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

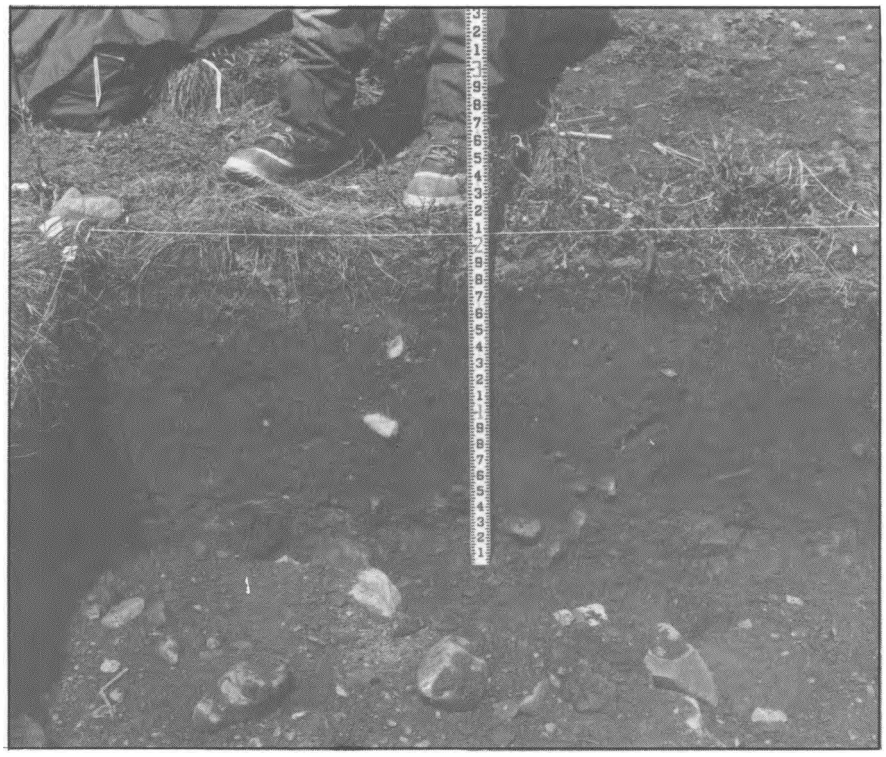

Fig. 6.

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

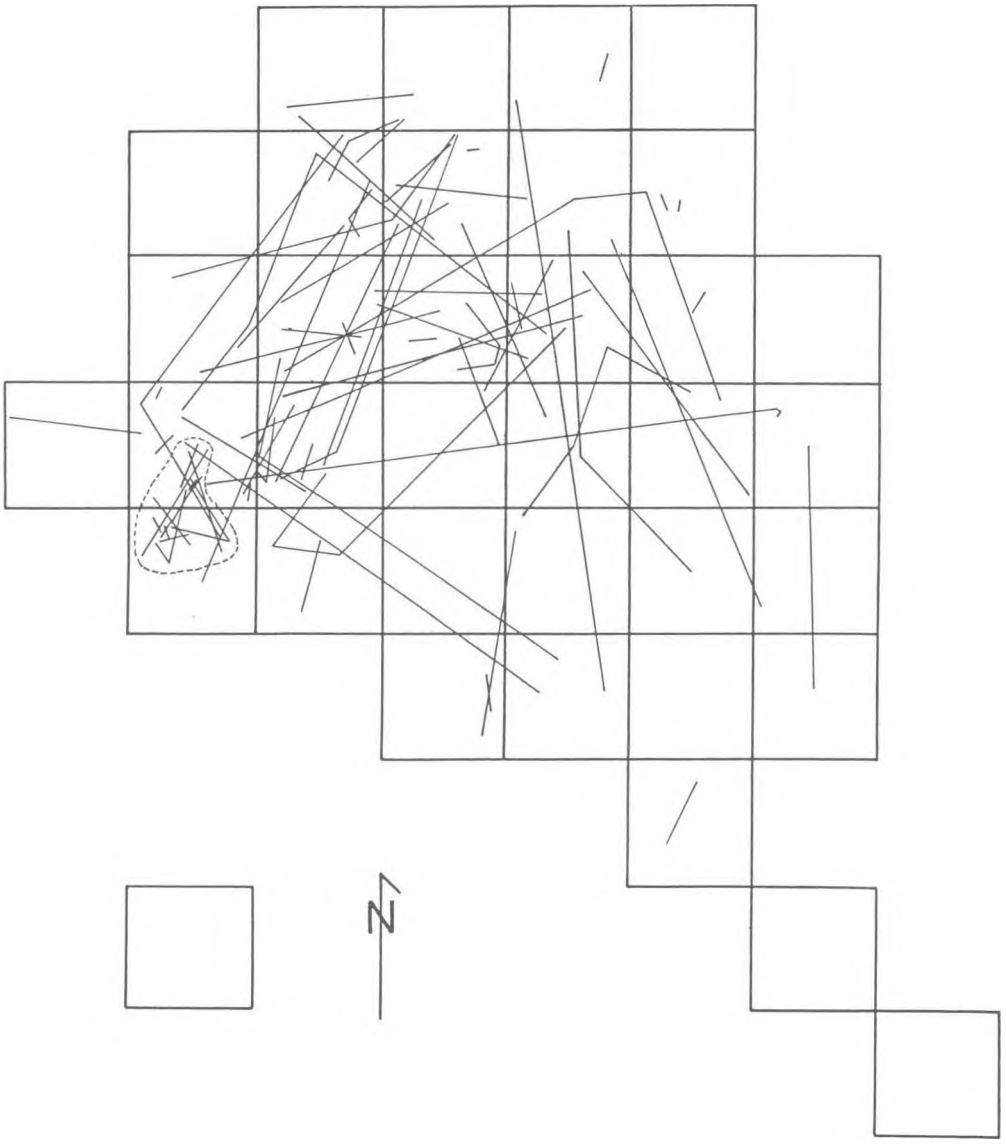

Fig. 7. Plan showing horizontal movement of artifacts. The concentration surrounded by a dashed line represents flakes removed from a split biface.

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

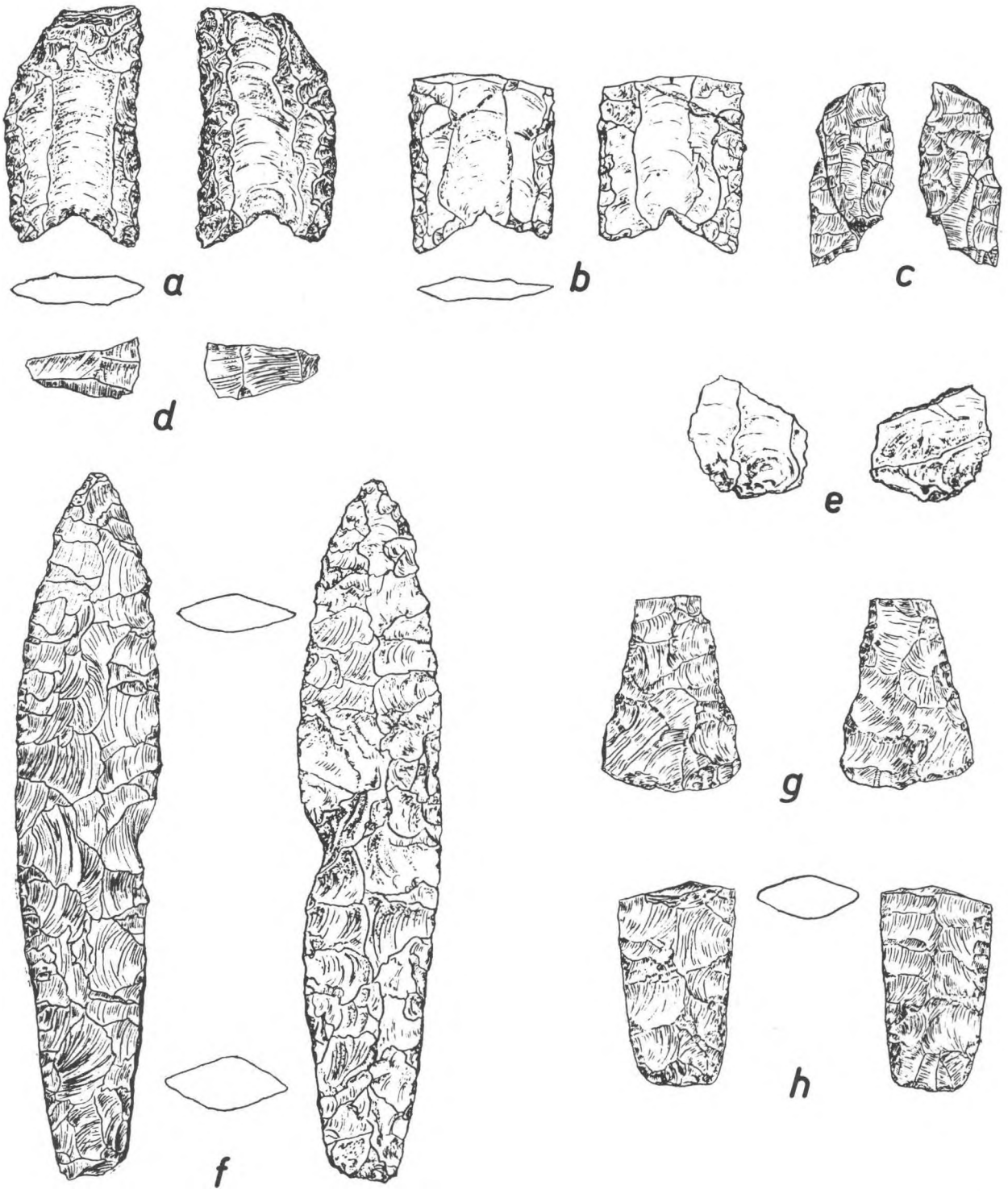

Fig. 8. Projectile points.
Fluted point fragments a-e. Putu points f,h. Triangular point g.

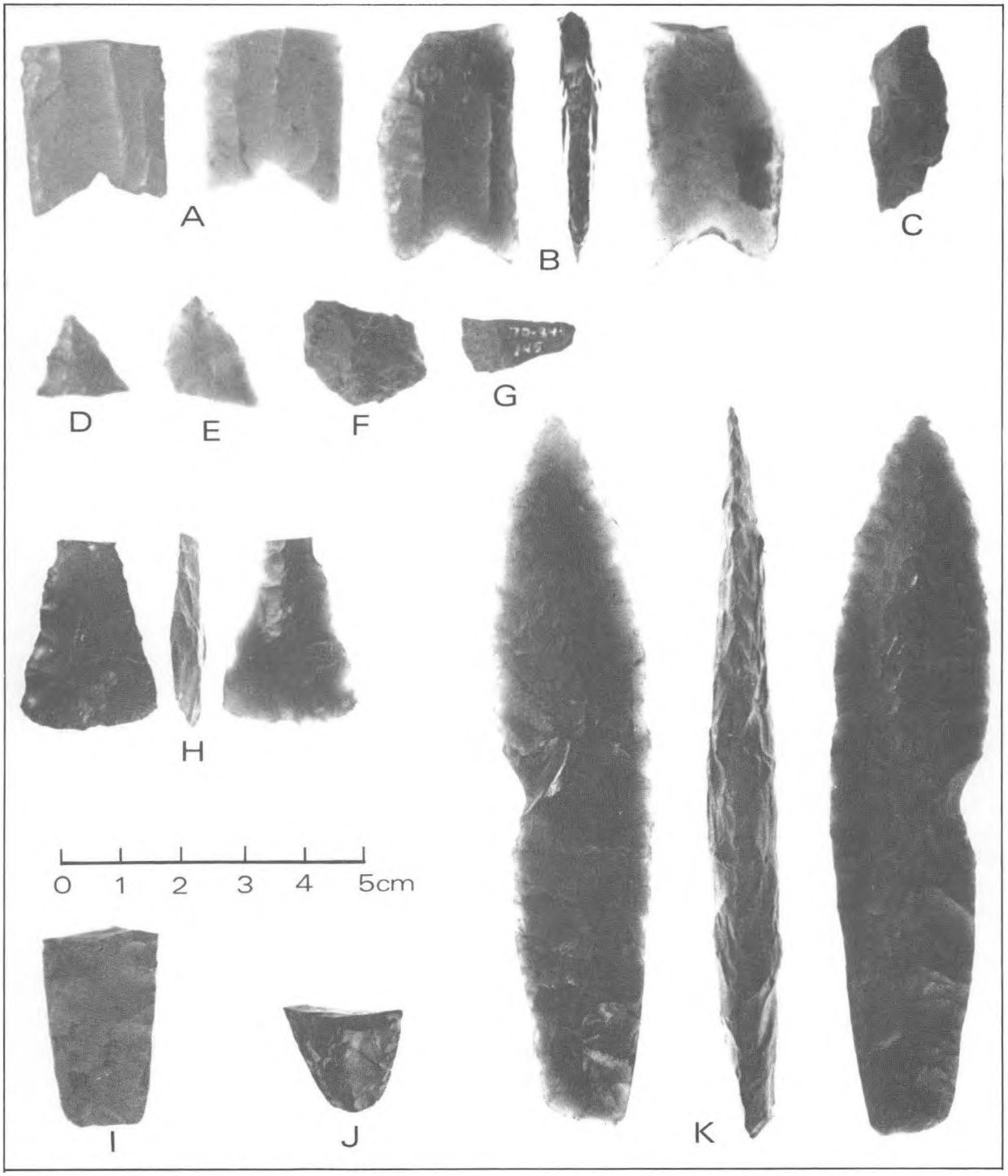

Fig. 9. Projectile Points.
Fluted point fragments a, b, c, f, g. Putu points i, j, k, e.
Triangular point h.

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.

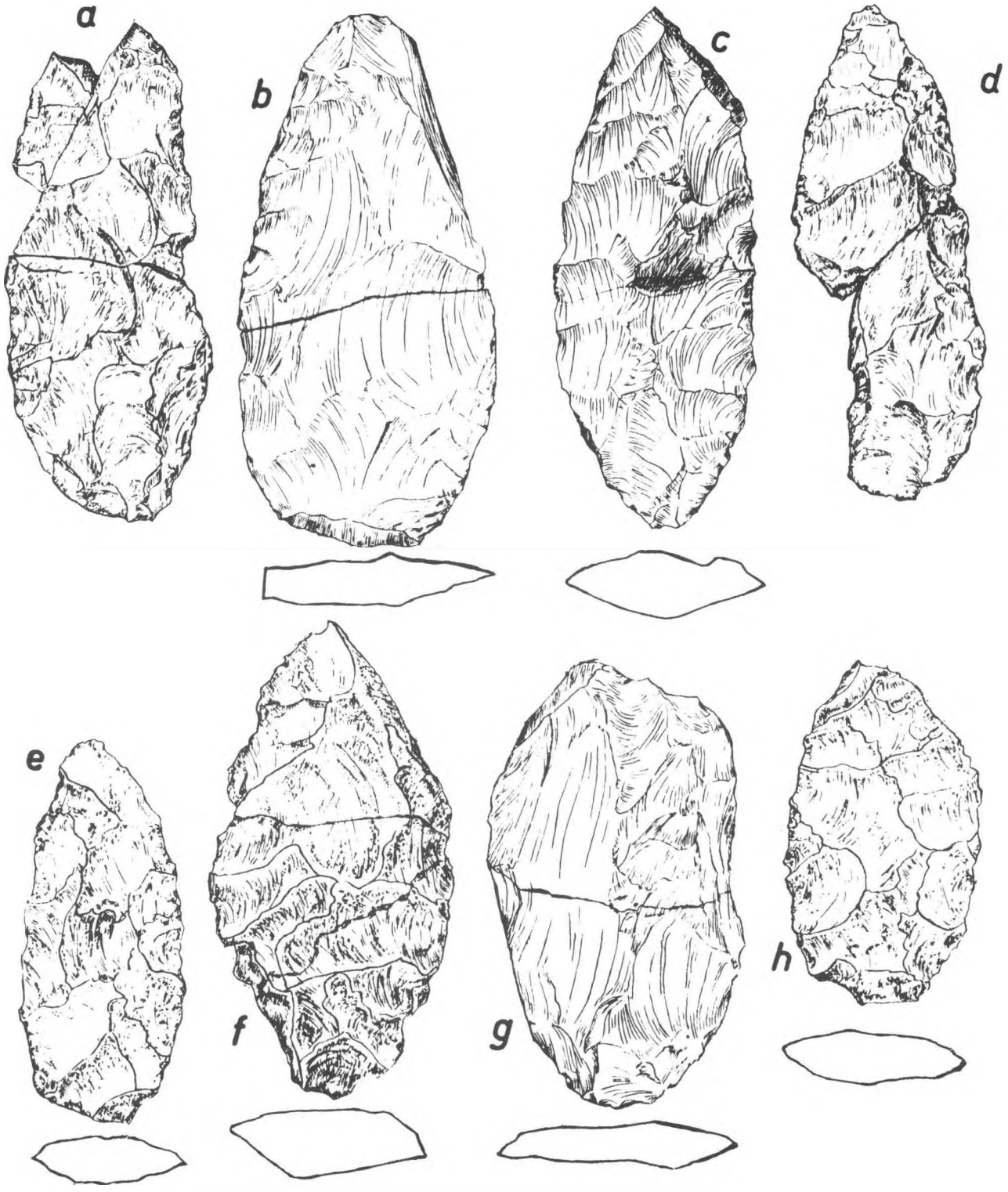

Fig. 10. Split bifaces. Specimens a & d are burins as well.

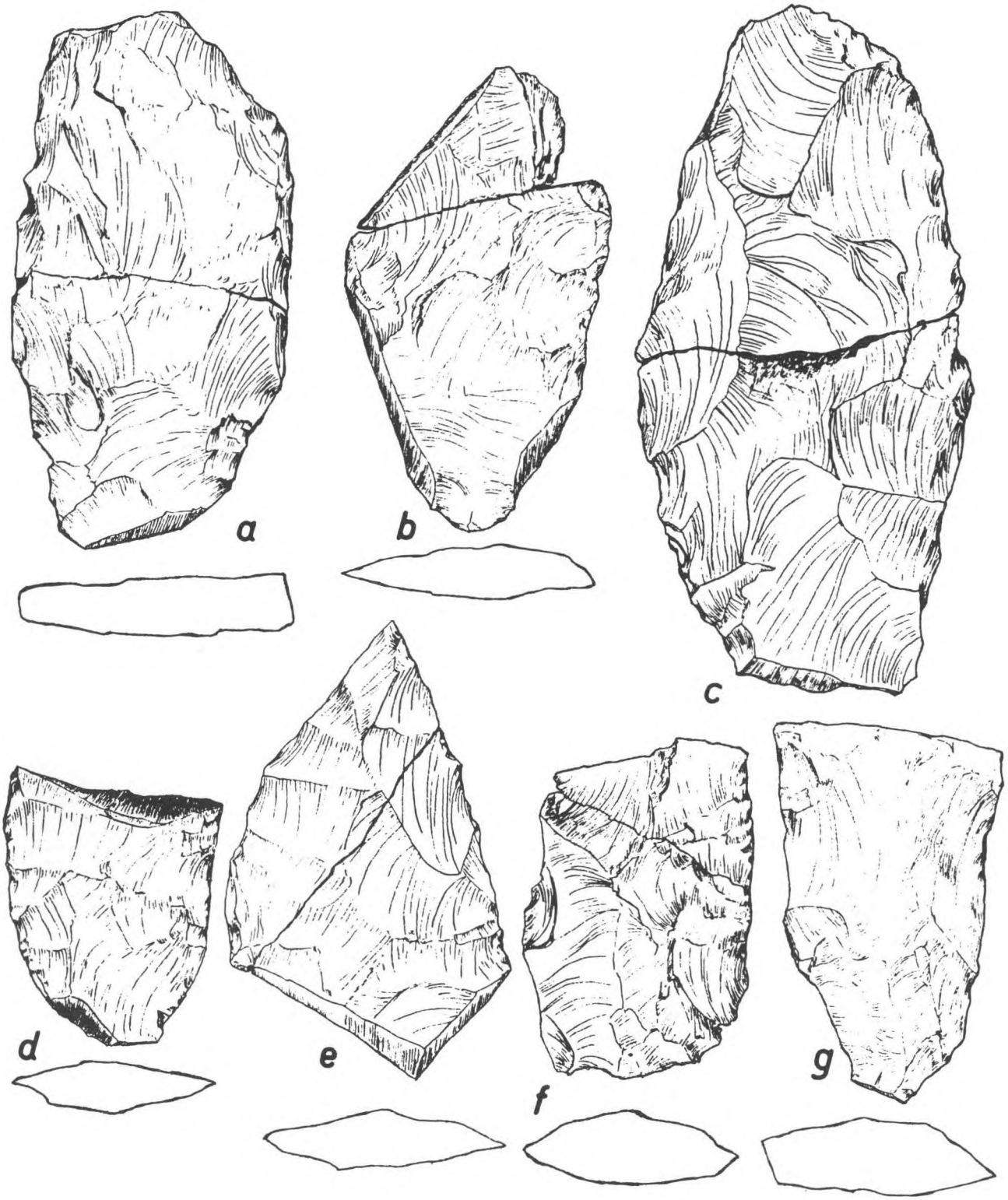

Fig. 11. Split bifaces.

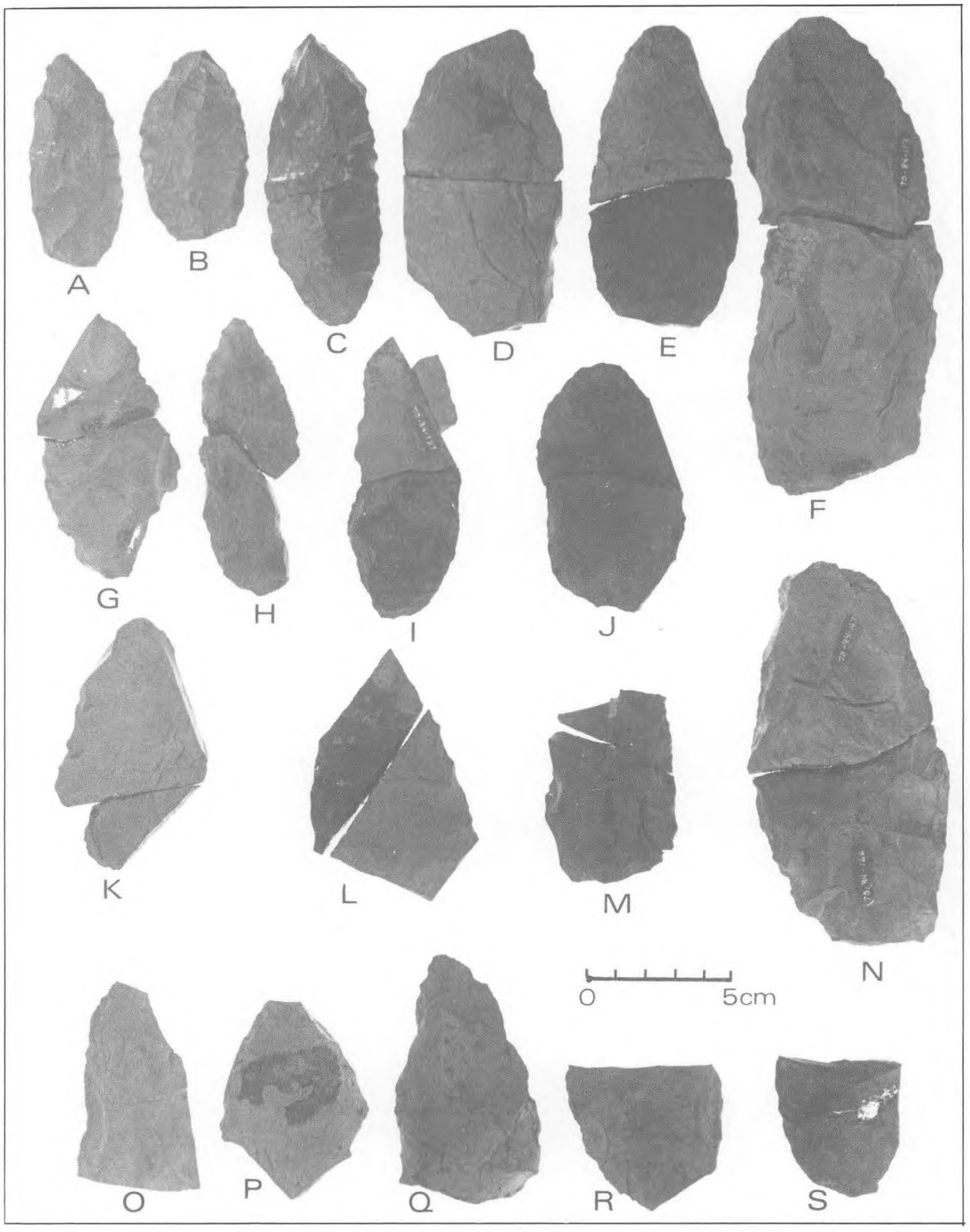

Fig. 12. Split bifaces.

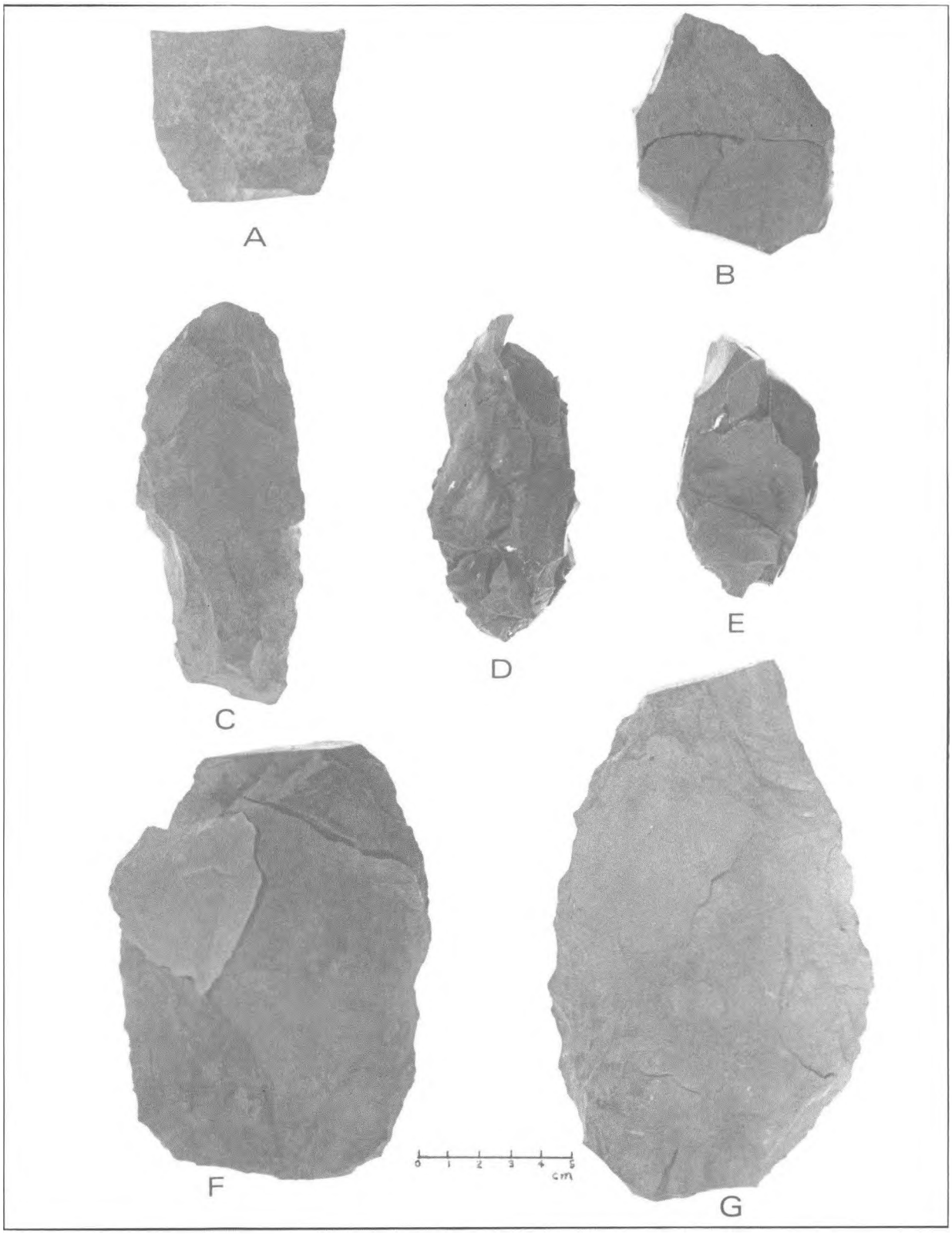

Fig. 13. Split bifaces. Specimen D shows 25 flakes covering the completed tool.

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.

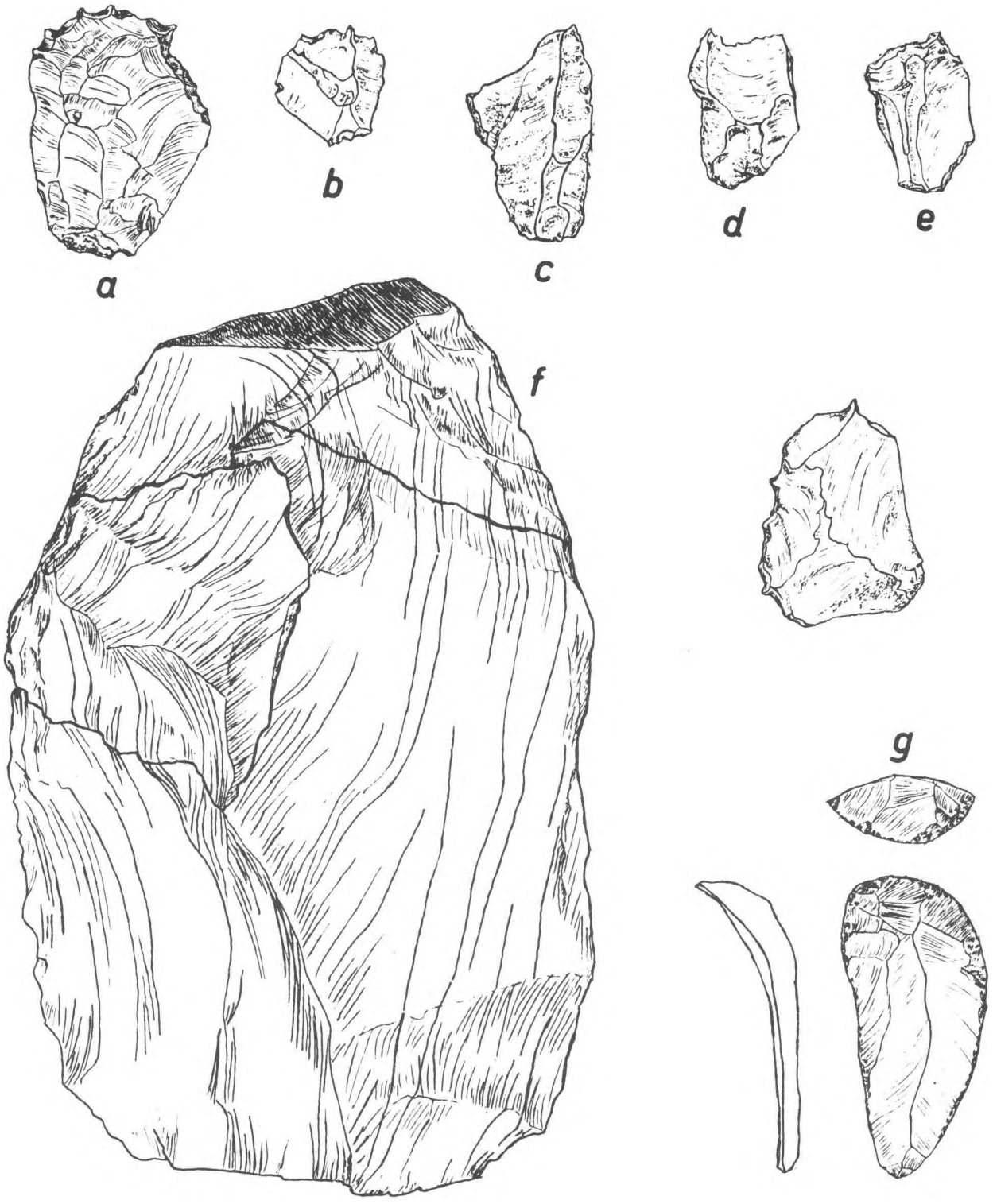

Fig. 14. Gravers, large biface and scraper on a blade.

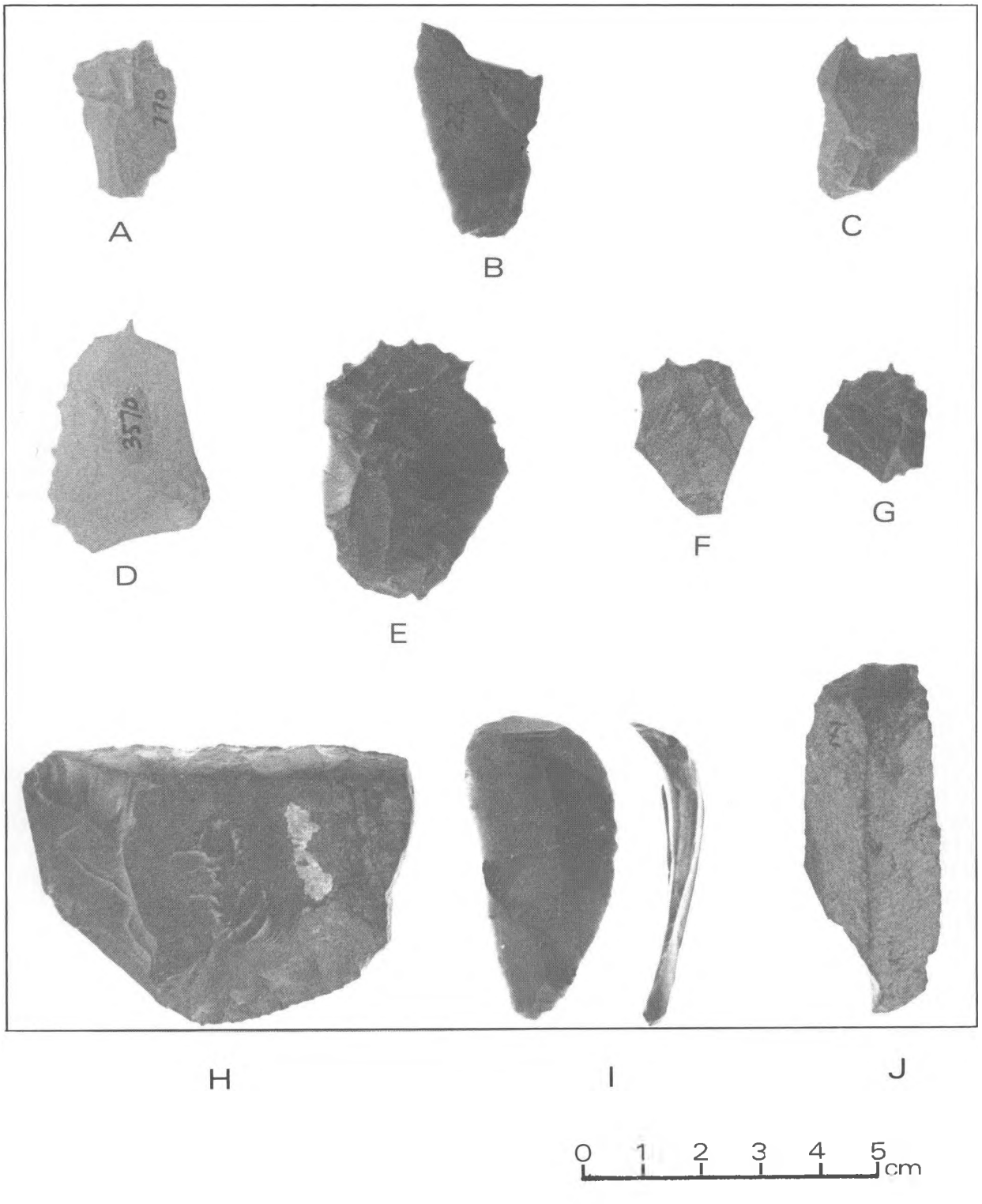

Fig. 15. Gravers and scrapers.

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

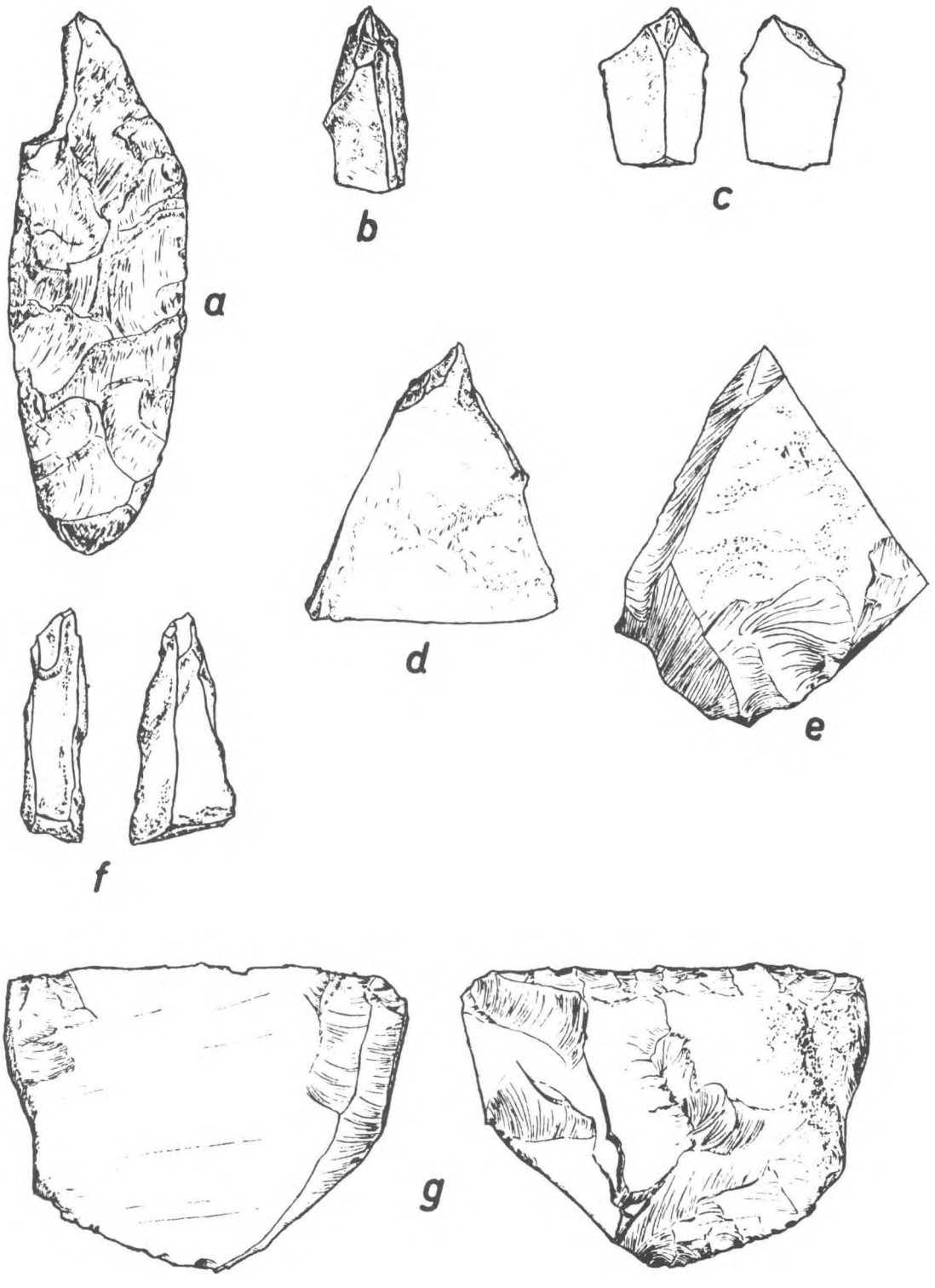

Fig. 16. Burins.

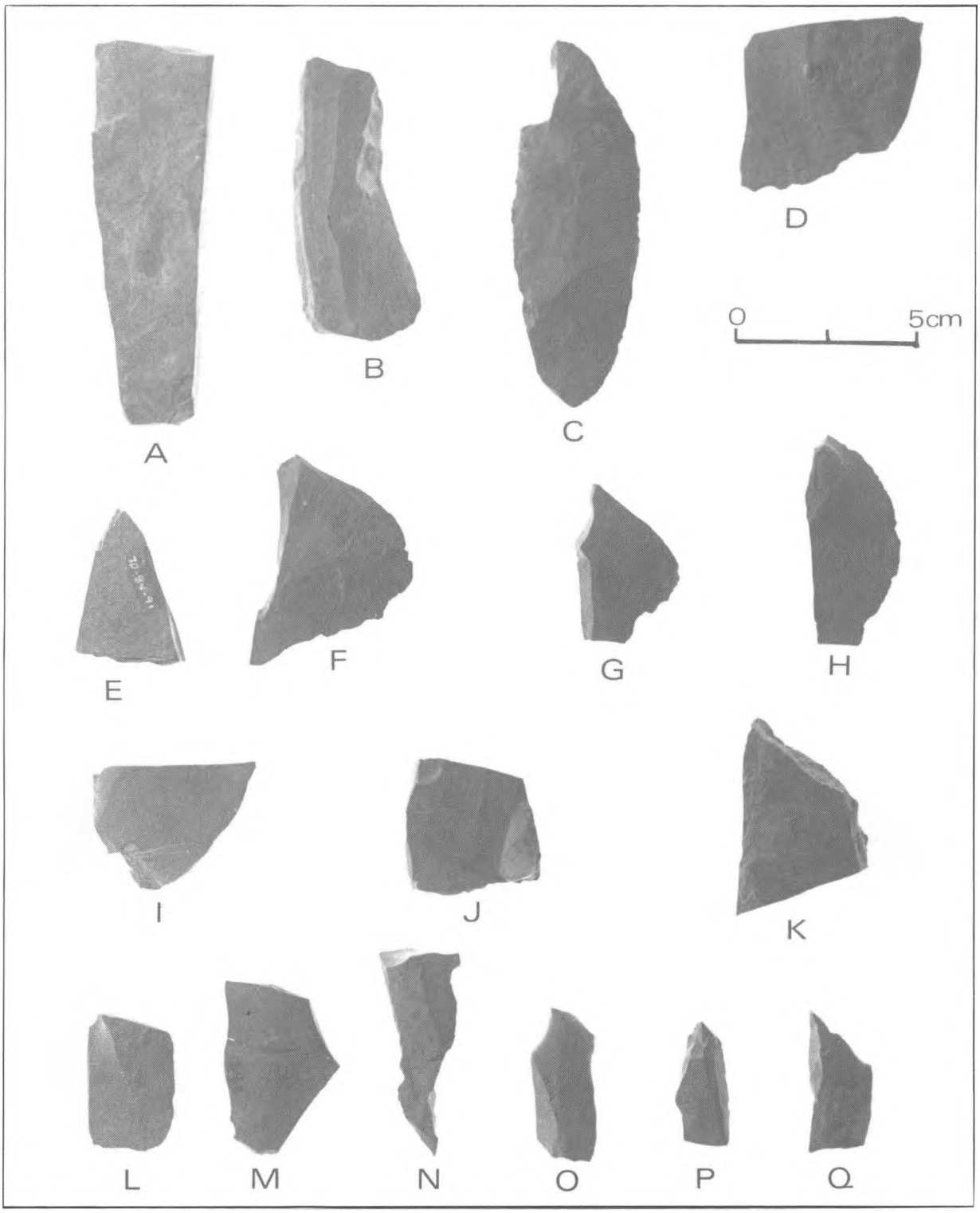

Fig. 17. Burins.

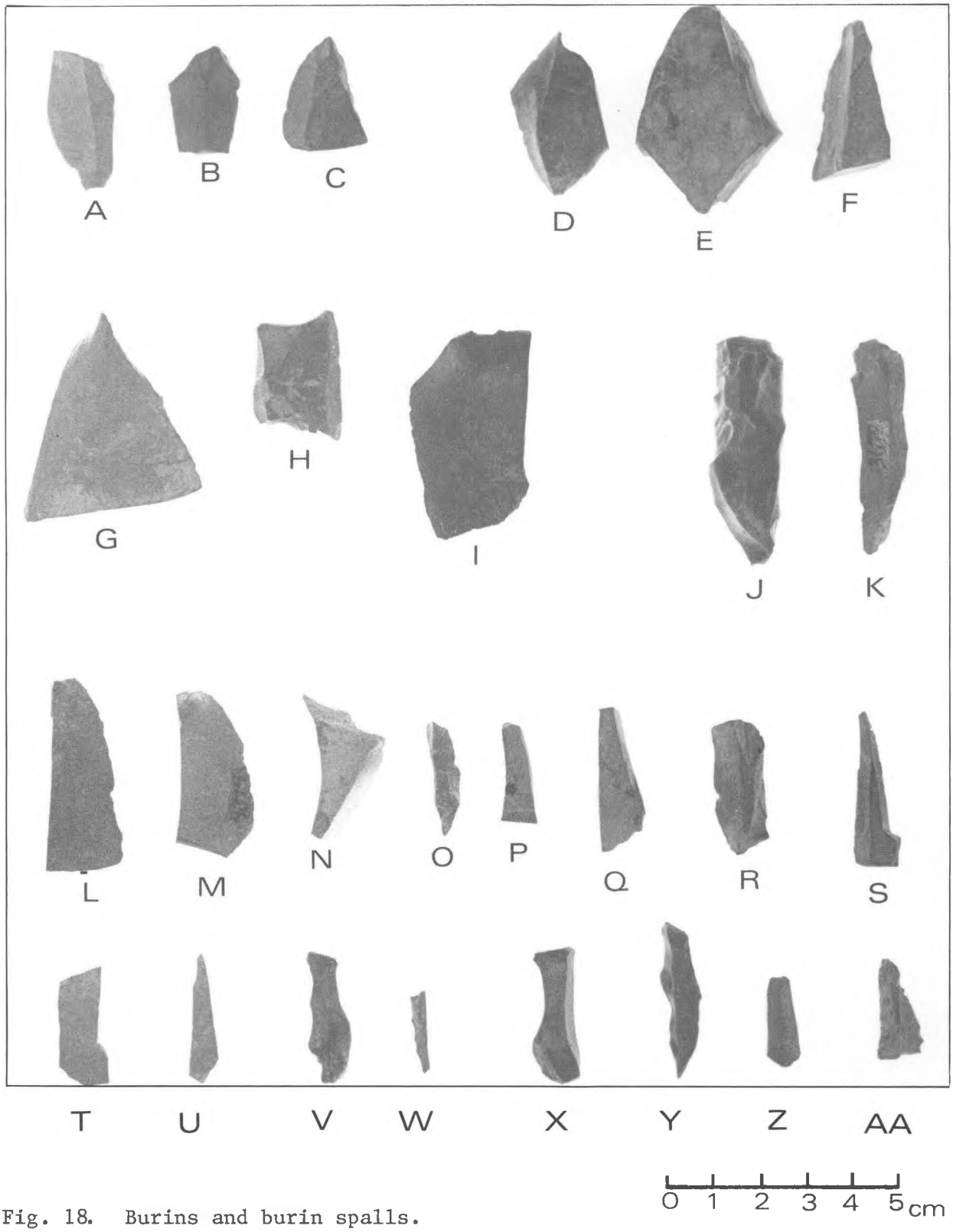

Fig. 18. Burins and burin spalls.

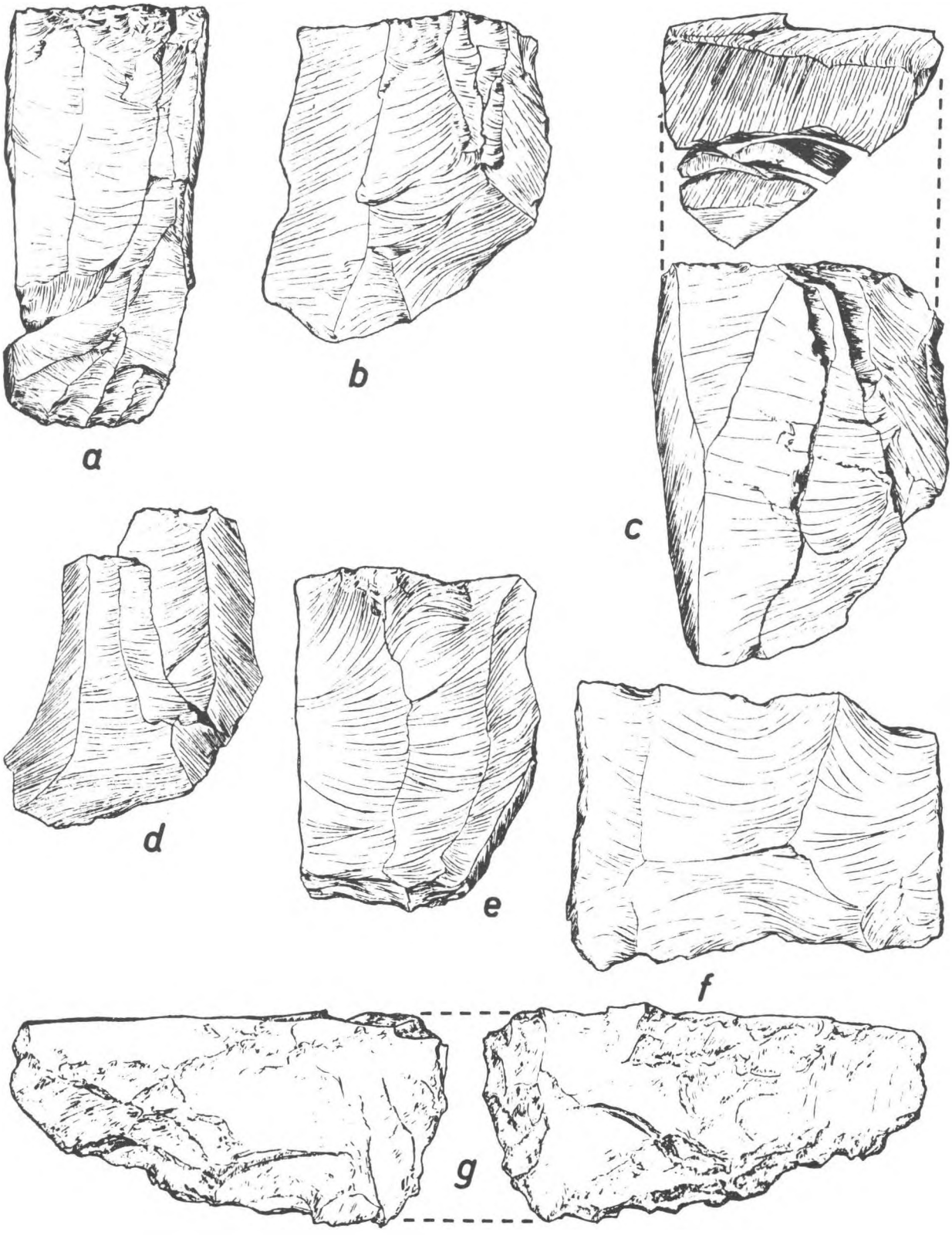

Fig. 19. Cores and boatshaped tool.

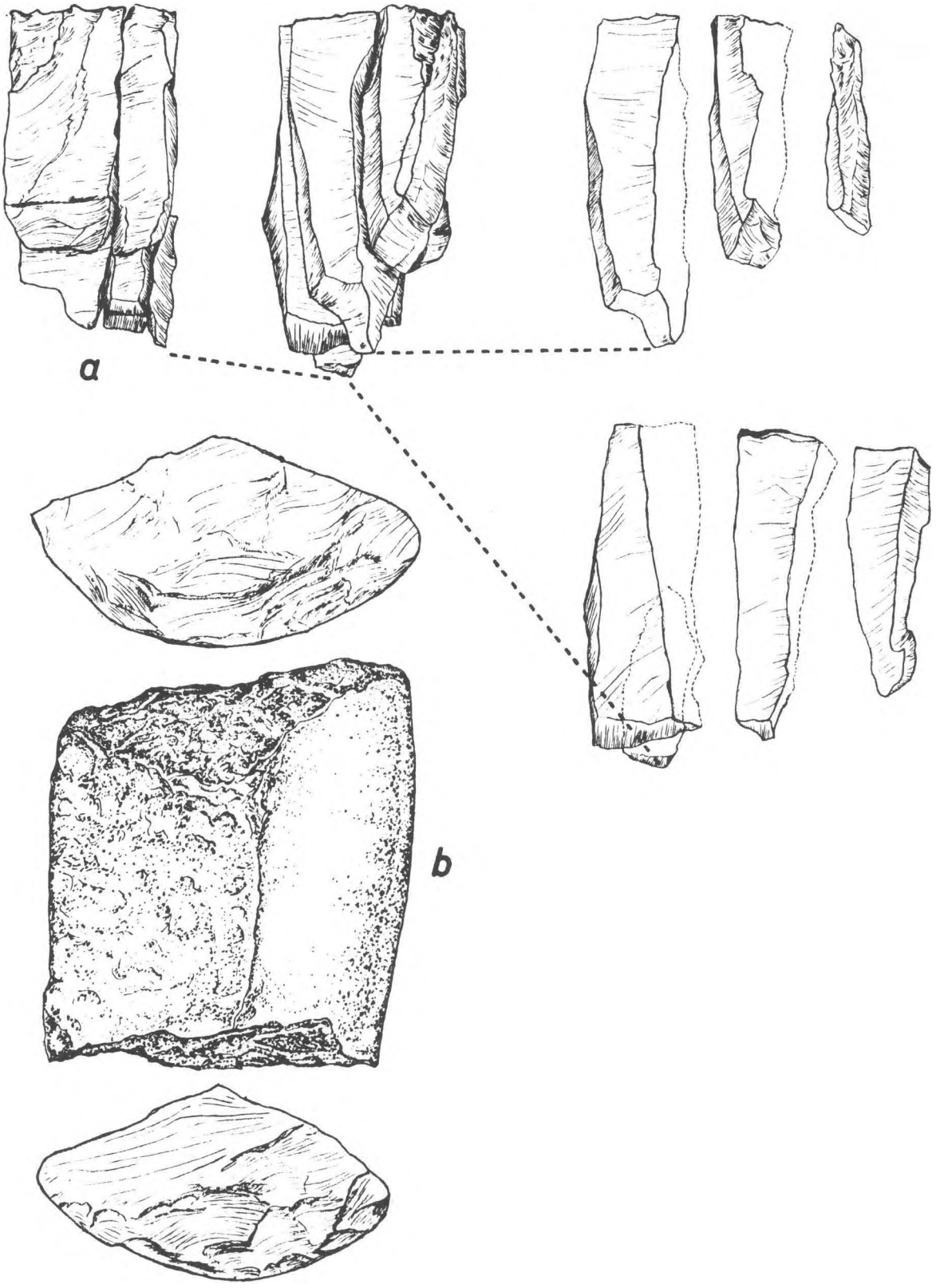

Fig. 20. Core reconstruction and hammerstone.

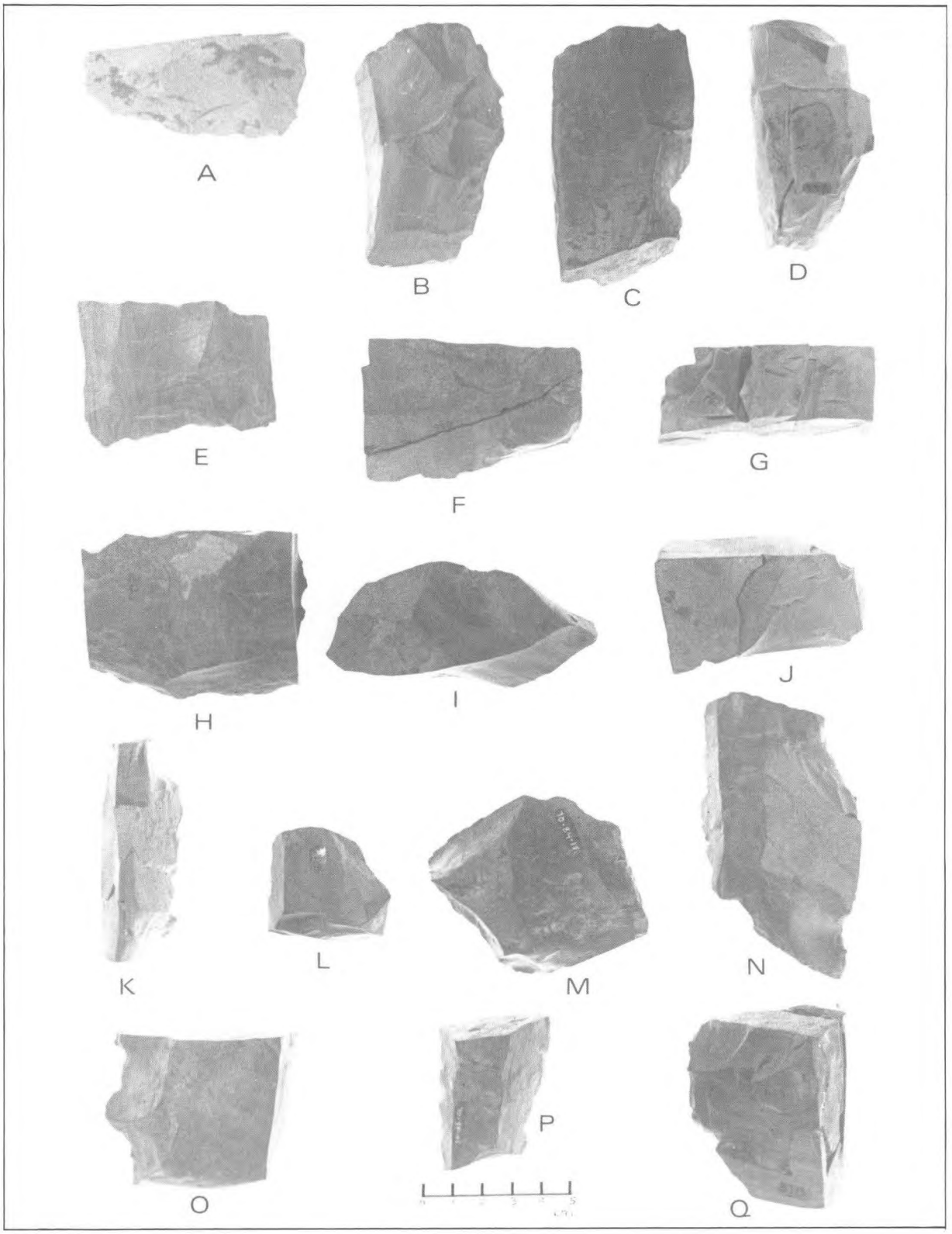

Fig. 21. Cores.

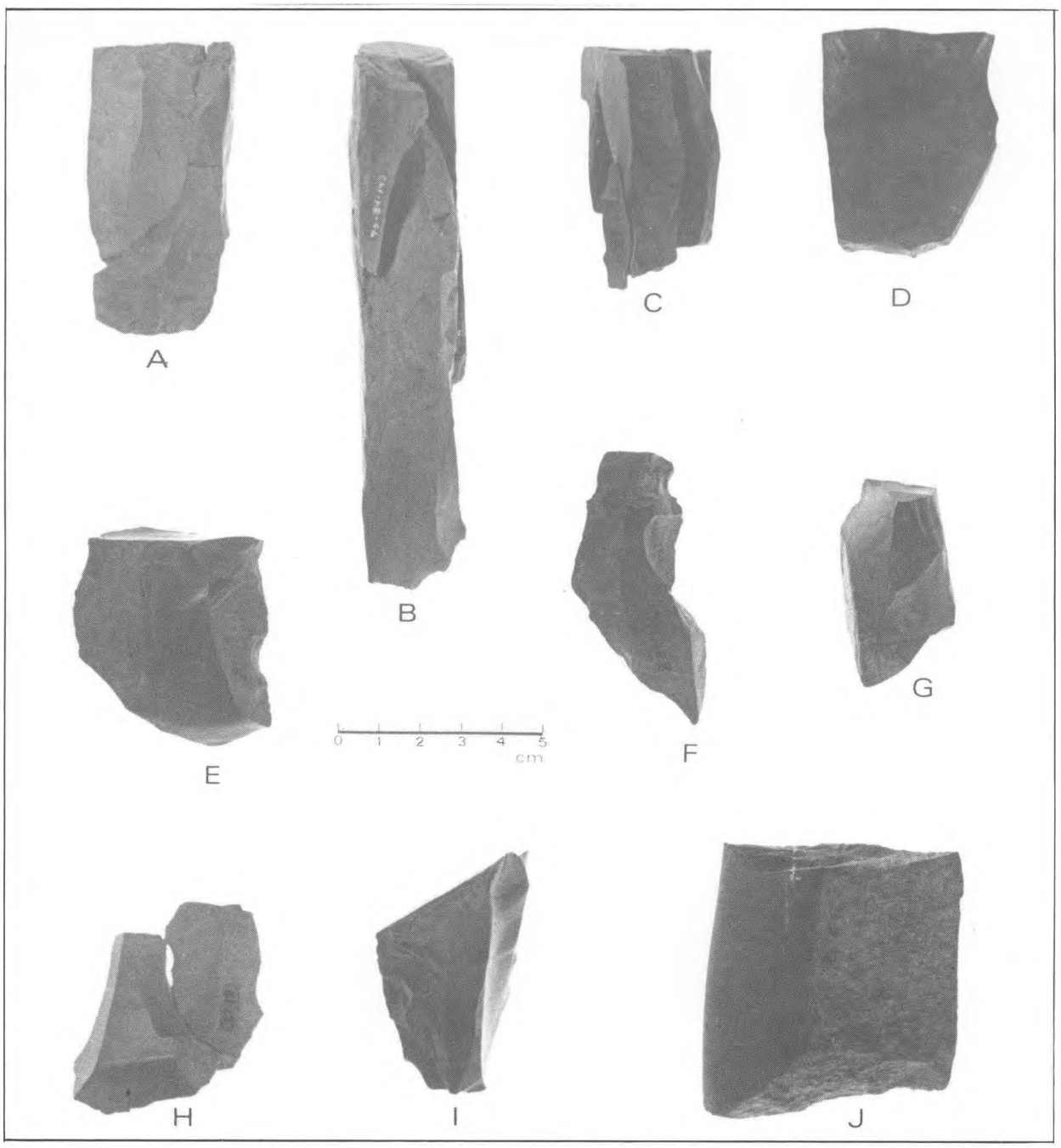

Fig. 22. Cores and hammerstone.

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

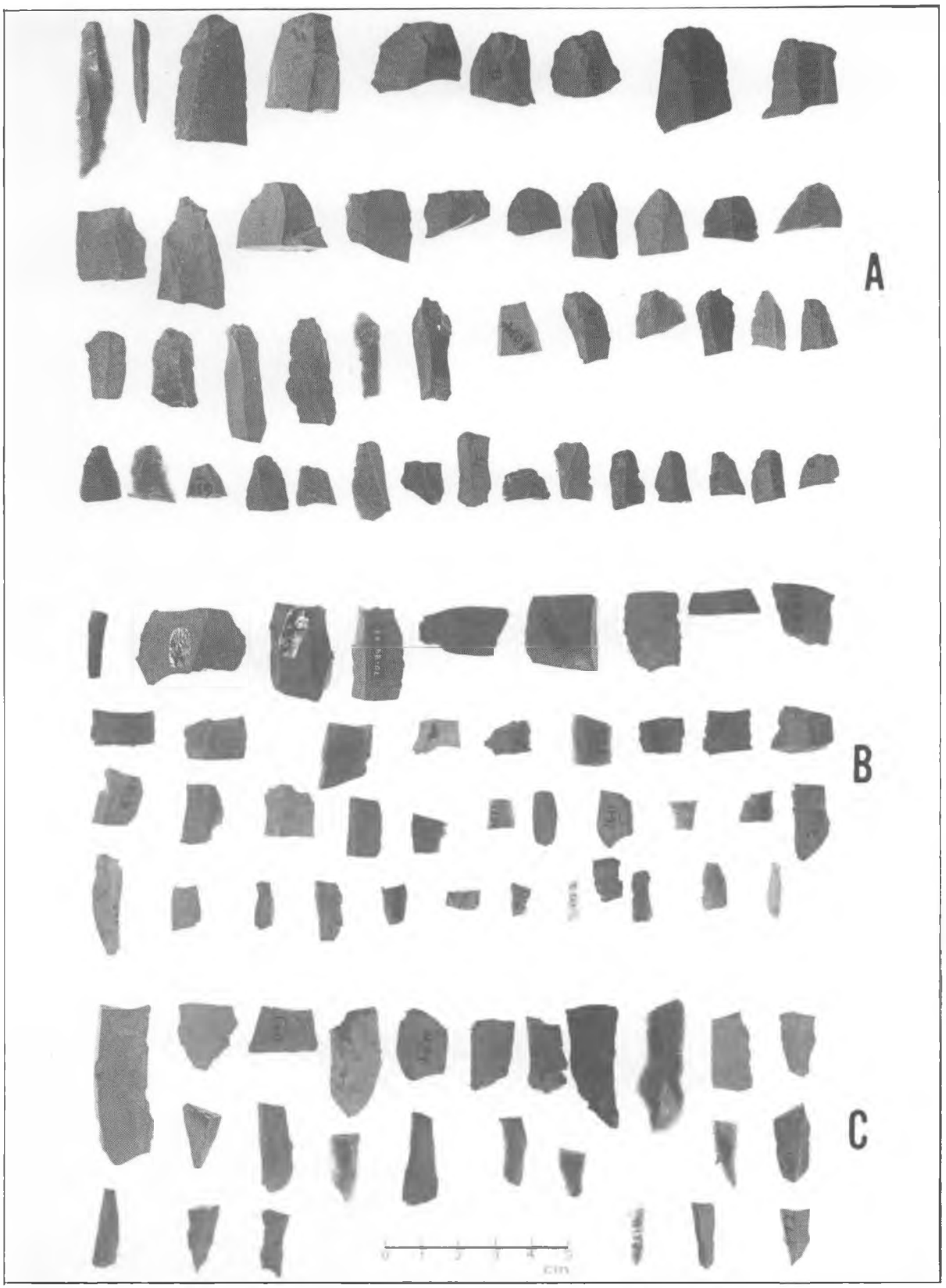

Fig. 23. Blade fragments. Proximal fragments A, Mid-sections B, Distal fragments C.

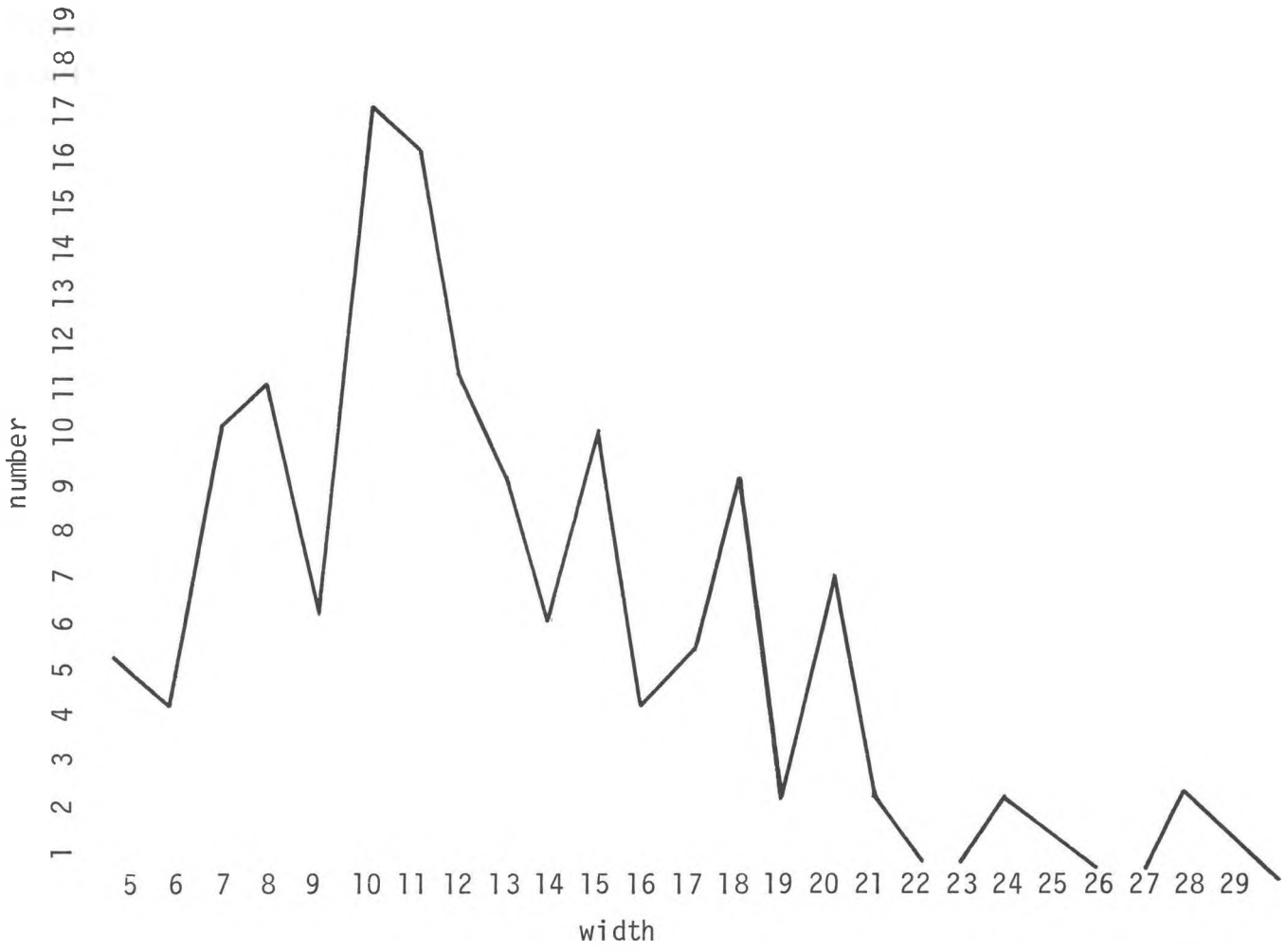

Figure 24.
Frequency of Blade Widths

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.