atigun sites.

The actual discovery of the Putu site resulted from a long chain of not necessarily linked events. Of the four areas of the pipeline route assigned survey crews, the Galbraith-Sagavanirktok area was the only section where the pipeline route had not been definitely decided. While all other crews were restricted in their work to the relatively narrow right-of-way, my crew had to survey the whole valley floor of the Sagavanirktok which lay within the mountains. The next event might best be seen from my field diary of June 13. "We began work on the east side of the Sag, starting at the large crescent lake. I found two, possibly three tent rings on the north shore, center of the Lake. Jack [Morry] and Jane [Rice] checked terraces west of there to the river and Danny [Hugo] checked the knolls to the east. We met about one mile north for lunch and when Danny returned he pulled out some large, well made biface fragments. He found them on a pointed knoll about 600-700 feet above the valley floor." Danny Hugo, a Nunamiut from Anaktuvuk Pass had worked with me in 1961 and 1962. After having searched the lower terraces, he climbed a very high knoll which seemed to him an almost certain hunting location. What he discovered there was a typical surface to sub-surface chipping station with not at all typical lanceolate points, the points showed marked similarity to known Paleoindian types. This site was given the field number S-111, catalog designation S-13 and University catalog acquisition number 70-84. I named it the Bedwell Site (Alexander, 1974) in honor of the late Dr. Steve Bedwell whose hope to spend a season with me in the Arctic can now be honored in no other way.

After the survey portion of the contract was completed the Bedwell Site was considered among the more valuable sites, one that should be tested even though it seemed to be

in no direct danger from pipeline construction. The rationale presented to and accepted, somewhat reluctantly, by pipeline personnel was that the site was in such an obvious location that any artifact hunter working on the pipeline would be drawn to the site. We set up camp July 11 on a location which we named Crescent Lake, one mile south of the knoll, and started excavations the next day. Our work at the Bedwell site soon established that the site area covered most of the knoll top but the bare slopes below were devoid of artifacts. A single flake was, however, found while returning to camp on July 28. It had been exposed by a burrowing ground squirrel whose home was on a flat bench some 300 feet south of the knoll top and 100 feet lower in elevation. The day had been long so I placed the flake on top of the burrow for ease of relocating the next day when more realistic time and energy could be devoted to further search. The next day Danny and I returned to the flat bench and there made simultaneous discoveries. As I held up the relocated flake he held up the base of a fluted point. Those two artifacts comprise the only surface discoveries from the Putu site during our two seasons work there. The site was called Putu, Danny's Nunamiut nickname, in that he had made the discovery that drew us to the area, and appropriate for an archaeological site as his name translates as "Hole."

The pressure of time and season, and our rather tentative position at the site clearly outside the pipeline route dictated a strategy of gaining the greatest amount of information possible in the briefest amount of time. The tactic dictated was to lay a series of adjacent squares touching at corners. This gave a checkerboard pattern which covered more area and provided more profiles than a simple straight trench.

Analysis of the artifact locations from the 1970 test indicated that the main concentration of artifacts was at the western extreme of the test and that the greater part of the site probably lay beyond that. Our work in 1973 confirmed this analysis. Where the original test uncovered slightly less than 500 artifacts the 1973 excavation gave us the proveniences for over 6,000 artifacts.

It is normally a pleasant, though never easy task to compose the proper acknowledgements due the various people and organizations for their contributions to a project. Each has made their particular addition, some more so than others. Writing these acknowledgements, however, has been a particularly lonely task. While editing the final draft of this manuscript I was informed that my chief assistant, Vicky Grafstom Leveaux and her young son had lost their lives in a tragic accident. My debt due to this brilliant young woman goes much beyond thanks for the three seasons we spent in the Arctic, during the first season she saved my son and I from drowning. We will all miss her.

Much of the credit for the success of that season's work is due my excellent crew. While all of them had one or more seasons excavation experience, only my chief assistant, Victoria Grafstrom, had any previous experience with the demands of Arctic work. One measure of those demands is that in the course of our daily hikes from valley floor camp to the site some 800 feet above, the accumulated

elevation gained just exceeds climbing Mr. Everest, starting at sea level. For their work that summer I would like to thank Neil Alexander, Charles Arnold, Diane Arnold, Victoria Grafstrom, Brian Seymour, Jean Williams, Ian Wilson, Pamela Wilson, and Henning Von Krogh. Thanks are also due Richard McIntyre and Mickey Van Hatten of the Frontier Flying Service in Fairbanks for taking such admirable care of our flying and general logistic needs. For their skill and tenacity at the often dull laboratory work, whether cataloging, deciphering mosquito stained field notes or piecing together flakes, my thanks go to Susan Irvine, Linda Sears, and Marc Stevenson. Thanks are due Dr. Robert Stuckenrath of the Smithsonian Radiation Biology Laboratory for his help in dating the site.

Finally I would like to express my appreciation and thanks for Canada Council's generous support of this project.

INTRODUCTION

But howe the people furst began
In that country or whens they cam
For clerkes it is a question.
John Rastell ca. 1520
A New Interlude . . .

On the subject of New World archaeology there have been fewer questions more persistent than those pertaining to the early occupation of this continent: where did the people come from? How did they get here? When did they arrive? A brief, conservative answer to a non-technical readership might say that the first migrants, so far unnamed, may have come from Asia, across the Bering land bridge some 40,000 years ago, followed by an occupation variously termed Clovis, Ilano, Paleo-Indian or Fluted Point, again from Asia using the same route 12,000 years ago. This answer would ignore a number of uncertainties that presently occupy those archaeologists working with the early data.

Among the questions that occupy this group's attention are: was the fluted point complex an indigenous development originating somewhere south of the Canadian border, or did it enter *in toto* from the Old World?; if the latter is correct, was the complex derived from a solely Asian base or does it have ultimate roots much farther west? These questions have so far not been answered due in part to the greatest mass of data coming from sites far south of the original point of entry. To answer these questions data have been needed from northern sites, and specifically data on the range of lithic technology and its placement in time. The Putu site was excavated with the expectation that data within that site might help answer those questions.

This report, presented with the above aims in mind, is organized in the following manner. *Setting* defines the location and environmental context. The section *Data* begins with excavation techniques, how data were acquired, followed by descriptions of the strata, features, artifacts, and dating. *Conclusions* include a summary of data, comparisons with other sites and the problems of technological content and placement in time. A full, complete discussion of Paleoindian origins is not the object of this report--the main objective is the presentation of data from Putu.

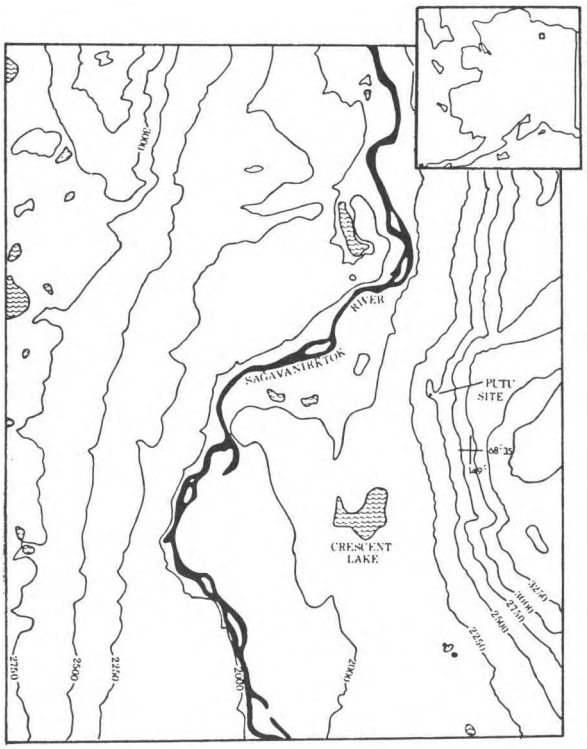
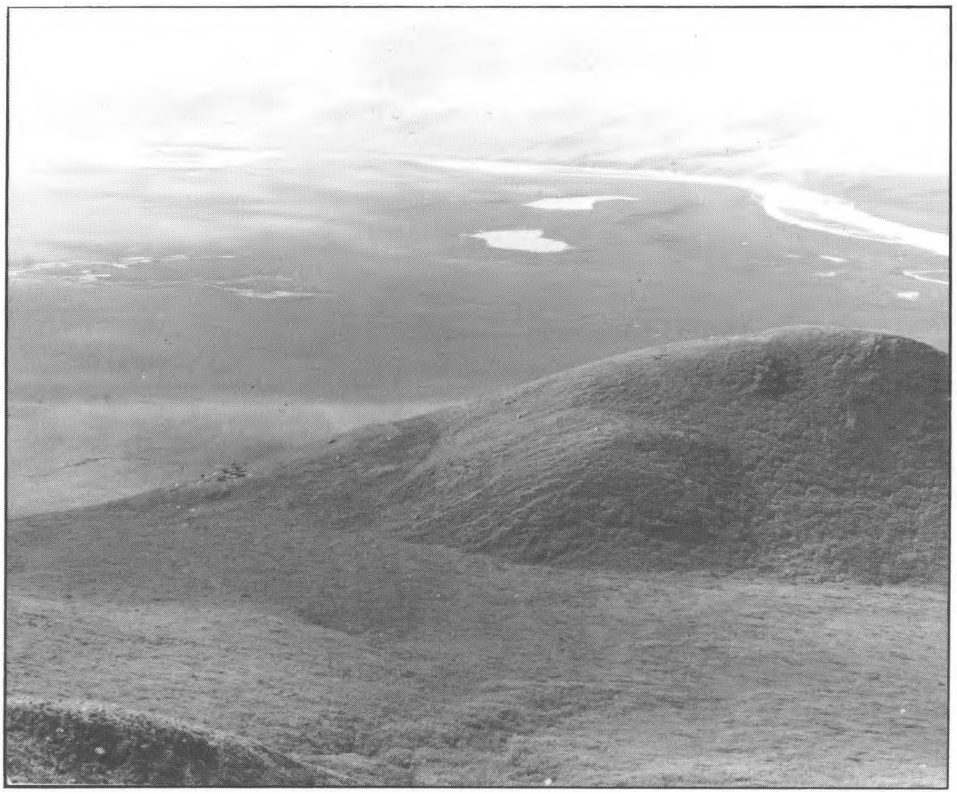


Fig. 1.

Location of the Putu Site.

Fig. 2.

View of Putu Knoll looking west across the Sagavanirktok Valley. The Putu Site is to the left at the base of the hill. The Bedwell locality is at the highest part of the knoll.



THE SETTING

There is a mountain round and low that lies by the Polar rim.

Robert Service
Ballad of the Northern Lights

The Putu site is located in the Central Brooks Range of Alaska at latitude 68°35' north, longitude 149°01' west. Located some 27 miles north of the divide and 13 miles south of the most northerly extension of the mountains it is on the boundary between the Central and Eastern Brooks Range and the Foothills physiographic provinces (Pewe, 1975). The site is on part of a large knoll jutting out from the side of a mountain slope which forms the eastern slope of the Sagavanirktok Valley. This knoll is 800 feet above the valley floor and approximately 1,000 feet below the mountain crest (Figures 1 and 2). The site itself is on a small, level bench 100 feet lower and 300 feet south of the knoll top. The subtleties of this particular location are crucial to the analysis of the site. Located on one side of, and high above, the valley floor, the very top of the knoll provides a view of all the valley and most of the plateau bounding the west side of the valley. This knoll top provides an excellent view for spotting game, and would allow a hunter to estimate where game might be in an area of nearly 24 square miles. The view from the Putu site terrace is, however, totally blocked to the north and the rounded shape of the slope restricts vision immediately below. In effect just a bit less than half the available area from the knoll top can be seen from the Putu site. From three seasons experience in hunting with the Nunamiut I consider the location to be an extremely poor choice for a hunting lookout especially when a panoramic view from a much more obvious spot is just a minutes walk uphill. At lunchtime and coffee breaks Danny Hugo would walk to the top of the hill to look for game.

Additional environmental factors, snow, wind, and mosquitoes, need also to be considered. The prevailing winds parallel the long axis of the valley, roughly north-south. With a location in the southern lee of the hill the Putu site area would be covered during the cold months with drift snow, potentially a desired resource for insulation. The location also provides a wind-break not only from the north but quite effectively from the south wind as well. We discovered that when there was too little wind at the site to keep the mosquitoes down, a bit of respite from their assaults or a mosquito free lunch-time nap, could be found on top of the knoll. When there was a south wind strong enough to make note taking difficult at the site, there would be a gale blowing on top of the hill, a gale sufficiently strong to allow walking perpendicular to the slope, one of the few simple Arctic pleasures. The site is an attractive location for a camp in that it provides level ground protected from the wind and possibly an insulating cover of drifted snow. Equally important during the winter on a still day the elevation difference could provide a temperature difference of as much as 30°F with the heavier, colder air blanketing the valley floor.

Another feature of the location important to the interpretation of the site is the small, level bench

at the north edge of the site (Figure 3). This bench is presently three to four feet higher, and as will be seen in the description of the stratigraphy the original height difference may have been as much as five feet when the site was occupied. Our tests on this higher bench produced no signs of occupation, a fact requiring some explanation. The amount of debris from the lower bench comes either from frequent re-use as a hunting station or as a campsite. If the former were true the two benches are equally endowed for the view is the same from both, and both are level and dry with equal wind factors. As a campsite, however, the lower bench has a level area some three times larger which could permit more habitation structures than on the higher bench.

The upper Sagavanirktok valley is in the Eskimoan Biotic province (Dice, 1943) characterized by typical Arctic tundra with lichens, mosses and sedges predominating. A profusion of small flowering plants with brief, sequential periods of flowering give some feeling of the progression of season, as do the time of appearance and disappearance of migrating birds. Small stands of dwarf willow and birch are occasionally met, the only stand presently of any size in the Sagavanirktok valley is at its junction with the Atigun River. Permafrost is everywhere found at varying depths. In some places the permafrost is buried by only a few inches of soil, in others by many feet. In the course of the site excavation no permafrost was found, even during relatively rapid excavation of several small tests.

The large land mammals now living in the area include, in order of relative abundance, caribou, Dall sheep, moose, and grizzly bear. While musk-ox may have been present in historic times there are neither accounts of them nor the osteological evidence. Late Wisconsin fauna almost certainly included bison, mammoth, and horst (Pewe, 1975). Smaller mammals likely to have been used by man, based on present Nunamiut use, include wolf, wolverine, ground squirrel, marmot, Arctic hare, red fox, Arctic fox, and rarely, porcupine. Lemming and vole are useful through raiding their winter food supply, a pleasant reversal in that their bedding materials are frequently stolen from human camps. At present there are too few migratory waterfowl nesting in the area to be of any economic importance. Willow and rock ptarmigan are present year round in numbers sufficient to allay starvation. Among the larger fish are lake trout, grayling, whitefish, and ling cod (*Lota leptura*) all found year round, and the Arctic char found in late fall. The latter do not at present migrate in large numbers.

The following list from 1973 records gives some idea of summer abundance of the larger mammal species. It is a fairly accurate record in that there were very few hours when some of the crew were not up and about, and game were sufficiently rare that a note was made after each sighting.

June 24	1 grizzly bear
29	1 female moose
30	30+ caribou; males, females and calves
July 3	wolves howling
5	wolves howling
18	2 caribou, 3 wolves, 1 fox
22	1 wolf
27	1 wolf
29	1 male caribou
31	3 wolves, 7 pups
August 10	1 wolf

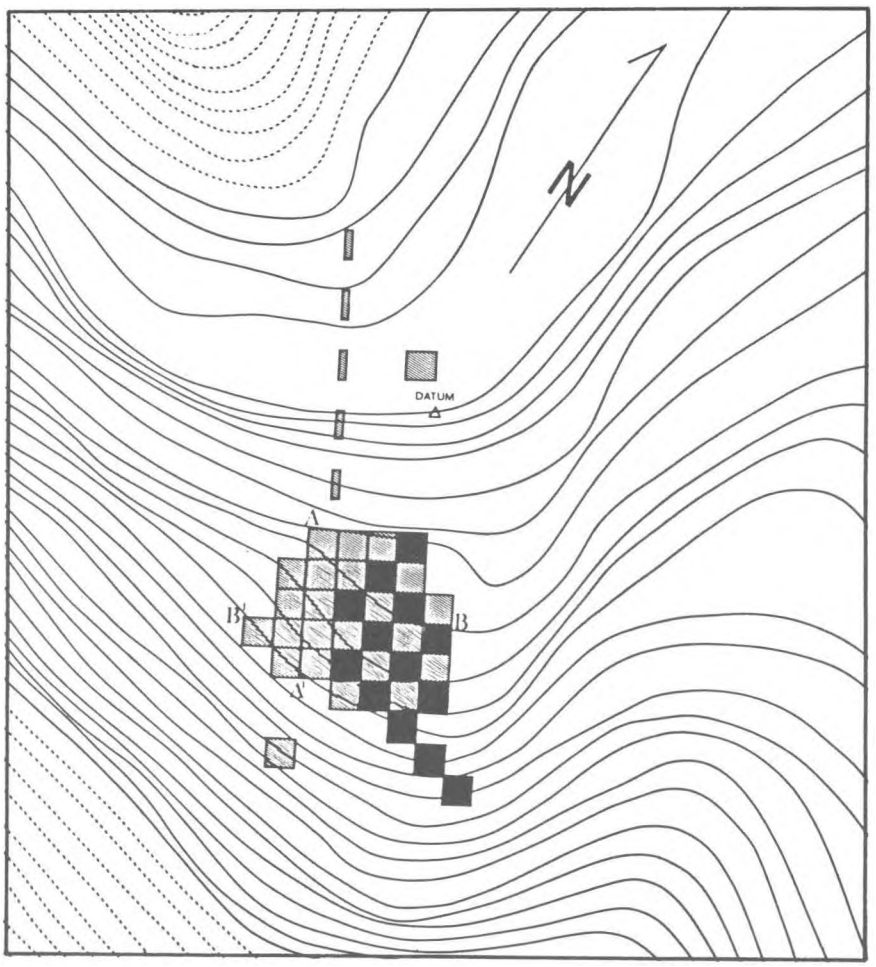


Fig. 3.

Excavation plan. The dark squares were excavated in 1970, the remainder in 1973.

Ground squirrels were an ever present pest in camp and at the site. No food, fabric, paper, or plastic bag was safe from their active collecting.

It is almost certain, however, that present conditions at the site do not accurately reflect conditions in the region some 11,000 years ago. At that earlier time, two large glaciers a few miles south of the site would have provided the main scenic focus from the site and their close proximity should have had a profound effect on all the environment. With the southern part of the Sagavanirktok Valley partially filled with ice, the flow of air would have been different in strength, direction, and temperature. Certainly during the summer growing season a wedge of cold air extending out from the ice would have had an effect on both plant and animal communities. One not insignificant effect would be that a relatively mosquito-free zone would provide an attractive haven for the large mammals, as summer ice pans do today. The ice pans are favored spots to Nunamiut hunters searching for a sleeping caribou. With most, if not all the north-south valley passes through the Brooks Range blocked by ice, migration patterns would not be the same as today.

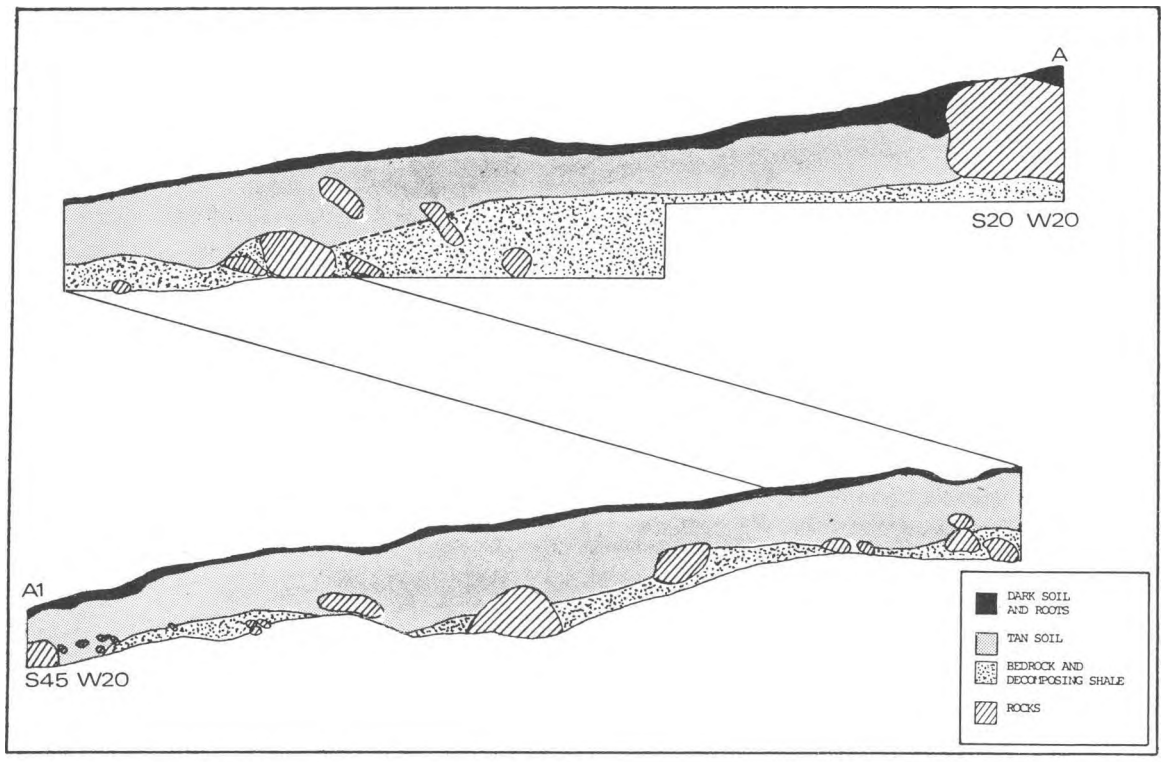


Fig. 4. Profile A-A'.

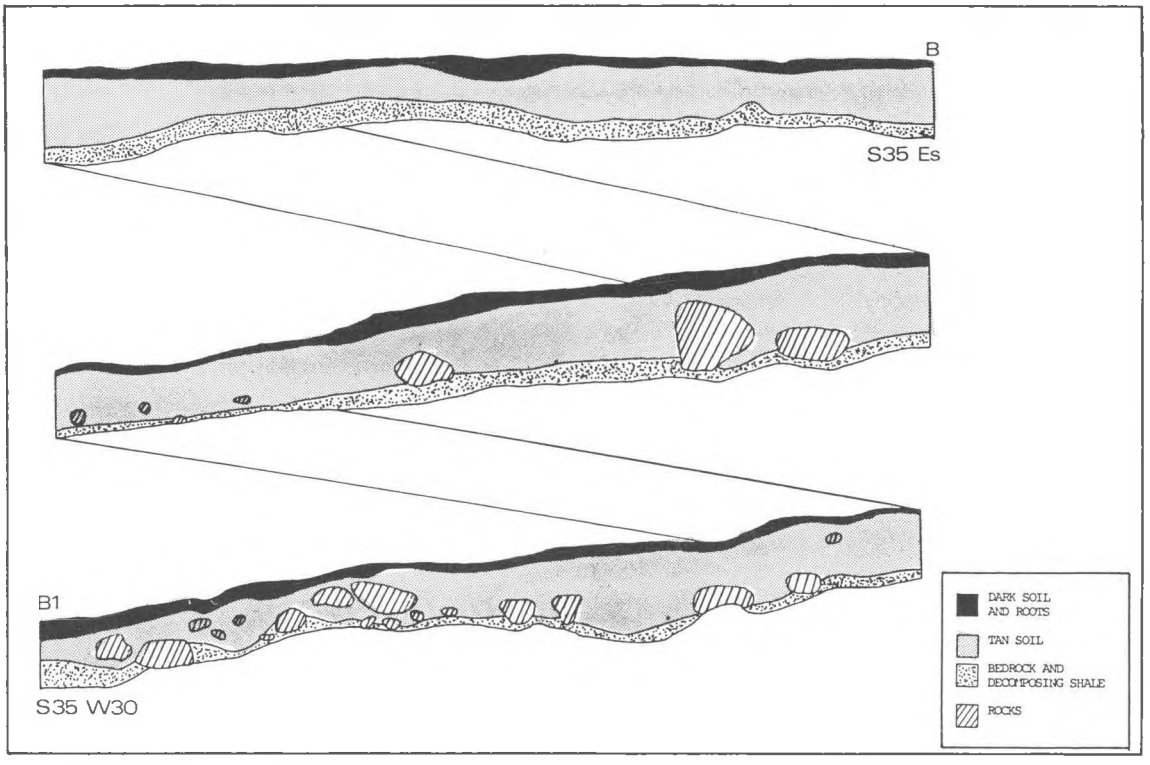


Fig. 5. Profile B-B'.

THE DATA

We mercifully preserve their bones, and pisse not upon their ashes.

Sir Thomas Browne 1658
Hydrotaphia: Urneburiall

Excavation Techniques

As previously mentioned our primary concern at the site was to collect data on technology and materials for dating. In order to obtain *in situ* provenience as often as possible all excavation was by trowel. Within each five foot square smaller units were excavated so that any material found on the screen (all fill was passed through 1/4 inch mesh) could be placed within a particular square foot no more than an inch in depth. It is some tribute to the skill of the crew that considerably less than five percent of the finds lacked exact three-dimensional and zonal provenience. On a larger scale, excavation was by natural strata, a relatively simple process for the 1970 test had established a clear pattern of three natural strata. Each five foot square was excavated in the following manner. The surface cover of vegetation was first removed; then the dark, soil zone was taken down to the top of the next zone. A plan was drawn of the exposed tan zone followed by this zone being removed one to two inches at a time. In all levels when artifacts were found in place they were left there until there was no room to dig. This was a problem only near the bottom of the tan zone, Zone II. The finds would then be measured for horizontal and vertical provenience and placed in individual coded plastic bags. The second zone would be removed to the top of Zone III and again plans were drawn. From two to six inches of the bottom zone were then excavated. The 1970 tests and occasional deeper excavation in 1973 had established this zone as culturally sterile.

The 1970 grid pattern of five foot squares was continued with the original datum point, a large metal spike driven into a boulder, relocated for vertical control (Figure 2). The datum was given an arbitrary elevation of 100 feet. Relocating the 1970 grid pattern was a simple matter in that the backfilling had become slightly depressed leaving the original walls exposed.

A master map of the site, begun in 1970 was kept up-to-date with all artifact locations. This map was used to plan the extent and sequence of the excavations as excavation was taking place. The overall strategy was to remove all but a small part of the site, leaving a few areas for possible later checking of our work. The field map indicated that parts of three unexcavated squares (S30-34, W25-30; S20-25, W20-25; and S15-20, W10-15) should retain cultural debris.

Stratigraphy

Three distinct strata were uncovered at the site (Figures 4, 5, and 6). Zone I is a black to brown-black loose textured soil, difficult to excavate due to the masses of fine roots of the surface vegetation. The zone was from three to six inches thick, from three to four inches being the normal. The zone contained a scattering of flakes, bone, and antler. Zone II, a loess zone below this, was recognized by a contrasting tan color, and a somewhat more compact texture. While not completely root-free it lacked the matted root masses of the

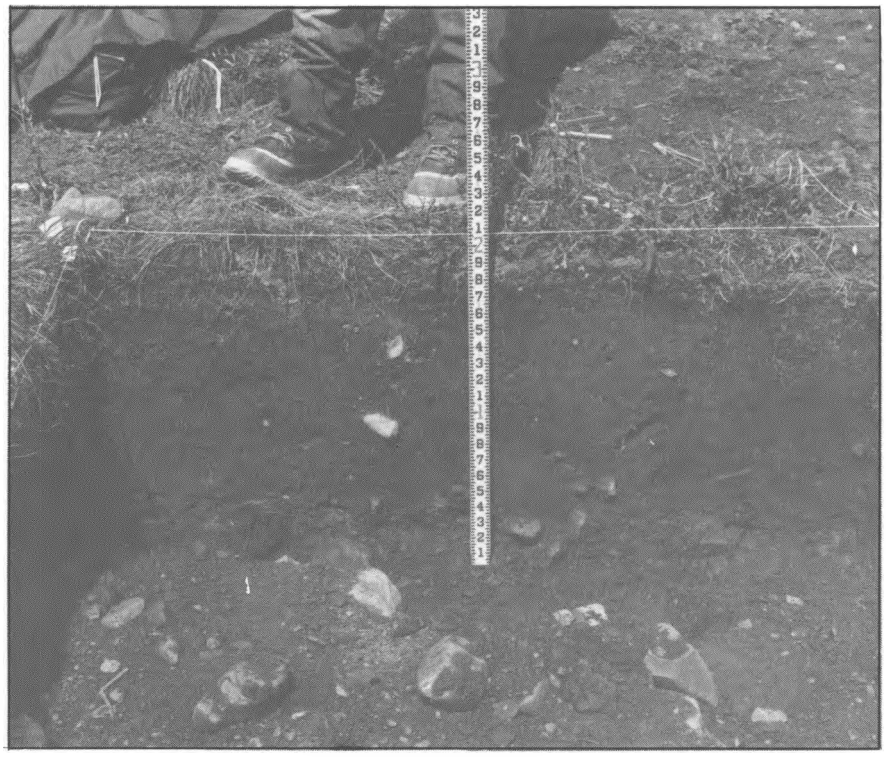


Fig. 6.

a. Stratagraphic profile at 10W between S20 & 25 with the top of Zone III exposed.

b. Stratagraphic profile at S20 between W5 & 10 with the top of Zone III beginning to show. The stadia rod is in tenths of feet.

top zone. Zone II ranges from nine to twenty inches thick with the deepest part found at the north edge of the site. No natural strata could be discerned within this zone. Zone III below was also easily recognized by its distinct gray colour and its composition of small rounded fragments of decomposing shale-like material.

Two cultural levels were found in these zones. In Zone I, directly below the surface and within the densest part of the root mass, were found flakes with no evidence of chemical or organic alteration, pieces of cracked bone, and fragments of antler. As several of the latter were quite clearly cut with a metal saw this occupation is considered to be recent, if not historic. Bone and antler were found only in this zone. The vast majority of finds at the site came from the lower part of Zone II, from one to three inches above the contact with Zone III. Occasional artifacts were met throughout Zones I and II and they almost certainly derive their locations from the burrowing activities of ground squirrels. One clear example of this was a series of large core fragments, all of the same material, which filled a partially open squirrel hole that ran from the bottom of Zone II to the surface. Since several fragments of this core were found in undisturbed deposit in the lower part of Zone II it is assumed that was its original place of deposition. Another example comes from the location of some twenty-five pieces that fit a broken biface. Fifteen of the flakes and the biface come from the bottom of Zone II, seven flakes from mid-zone, and three from the top of the zone. Locations of this series are shown in Figure 7. Of all artifacts found in Zone II approximately 85 percent were found in the bottom two inches of the zone, 10 percent in the middle of the zone, and 5 percent near the top of the zone.

There has been considerable horizontal movement of artifacts within the site as seen in Figure 5 which shows the locations of all artifacts so far joined. At the present state of analysis the reasons for such movement, whether from the activities of man or beast, or natural phenomena such as down-slope creep or frost heave cannot be discerned. It is probable that all factors were to some degree responsible.

Tests on soil acidity were made on two samples taken from profiles at three inch intervals from the surface to the lowest part of the excavation. The high acidity as seen from Table I would account for the lack of organic materials in the older part of the site.

TABLE I

Results of ph tests on two profile samples taken at 3 inch intervals

	pH of sample 1 s 40 ft. w 20 ft.		pH of sample 2 s 20 ft. w 71/2 t.
surface	4.5	Zone I	5.0
3 inches	4.0		4.5
6 inches	4.0		4.0
		Zone II	
9 inches	4.0		4.0
12 inches	4.0		4.0
15 inches	-		4.5
18 inches	-		5.0
		Zone III	
21 inches	-		5.0

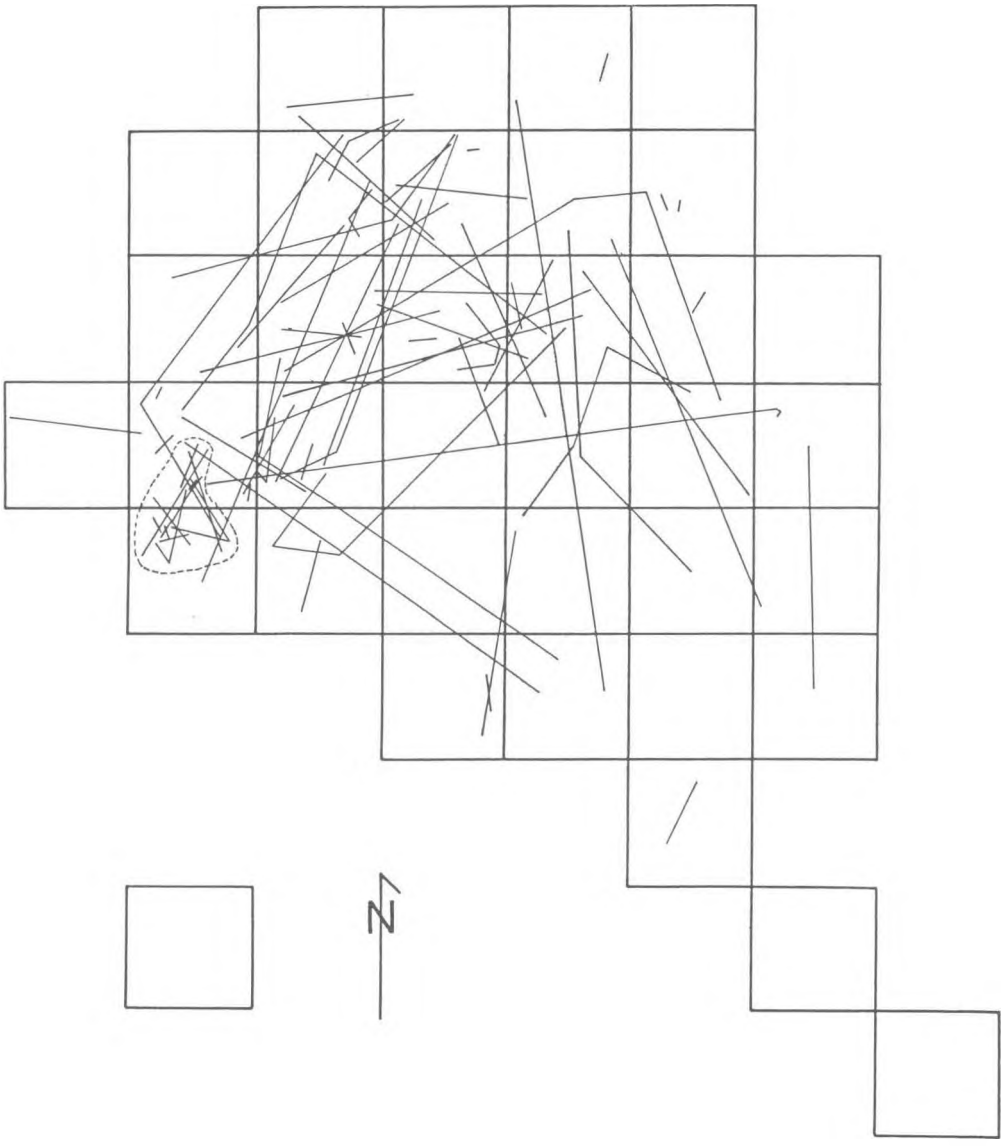


Fig. 7. Plan showing horizontal movement of artifacts. The concentration surrounded by a dashed line represents flakes removed from a split biface.

Features

All potential features such as soil staining, arrangements of rocks, charcoal concentrations, ground squirrel holes, and the like were given feature numbers. Of these the following appeared to be cultural remains. Their locations can be seen in Figure 8.

1. Zone I -- Hearth. This is a shallow, circular depression ca. 10 inches in diameter, 1 inch thick containing small flecks of charcoal. It was found directly under the root mat. It probably represents the remains of a small fire built directly on the tundra cover.

2. Zone I -- Hearth. Numerous small flecks of charcoal and a single piece of bird bone were found in a circular depression 1 foot, 7 inches in diameter, 2 inches thick in the root mat of the zone.

3. The same type of hearth as Feature 1.

4. Zone I -- Possible Hearth. This is an irregular shaped concentration of charcoal flecks, 10 inch maximum dimension found in the root mat.

5. Zone II -- Possible Hearth. This is a charcoal concentration ca. 6 inches in diameter found 3-4 inches above Zone III.

6. Zone I -- Charcoal Concentration. This charcoal was found in a section of tundra crack, 1 foot, 2 inches long most likely wind-blown and trapped in the concavity. It was found in the root mat.

7. Zone I -- Hearth. This charcoal concentration, ca. 1 1/2 inches thick and 16 inches in diameter was found in the bottom of the zone. It is considered the same type hearth as Features 1 and 2.

8. Zone I -- Hearth. This is a circular concentration of charcoal 12 inches in diameter that is directly adjacent to Feature 7 and may be an extension of that feature.

9. Zone II -- Hearth. This is the largest concentration of charcoal found at the site, an elongate north-south oval 3 feet long, and 1 foot 3 inches wide, but with no obvious, measurable thickness. It was found 2 inches above the top of Zone III. The main concentration of staining and charcoal flecks comes from a circular area 1 foot 6 inches in diameter located in the center of the feature.

10. Zone II -- Flake Concentration. Directly below and near the south one-third of Feature 9 were found 119 flakes in an area of 10 inch maximum diameter. There is no evidence that the features are associated.

11. Zone II -- Flake Concentration. A densely packed mass of over 400 flakes were found in an area 3 inches by 7 inches bounded on one side by a head-size conglomerate boulder. While most flakes found at the site were found lying horizontal to the surface, the flakes in this concentration were found at all angles from vertical to horizontal. Their association seems quite certain as the low density of flakes elsewhere allowed easy definition of the feature area. This feature represents a single event. The three most likely possibilities are that someone used the boulder as an anvil, as a place to sit, or that flakes collected on a skin were gently dumped at the edge of the boulder.

Artifact Types

In the following section describing artifact types all numbers in parentheses are catalog numbers, those numbers with 70-84 prefix came from the 1970 work. While the

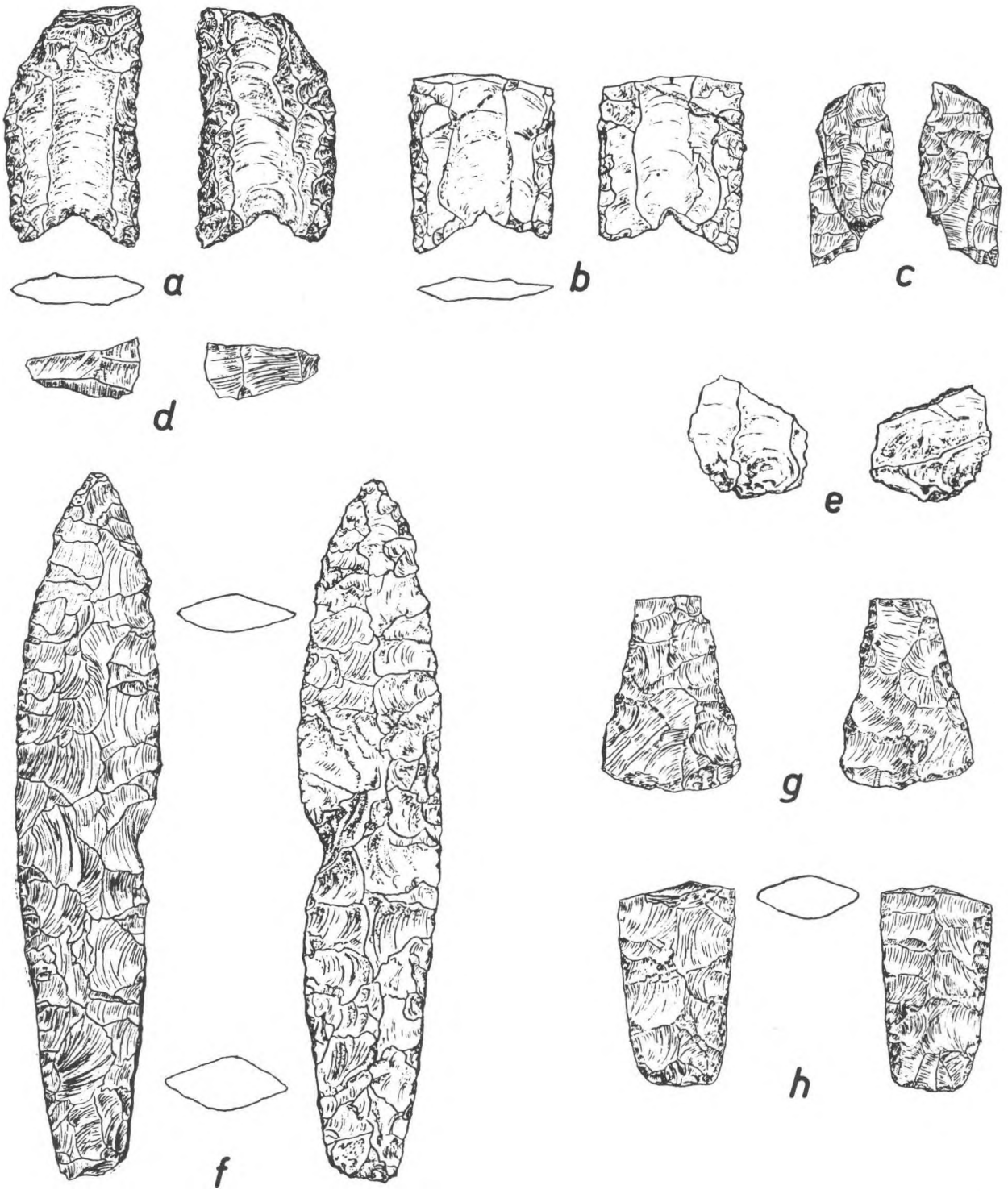


Fig. 8. Projectile points.
Fluted point fragments a-e. Putu points f,h. Triangular point g.

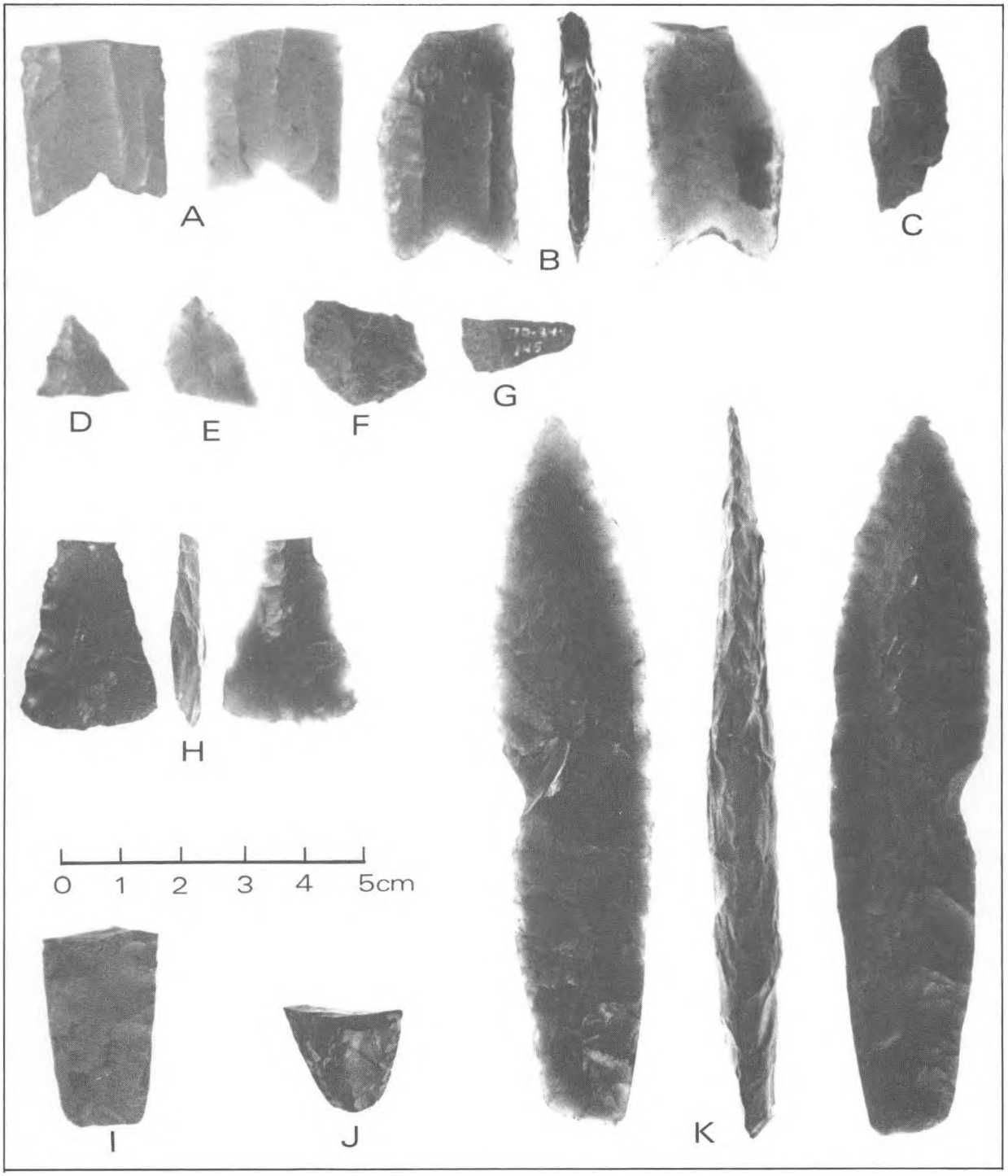


Fig. 9. Projectile Points.
Fluted point fragments a, b, c, f, g. Putu points i, j, k, e.
Triangular point h.

functional terms such as points, knives, scrapers, etc. have been used for titles, no such function has been assumed unless specifically stated.

Fluted Points -- 4

This group composed of incomplete fragments is too small to provide an overall type description. The only certain common attribute is the presence of basal fluting scars. The three specimens that have more or less complete bases indicate that parallel blade edges are another defining attribute.

1. (70-84-73) (Figures 8b and 9a).This point base was the original discovery that prompted our excavation of the site. It is of fine-grain, gray-tan chert, measuring 2.9 cm long, 2.3 cm wide, and 0.4 cm thick. Heavy grinding occurs on the base and edges, extending 2.2 cm on one and 0.9 cm on the other. Each face was thinned by the removal of three parallel channel flakes, the central flake being the last one removed.

A snapping type hinge fracture resulted from force applied to one side, and the location of the fracture just 0.5 cm above the edge grinding is some indication that the specimen was hafted when broken. Flakes removed from the edges are quite flat with almost imperceptible bulbs of percussion.

9b). (70-84-74) (Figures 8a and 3b) This incomplete point is made of obsidian from the Batza Tena quarry area (Erle Nelson, personal communication, 1975). The incomplete length is 3.9 cm. It is 213 cm wide and 0.6 cm thick. The base and one edge for 2.1 cm of its length are heavily ground. The other, longer edge has no grinding, while quite pronounced grinding is found on both sides on the ridges produced by the channel flakes. Each face was thinned by the removal of three parallel flakes with the lateral flakes shorter than the central flake. This specimen may have been used as a knife.

3. (70-84-224)(57) (Figures 8c and 9c). This broken, incomplete specimen, of fine-grain, blue-gray chert was found in two pieces, one located during each of the two field seasons. It is 1.3 cm wide and 0.5 cm thick. The incomplete length is 3.0 cm. One ear of the base is missing as is the tip and part of one edge. The tip was broken by a snapping fracture, and the edge by a burin blow. It was thinned by the removal of single channel flakes on each face. The fluting scar on one face has been flaked over from the base for one-third of its length. All flake ridges show considerable wear. The maximum extent of grinding (on the edge missing the basal ear) is 2.4 cm. Both edges and base are heavily ground but due to the fragmentary nature of the specimen the full extent is only an estimate. Due to the narrowness and surface grinding indicating use I feel this specimen was most likely used as a drill. It should be noted that my reconstruction based on the 1970 fragment (Alexander, 1974, Figure 3c) incorrectly assumed a much wider total width, and that specimen was too small to show significant surface wear.

4. (436) (figures 8e and 9f) This is a basal section broken during manufacture, being part of the basal section that fractured during the removal of a central flute. One face has two parallel channel flakes, while the other face has a single flake scar with a positive bulb of percussion centered between the two flakes of the other

face. The basal section including the striking platform is bifacially worked. It is made of gray-green chert and measures 2.0 cm long, 1.8 cm wide, and 0.4 cm thick.

Lanceolate (Putu) Points - 4

This relatively homogeneous series of tools includes one complete specimen and three basal fragments. I consider them sufficiently distinct from other named types to propose the name Putu. Specimen no. 137 is considered type specimen for the group and its description serving for the group. The group is characterized by an elongate lanceolate outline with convex edges, the widest part slightly above mid-point. Cross section is markedly different between blade and base, the former shallow convex, the latter convex-angular, noticeably thicker than the blade. Flaking is well controlled though not patterned. On the basis of direct comparison between these specimens and the specimens and casts in the Smithsonian which are considered Agate Basin I feel they share no attributes other than being manufactured of a good quality stone.

1. (137) (Figures 8f and 9k). This complete specimen is of dark tan, fine-grain chert and is 11.5 cm long, 2.4 cm wide, some 4 cm from the tip, and 1.1 cm thick along the base. The cross section is shallow biconvex along the blade while the base continues the convex contour of one side with the other side markedly angular, a shape derived from shallow flake scars meeting at a well-defined central ridge. There is heavy grinding on the basal edges extending some 4.5 cm. All but the more concave flake scars show considerable wear giving an almost glassy surface, while the flake ridges have a dull matte surface. When viewed under 32x magnification the blade edges show grinding wear suggesting dual function as point and knife. Basal thinning was accomplished by the removal of two to three short, steep flakes. The overall outline is elongate lanceolate with convex edges and an almost straight base. The specimen is widest above mid-point.

2. (4466) (Figures 8h and 9i). This basal fragment of light gray-green chert is 3.3 cm long, 1.9 cm wide, and 0.8 cm thick. Both edges and base are heavily ground. The most extensive grinding extends for 2.5 cm from the base. In cross section, outline, and workmanship this specimen is so close to the complete point described above as to suggest the same person was responsible for their fabrication. Unlike that specimen however, this one has no evidence of use.

3. (5) (Figure 9j). This basal fragment of glassy black chert is 1.9 cm long, 1.9 cm wide, and 0.7 cm thick. Unlike the above two specimens the base is slightly rounded, most likely the result of basal thinning being incomplete as indicated by a section of cortex not having been removed. The cross section is the same convex-angular shape found on the other points. The edges are lightly ground. It has been broken along a crystaline fault plane in the chert. One edge and a tip formed by the fracture at the longest edge show use wear.

4. (4) (Figure 9e). This point tip of blue-gray glassy chert is 2.1 cm long, 1.6 cm wide, and 0.3 cm thick. In workmanship, outline, and cross section it is identical to the complete point. There is no evidence of intentional or use grinding.

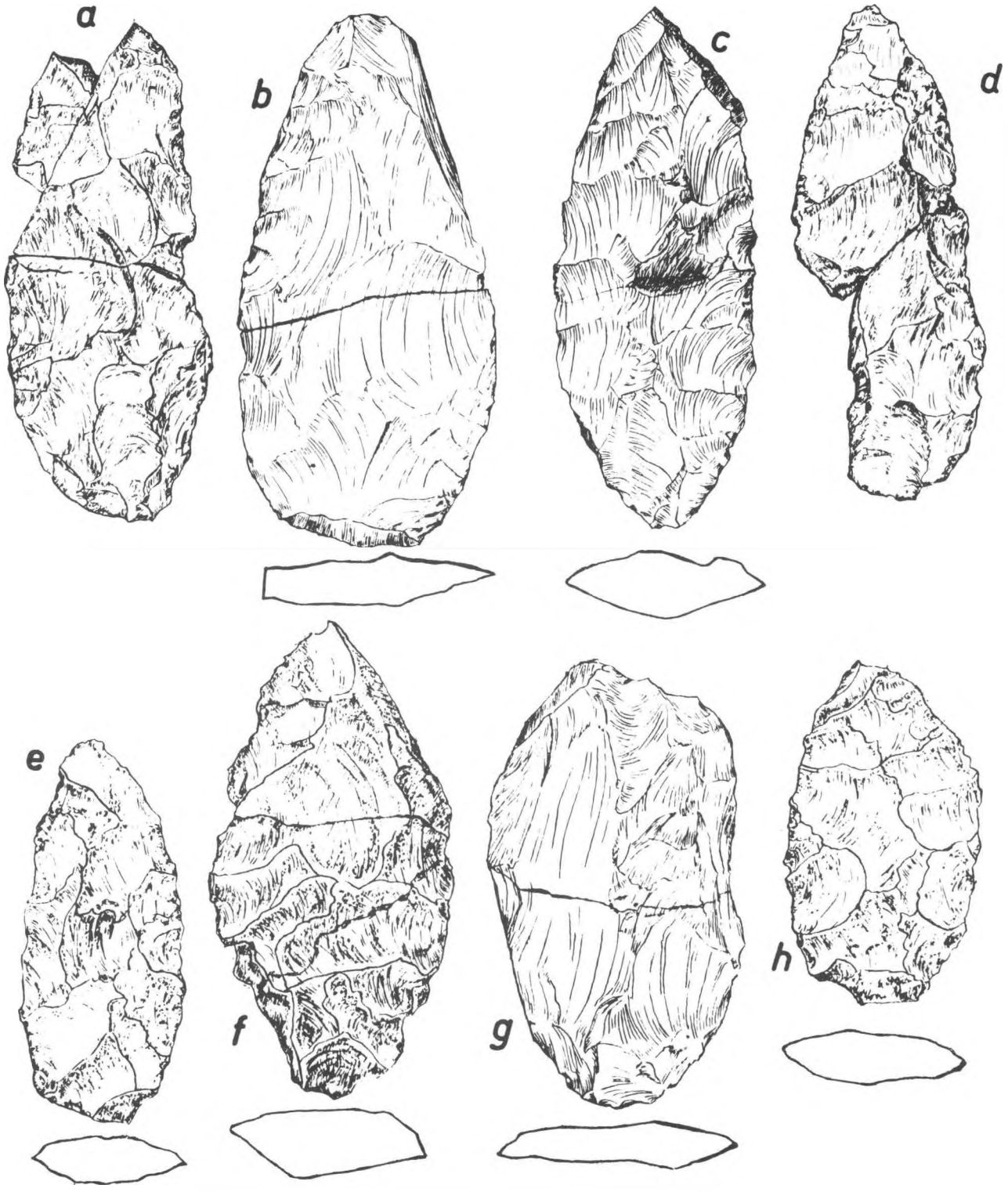


Fig. 10. Split bifaces. Specimens a & d are burins as well.

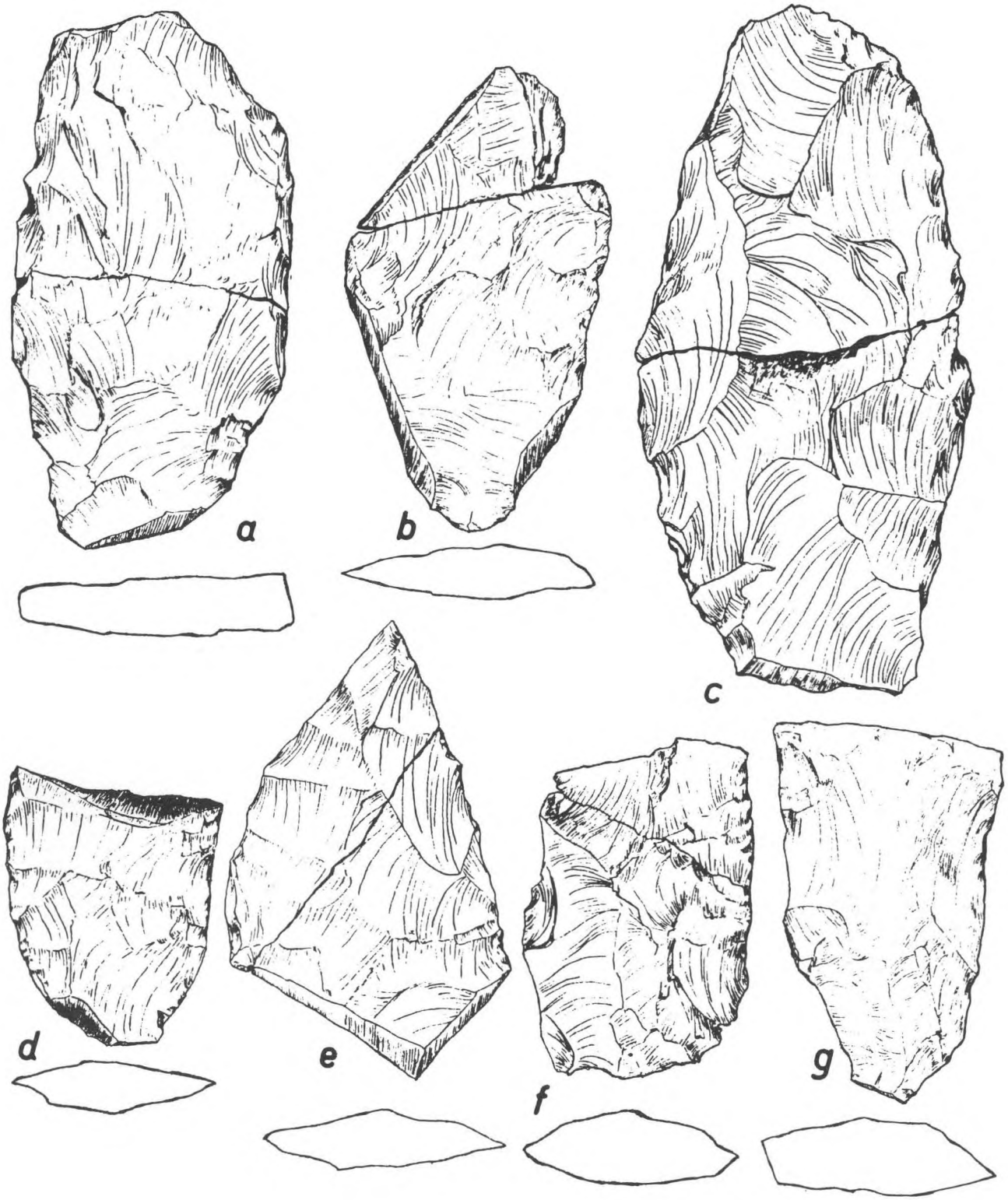


Fig. 11. Split bifaces.

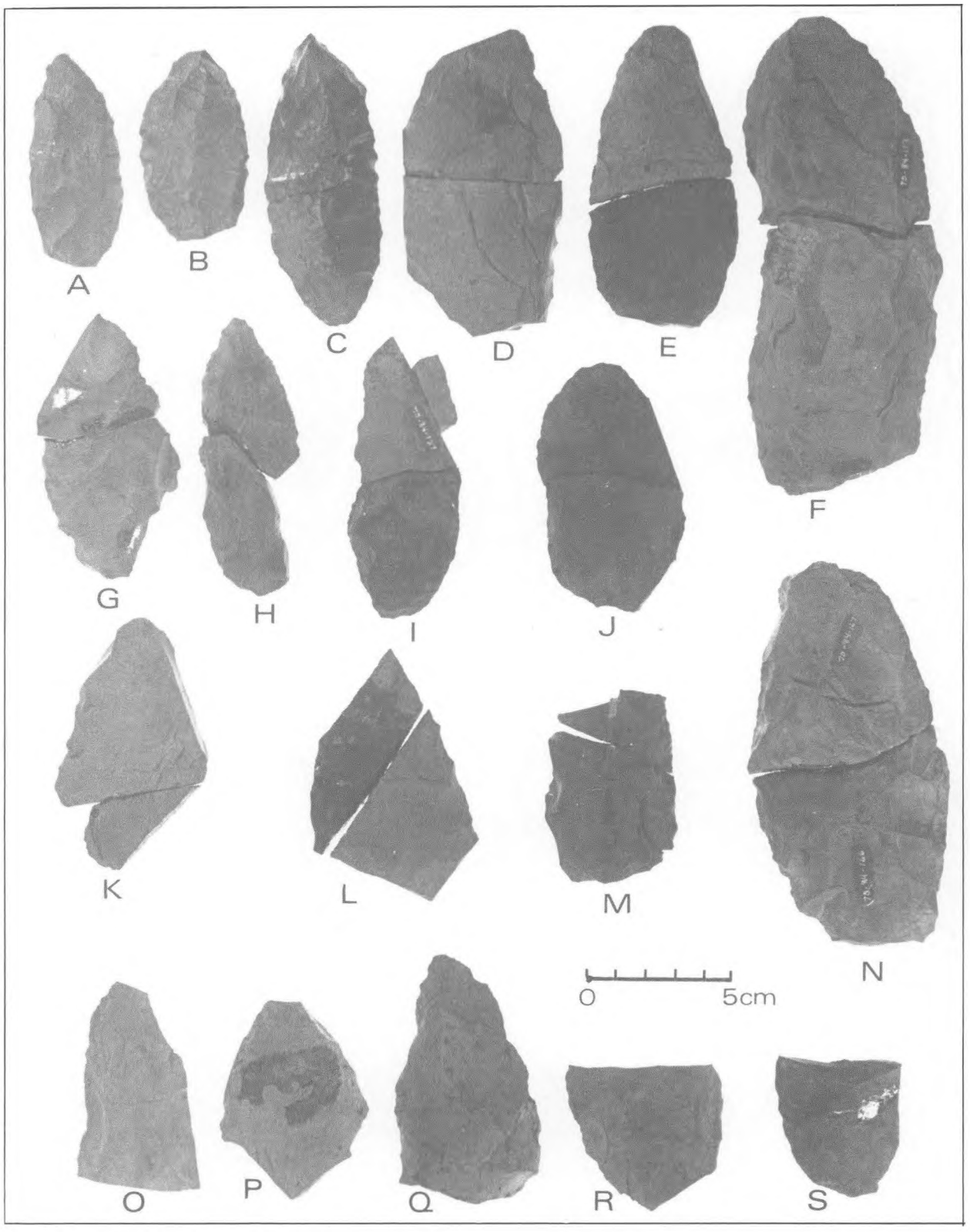


Fig. 12. Split bifaces.

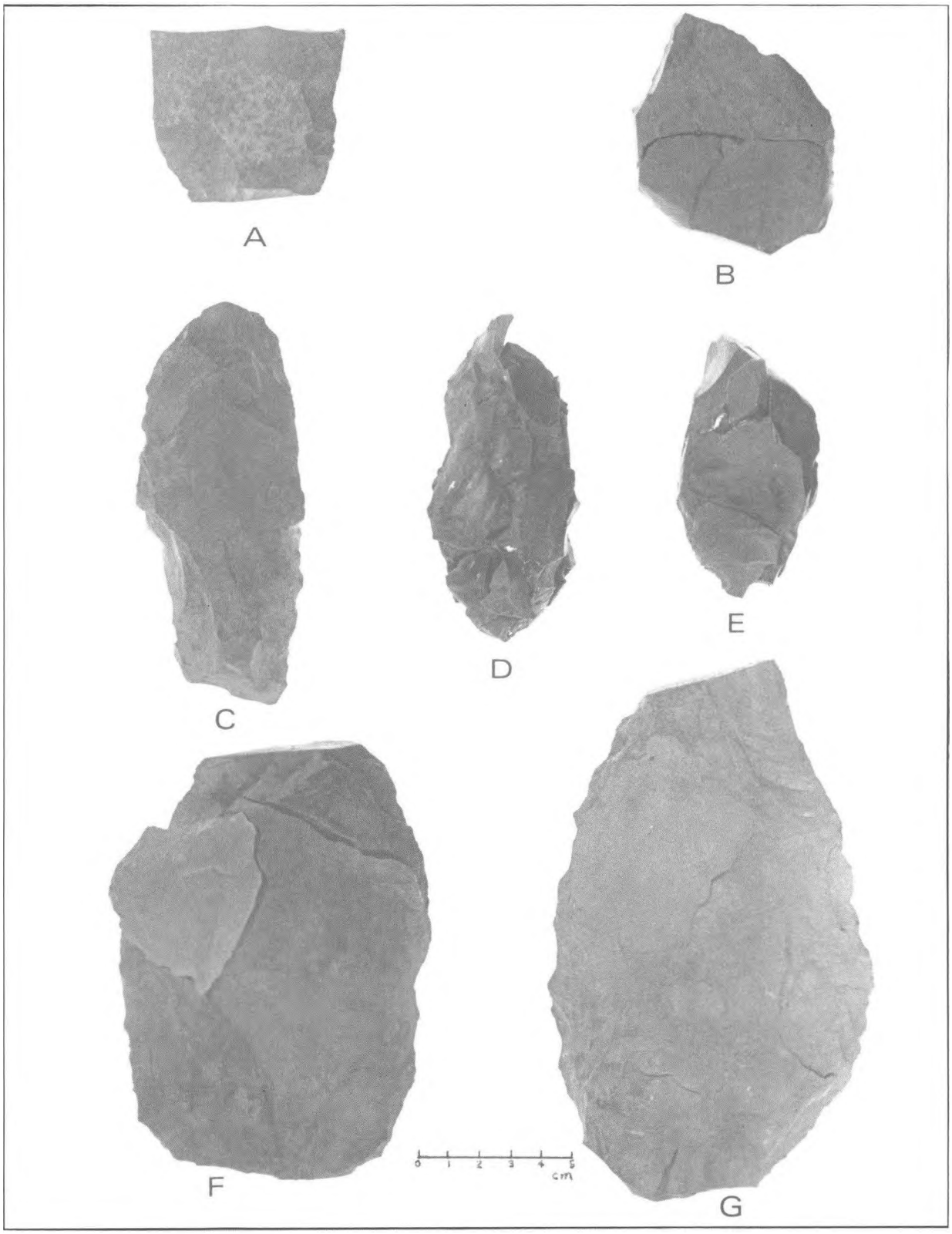


Fig. 13. Split bifaces. Specimen D shows 25 flakes covering the completed tool.

Triangular Point - 1

1. (795) (Figures 8g and 9h). This specimen of black glassy chert measures 3.1 cm long with the tip missing (estimated complete length of 4.1 cm) 2.2 cm wide, and 0.4 cm thick. The outline is triangular with a slightly curved base and straight edges. The workmanship of broad shallow flakes is the same as found on other points from Zone II. One edge has steep marginal flaking on one side, suggesting either an attempt to reshape a broken piece, or that the point was broken from pressure during the final stages of manufacture. I prefer the latter interpretation as other evidence suggests an incomplete job, e.g., small sections near the base which are unfinished, a lack of edge grinding, and no evidence of use. This tool fits within the range of variation of the chindadn type from Healy Lake. The comparison is based on the descriptions of McKennan and Cook (1970) and from my own perusal of those specimens found up to and including the 1970 field season at that site.

Point fragment - 1

1. (52) (Figure 9d). This tip fragment of light gray-tan glassy chert is 1.6 cm long, 1.5 cm wide, and 0.4 cm thick. It was probably broken in manufacture as the end is not finished and the overall surface finish is considerably cruder than the other point specimens.

Large Bifaces - 41

These specimens are characterized by the bifacial removal of large flakes from a generally poorer quality chert than that used for making other tools. The most common stone types are coarse granular chert and mud-stone with definite laminar fracture planes. The biface outlines indicate that the desired shape was an elongate tear-drop outline with the widest part near the center, and an even bi-convex cross section (Figures 10, 11, 12 and 13). The range in length is from 5.8 to 18 cm, in width from 2.7 to 10.6 cm, and in thickness from 0.8 to 2.4 cm. Incomplete specimens indicate that large, flat slabs of stone provided the initial blank and major reduction in the process of shaping was along the edges until the flaking could reach the center of the piece. On almost all specimens the edges are both evenly contoured in outline and decidedly sinuous when viewed edge on.

An unusual aspect of this series is that of breakage. Within the group of 41 specimens there are only two that are not broken. There are, however, fifteen complete specimens reconstructed from two pieces. These and seven other framgents that could be either bases or tips are all broken near the midpoint. This group of mid-fracture bifaces contains nine specimens with use-wear on the more acute angle formed by the intersection of the fracture and one edge (Figures 11, 12, and 13). Wear at the tip and edges of the fracture indicate use as burins. These tools are comparable to the type described by Humphrey (1971, p. 129) as knife-gravers.

One mid-fracture specimen (70-84-167, 166) (Figures 11c and 12 n). is deeply grooved at the angle formed by the fracture plane and the center part of one side. It was probably used to dull biface edges for flaking or to grind the projectile point bases.

The group of large bifaces is a mixture of used and resharpened

pieces, as well as specimens that are in the beginning stages of manufacture. In a few instances there are heavily abraided edge remnants where resharpening has been incomplete. The differences in raw material used for this series of bifaces, as opposed to the bifacial projectile points would argue that the former were not blanks for making the latter.

Unifaces - 3

1. Scrapers on blades (Figures 14g and 15i). 6i) One specimen (70-84-5) and 114) is a well-made end scraper. It was made on a curved blade of gray, glassy chert having a tear-drop outline. Shallow retouch and grinding are found on all edges. A number of small, use-produced flakes were removed from the ventral face near the distal working edge. Flake ridges on the dorsal face show considerable abrasion at both ends, suggesting a well-used tool that was hafted. It is 4.9 cm long, 2.4 cm wide, and 0.6 cm thick.

A second end scraper (7) (Figure 15j) was made on a straight-edged blade of brown to black mottled chert. There is steep retouch on one end and some slight abrasion of the working edge. It is 5.6 cm long, 2.2 cm wide, and 1.3 cm thick.

2. Scraper plane (70-84-116) This specimen is a thick block of gray-green chert having very steep retouch on all edges. The edges are irregular with projecting parts of the edge showing some use polish. It measures 7.1 cm long, 5.5 cm wide, and 2.5 cm thick.

3. Gravers - 9. (Figures 14 and 15) This series contains two groups, multi-spurred and single-spurred gravers, each with differences in manufacture, differences that may be related to function. There are four multi-spurred gravers, all made on flat flakes which have been unifacially worked to provide an edge with three to six projections. These projections are spaced from 0.4 to 0.6 cm apart. The tips describe a slight arc which would allow each to be used individually on a flat plane or in pairs as compass points, or all together on a curved, concave surface. The parent flakes range in length from 2.6 to 4.2 cm, in width from 1.4 to 3.7 cm, and in thickness from 0.2 to 0.5 cm. Graving tips range from 0.15 to 0.17 cm thick. Where these multi-spur tools were made on flat flakes the five single-spurred gravers have been fashioned on flakes on which an existing triangular cross section, a shape utilized to form the backbone for the graving tip. One specimen (770) (Figure 14e) has unifacial modification of the proximal end and considerable abraiding along the dorsal ridge, suggesting that it was hafted. Tip thicknesses are slightly greater for the single-spurred gravers, ranging from 0.2 to 0.9 cm. The tools vary in length from 2.2 to 2.8 cm, in width from 1.4 to 2.6 cm, and in thickness from 0.3 to 0.9 cm.

Burins - 44

Burin types have been assigned on the basis of the method used to form the working tip. All but four of the specimens show varying degrees of wear on the working edge. Use-wear is also found on the burin-blow scars, including a few examples of scratches parallel to the long axis of the scar. That wear, along with the tiny use-flakes whose points of origin on the burin-blow scars suggest a planing action, as opposed to engraving by using a pointed corner. The width of the working edges ranges from 0.3 to 0.7 cm.

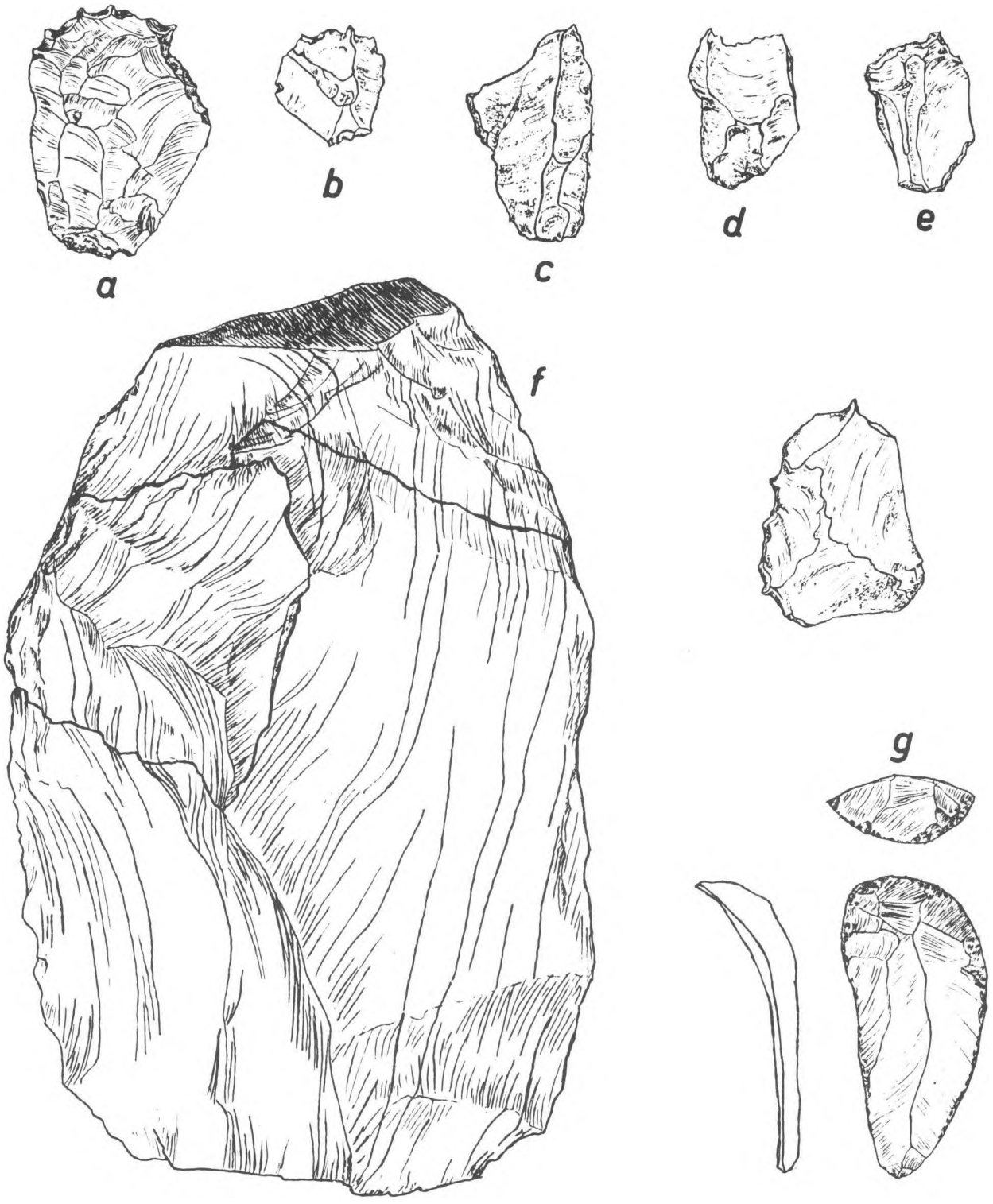


Fig. 14. Gravers, large biface and scraper on a blade.

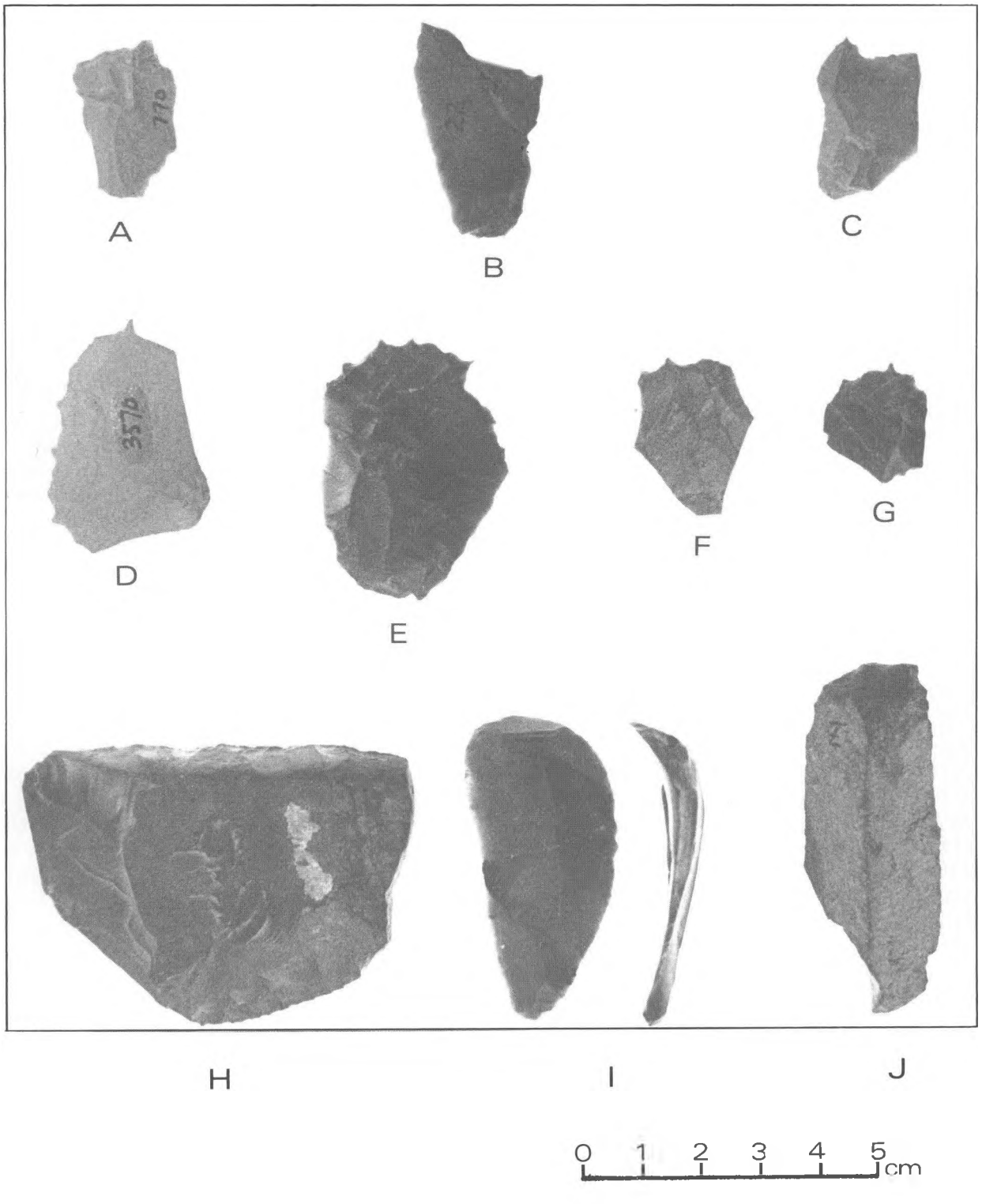


Fig. 15. Gravers and scrapers.

1. Intersection of two burin-blows 19 (Figure 16) Eight specimens were made on flakes of fine-grain tan or gray chert, the remaining eleven on dense granular tan chert. One specimen (70-84-192) (Figures 16a and 17c) was made on a biface, all others made on flat, slab-shaped flakes (1354, (Figures 16b and 17p).

2. Burin-blow on unprepared platform - 19 (Figures 16-18)

Seven specimens were made on fine-grain tan chert, the remainder on dense granular tan chert. While the majority of these burins are made on slab-like flakes, two of them (70-84-194 and 24) (Figures 16c and 18a,b) are on blades and one (70-84-132) (Figures 10a and 12i) at the end of a small biface. One specimen was fashioned by striking a biface, first on one edge breaking it at an angle approximately 45° to the edge, then the resultant basal fragment was struck a burin-blow on the base which removed the other edge (Figures 10d and 12h). The center of that burin scar was then pecked to shape a small concave notch. This is the only instance of pecking as a shaping technique among all the Putu tools and I can think of none other in the Paleoindian literature. The tool was used on both ends at the intersection of striking plat-form and burin-blow. The parent biface, some 8.5 cm long has extreme use grinding on all surfaces excepting the last few flake scars near the tip. The biface appears to have been used for a long time before final resharpening and later refashioning as a burin.

3. Burin-blow on uniface platform - 3 (Figures 16d and 18g). Two of these are made on dense tan chert flakes, the other on a glassy, gray chert blade. Straight striking platforms were prepared by steep unifacial flaking.

4. Beaked burins - 3 (Figures 16f and 18d-f) These specimens have a working edge formed by a series of burin-blows perpendicular to the flat plane of the parent flake removing the existing pointed tip at one end of the flake.

Pseudo-burins - 15. These specimens are similar to the type 1 and 2 burins described above in all but mode of manufacture. No burin-blows are present, the user simply selecting a thick flake where the intersection of two snapping fractures provided a working edge of the proper thickness and angle. All are of the same dense tan chert excepting on clear quartz crystal on which the natural pyramid shape tip provided a working edge. All specimens show signs of use.

Burin spalls - 20.(Figure 18j-aa) Eight of these specimens are triangular in cross section representing the initial removal of a spall from the parent flake. One of these has unifacial flaking on the parent flake edge. The remaining 12 burin spalls have four or more facets in cross section. Some of the specimens retain evidence of use on or near the point of percussion indicating a spall removed to rejuvenate the burin edge. None have evidence of use after their removal. The burin spalls range in length from 1.3 to 5.1 cm.

Utilized Flakes - 121

These tools were fashioned on the more fine-grained stone found at the site. All flakes from the site were examined under a 5x binocular microscope for signs of use-flaking and wear. The criteria for considering a flake utilized were a series of adjacent flakes removed from an edge, and wear scars. Flake size ranges from 1.5 to 6.0 cm long with the majority near 4.0 cm. The following

types have been assigned on the basis of edge shape and in each case a particular function is assumed.

1. Convex - 45. The working edges of these specimens are shallow arcs of a circle 13 to 15 cm diameter. They range in length from 1.5 to 3.0 cm. Working edges are found on one or both sides of the flake, most commonly the former. These tools were probably used for generalized shaping of hard materials.

2. Straight - 36. The working edge of these tools is straight suggesting a more specialized function than the convex edged tools. Length of edges ranges from 0.8 to 4.0 cm. While most specimens were used on a single edge, four have used on the distal end of a snapped flake. One specimen has limited bifacial flaking suggesting that it may have been used as a knife. The remainder were probably used as scrapers on plane surfaces.

3. Concave - 18. While all these have concave working edges there are marked differences in the degree of concavity. Thirteen have edges describing arcs 12 to 20 cm diameter while five have arcs from 0.5 to 0.9 cm diameter. All were used to shape curved sections, the latter group of five probably shaping for thin rods such as needles. It should be noted that widths of the slotted bone points from Trail Creek fall within the smaller diameter (Larsen, 1968, p. 54).

4. Pointed - 22. These tools are functional gravers whose edges were modified by use--as opposed to the pointed gravers described above with the graving tips quite purposefully shaped. All but two have triangular cross sections with the backbone ridges formed by the intersection of two flake scars on the parent flakes. This same pattern was seen in the pointed gravers, and the same use is assumed.

Cores - 43 (Figures 19, 20, 21 and 22).

Core material appears to have come from bed-rock quarries in that water worn or otherwise eroded cortex surfaces were not found. In most instances the raw materials seem to have been slabs. One possible quarry source was discovered a mile south of the site in a ravine halfway up the mountain slope, at much the same elevation as Putu. The quarry contained bands of chert exposed in a shale-like formation.

The close to 7,000 flakes and cores recovered during the two seasons' work can be grouped in approximately 20 types of material. The one material that predominates is a tan to brown, fine-grained chert that can be sub-divided in eight or more types on the basis of dark colored streaks, or the inclusion of microscopic green dots. Other types less well represented include green chert with irregular black lines or amorphous shapes, and a few specimens of green or fine-grain to glassy black chert. The latter type is the most common material in recent Eskimo and earlier Tuktu sites in this area. The green chert with black inclusions is the commonest material found at the Atigun site, a Kavik occupation in the next valley to the west.

Ten of the cores have been partially reconstructed with sufficient completeness to show the technique of core reduction (Figure 12a). The plat cleavage planes of the block of stone were used as initial striking platforms. The first blow removed a corner from one end or one side of the core, giving a triangular cross sectioned blade with two cortex surfaces. The next, adjacent, blow produced a somewhat thinner blade with the dorsal side having one cortex and one flake scar surface. One or two more blades of this type might

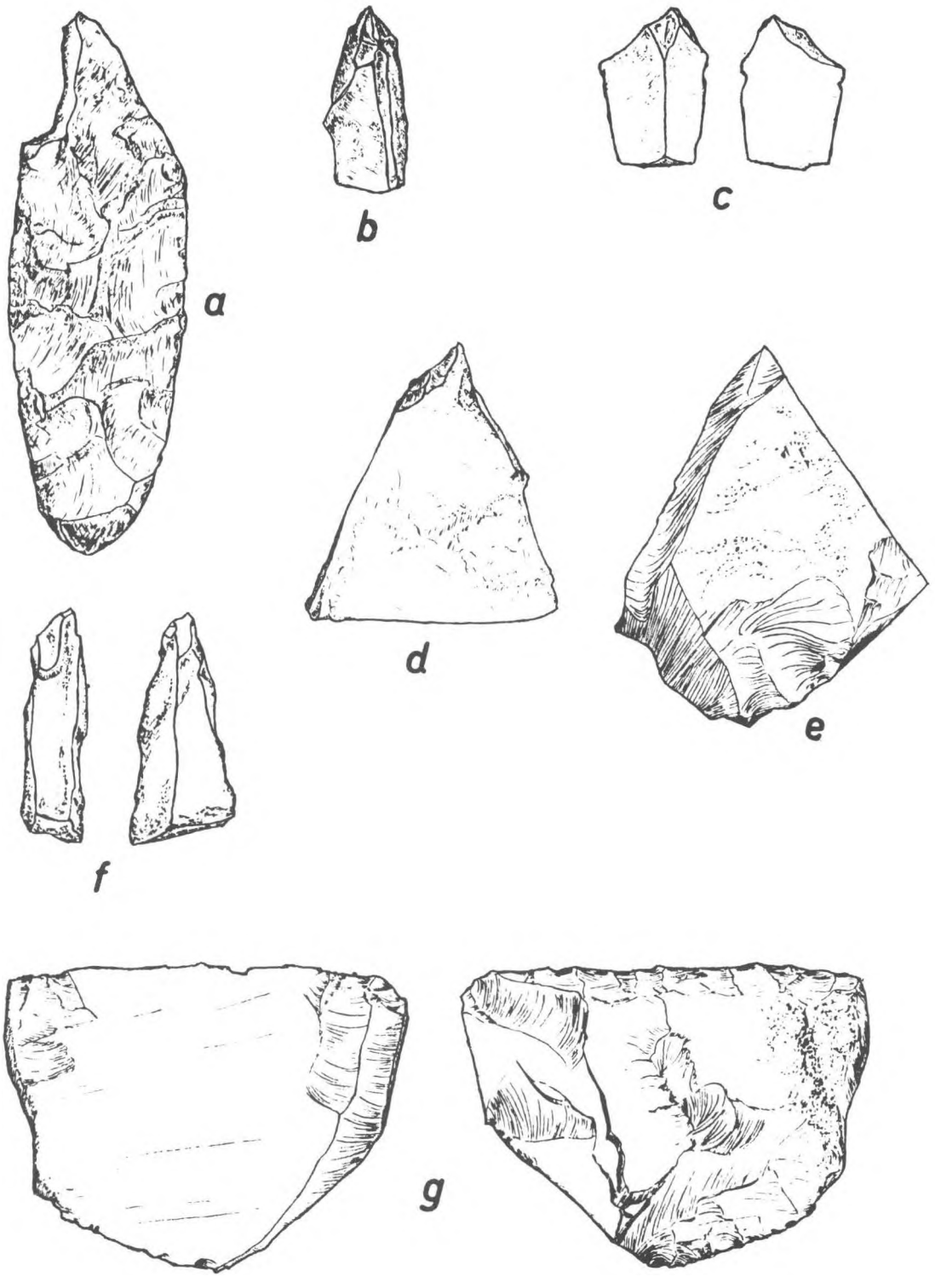


Fig. 16. Burins.

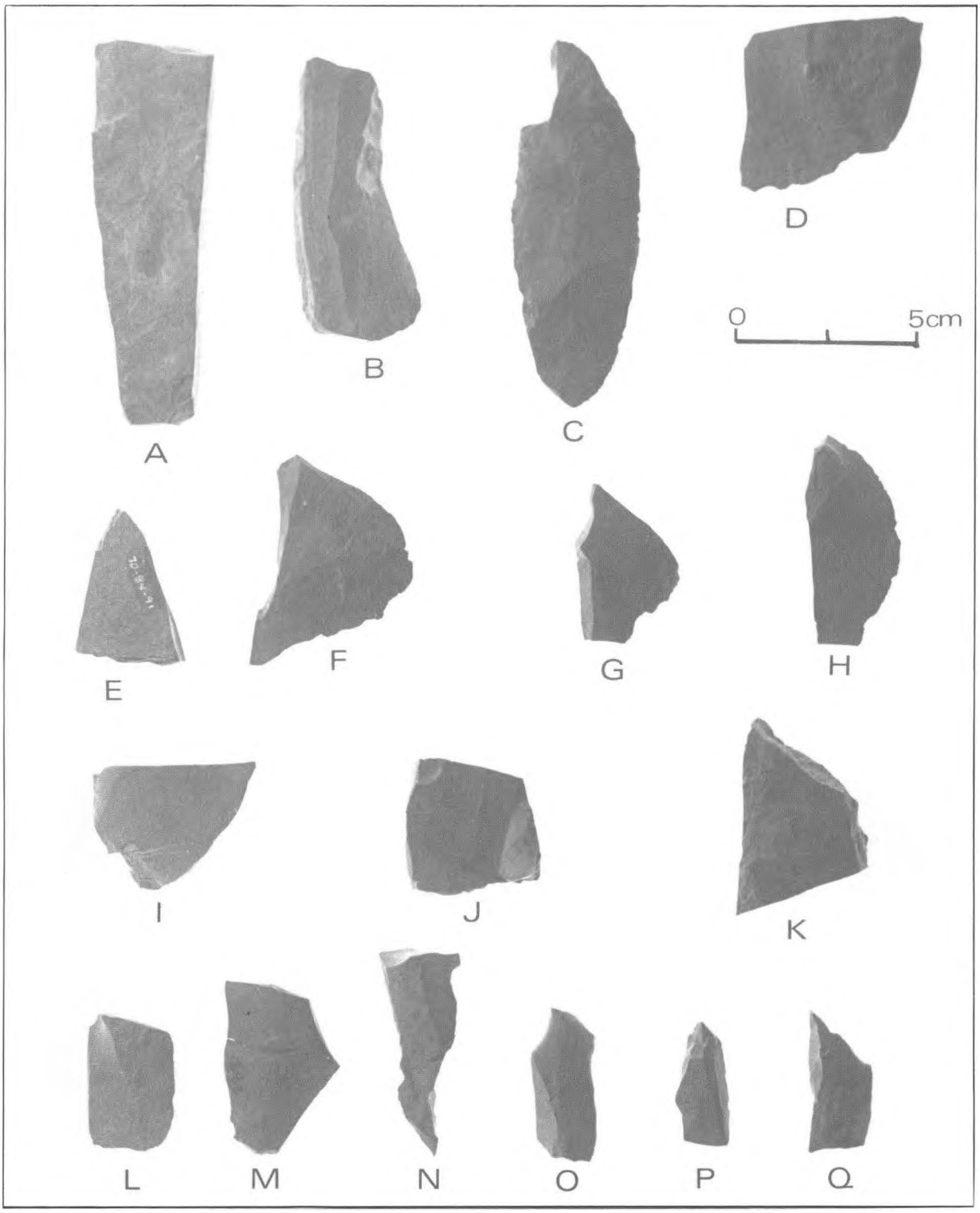


Fig. 17. Burins.

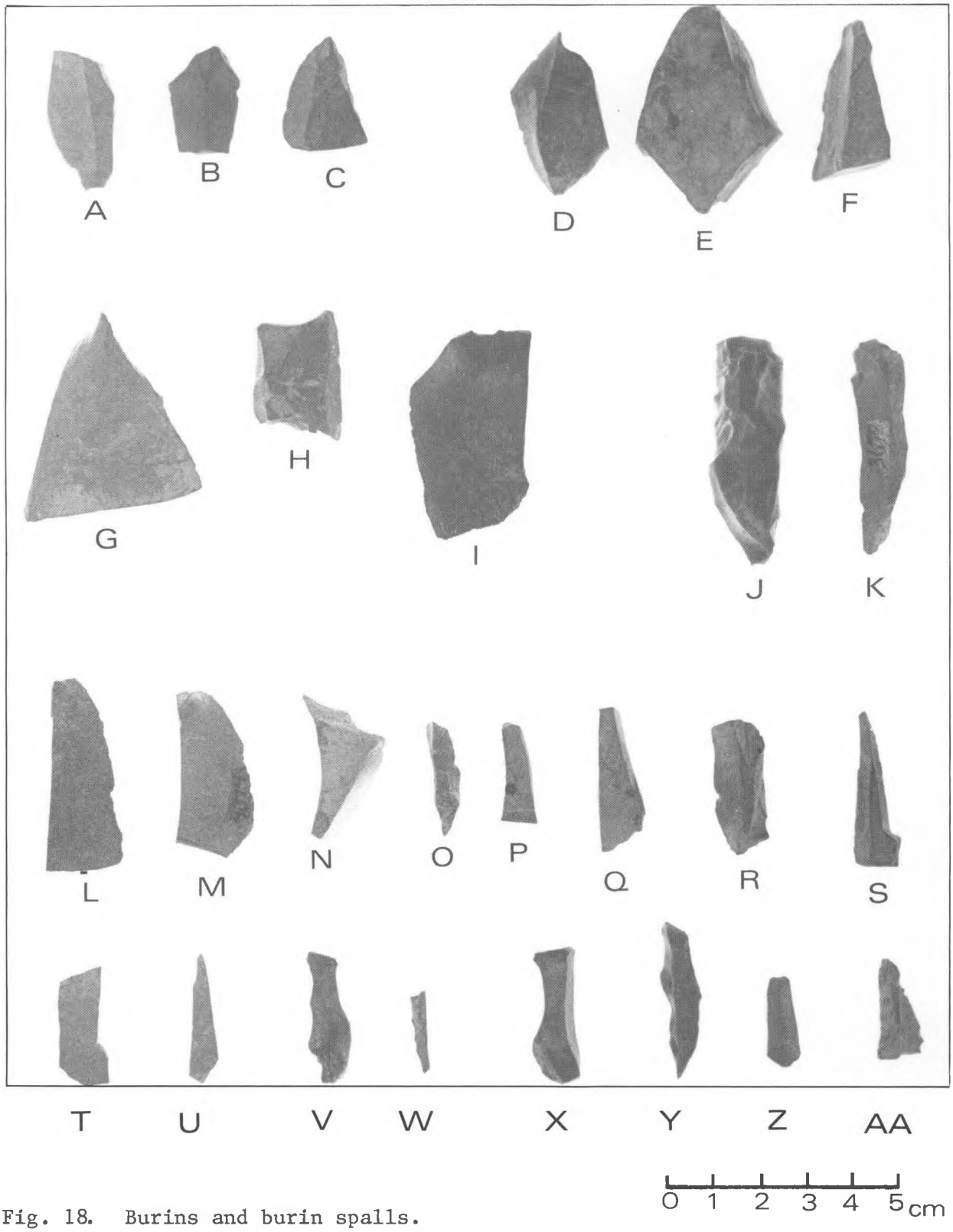


Fig. 18. Burins and burin spalls.

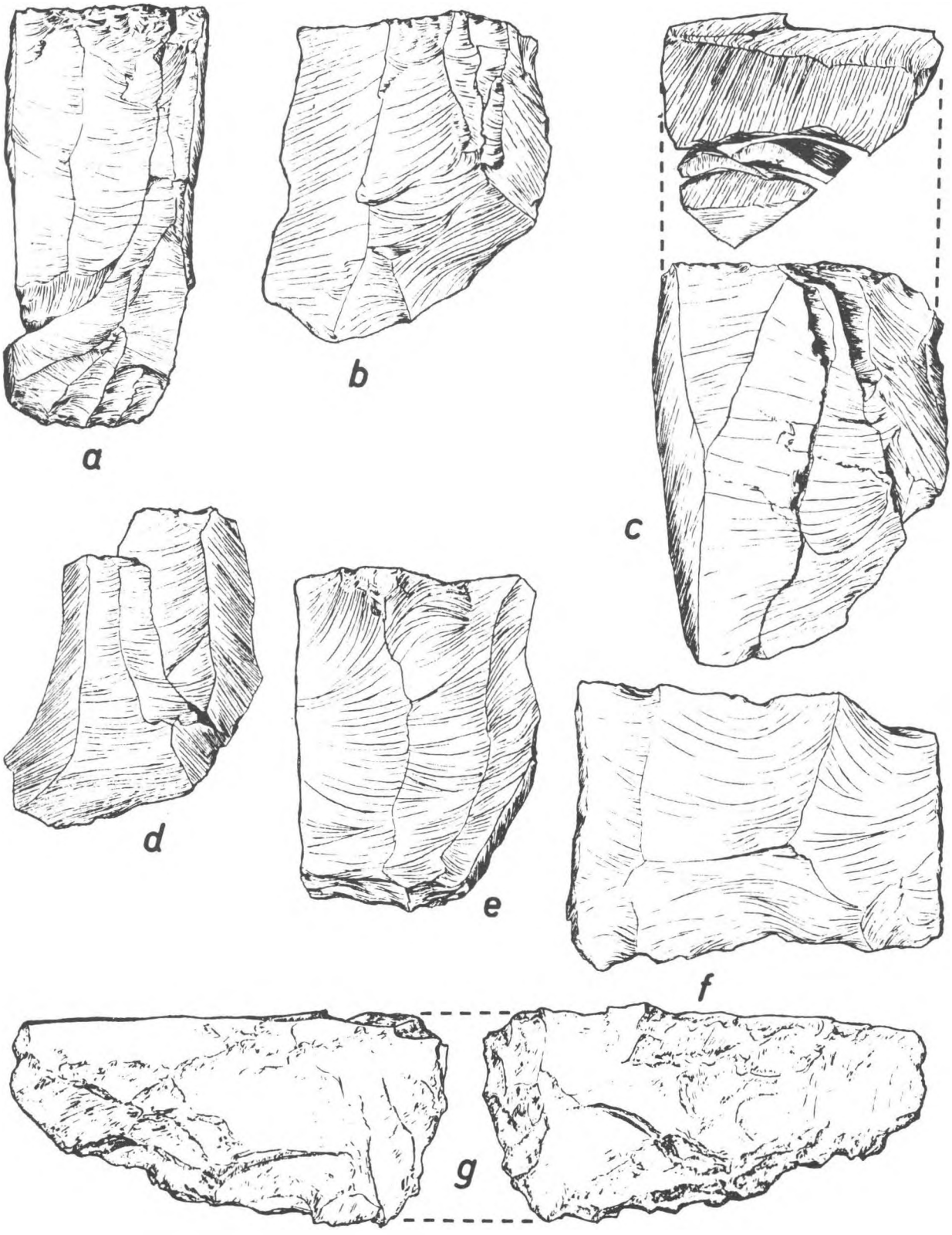


Fig. 19. Cores and boatshaped tool.

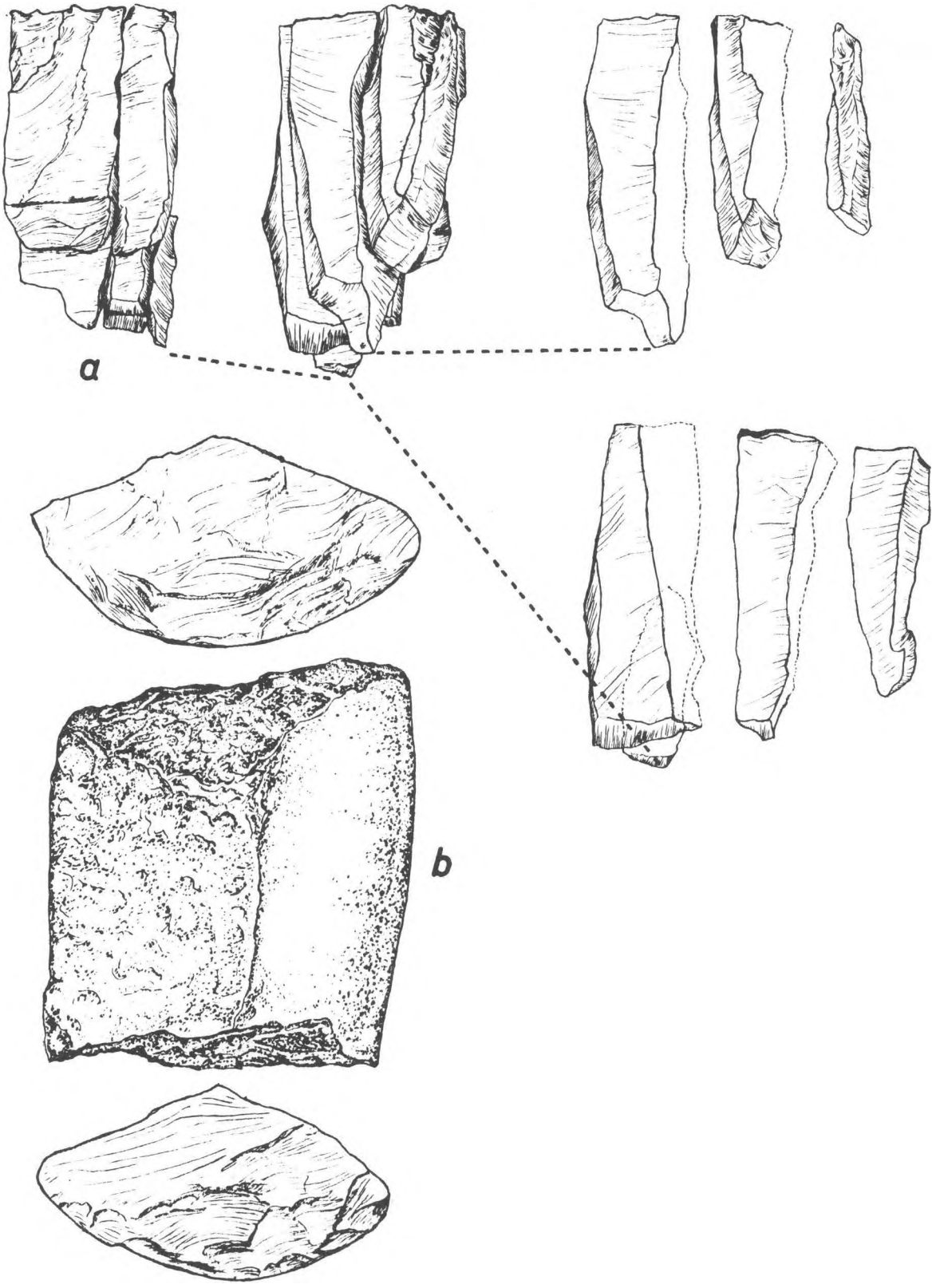


Fig. 20. Core reconstruction and hammerstone.

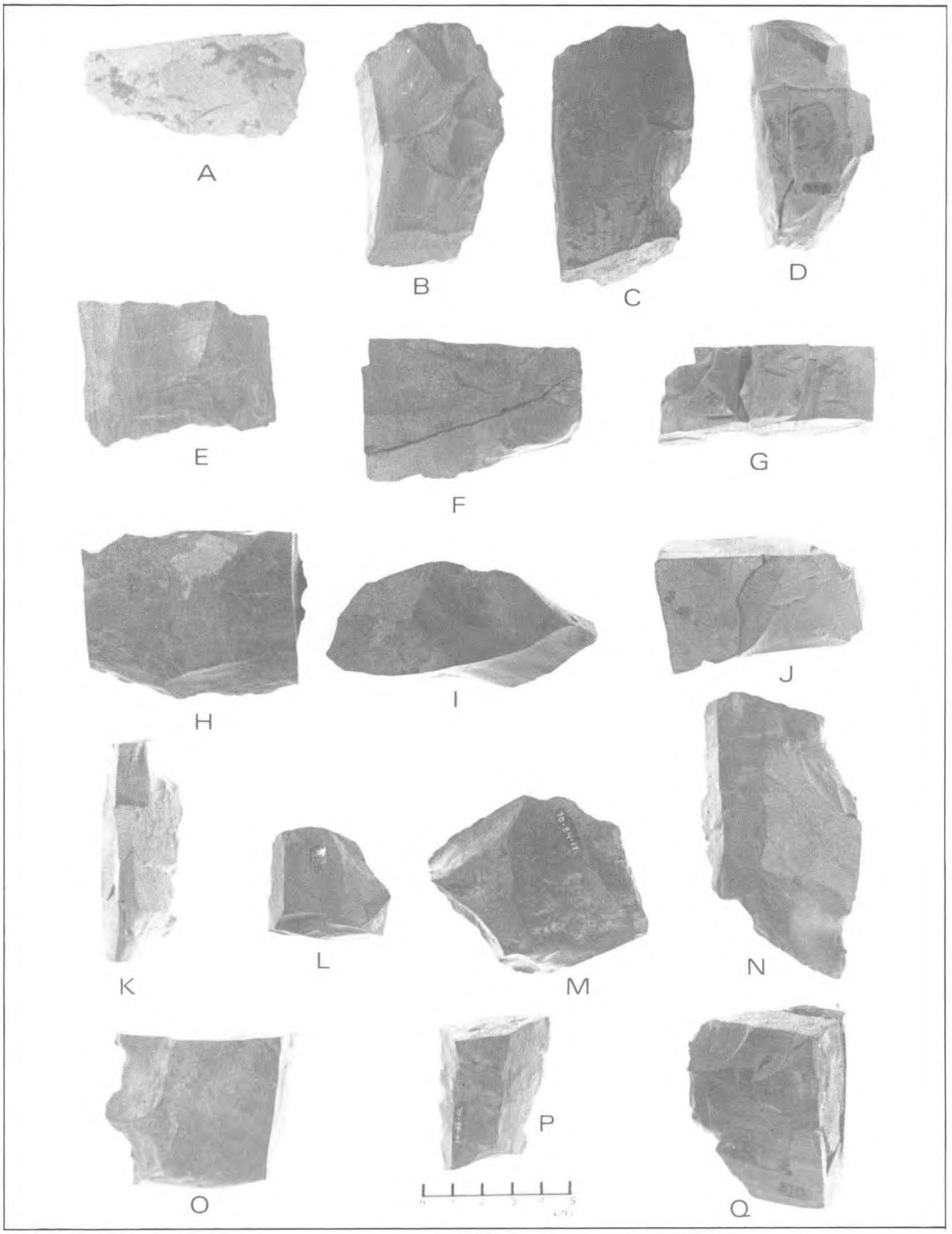


Fig. 21. Cores.

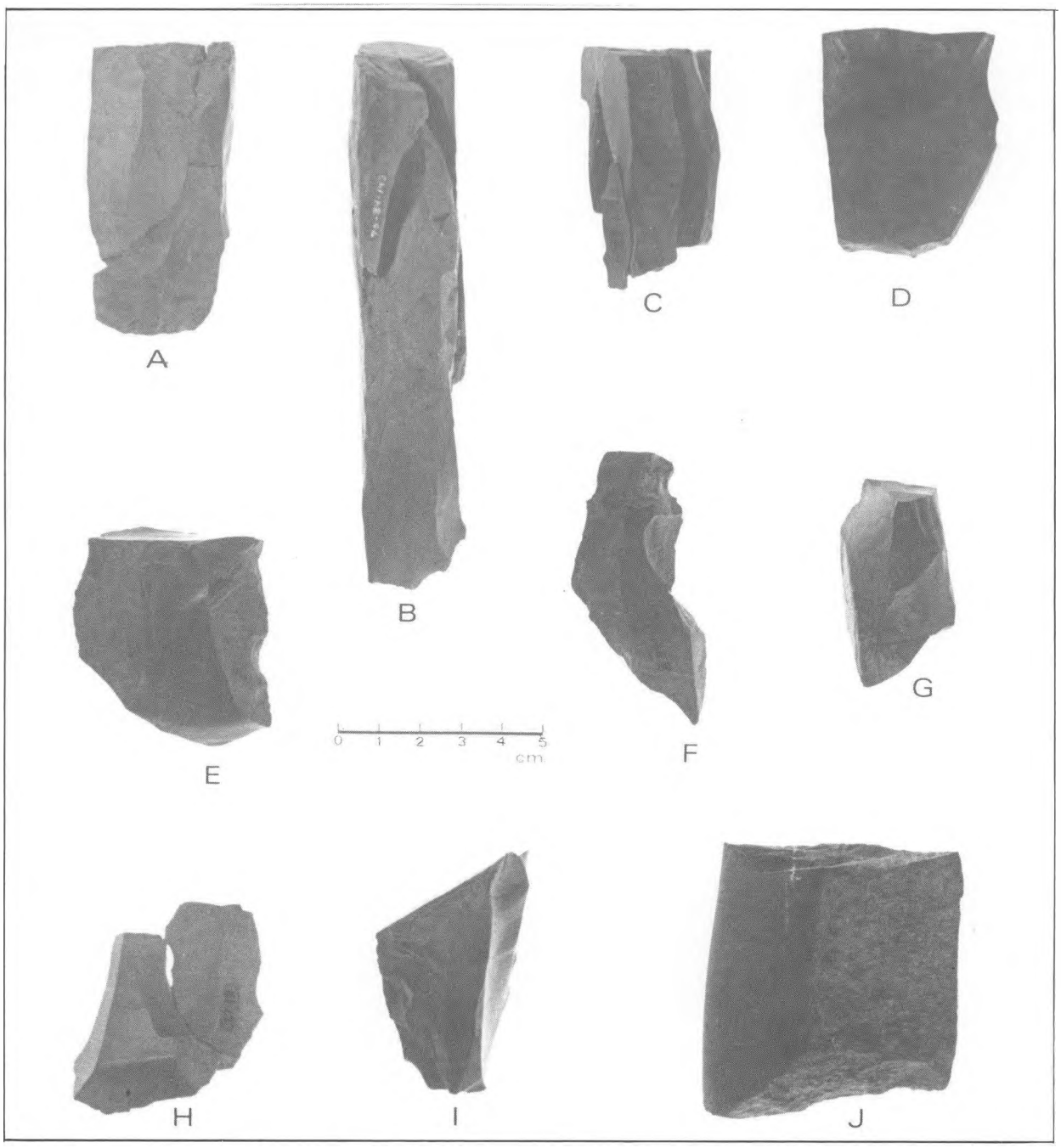


Fig. 22. Cores and hammerstone.

be produced before a blade would be removed having fresh flake scars on all three sides. If the distal end of the blade curved in too much, or ended in a hinge fracture the core would be rotated and another corner removed. Only nine of the cores were not so rotated. In some instances an attempt was made to remove a hinge fracture by a series of flakes from one or both sides. The length of the discarded cores suggests that the minimal acceptable blade length was from 5 to 6 cm.

One core (919) (Figures 16g and 15h) does not fit this pattern. It is the only core of glassy black chert. The blank is a slab 1.1 cm thick with the longest side having very steep unifacial flaking to give a straight edge. While the presence of crushing flakes indicates possible use as a scraper the edge was used as a striking platform for the removal of at least two blades. The blade removal scars were then used as a platform for a burin-blow that, if successful, would have removed the scraper edge.

A second core (70-84-77) (Figure 19g) deserves special mention. This is a biface preform split longitudinally by a burin-blow. Subsequent blows on the burin scar platform removed flakes from part of one side and a short blade at one end. This specimen appears identical to the "boat-shape tools" described by Humphrey (170, pp. 258-9) for the Utukok sites. Made of tan, fine-grained chert it measures 7.5 cm long, 3.7 cm high, and 1.1 cm thick.

Blades - 140 (Figure 23).

A variety of blades were found, the most common having two to three dorsal facets, although one of the narrowest specimens (131) (Figure 23) has seven dorsal facets. A striking feature of the blade collection is the complete absence of complete, or unbroken blades, and we have been able to reconstruct only three of them. Further discussion of this will be found in the comparative section. The three complete blades measure 4.6, 4.4, and 3.0 cm long. The distribution of blade widths given in Figure 24 indicates a preference in the 10 to 11 mm range widths which fall just inside the maximum defined by Taylor (1962) for microblades.

Other Stone - 3

1. Hammerstone (70-84-188) An elongate water-worn slab of gray quartzite, roughly oval in outline appears to have been used for pounding. Both ends show considerable battering. Unifacial flakes have been removed from both sides, near one end producing distinct notches which might have been used for hafting, although their shallowness and placement argue against such interpretation. The specimen is 12.3 cm long, 8.1 cm wide, and 1.8 cm thick.

2. Stone flaking tool - 1 (15) (Figure 12b, Plate 10j) This incomplete specimen is of dense, gray igneous stone. The material is unlike any other at the site and I cannot recall seeing any other examples of this material on the north slope of the Brooks Range. In outline it is subrectangular, a form achieved by unifacial flaking of both ends 90° to the striking platform. Before modification the specimen appears to have been an elongate flattened rod with markedly bi-convex cross section, a shape derived from stream rolling. The present surface is an extremely smooth, curved plane suggesting either intentional or long-term use polishing. This specimen was almost certainly used as a baton hammerstone for flaking, discarded at the site

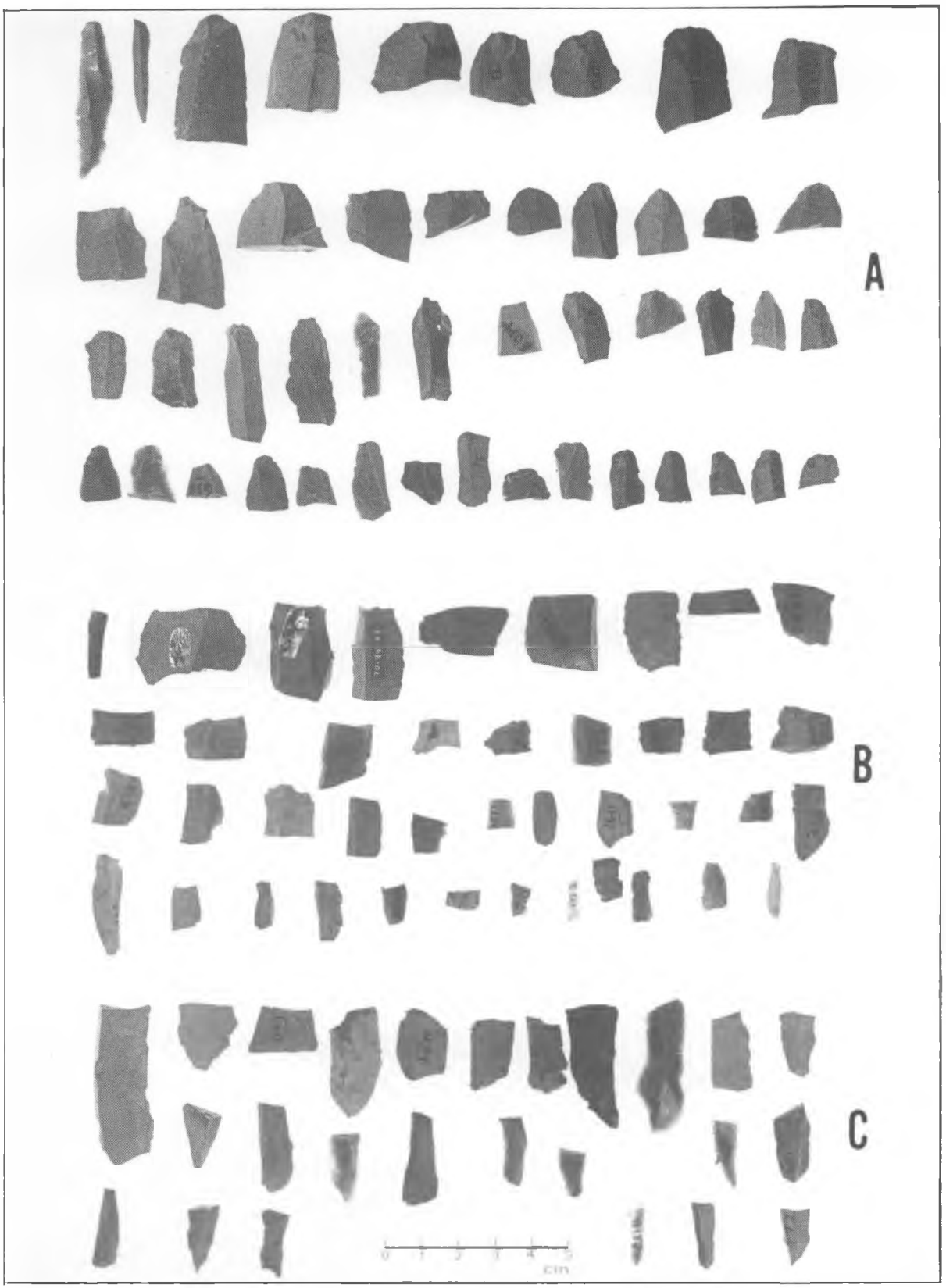


Fig. 23. Blade fragments. Proximal fragments A, Mid-sections B, Distal fragments C.

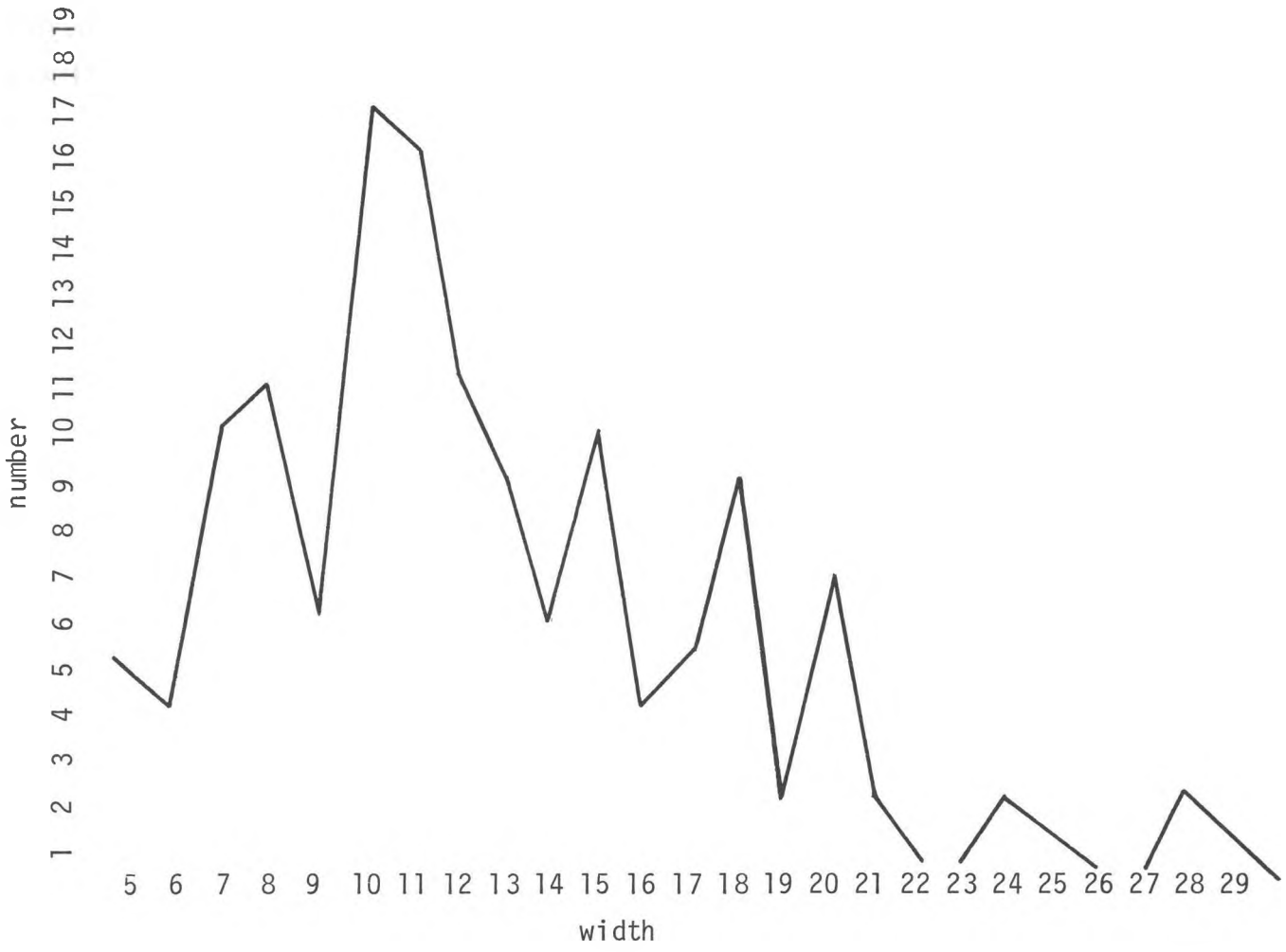


Figure 24.
Frequency of Blade Widths

due to its becoming too short and/or too light for effective use. It measures 6.8 cm long, 6.2 cm wide, and 3.4 cm thick.

Antler and Bone - 24

Included among these specimens are the fragments of at least one antler, one long bone, and one caribou mandible. All of the antler and bone finds are from the upper part of Zone I. One antler fragment has been sawn half through with a thin metal saw, the saw groove being 0.08 cm wide.

Dating

Organic material for dating the site was, at best, rare. All charcoal whether from concentrations or single flecks was collected by trowel tip, transferred to plastic bags and sent without pre-treatment to the dating laboratories. The results are as follows:

Zone	Nature of Material	Lab. #	Date
I	Charcoal from hearth (Feature 7)	GAK-4940	650±100B.P.
II	Soil from lower half of zone	GaK-4939	6,090±430B.P.
II	Soil from lower half of zone	WSU-1318	8,454±130B.P.
II	Charcoal from combined samples	GaK-4941	5,700±190B.P.
II	Charcoal from hearth (Feature 9)	SI-2382	11,470±500B.P.

The single date for Zone I fits well with the presence of preserved organic remains and antler cut with a metal saw. While metal was never common, Eskimo use of the material was widespread during the Thule occupation of Alaska.

For Zone II the two dates on soil overlying the cultural deposit fit well with the presumed dating of Clovis and with the depth of the soil. Of the two dates from the cultural deposit the 5,700 date is clearly out of line at just less than half the other date of 11,470. While the more recent date should be discarded as most unlikely, the older date is quite close to other dated Alaskan sites with comparable cultural debris. These sites include Healy Lake with a date of 11,090±170 (McKennan and Cook, 1968), the Akmak assemblage with a date of older than 8,500 years (Anderson, 1970), and Batza Tena with an obsidian hydration estimate of 12,000 years (Clark, 1972).

A recent series of dates have been published by Hamilton and Porter (1975) on glacial events in that part of the Sagavanirktok lying within the mountains. The oldest date, 12,780±440 postdating the Itkillik readvance comes from 25 km north of the Putu site. A more recent date of 12,170±270 occurs 17 km north of the site. The Itkillik II stage has been dated, from two areas some 20 km south of the site, at 11,760±200, and 11,890±200. These four dates suggest that Putu was occupied no more than 400-500 years after that part of the valley became clear of glacial ice. The probability of an ice free pass through the Brooks Range is indicated by the occurrence of Batza Tena obsidian at Putu (Alexander, 1974). This could result either from a rapid deterioration of the ice mass or the lack of extensive ice during the period in the two major passes to the west, the Itkillik and Anaktuvuk valleys.

COMPARISONS AND CONCLUSIONS

For things were done in the Midnight Sun that no tongue will ever tell.

Robert Service
Ballad of the Black Fox Skin

The following interpretations assume that the artifact collection from the Putu site is very nearly complete. This assumption is of sufficient importance that elaboration is here needed on the reasons for such assumption. First it should be recalled from the site description and a look at the site map in Figure 2 that the area for necessary testing was quite limited by the immediate topography. On all but the north side of the site the slopes are quite steep, and on the north side there was a higher terrace on which most of the original surface was exposed. Testing outside the known occupation area on the north terrace uncovered no cultural material. All excavation units were extended beyond the area of artifact recovery. The slopes below and the terrace above the site appear to have been unused.

Excavation technique chosen for the site had as a goal maximum artifact recovery with provenience data. The success of that technique is indicated by our obtaining the provenience of over 95 percent of all materials, including flakes no larger than a few millimeters in any dimension. Very few flakes were first seen on the screen and fewer still in the backdirt. One measure of the degree of collection completeness is the number of flakes and broken artifacts that we have been able to join, just over 300 at this time. Another measure comes from the sample of large bifaces. Of the 41 specimens so identified only 2 were found complete. The remaining 39 fragments were combined to reduce the sample to 15 complete bifaces. Only 7 pieces remain incomplete. As already shown in the descriptive section, bifaces were deliberately broken to produce engraving tools. It is quite likely that some of the 7 missing pieces were taken from the site for later use. It is most unlikely that at each camp all tools were produced *de novo*.

While it is a fair assumption that the Putu collection is considerably more than a representative sample, it is an equally fair assumption that the site represents only one aspect of the range of cultural remains that should be associated with the culture. Whatever the season of the site's occupation it is only one of the years' many seasons. Those tools appropriate for one season of one place should not be expected from each place where tools were left behind.

Internal Comparisons

The contrasting paucity of formal tools in Zone I and the complete absence of bone and antler in Zone II are consistent with other indications of separation between the two zones. I feel that the biface and burins found in Zone I, because of their degree of patination, a factor absent in all other Zone I artifacts, belong to Zone II, that their occurrence in Zone I is due to the activities of ground squirrels rather than of man. Zone I has the appearance of a brief stop, to build several fires, have a meal and spend some time shaping a few bits of antler, a few bits of stone. The remains show that these activities did take place. The remains are also

typical of a hunting station and I think in this particular case they may represent a very specialized form of hunting, that of wolf hunting. The modern Nunamiut pattern is to occupy a high lookout a mile or more from steep sandy banks where wolves are likely to have a den. The lookout may be continued for several days until movement of wolves gives away the den's location after which traps or snares can be set, or the wolf pups dug out. While the Putu site location is poor for caribou hunting it does have a good view of several potential wolf denning areas.

Unfortunately none of the Zone I remains have sufficient typological distinctiveness that might give clues to the identity of these hunters.

The initial Paleoindian occupation of the site presents a much different scene. A large number of specialized tools were discarded, broken, or lost, tools used for hunting, butchering, hide preparation, and manufacture of other tools. The first three activities are seen in the 10 projectile points, 41 larger bifaces, and 3 scrapers. In all these 54 tools make up just less than 12 percent of the collection of tools. The remaining 88 percent of the tools were to varying degrees associated with the manufacture of other tools, most likely the fabrication of items from bone, antler, ivory, and wood.

While organic remains were not preserved in the acidic soil, one possible suggestion of what was being manufactured comes from the blades recovered at Putu. All blades were broken and of these all but three are missing one or both ends. As part of the lab analysis the blades were separated into proximal ends, mid-section, and distal ends. Then each piece from each group was fitted against all end breaks from the other two groups, regardless of color, size, shape, or stone type. It appears that blade sections were the desired product either manufactured at and removed from the site, or brought to the site as finished products. Based on the number of mid-sections and ends at least 200 blade sections are missing. One possibility is that they were inset in slotted antler shafts. Evidence for such shafts comes from the early materials at Trail Creek (Larsen, 1968), which included thin antler shafts slotted on both sides as well as a few microblades that are almost certainly associated with them. Judging from the lengths of both shafts and blades it would seem that each shaft had from 6 to 8 blade sections inset. (It should be noted that like the Putu specimens, all of the Trail Creek blades are blade sections.) If we take this as a reasonable estimate then the 200 + missing Putu blade sections could be accounted for by the manufacture of 25 to 30 slotted shafts, a not at all unreasonable estimate considering the number of shaping and engraving tools used at the site. A similar interpretation and comparison with the Trail Creek tools has been made by Anderson (1970) for the Akmak blades.

While 9 of the 24 bifaces were also broken and used as engraving tools, and may have been fashioned for this purpose alone, the majority appear to have been used as knives with most of them showing signs of resharpening. Some, if not all of the projectile points may have been used as knives. Butchering of game is certainly indicated.

The variety of lithic raw materials, almost all from bedrock sources, show more than passing

knowledge of the immediate area. The use of Batza Tena obsidian from the other side of the Brooks Range extends the range considerably beyond mere local knowledge. It is interesting to note that a single flake of obsidian is part of Humphrey's early Utukok material (Humphrey, 1970).

Several features in Zone II provide evidence for specific activities at the site. Two separate events are seen in the location of a hearth (Feature 9) directly above a concentration of flakes (Feature 10). The duration of time separating these events cannot be absolutely determined. The absence of thermal fracturing on the flakes argues against their having been dumped in the fire and argues for at least some time to isolate and insulate the flakes from the fire.

A second concentration of flakes (Feature 11) found at the base of a small boulder shows flaking activity at that spot, and the overall high density of flakes in the immediate area suggests selection of the southwest portion of the site for flaking activity. At the present stage of analysis it appears that the concentration of large boulders in the south-central part of the site may have formed a structure, that flaking took place to the west, as did cooking, and antler working and butchering were more common in the north and northeast part of the site. A major problem in the analysis of activities is the amount of lateral movement of artifacts, a factor that can be appreciated by a glance at Figure 5.

External Comparisons

There are a series of northern sites which I feel show close relationship with the Putu materials, including some of the 50 + localities reported for the Batza Tena obsidian source (Clark, 1972); at least five of the Utukok sites (1, 3, 6, 12, and 13) reported by Humphrey (1970); the Akmak assemblage at Onion Portage (Anderson, 1970); the early occupation at Trail Creek (Larsen, 1968); and the Chindadn occupation at Healy Lake (Cook and McKennan, 1970).

The Batza Tena sites, due to their location at a quarry used during much of man's occupation of Alaska, all run high risk of being mixed assemblages. The collections from the Batza Tena localities include most of the artifact types found at Putu. These include both fluted points, lanceolate pointknives, micro-blades, polyhedral cores, end scrapers, large biface knives, and utilized flakes. The lack of burins and gravers is probably due to obsidian being an exceptionally poor material for such tools, and the primary concern at the site was the shaping of obsidian tools and tool blanks.

The Utukok sites show closer similarities. These sites are essentially large surface sites, all located on elevations that are good hunting lookouts, and all run a considerable risk of being multicomponent sites. Two of the sites, 1 and 12, show the same mixture of fluted and lanceolate points as found at Putu. While Humphrey places site 1, along with 3 and 13 in his Clovis-like Driftwood Creek complex, and sites 12 and 6 in his Kiktoyak complex, I feel they could be lumped into a single complex. This is based on my interpretation of Putu as a brief occupation or occupations by a single group, in other words a single complex, and the marked similarities with Putu artifact types and those from both Utukok complexes. These types include blades

and micro-blades, polyhedral cores, end scrapers, large biface knives including the knife-gravers, fluted and lanceolate points, burins, gravers, boat-shaped tools, and high proportion of utilized flakes. The overall mixture of most of these elements at Putu and the two early Utukok complexes suggest to me a single group. Three separate cultures seem clearly out of line.

Humphrey has pointed out the similarity of his Kiktoyak complex with both Akmak at Onion Portage and the lower levels at Healy Lake (1970, pp. 138-9). The lack of projectile points at Akmak prevents the usual method for site comparison, however, the assemblage does have distinct artifact types that do allow comparison. Most of the Akmak formal tools types have counterparts at Putu. One type found only in Akmak, ovoid core bifaces, may be the result of different available raw materials. Another type, the campus-type micro-core, while not found at Putu, was almost certainly used to produce the very narrow, multi-faceted micro-blades that are present. At both Akmak and Putu the carrying away of blade sections was a common trait. Other tool types found at both sites include burins, large bifaces, ground stone, end scrapers and utilized flakes.

While published descriptions for Healy Lake are not yet completed I have had the opportunity to examine the finds up to and including the 1970 field season there, and made a brief visit to the site during the 1969 season. Both Healy lake and Putu have fluted and Chindadn points as well as burins, blades and large bifaces. Due to the uncertain stratigraphic position of the Healy Lake materials it is impossible to determine at this time whether the lanceolate point-knives are also part of the early tool assemblage, although I suspect this is the case.

Comparison with Trail Creek is also difficult due to uncertain stratigraphy with the added complication that so few stone tools were found in the early occupation and no organic remains came from Putu. The comparison is based on similar microblades occuring at both sites. The single chalcedony point fragment (Larsen, 1968, p. 56) which Larsen considers might be the oldest artifact from Cave 2 may be the remnant of a reworked fluted point.

Five of the above mentioned sites have been assigned dates, four of the sites with radiocarbon dates and one with obsidian hydration dates. The former place Akmak at older than 8,500 years, Healy Lake at 11,000 years, Trail Creek at ca. 9,000 years, and Putu at 11,470 years. The obsidian hydration dates for Batza Tena indicate an occupation ca. 12,000 years ago. These similarities in time and closeness in space can be interpreted in a variety of ways. It is possible that we are dealing with a series of separate migrations, each group maintaining a distinct tool kit and stone working technology; or we have evidence for a single group or related groups who show some differences in adapting the same tool kit and technology to different environmental conditions, the conditions of terrain, purpose of terrain use, and materials available for technological needs. I believe that latter interpretation is the more likely. All of the sites are found in what is today a very similar environment, an environment that might have been the same during the more rigorous conditions of the late Peistocene. This is presently a tundra environment with scattered islands of tiaga forest with herds of moose and caribou as the major

large game animals. Certainly the environmental differences found to the immediate north and south of the Brooks Range are considerably less than those much farther south where Clovis sites are known, sites in low, hot desert, high plains, prairie, and Gulf coastal plains. The present interpretation of Brooks Range prehistory for the time periods later than Clovis occupation provide no evidence for numerous distinct groups occupying small regions, indeed only during the period just preceding historic contact when Nunamiut and Kutchin coexisted on the north slope do we have more than single definable occupations. Farther to the south Clovis is usually given a unique position or occupation of their terrain. In order to postulate a simultaneous occupation by distinct groups or a rapidly changing sequence of technologies I feel we should be able to demonstrate major differences in cultural remains, and, ideally, the stratigraphic proof.

The archeological finds at Putu give evidence for a culture with a larger variety of tool types than has previously been shown for the north. The projectile points, and/or knives, includes fluted, lanceolate, triangular Chindadn, and a suggestion of bone points with inset micro-blades; shaping tools include a variety of burins, gravers, utilized flakes, and split-knife pseudo-burins. Cores for the material at hand include rotated polyhedral cores, a boat-shaped core and the suggestion of wedge cores. A series of dates from sites with most if not all of this technology suggests an occupation of Alaska's north before 11,400 years ago. The spread of this culture, its knowledge of local terrain and widespread utilization of a raw material source such as the Batza Tena obsidian quarry should indicate that the initial occupation preceded that date by more than a few hundred years.

THE PUTU COMPLEX

Arctic archaeology for many years has resembled a game of follow the leader, in this respect, that once the initial discovery of a totally new period, or culture, or phase has been made, this has been followed almost immediately by numerous similar discoveries by other field workers in other areas. Examples are not hard to find. First in mind are the rather exceptional finds of ASTT (Arctic Small Tool Tradition) by J.L. Giddings. By the time the Denbigh site report was published there were literally scores of ASTT sites known from one end of the American Arctic to the other. A similar pattern may be seen with the discovery of Side notched points, first again by Giddings, followed by Campbell and then by practically every field worker in the north. The third example, one I want to enlarge upon, has been discovery of fluted point sites in northern Alaska. While the gap in time between Soleki's initial discovery and its follow-up by Humphrey, the decade since Humphrey's Utukok work has seen the discovery of numerous sites containing fluted points. If these sites are not now commonplace, they certainly can no

longer be characterized as rare.

While we can say that the data base for this early period has gone well beyond Solecki's description of an isolated point, the synthesis of these data has not gone much beyond his initial statement. The reasons for this, as I will try to show are that these early sites suffer from one or more defects. Most of the sites have been found either resting directly on glacial gravels or are no deeper than the matted tundra root system. As such few can be characterized as buried deposits and most are located in favored hunting lookout stations that have been used and reused for thousands of years. Our cautious clan has characterized these sites as at least potentially mixed deposits. To further compound the problem the data have been interpreted on the basis of what is understood for sites several thousand kilometers to the south. The Putu site does not, however, seem to suffer from the above defects and the finds made at that site suggest that a slightly different approach to interpretation should be considered.

Three distinct horizontal strata were located at the Putu site. The uppermost is a dark root-matted soil only a few inches thick. Below this is a light tan loess zone from one and a half to two feet thick. Artifacts belonging to the early occupation were clustered in the bottommost two to three inches of this zone. The basal, sterile zone below is composed of a gray decomposing shale.

It is necessary at this point to provide more detail on the site location as it bears on the probable use of the site. Approximately 30 meters below the crest of the hill are two small benches, ca. 20 x 15 meters, with only a meter difference in elevation. The Putu site is on the lower of these. Testing of the higher bench uncovered no sign of human use. The site location cannot be explained as a hunting lookout, if for no other reason than there is no view. Where the top of the hill has an unrestricted view of the valley, from the Putu site less than one-quarter of the valley can be seen by a standing hunter. When sitting the view is restricted to the other side of the valley two kilometers distant. The artifacts recovered are neither indicative nor definitive on the site usage. A single broken scraper is balanced by a single hammerstone. The most common forms are broken blades. The predominant tool function appears to have been the shaping of antler as witnessed by the number of gravers, burins and pseudo-burins formed by splitting bifaces. Analysis of the reconstructed pieces indicates that very few of the stone tools were actually produced at the site. Items that might suggest hunting implements (which would be consistent with either a habitation or hunting site) include three fluted point fragments, one lanceolate point with three basal fragments of the same type, and a small triangular point. Except for the latter all show signs of considerable wear, suggesting at least partial employment as knives.

Before commenting on the association of the three point types found at Putu I would like to first present data on dating the site. Contrary to Bryan's recently published statement (Bryan, 1978) which claims the dates are confusing, I feel the dates are quite straightforward and internally consistent. They are: from a charcoal hearth at the bottom of the tan zone a date of 11,470±500; soil from the lower half of this zone 8,454±130; soil

from the upper half of the zone 6,090±430; a combined charcoal sample of small flecks discovered throughout the zone 5,700±190; and from charcoal in the upper root zone associated with a few flakes and pieces of saw cut antler 650±100.

A recent series of dates have been published by Hamilton and Porter (1975) for glacial events in that part of the Sagavanirktok contained within the mountains. The oldest date of 12,780±440 postdating the Itkillit readvance is found some 25 kilometers north of the Putu site. A slightly more recent date of 12,170±270 places an end morain some 17 kilometers north of the site. The Itkillik II stage has been dated from two areas ca. 20 kilometers south of the site at 11,760±200 and 11,890±200. These dates suggest that Putu was occupied no more than 400 to 500 years after that part of the valley became clear of glacial ice.

In northern Alaska fluted points are found associated with lanceolate points as often as they are found alone. While Humphrey separated his Utukok finds into two early components, Driftwood Creek with fluted points and Kiktoyak with lanceolate points, one of the three Driftwood Creek sites has lanceolate points and one of the two Kiktoyak sites has fluted points. This same pattern appears with Donald Clark's Batza Tena localities. There Clark has defined a fluted point complex and a lanceolate point complex, even though few of the localities contained only one type. He did however recognize the problem and stated "if RKIg-30 constitutes a single component we are confronted with a case in which fluted points are associated with leaf-shaped and probably lanceolate points" (Clark, 1975). It should be mentioned that the obsidian fluted point from Putu was made of Batza Tena obsidian. At Healy Lake the lowest levels contain all three point types as found at Putu.

The similarities of these various sites does not rest on projectile points only. The Utukok sites share also blades, polyhedral cores, end scrapers, large biface knives including ones split to produce gravers, multi-spurred gravers, boat-shaped tools and a high proportion of utilized flakes. Humphrey has pointed out the similarities of his Kiktoyak complex with both Healy Lake and the Akmak complex at Onion portage. The lack of projectile points at Akmak prevents the usual method for site comparison, however, the assemblages have other distinct types that do allow comparison. Indeed most of the formal tool types at Akmak have counterparts at Putu. One type found only with Akmak, the ovoid core bifaces might be the result of different available raw materials. Another type, the campus microcore, while poorly represented at Putu, was almost certainly used to produce the narrow, multifacetted microblades that are present. Other tool types found at both Akmak and Putu include burins, large bifaces, end scrapers and utilized flakes. The burins, blades and large bifaces are also common at Healy Lake where all three of the point types known at Putu have been found in the lowest levels.

It would appear then that a series of early sites in northern Alaska, including the lowest level at Healy Lake, Akmak at Onion portage, the Driftwood Creek and Kiktoyak complexes of the Utukok region, the comparable complexes at the Batza Tena localities and the Putu site all share, albeit with rare absences and certainly different proportions, a common base of

tool types. They include fluted points with triple fluting, lanceolate points, the chindadn type triangular point, burins, gravers, split biface gravers, large bifaces, campus type cores, blades and microblades, end scrapers on blades, and utilized flakes. At least three of the sites have dates that indicate little time spread, Putu at 11,470 Healy Lake at 11,040, and Akmak at older than 8,500. If on the basis of artifact similarity we assume similar antiquity for the Utukok and Batza Tena sites and the assignment of different complex status by the various authors is correct we are faced with the rather peculiar proposition that ca. 11,000 years ago northern Alaska was populated by inhabitants producing at least seven distinct tool kits. If that is the case it is the only time that we might suggest such a heterogeneous population. For the remainder of north Alaska's prehistory we find a progression of populations, more often replacement of populations, but only in one case a sharing of the ecological zone by two groups. And that is the historically known brief period when the Nunamiut shared part of the Brooks Range with Kutchin groups. I believe that a much more satisfactory explanation is that during the period ca. 11,000 years ago give or take a thousand years, we were dealing with a single population, whose artifactual remains I would term the Putu Complex. Whatever variation that is seen should be expected mainly on the basis of site utilization differences. Clearly we should not expect the same tool kit to be found at a quarry as we would find at a temporary habitation locality and neither would give identity in all respects with a hunting lookout.

The Putu Complex presents a wider variety of tool types than what is expected from sites known in the southern regions. While I believe that it is too soon to provide definitive statements, as more clearly dated sites are required, our speculations now have to include whether the differences between fluted point complexes north and south are due to the attrition of certain types as people moved south, or whether these types were only added later as ideas moved from south to north. My own bias says that this variety of types has its closest similarities with the upper paleolithic of Russia, specifically some of the Koystenyki finds, and on the basis of burin, blade, and biface technology, no similarities with Asian-American predecessors.

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