TWO PROBABLE SHIELD ARCHAIC SITES IN

KILLARNEY PROVINCIAL PARK, ONTARIO,

P. L. STORCK

ABSTRACT

Two collections of stone implements and flake debitage obtained from test excavations at sites in and adjacent to Killarney Provincial Park are described and tentatively assigned to the Shield Archaic complex. In the descriptive analysis of the artifacts, emphasis is placed on interpreting manufacturing techniques as indicated by incomplete tools and flake debitage. It is argued that information on manufacturing techniques should be combined with purely descriptive and functional attributes in developing a rigorous and widely-used typology of Shield Archaic artifacts. The establishment of a sound typology is, of course, essential to any attempts to determine whether there are regional differences or temporal trends in the lithic technology of the Shield Archaic, a complex which was extremely wide-spread and may have persisted for several thousand years.

INTRODUCTION

This paper describes the results of test excavations at two possible Shield Archaic sites located in and adjacent to Killarney Provincial Park on the north shore of Georgian Bay, Ontario. The sites were located and tested during the summer of 1970 in the course of a three month survey which the author and one assistant conducted in the southern part of the park. The objective of the survey was to attempt to locate sites occupied by peoples closely related to those who occupied the George Lake I (Greenman, 1943, 1955, and 1966; Greenman and Stanley, 1943) and Sheguiandah (Lee, 1954, 1955, 1956, and 1957) sites for the purpose of more firmly dating the initial late glacial occupation of the Georgian Bay region and determining the external cultural relationships of these peoples (Storck, 1970, 1971).

Areas investigated in detail are shown in Figure 1. Ninety to ninety-five percent of the survey time was spent in locating elevated beach ridges formed during the past seven or eight thousand years and testing the more favorable areas for evidence of human occupation. Raised beaches were located on slopes of Killarney Ridge and Blue Ridge and ranged in elevation from ten to approximately 200 feet above the present level of Georgian Bay. Figure 1 does not include extensive areas that were checked out and found to contain no elevated beaches. Information on the location, number, approximate elevation, and condition of the beaches is available in the daily field notebook which is on file at the ROM.

Unfortunately no sites were located which might contribute to an increased understanding of the Late Paleo-Indian-early Shield Archaic complexes as represented at the George Lake I and Sheguiandah sites. However, two small sites which were tested, the O.S.A. Lake site and the Lamorandiere Bay site, contain material that is probably related to the later Shield Archaic occupations of the region since they lack apparently early artifacts such as lanceolate projectile points. Although these components cannot be more accurately dated, the debitage and artifacts do provide useful information concerning the total range of artifacts and others aspects of the lithic technology of the Shield Archaic complex and hence contribute toward a definition of that complex.

O.S.A. LAKE SITE I

The site is located in the southern part of Killarney Park on the eastern shore of O.S.A. Lake and at the narrowest part of land between this lake and Killarney Lake to the east (Lake

Panache map sheet, 41 1/3 W. edition 2, military grid reference 704001, Figure 1). The site is situated on the crest and backslope of a small ridge of a former beach which is approximately five feet above the current level of the lake and twenty to thirty feet inland from the shore. A number of quartzite waste flakes were collected from two "tree-throws" (mounds of earth thrown up by the roots of fallen trees) and the surface of an old portage trail which crosses the site and, because of this, the area was extensively tested (Figure 2). This produced a large quantity of quartzite debitage and a small number of stone tools. Unfortunately no bone was preserved. The artifacts were found immediately below the humus in the uppermost or A1 horizon of a podzol. Almost no artifact material was found in the underlying bleached A2 horizon. The artifacts and much of the debitage occurred in three major concentrations in Areas 2 and 3 (Figure 2). Two concentrations of fire-cracked rock partially surrounded by debitage in Area 3 may have been hearths around which a considerable amount of stone knapping took place.

DESCRIPTION OF THE ARTIFACTS

A total of twenty-six complete and fragmentary implements and 2,785 waste flakes were recovered from the three test areas giving a ratio of approximately 140 flakes to every artifact. This indicates that a considerable amount of stone knapping activity occurred at the site and the presence of one flake blank, two or possibly three preforms, and at least one fragment of a nearly completed tool are evidence of several stages of tool preparation. With one exception, all of the artifacts and flakes are of white or grey quartzite with the former predominating. The grey quartzite appears to contain appreciable amounts of clay. Two fragments from the same side-notched projectile point are bluish-white quartz.

FLAKE BLANK (Plate 1)

One large flake is probably a blank. The flake is approximately 1 2.0 cm long perpendicular to the striking platform, 13.5 cm wide at right angles to the previous measurement, 3.0 cm thick, and weighs 392 grams (approximately 13½ ounces). There is a small area of cortex on the dorsal face indicating the flake was removed from the exterior of a larger block. Numerous flakes were removed from the proximal end of the dorsal face either prior to the removal of the flake (blank) itself or subsequent to its removal in an attempt to thin the bulbar end. The blank is otherwise unmodified.

All of the artifacts described below were made from large flakes. One fragment of a biface and a worked flake were clearly made from naturally available flakes as small areas of cortex are present on both faces of each artifact. Seven other artifacts have small areas of cortex on only one face. These tools could either have been made from naturally occurring flakes or from flakes which were removed from larger pieces specifically for use as blanks.

BIFACIAL PREFORMS

Two or possibly three specimens can be identified as preforms. Following Crabtree's definition (1972, p. 85), a preform is an unfinished, unused form of a proposed artifact with large deep flake scars and irregular edges.

The rectangular preform (Plate 2) was probably made from a large thick flake. Full facial flaking has removed any cortex which may have been present and the original nature of the flake (blank) cannot be determined. The preform is 18.7 cm long, 8.6 cm wide, and 4.1 cm thick, and weighs 676 grams (approximately one and a half pounds). The preform has been roughly flaked by the removal of large irregularly-shaped flakes producing a markedly sinuous edge. The thickness of the preform is a result of the fact that many of the flakes ended in hinge fractures leaving material in the center of the object. There is no evidence of secondary retouch or wear resulting from use.

The second preform (Plate 3,b) is quite small and was made from -a short, thick, and probably tabular flake of quartzite containing a considerable amount of clay. Both ends are natural fracture surfaces along cleavage or bedding planes. The specimen is 5.2 cm long, 1.3 cm wide, 1.6 cm thick, and weighs twenty-six grams. The preform was probably discarded after step-flaking left a thick mass of material near the center of one face which either could not be removed by further flaking or, if removed, would have produced a preform too small to be useful.

A third specimen (Plate 3,a) may be a broken preform since it exhibits large flake scars, a sinuous edge, and no secondary marginal retouch or evidence of use.

SIDE-NOTCHED PROJECTILE POINT (Plate 4)

The basal fragment of a side-notched projectile point and the fragment of a tip probably belong to the same artifact since, although they do not fit together, they are both made of the same bluish-white quartz. No other artifacts or even flakes of this material were recovered from the site. The single complete side-notch on the basal fragment is somewhat squarish and is approximately 8.0 mm long and 3.0 mm deep. Although part of the base has been broken away, the proximal margin of the complete notch (e.g. the margin toward the base of the point) is 7.0 mm above the fracture and clearly both notches were located well above the base producing a substantial stem.

LANCEOLATE BIFACIAL IMPLEMENT WITH GROUND EDGE (Plates 5,6)

The original length of the implement cannot be determined as the tip is broken but it is presently 1 3.2 cm long. The artifact has a maximum width of 4.8 cm about mid-way between the base and the tip and a thickness of 1.8 cm. The margins along the edge of the wide end of the artifact have been purposefully ground. The grinding extends 2.8 cm along the edge and from 6.0 to 8.0 mm back from the edge on the margins of both faces. The angle of the cutting edge is approximately 60°. The ground edge suggests that the artifact might have been hafted and used as an adze. Alternately, it could have been hand-held and used as a multi-purpose tool with the chipped edges also being used for cutting.

COMPLETE BIFACES

One complete rectangular (Plate 7,b) and two trianguloid (Plate 7,a and c) bifaces were recovered. The rectangular biface is 10.5 cm long, 6.3 cm wide, and 2.1 cm thick and weighs 141 grams. The entire circumference of the artifact could have served as a cutting or scraping edge as it is thin and has been extensively retouched. The cutting edge angle varies from approximately 43° to 79°. The two trianguloid bifaces, Plate 7a and c respectively, measure 12.0 and 10.9 cm long, 8.2 and 5.9 cm wide, 1.6 and 1.8 cm thick, and weigh 110 and 88 grams. The entire circumference of these artifacts could also have been used for cutting. The edge angle varies from 28° to 42° on one specimen (Plate 7a) and from 35° to 58° on the other.

BIFACIALLY WORKED IMPLEMENT FRAGMENTS

Eleven bifacially worked implement fragments were recovered. One (Plate 8,a), made from a naturally available flake as indicated by the presence of cortex on both faces, exhibits some bifacial flaking on the margins of both faces but was probably broken before completion and discarded. The artifact cannot really be described as a broken preform since the original blank was apparently so close to the desired shape and size of the final tool that only a small amount of discontinuous marginal flaking was actually required in producing a thin working edge, at least on the fragment recovered. This indicates that with a suitably shaped blank the preform stage could sometimes be by-passed in tool manufacture.

Two fragments from what were apparently large ovoid bifaces (Plate 8,c and d) are probably from completed tools which were broken, possibly during use, and discarded. Both fragments are uniformly thin (1.4 and 1.5 cm respectively) and exhibit shallow primary flake scars and considerable secondary marginal retouch. The nature of the flaking suggests that the tools were completed before being broken and hence that the breakage occurred as a result of use. If both implements were symmetrical, the breaks occurred at right angles to their long axes. While it cannot be demonstrated in this instance, this kind of break could be the result of hafting and using the bifaces as axes for wood working.

Of four distal fragments of bifacially worked implements, two (Plate 9,d,e) may be from projectile points while the other two (Plate 9, f and g) may be from lanceolate or ovoid knives. All were broken at right angles to their long axes.

One fragment of an ovoid biface (Plate 8,b) exhibits full facial flaking on the obverse face and only a small amount of discontinuous marginal flaking of the reverse face. One end forms a distinct point with an obtuse angle while the other end is rounded. The artifact is 10.8 cm long, 6.4 cm wide, and 1.7 cm thick.

Three implement fragments (Plate 9, a, b, and c) from bifacially worked objects are unidentified.

UNIFACIAL TOOLS (Plate 10, a, b)

Two fragments of unifacially flaked tools were recovered. One (Plate 10, a) has a small projection approximately 4.0 mm long. It was isolated from the edge by the removal of two large flakes which created deep concavities on both sides of a ridge. The projection could have been used for piercing, engraving, or drilling.

WORKED FLAKES

Five quartzite flakes exhibit a small amount of unifacial marginal retouch along either a single edge or a short segment of one edge. The cutting or scraping edges on three flakes (Plate 10, d, e, and f) range from 1.6 to 5.3 cm long while the edge angles range from 42° to 62°. A short cutting edge on the fourth flake (Plate 10, g) has an obtuse angle of 113°. The fifth flake (Plate 10, c) has two deep concavities formed by steep unifacial flaking and might have served as a spokeshave. The concavities are between 2.0 and 2.5 cm wide and 7.0 and 9.0 mm deep.

WASTE FLAKES

As mentioned previously, a total of 2,785 quartzite waste flakes were recovered from the three excavated areas of the site. Of these, 390 contain appreciable amounts of clay and perhaps as a consequence the striking platforms, bulbs of percussion, and other attributes of flaking are not often present or well-developed. Consequently, these flakes were not included in the study described below and the debitage analysis was based on a sample of 2,395.

Approximately ninety percent of the flakes are incomplete consisting of proximal, mid-section, and distal fragments which indicates that a considerable amount of breakage occurred in the process of flaking. In fact, proximal fragments of flakes are outnumbered by mid-section and distal fragments by a ratio of approximately two to one.

PLATFORM FLAKES

There is a total of 931 platform flakes which is approximately thirty-nine percent of the total sample of flakes. Platform flakes are those flakes which exhibit the striking platform or striking surface and the accompanying bulb of percussion and/or lip (see Figure 5). The term "striking platform" does not refer to the nature of the force but to the point where the force, whether pressure or percussion, was applied. Platform flakes may be either complete flakes or proximal fragments of broken flakes. In this analysis, platform flakes were further classified according to the type of platform: (1) natural surface or cortex, (2) fracture surface, (3) flake scar remnant, (4) faceted, and (5) indeterminate. Figure 4 illustrates the frequency of the different types of platforms. As might be expected, it is not always possible to satisfactorily differentiate between a fracture surface and a flake scar remnant and both categories contain some error although this is perhaps somewhat greater in the former category. A faceted platform is defined by the presence of at least two flake scar remnants. The term "faceted platform" is descriptive only and hence is preferable to "prepared platform" which implies intention. While some platforms with flake scar remnants may have been deliberately prepared for flake removal, others were probably simply selected because they were suitable surfaces for flaking, the flake scar remnants on the platform being the result of tool preparation (core reduction) rather than platform preparation.

The vast majority of platform flakes have either no visible or else diffuse bulbs of percussion. In addition, a total of 254 or slightly over twenty-seven percent have slight platform overhangs or lips on the ventral surface. These would be classified by Fitting (1967, p. 239) and Crabtree (1972, pp. 44 and 74) as soft hammer flakes indicating they were probably produced by soft hammer percussion, such as with the use of a bone, antler, or wooden hammer, or by pressure. Only a few flakes, many with natural platforms, exhibit prominent bulbs of percussion, crushed contact areas on the platform where the force was applied, and/or bulbar scars. These features are attributed to direct percussion flaking with a hammerstone.

Of the platform flakes, approximately eighty-seven percent provided striking angle estimates (see Figure 5). The striking angle is the angle between the striking platform and the dorsal surface of the flake. This was determined within five degree intervals with a protractor goniometer. It is important not to place the goniometer on the very margin of the dorsal face if this area has been extensively flaked since this kind of flaking probably represents edge or platform preparation prior to detaching the flake. The resultant angle would be an estimate of the striking angle used in edge preparation and not in the removal of the main flake. The striking platform should perhaps more correctly be referred to as the striking face since the entire platform may not have received - the force used in detaching the flake. In some instances, particularly with faceted platform flakes from lenticular bifaces, the striking angle may have been considerably less than the angle formed by the dorsal surface of the core from which the flake was removed (see Figure 5). On some flakes where the striking angle could be estimated because of the pronounced battering caused by the blow which removed the flake, the striking angle was as much as ten or fifteen degrees less acute than the angle formed by the dorsal surface of the flake and the faceted "platform".

Table 1 presents the percentage frequencies of flakes having obtuse and two classes of acute striking angles in each of the four categories of platform flakes. The most pronounced differences between the different types of platform flakes occur in the percentage of flakes having obtuse striking angles and those having acute striking angles of 45° or less. Over twenty percent of the flakes with natural and fracture surface striking platforms have obtuse striking angles compared with approximately nine percent of the flakes with single flake scar platforms and only six percent of the faceted platform flakes. Conversely, none of the flakes with natural platforms and only a fraction of a percent of those with fracture surface platforms have acute striking angles of under 45° compared with between five and ten percent of the other two platform types. These differences would appear to indicate that flakes with natural and fracture surface platforms were probably struck more often from blanks or cores with obtuse edges in the early stages of reduction than were the other types of platform flakes. However, the relatively large percentage of natural and fracture surface platform flakes with striking angles ranging from 89° to 45° seems to support evidence discussed earlier that large flakes, already having acute edges, were frequently used as blanks.

FACETED PLATFORM FLAKES FROM BIFACIAL CORES OR TOOLS

Out of a total of 931 platform flakes, only forty-one or slightly over four percent can be identified, with reasonable accuracy, as having been struck from lenticular bifaces in the process of tool manufacture. All of these flakes have acute edge or platform angles ranging from 65° to

TABLE 1

PERCENTAGE FREQUENCY OF FLAKES ACCORDING TO PLATFORM TYPE AND STRIKING ANGLE[1]

STRIKING ANGLE	PLATFORM TYPE					
	Indeterminant	Natural Surface	Fracture Surface	Flake Scar Remnant	Faceted	Combined Total
greater than 90°	21.05 (20)[2]	20.93 (9)	20.51 (32)	9.56 (31)	6.28 (12)	12.85 (104)
between 45 and 89°	78.94 (75)	79.06 (34)	78.84 (123)	85.18 (276)	83.76 (160)	82.57 (668)
under 45°	------	------	0.64 (1)	5.24 (17)	9.94 (19)	4.57 (37)
Totals	99.99 (95)	99.99 (43)	99.99 (156)	99.98 (324)	99.98 (191)	99.99 (809)

1 — total sample: 809
2 — ( ) actual number of specimens

27° and, more importantly in terms of their identification, exhibit two or more flake scars on both the platform or striking surface and on the dorsal face indicating that bifacial flaking was consistently directed at the same edge. The edges of the striking platforms on these flakes were heavily abraded presumably to facilitate flaking and, as a result, in some instances have become almost rounded.

In a collection in which bifacial tools predominate, it is initially surprising and seemingly contradictory to find such a low percentage of flakes that have been struck from bifaces. However, there are two closely related reasons for this, both concerning the problem of recognition. First, only faceted platform flakes can provide evidence of bifacial flaking although it is recognized that flakes with other types of platforms (such as single flake scar remnants and natural surfaces) could also have been struck from bifaces. In this collection, faceted platform flakes account for approximately twenty-seven percent of the total number of platform flakes of all types (excluding proximal flakes on which the type of platform could not be determined because of the small size of the platform remnant). This is the maximum percentage of flakes from bifaces that theoretically could be recognized if it could be assumed that all faceted platform flakes were actually from bifaces. This assumption, of course, is not justifiable. Enough of the striking platform and dorsal surface of the flake must be present in order to determine whether two or more flakes were previously removed by bifacial flaking along the same edge before the flake can definitely be identified as having been struck from a lenticular biface. Regularity in flaking is a critical attribute. The presence of an acute striking angle or a faceted platform are not, even in combination, sufficient to identify these flakes and obviously many will simply not be recognizable because of small platform remnants.

The second aspect of the problem of recognizing flakes that have been struck from bifaces is related to their production. Flakes exhibiting the attributes mentioned above, particularly evidence of uniform bifacial flaking, are most likely produced only during the final stages of trimming. Flakes produced during the earlier stages of core reduction would be generally larger and more irregular in size. More pertinent to the present discussion, however, is that during the process of core reduction, the edge of the biface becomes quite irregular and sinuous because of the removal of large flakes by blows from many directions. This is readily apparent by a comparison of the preform (Plate 2) with completed bifacial tools in Plate 7 and Figure 3. The majority of flakes removed during this stage of core reduction will probably have platforms consisting of single flake scar remnants and consequently could not be reliably identified as having been struck from a biface. Only during the stage of final trimming to produce a less sinuous edge will faceted platform flakes be produced that can, in some instances, be identified as coming from lenticular bifaces. As a consequence, sites where edge trimming and re-sharpening were the only stone knapping activities should, theoretically at least, have a much higher percentage of faceted platform flakes from bifaces than sites such as the one under discussion where all stages of tool manufacture are represented. Because of the problems in identifying these flakes, however, this percentage will probably always remain small.

In order to determine empirically the range of striking angles that might be found on flakes struck from bifaces, edge angles were measured on eleven complete and fragmentary bifaces which were probably finished artifacts before they were lost or broken and discarded. From six to eleven measurements were made on each artifact to allow for variation. The edge angle varies from 24° to 81° a range of 57°. On individual artifacts, however, the edge angle may vary by as little as 12° or as much as 54°. This indicates that faceted platform flakes, and other types of platform flakes as well for that matter, with edge angles as high as 81° could be from completed or nearly completed bifaces. It is important to note in this regard, however, that eighty-seven percent of all faceted platform flakes (and eighty percent of all types of platform flakes) have striking angles of eighty-four degrees or less although, of these, only twenty-four percent (slightly over five percent of all platform flakes) had large enough striking platforms to allow them to be identified as having been. struck from bifaces.

CONCLUSIONS AND SUMMARY

Although this cannot be demonstrated stratigraphically, there is no reason to believe that more than one archaeological complex is represented and, on typological grounds, all of the artifacts can be assigned to the Shield Archaic. Unfortunately, in the absence of radio-carbon dates or stratigraphy, it is not possible to date the site or to determine whether it was occupied only once or several times. Wright (1970, pp. 42-43) has suggested some general trends in the relative importance of certain types of artifacts but these have not as yet been dated. In any event, this method of dating would be difficult to apply to any collection which may contain more than one assemblage resulting from two or more occupations which occurred over an unknown period of time.

Of special note in this collection, is the lanceolate bifacial implement with ground edge. The grinding was deliberately done to create a working or functional edge and is not, primarily at least, the result of use. Stone grinding of this type is apparently very rare in Shield Archaic assemblages and, in an analysis of 778 stone artifacts from eleven sites, Wright (1970, . p . 43) found that only sixteen or approximately two percent had been shaped to any extent by grinding and a number of these apparently had their origins in the Laurentian Archaic tradition.

The analysis of the blanks, preforms, and completed tools provides information about the lithic technology which, in some instances, is also supported and amplified by the analysis of the waste flakes.

All of the artifacts were made from large flakes which were either detached from larger pieces specifically for use as blanks or, alternately, were simply selected from flakes which were naturally available. This is indicated by small areas of cortex still remaining on some of the tools and is also reflected in the distribution of striking angles on platform flakes. Thick flakes were fashioned into preforms by rough bifacial flaking producing large deep flake scars and sinuous edges. The preform was then trimmed by bifacial flaking to produce the completed tool. Not all of the tools, however, were fashioned from preforms. In some instances the original blank was so close to the desired shape and size of the proposed tool that only a small amount of marginal flaking was required and the preform stage could be by-passed. Two implements were made by unifacial flaking but the majority were made by full facial or marginal bifacial flaking. Insofar as this can be determined from the debitage, much of the flaking was accomplished with a soft hammer such as an antler, bone, or wooden tool. Very few of the waste flakes were modified for use as tools and the lithic technology as a whole was based on bifacial core tools.

LAMORANDIERE BAY SITE

The site is located on a raised beach on the south slope of Killarney Ridge above Lamorandiere Bay, a small extension of Killarney Bay on Georgian Bay (Lake Panache map sheet, 41 1/3 W, edition 2, military grid reference 624954) (Figure 1). The beach ranges from approximately 217 to 234 feet above the present level of Georgian Bay (Lake Huron) (e.g. 798 to 815 feet above mean sea level). The elevation was determined with a transit by running a line-of-sight to a point of land on Lamorandiere Bay, a distance of approximately one and a half miles. A transverse section of the beach through the site was also plotted with a transit to illustrate differences in elevation of various parts of the beach as well as the location of the site on the beach profile (see Figure 6). Isolated flakes were found scattered over an area 50 to 75 feet long paralleling the long axis of the beach and within 20 feet of the talus slope at the back of the beach. Only one concentration of flakes and artifacts was located and this was confined to a single large "tree-throw" near the back of the beach. Several hundred quartzite waste flakes, a few worked and/or utilized flakes, and fragments of two rudely-shaped bifaces were recovered. The soil matrix consists of fine to medium sand containing gravel and numerous well-rounded water-worn cobbles up to five or six inches in diameter and predominantly of quartzite.

THE POSSIBLE AGE OF THE BEACH

Occurring at an elevation of between 798 and 815 feet above sea level, this beach is intermediate between the post-Pleistocene Cedar Point stage at 848 feet and the Payette stage at 782 feet. The elevations of the Cedar Point and Payette stages in this region were determined at a locality a few miles north of the village of Sheguiandah on eastern Manitoulin Island (Hough, 1958, Figure 45, p. 233). These elevations can probably be extended to the Killarney area since Sheguiandah is less than thirty miles away. Subsequent to their formation, these beaches were uplifted several hundred feet by isostatic rebound since south of the line of zero uplift in southern Lake Huron the Cedar Point and Payette stages have elevations of 493 and 465 feet, respectively (Hough, 1958, pp. 229-233). These lake stages are part of the post-Algonquin series of lake stages preceding Lake Stanley and all of the beaches in this series are estimated to date between approximately 9000 B.C., or slightly earlier, and 8500 B.C. (Flint, 1971, Table 21-F, pp. 566-567). The Cedar Point and Payette stages occurred toward the end of this interval. These dates provide a rough estimate of the age of the beach on which the site is located and hence a possible base date for the site itself. The site could, of course, be very much younger and unfortunately no other means of dating are available.

DESCRIPTION OF THE ARTIFACTS AND DEBITAGE

The artifacts include two bifacially-worked preforms in different stages of preparation, a flake graver, and ten worked and/or utilized flakes.

BIFACIALLY-WORKED PREFORMS

The trianguloid fragment (Plate 12a) was nearly completed before being broken in the process of manufacture by a transverse fracture along a bedding plane. The artifact is approximately 13.0 cm long, 14.0 cm wide, 3.40 cm thick, and weighs 362 grams. It was roughly shaped by the removal of large irregular-shaped flakes producing a markedly sinuous edge. Approximately fifty percent of the edge has been dulled by step-flaking and grinding to such an extent that it has become almost rounded. Significantly, edge grinding is absent in the deep negative bulbs of percussion left by the removal of large flakes which indicates that it is probably the result of edge preparation for further flaking rather than the result of use. This interpretation is supported by the fact that the artifact was clearly broken before being completed and, perhaps more importantly, by the fact that similar edge grinding occurs on the striking platforms of numerous flakes. According to Crabtree (1972, pp. 12, 38, 68, and 84) edge preparation by grinding served to strengthen the striking platform for flaking.

The second preform (Plate 12b) was apparently discarded as unusable after a small amount of preliminary flaking. Small areas of cortex still remaining on the dorsal and ventral faces indicate that it was made from a naturally occurring thick tabular flake. It is 10.8 cm long, 5.7 cm wide, 3.5 cm thick, and weighs 223 grams. The obverse face has been almost completely flaked by full facial flaking but only three flakes were removed from the reverse face. Unlike the other preform, the edges have not been ground.

FLAKE GRAVER (Plate 13a)

A short point approximately 7.0 mm long was formed on the long axis of the flake by unifacially flaking (from the dorsal face) small notches on both sides of a ridge between two flake scars. As a consequence, the point has a triangular cross-section which presumably would have given it added strength in use. The point could have been used for fine cutting, incising, and/or piercing.

WORKED AND/OR UTILIZED FLAKES (Plate 13, b-I)

Ten flakes (six percent of the total number of flakes) were used as cutting or scraping tools with either no intentional modification, the functional edge being identified by evidence of use, or only a small amount of unifacial marginal retouch. Only a short segment of one or sometimes two edges was used. The length of the working edge varies from approximately 6.0 to 30.0 mm but it is always short relative to the circumference of the flake. Clearly the selection and preparation, if any, of suitable flakes for an immediate task was guided by expediency and these tools were probably used only once and then discarded.

DEBITAGE

A total of 344 flakes were recovered, of which 157 (45.6 percent) are complete flakes or proximal fragments with striking platforms. The percentage frequency of flakes classified according to platform type and striking angle is presented in Table 2. Unfortunately, in most cases, the sample size is very small and the percentages may not be too meaningful. In a general sense, the distribution of striking angles on all types of platform flakes combined is similar to that at the O.S.A. site. The slightly higher percentages of flakes with striking angles greater than 90 degrees and those with angles of less than 45 degrees at the Lamorandiere site may not be significant as they are based on very small samples.

The majority of platform flakes have diffuse bulbs of percussion and/or lips indicating they were probably removed by soft hammer percussion. On the 157 platform flakes, only thirty-four or 21.6 percent have faceted striking platforms and, of these, only nine or 5.7 percent can tentatively be identified as having probably been struck from lenticular bifacial preforms or nearly completed tools. It is of interest to note that these percentages are remarkably similar to those from the O.S.A. site which are based on a sample almost six times larger. It is difficult to say whether this is simply a coincidence or the result of the fact that bifacial preforms probably formed an important part of the lithic technology at both sites. While both sites were manufacturing stations, they appear to have served somewhat different functions in this regard. Several stages of tool manufacture are represented at the O.S.A. site.

TABLE 2

PERCENTAGE FREQUENCY OF FLAKES CLASSIFIED ACCORDING TO PLATFORM TYPE AND STRIKING ANGLE

STRIKING ANGLE	PLATFORM TYPE					
	Indeterminant	Natural Surface	Fracture Surface	Flake Scar Remnant	Faceted	Combined Total
greater than 90°	27.27 (3)[1]	30.43 (7)	28.57 (2)	14.63 (12)	11.76 (4)	17.83 (28)
between 45 and 89°	72.72 (8)	65.21 (15)	71.42 (5)	79.26 (65)	79.41 (27)	76.43 (120)
under 45°	------	4.34 (1)	------	6.09 (5)	8.82 (3)	5.73 (9)
Totals	99.99 (11)	99.98 (23)	99.99 (7)	99.98 (82)	99.99 (34)	99.99 (157)

1 — ( ) actual number of specimens

However, no completed bifaces or other tools (excepting the flake graver) were recovered from the Lamorandiere site and it may have functioned solely as a quarry station where only preforms were prepared and, together with suitable naturally occurring flakes useful as blanks, taken elsewhere to be finished into tools. The small amount of debitage certainly suggests that the site was used very briefly only once and by only a few people. While speculative, this interpretation is reasonable considering the fact that in this region of abundant quartzite there would be little need for the establishment of periodically revisited quarries unless this facilitated other activities in the seasonal subsistence cycle.

CULTURAL AFFILIATION

This small collection is tentatively assigned to Shield Archaic primarily because of the trianguloid fragment of the bifacially worked preform and the evidence provided by the debitage that other similar artifacts were probably also made at the site.

In concluding this paper, I would like to make a few comments about some problems in working with Shield Archaic material. Wright (1970) and others have commented on the general uniformity of the Shield Archaic complex throughout the vast area of its distribution. This uniformity may be partly a reflection of a widespread similar adaptation to the environmental conditions of the Canadian Shield but it may also, at least in part, be only an apparent uniformity attributable to the level of analysis used in describing and classifying artifact material. There may be geographic differences and, as Wright (1970) suggests, temporal trends in certain aspects of the Shield Archaic lithic technology but these will probably only become most readily apparent through detailed typological studies that consider not only the formal aspects of the artifacts but the methods used in their manufacture as well.

As is generally true in other areas of archaeological research both in Ontario and elsewhere, there is a need, in dealing with the Shield Archaic, for the adoption of an agreed-upon terminology for the description of stone tools and, especially, for the development of a commonly used typology of Shield Archaic artifacts, at least to the extent that the data permit.

The typology should be based primarily on purely descriptive or formal attributes including metrics as well as methods of manufacture and, secondarily, where possible, on evidence of function. A survey of the literature indicates that often two or more descriptive or functional terms are used by different authors in naming what are probably the same "types" of artifacts while other "types" of tools are not recognized or at least used by every worker. For example, a plethora of scrapers or artifacts included in the scraper category has been described including various end and side scrapers, gravers, ovate scrapers, exhausted core scrapers, random flake scrapers, spokeshaves, specialized scrapers, angle gravers, small crescentric end scrapers, and semi-circular side scrapers to name only a few. In addition to the fact that some of these "types" appear to be redundant or overlapping, many are so vaguely defined as to make it impossible for others to make the same typological distinctions. This is also true with other artifact classes as well, and in some instances the typological distinction between lanceolate projectile points and knives, between unifacial or bifacial blades and marginally retouched flake knives or scrapers, and between blades and choppers is not too clear. In addition, I believe a greater effort should be made to identify flake blanks, preforms, and partially completed tools broken in the process of manufacture. These artifacts are not often reported, and it might be questioned whether they are being either overlooked (in the case of the flake blanks) or misidentified as completed tools which were broken through use. Until such time as there is some uniformity in the description and typological classification of artifacts, inter-site comparisons will be difficult if not actually impossible without each worker re-analyzing every collection himself.

Methods of tool manufacture may, of course, be very useful in formulating a typological classification of artifacts and, in this way, could, like the types they help define, be found to have geographic and/or temporal significance. However, some general techniques not associated with particular types of artifacts could also have some value in this regard. One question which is raised by the two collections described in this paper is the extent to which bifacially flaked preforms were used in the Shield Archaic complex as a whole in the initial stage of tool manufacture as compared to flake blanks, whether naturally available or intentionally made. Was this entirely guided by expediency and the nature and supply of raw material or might this have some geographic and/or temporal significance? Somewhat related to this is the question of the extent to which the distribution of striking angles and platform types in the flake debitage can be regarded as an indication of (1) core type (such as bifacial preform or flake blank) and (2) the stage(s) of tool preparation represented at any given site. Does an extensive use of bifacial preforms produce high percentages of flakes with faceted striking platforms and, secondly, are factory sites characterized by higher percentages of flakes with obtuse or nearly obtuse angles as compared with sites where artifacts were simply re-sharpened? Is it possible, in other words, to identify the types of cores used and the particular stages of tool manufacture at a given site on the basis of the debitage alone? At a different level of analysis, are the methods of tool manufacture, and the characteristics of the debitage sufficiently distinctive to allow Shield Archaic assemblages to be differentiated from other archaeological complexes such as Paleo-Indian, Laurentian Archaic, Laurel, Saugeen and Point Peninsula, and various Iroquoian and ancestral Iroquoian manifestations? Continued work on these and other questions concerning stages of tool preparation and manufacturing techniques may contribute toward a definition of the Shield Archaic and to the development of a chronological sequence in the long history of this complex.

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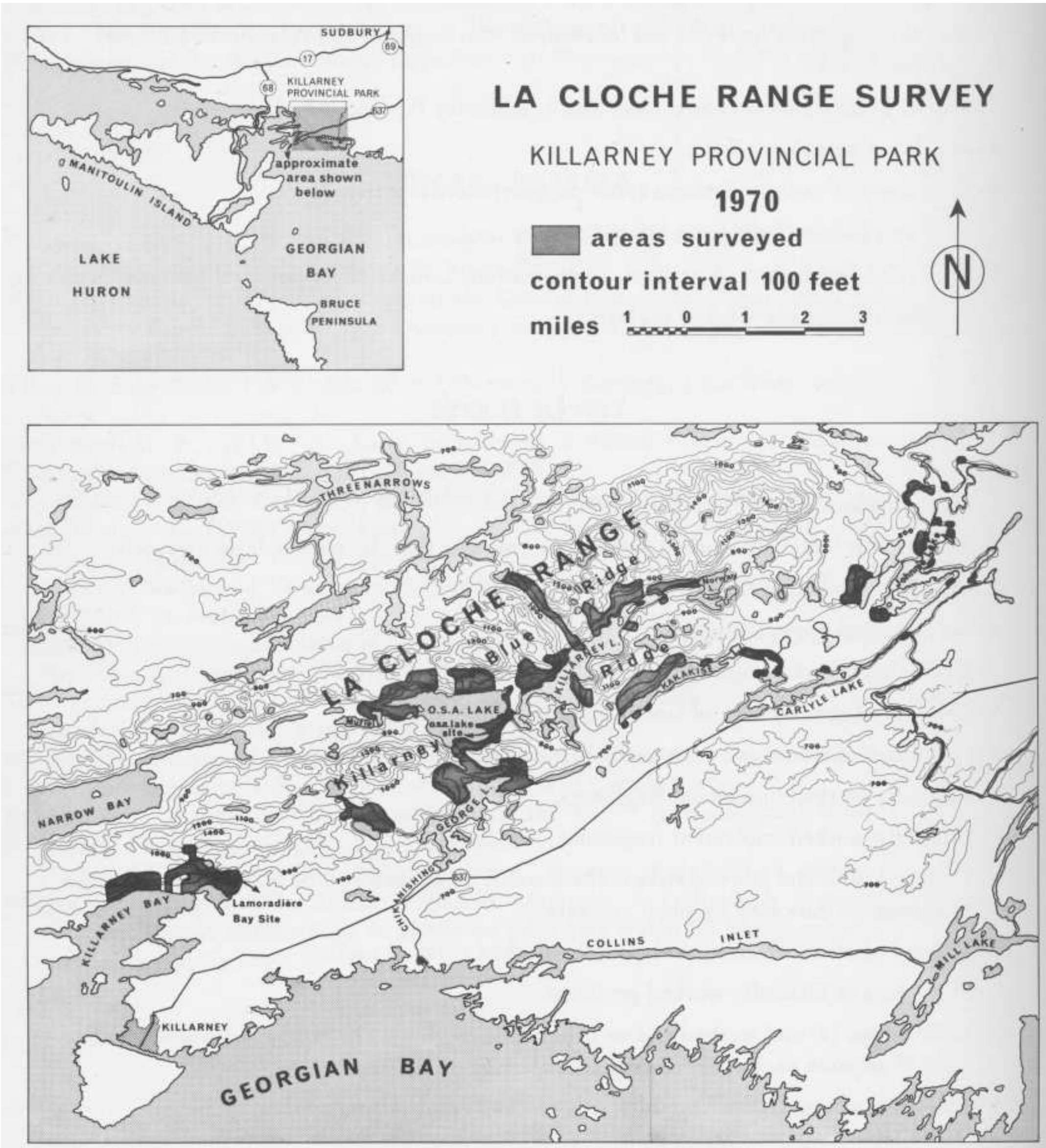


Figure 1

Map showing areas surveyed and location of sites tested in and adjacent to Killarney Provincial Park.

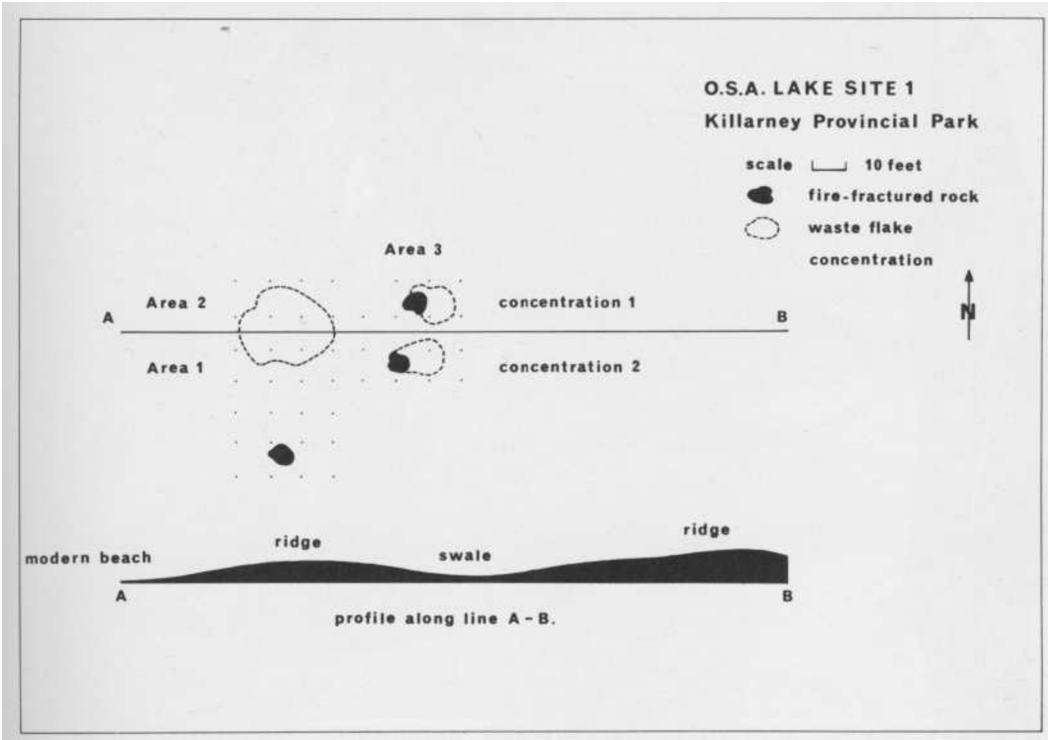


Figure 2

Map of excavations at O.S.A. Lake Site 1,
Killarney Provincial Park.

Plate 1

Flake blank: a - dorsal face, b - ventral face.

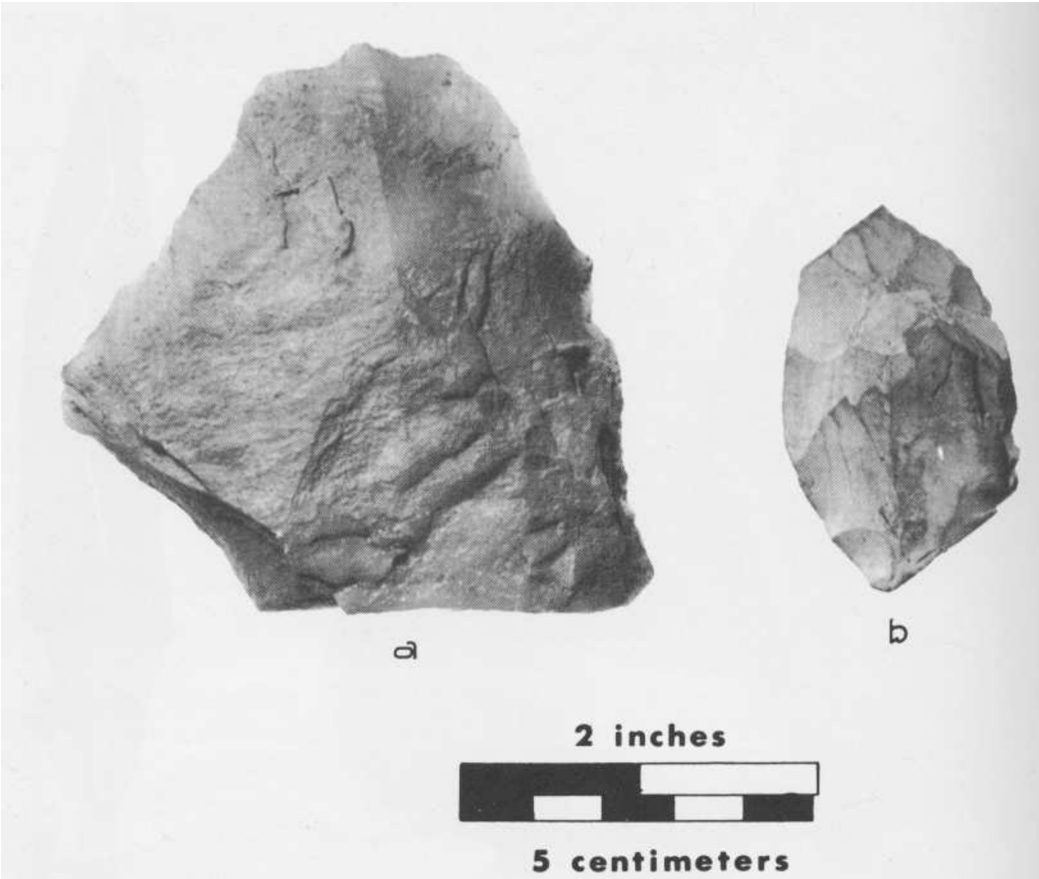


Plate 3

Bifacially-worked preforms.

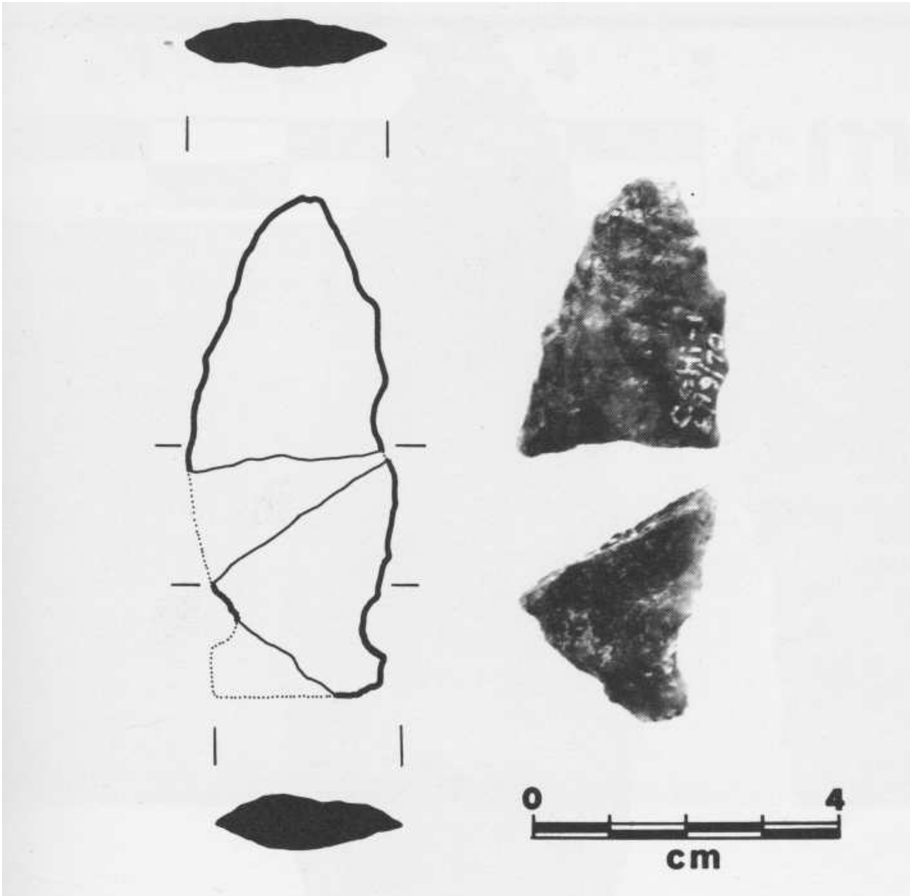


Plate 4

Side-notched projectile point.

Plate 5

Lanceolate bifacial implement.

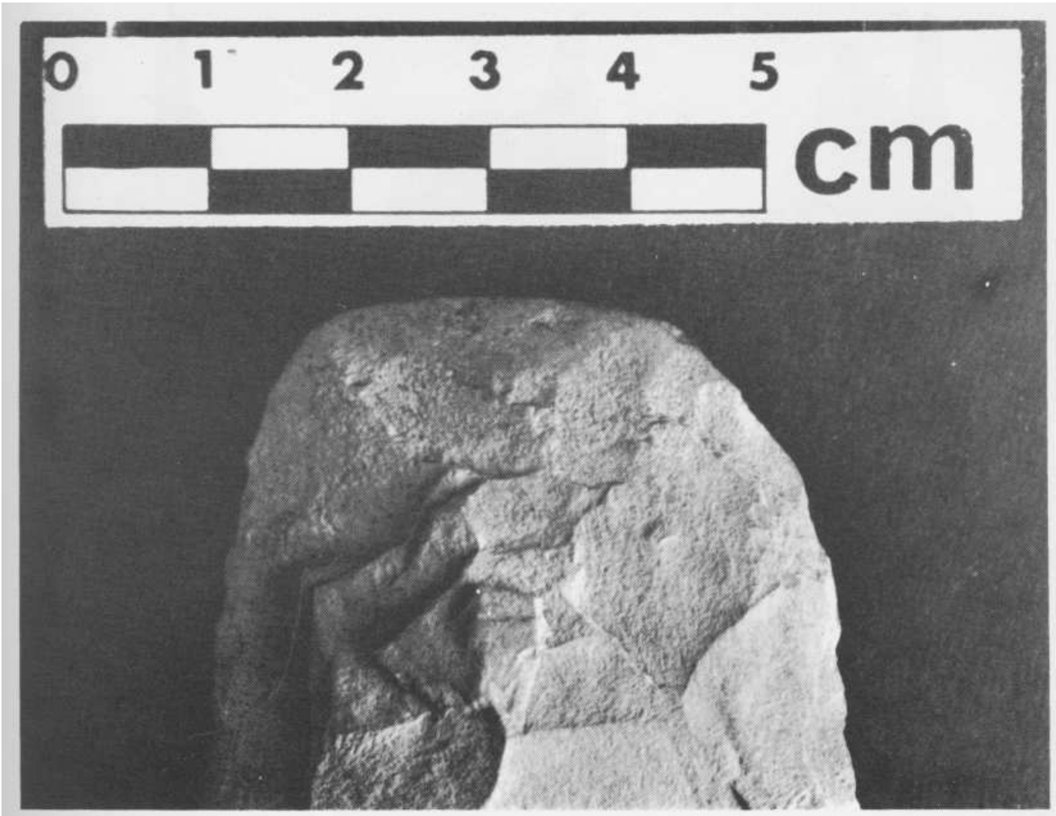


Plate 6

Close-up of ground edge of lanceolate bifacial implement.

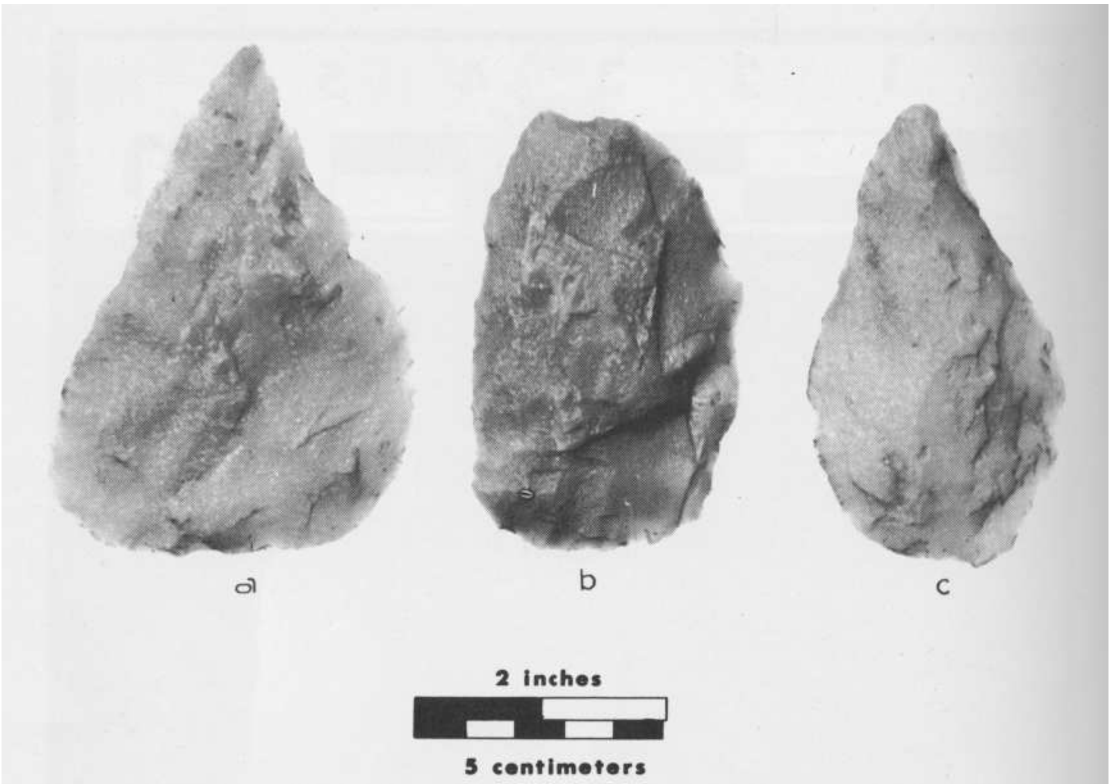


Plate 7
Complete bifaces: a and c - triangular, b - rectangular.

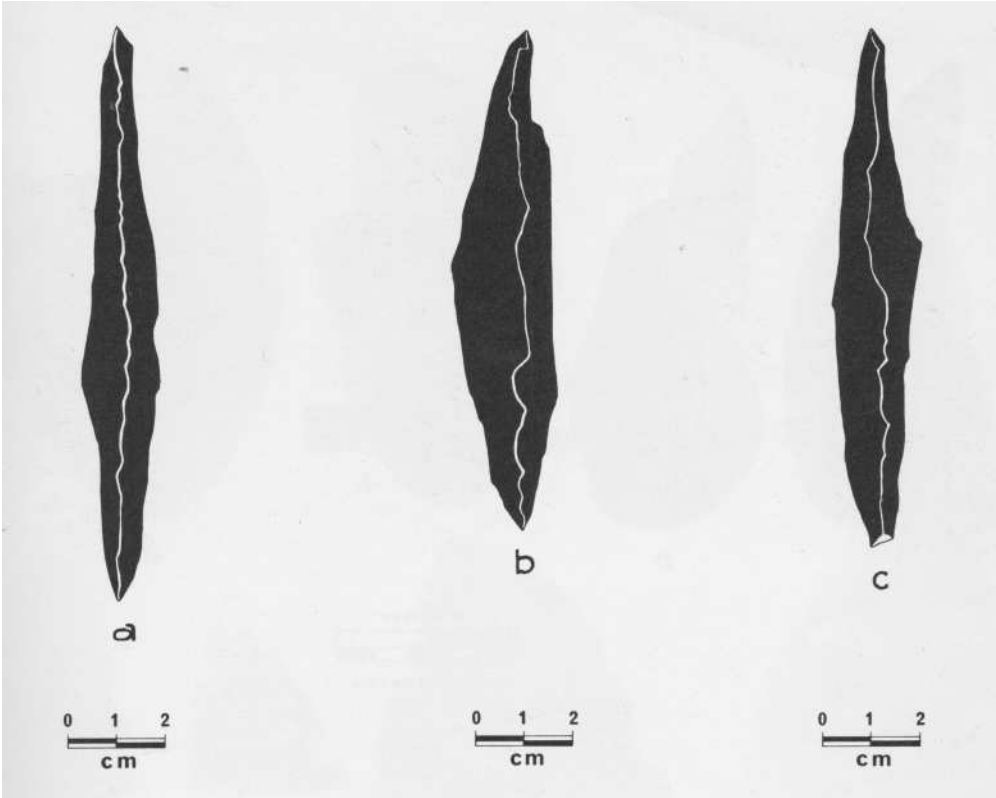


Figure 3

Profiles of complete bifaces.

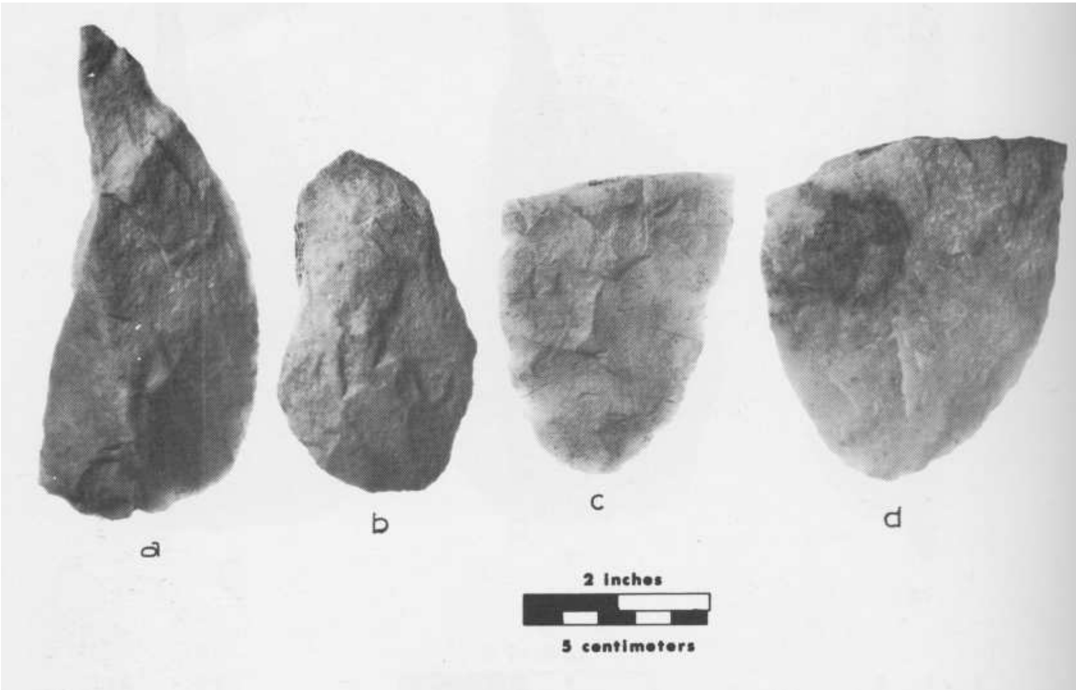


Plate 8

Bifacially-worked implement fragments.

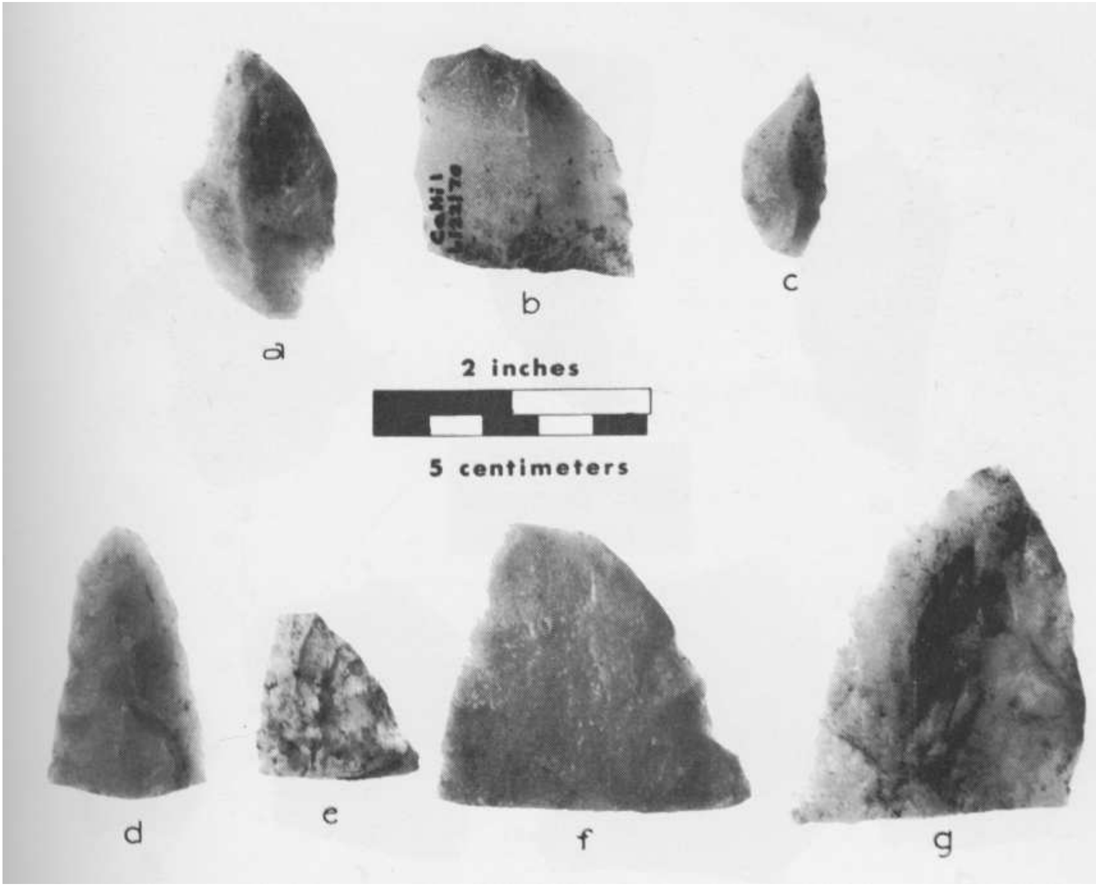


Plate 9

Bifacially-worked implement fragments.

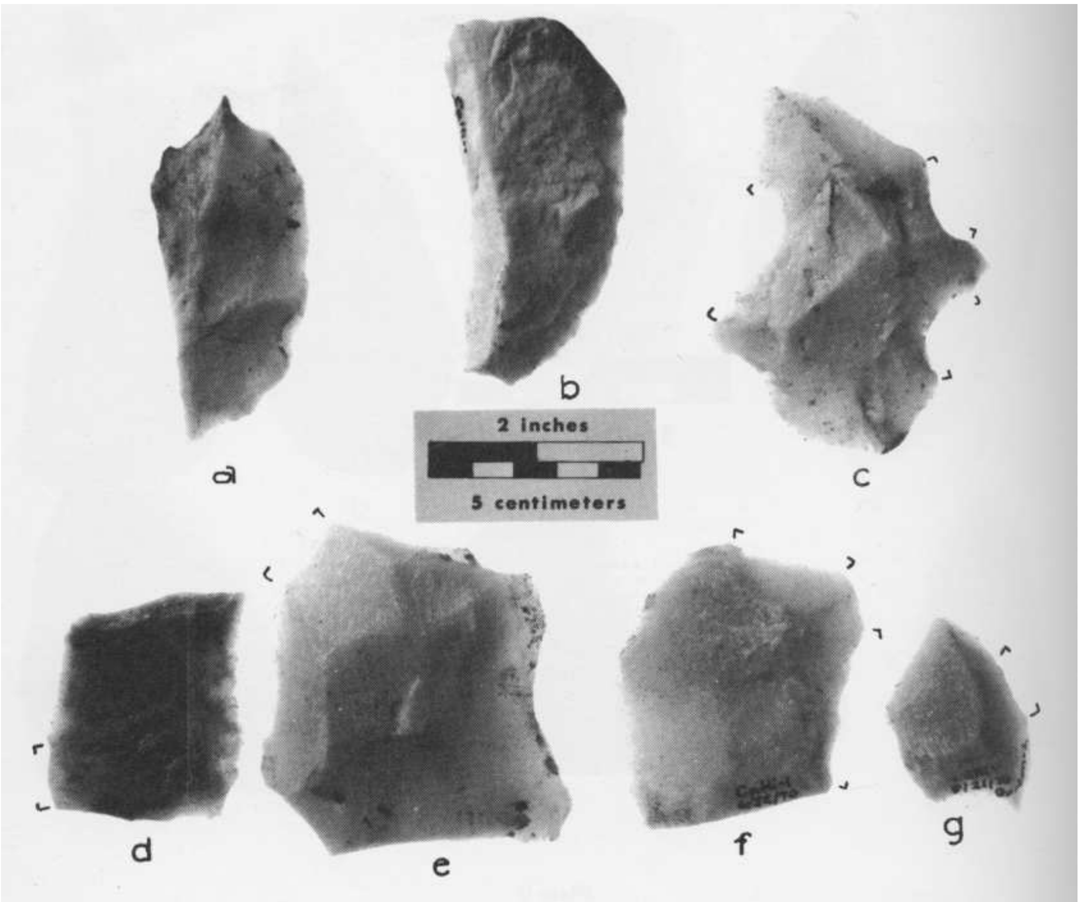
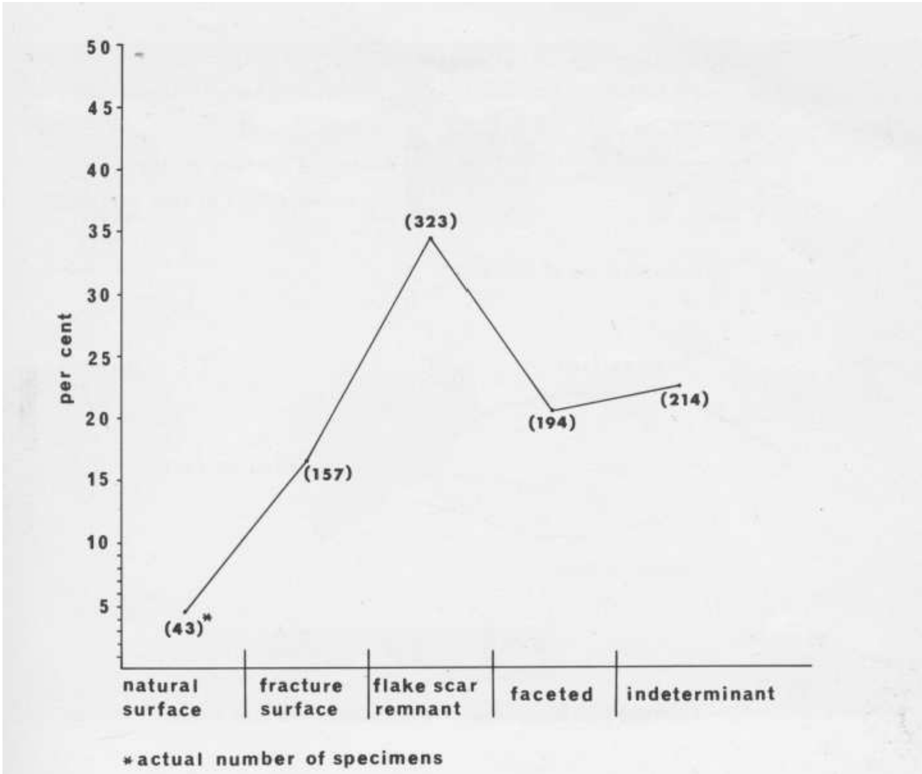


Plate 10

Unifacial tools and worked flakes. The borders of worked and/or utilized areas on each specimen are indicated by small brackets.



NATURE OF PLATFORM

(Sample: 931)

Figure 4

Frequency of various platform types on quartzite waste flakes.

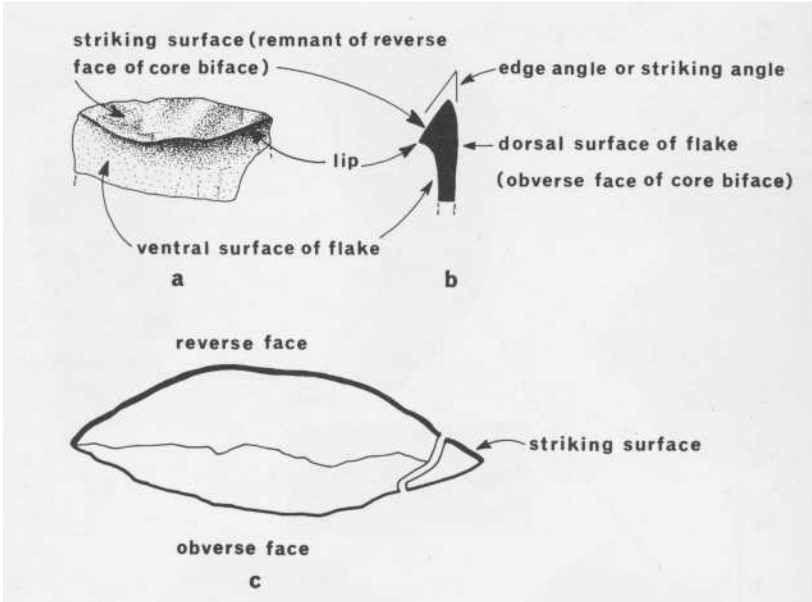


Figure 5

Faceted platform flake from bifacial core or tool.

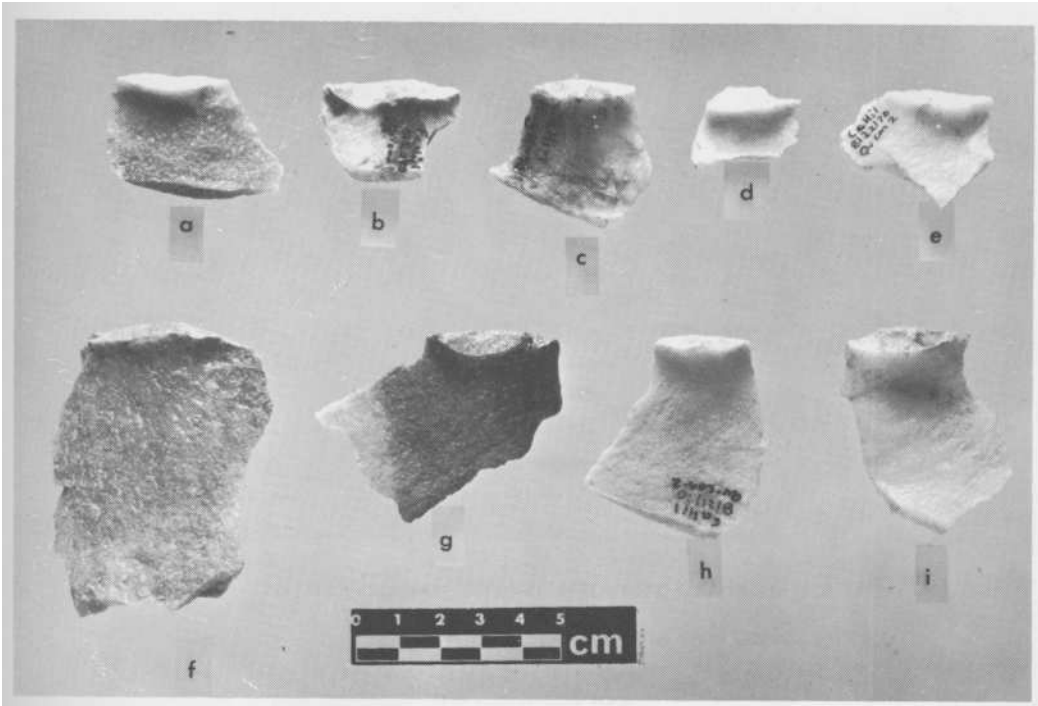


Plate 11

Faceted platform flakes from bifacially-worked cores or tools.

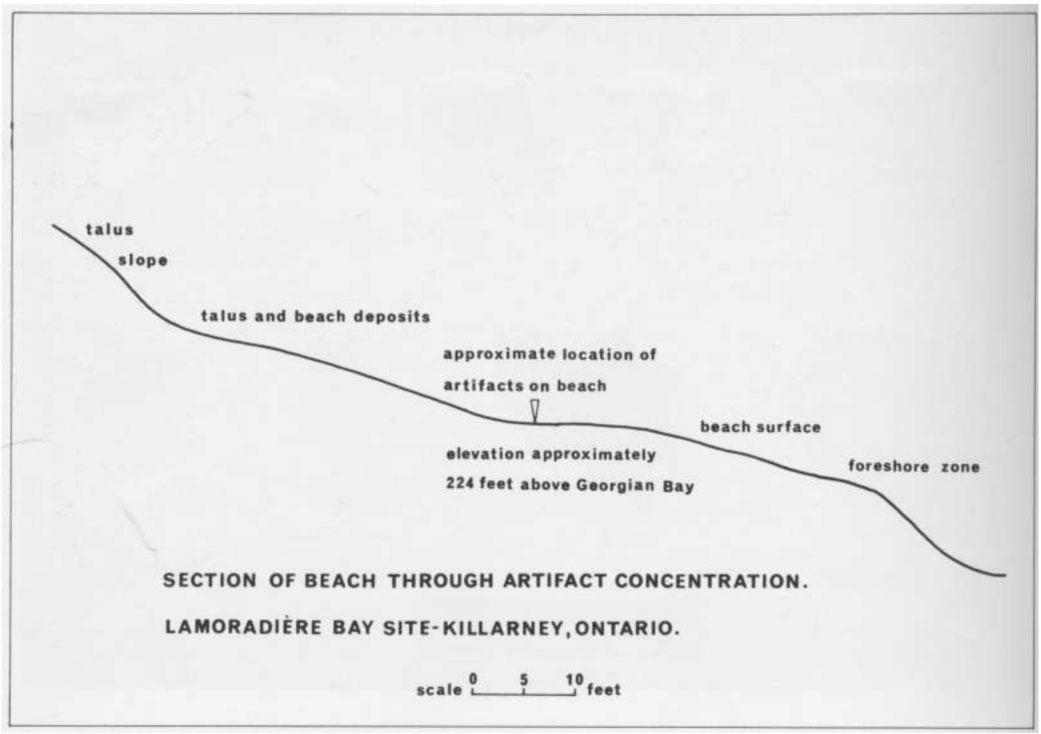


Figure 6

Section of Beach through artifact concentration, Lamorandiere **Bay** site, Killarney, Ontario.

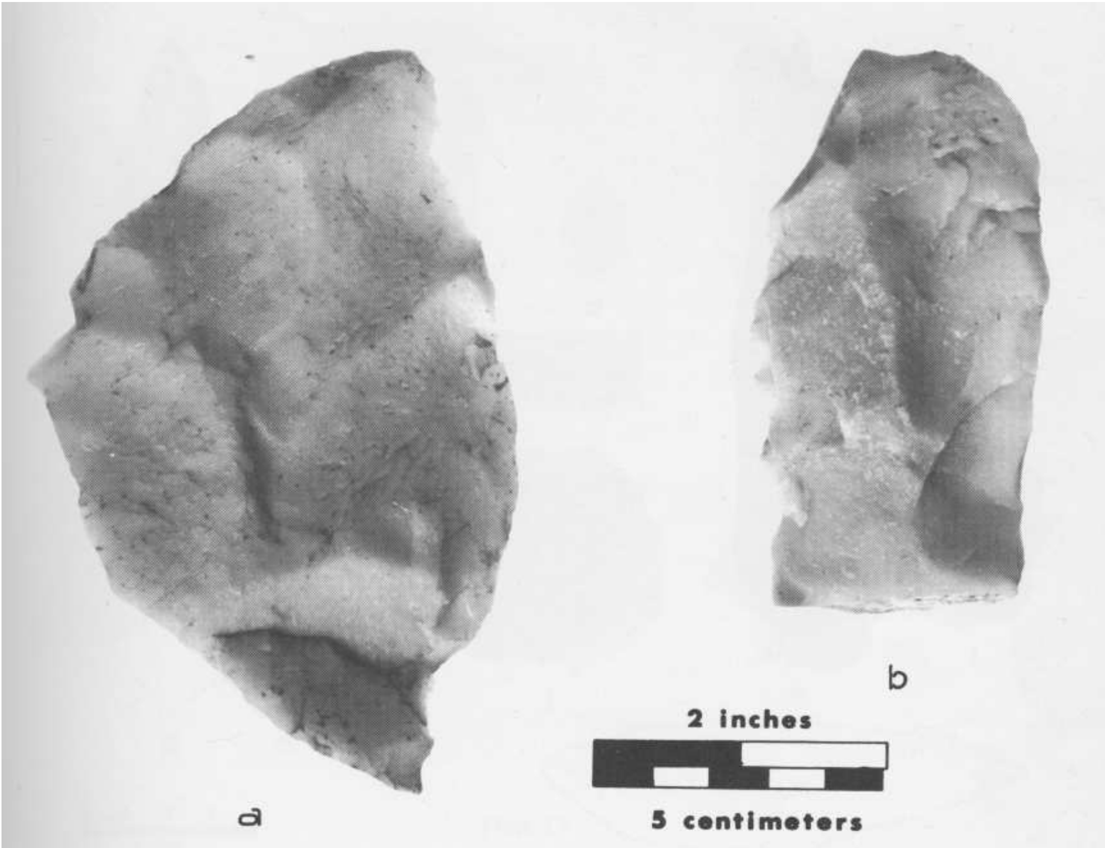


Plate 12

Fragments of bifacially-worked preforms.

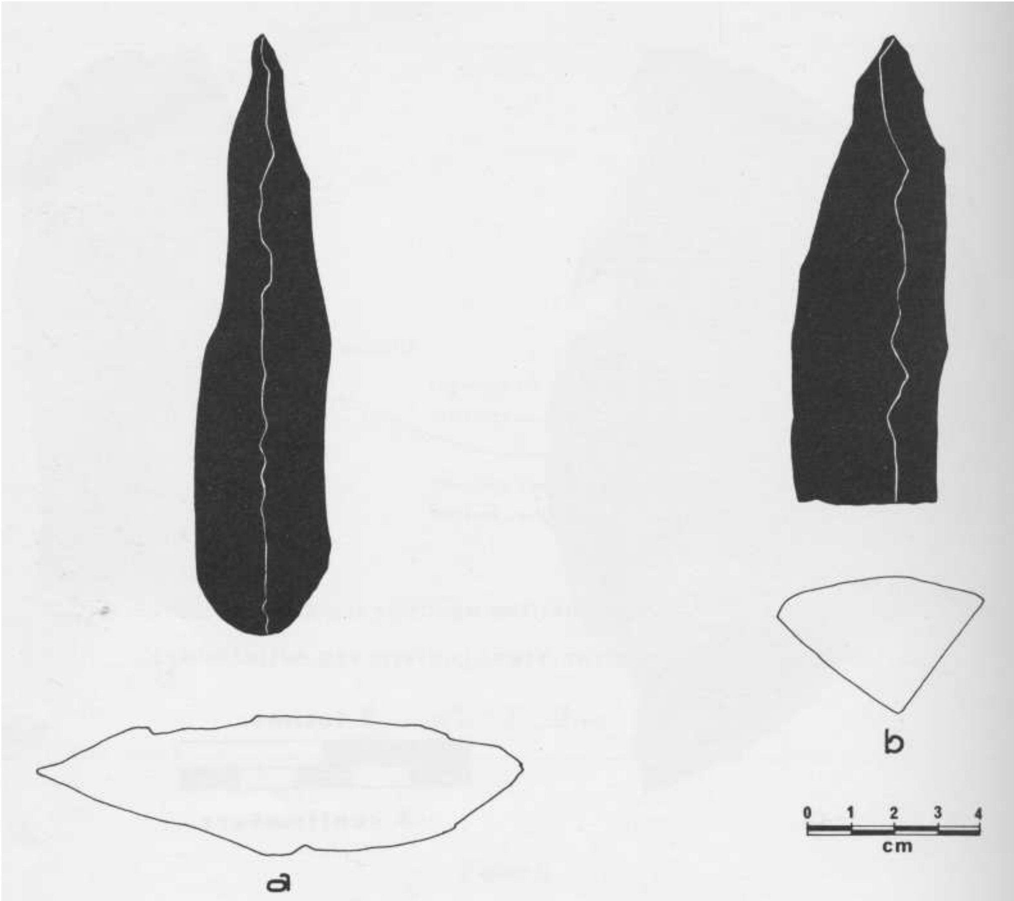


Figure 7

Profiles of bifacially-worked preforms.

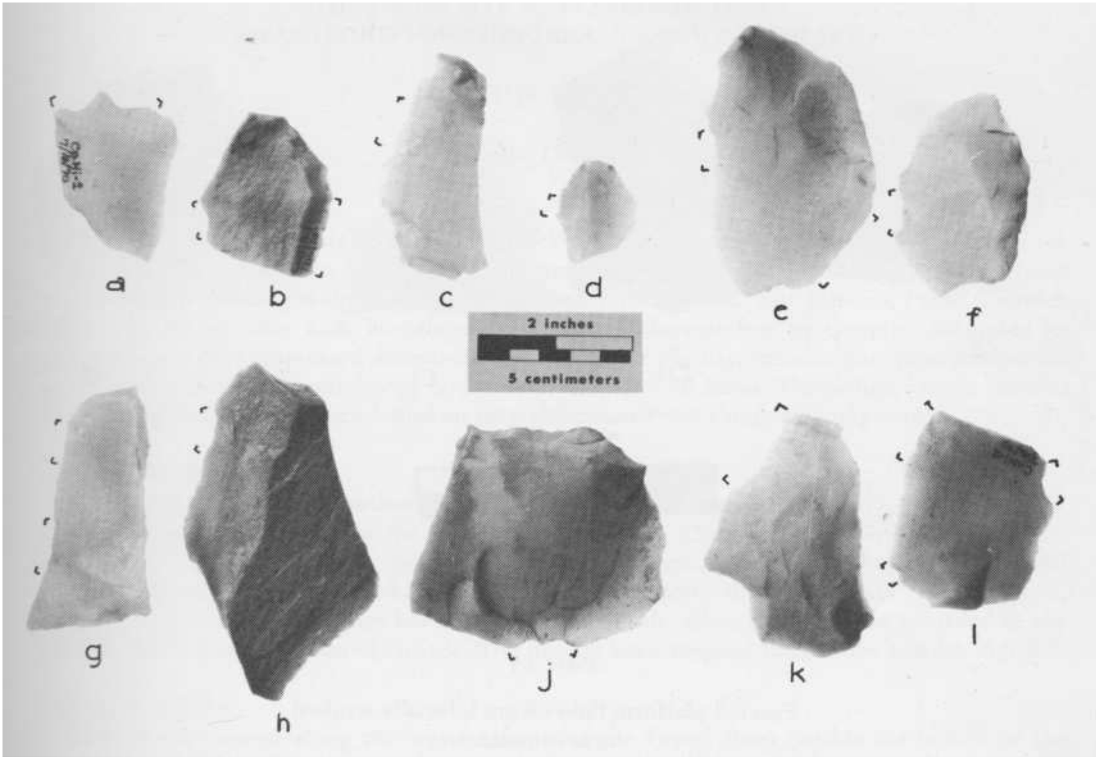


Plate 13

Flake graver (a) and worked and/or utilized flakes (b-1). The borders of worked and/or utilized areas on each specimen are indicated by small brackets.

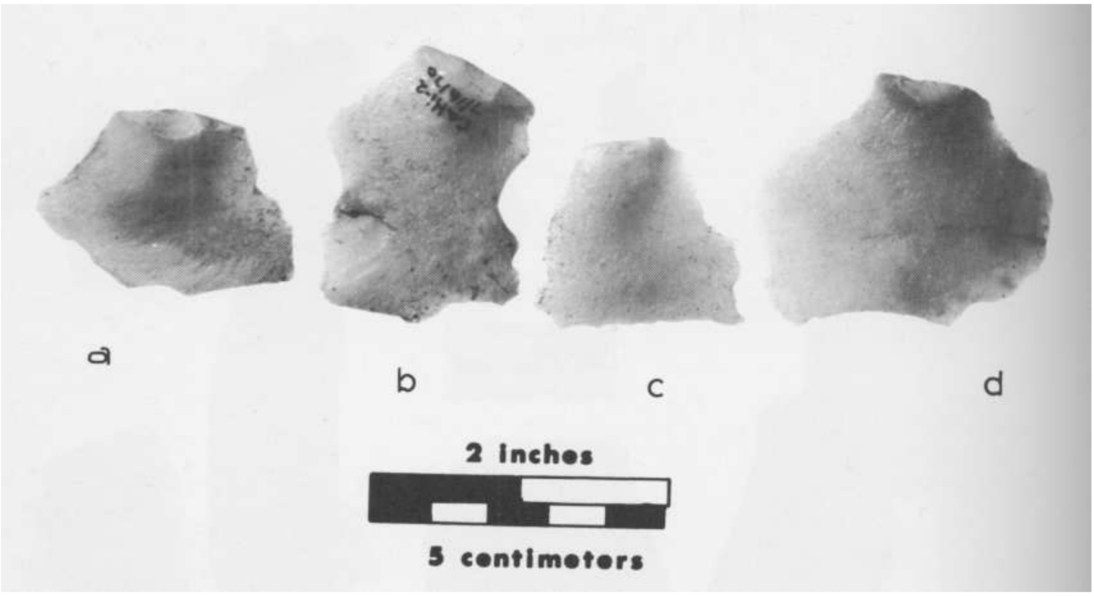


Plate 14

Faceted platform flakes from bifacially-worked cores or tools.