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SITE ON THE NORTH SLOPE, ARCTIC ALASKA.

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THE GALLAGHER FLINT STATION

AN EARLY MAN SITE ON THE NORTH SLOPE, ARCTIC ALASKA

A

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THE GALLAGHER FLINT STATION

AN EARLY MAN SITE ON THE NORTH SLOPE, ARCTIC ALASKA

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PROLOGUE

Tales Related by Sagdluaq, the Colville River Eskimo.

The World's Islands become Mainland and Mankind Hunts the Mammoth.

The world was not always the same as it is now. Nor were the game animals. Our first ancestors hunted big game which exist no longer.

The birds too have changed, for there are memories of their once being heavy and slow fliers. It was in the time when people walked on their hands.

Everything is different now, the world, the game, and the people. Now everything living can be killed with our weapons. So we marvel when we hear of all the tremendous animals which in olden times were dangerous for the hunters; for their size made them invulnerable.

There was once a time when there was no mainland. All land was as it were broken into pieces. The enormous plains now watered by rivers full of fish were not there at all. And people lived on high islands washed by the sea.

Even in very early times men were clever whalers, and many whales were towed in. The pieces of whale meat had to be carried up the mountains, where people had their houses and tents because of the great swells. That is why whale bones are sometimes seen far from the sea and high up.

The first lands to be populated were the high lands at Umiat, Uivfagtait and other small mountains away up the upper course of Colville River; and of course there were people on the high mountains round about Point Hope and in behind Kotzebue Sound.

It was not until Father Raven harpooned a sea animal floating on the surface, an animal without beginning or end, that the great mainland came. The mountains were then connected with the low lands and the world became bigger. For this reason, all low land is new land.

Old shamans also relate that when the mainland was first made it was still bigger than it is now, and it was possible to walk from Cape Prince of Wales over the Diomedes Islands to Nuvung, across Bering Strait to the large settlement at East Cape. All that is left now is the shoals stretching out into the sea from the extreme edge of the lagoons.

The land in Bering Strait connected longest was the two high islands Big and Little Diomede. A low isthmus ran between them, but an earthquake came and parted them. Long afterwards one could see whale ribs at the submerged settlement jutting up out of the sea.

The following story is told about it:

There was once a young man who had caught a baby seal and put it behind him in the cockpit of his kayak, intending to take it home alive. However, the seal was afraid and scratched at his back all the way home to the settlement. There was no icefloe where the kayak man could stop and get out of his boat, and although he hurried all he could, the seal scratched such deep wounds in his back that he died the moment he beached the kayak. His mother, who had thus lost her only son, took revenge by flaying the young seal alive and letting the "naked" animal escape in the sea. But the seal took revenge too. It raised an earthquake so violent that the entire settlement sank into the sea. This was the origin of the two islands, Big and Little Diomede.

All this shows how old the world is, and therefore it is not surprising that there were game animals then such as we no longer know. The most wonderful of them all we call the k i l i v f a k, the mammoth. Its skeleton lies everywhere about the tundra, and we marvel at the immense size of its bones. Its tusks were so enourmous that one man could hardly carry one of them. It was fine ivory, still better than walrus tusk, and we find a mammoth tusk we fashion weapons out of it, or we car drinking horns that are much larger and more beautiful than what can be made out of musk-ox horn. Everything made of mammoth tusk has the protective force of an amulet.

Nowadays we find these big animals only deep down in the ground; and its a strange fact that everything our forefathers told us about them was just that, that they had such enourmous strength that they were always content to walk on top of the ground; they could also disappear down below at places where there were no holes or caves at all.

We have two stories about mammoth hunting.

A Man was once out hunting. He went about looking for game, when suddenly he caught sight of something which was tearing up the earth's surface. It was far into the interior, and yet it looked like a sea animal cleaving the top of the water - it could go through the ground so quickly.

The man gazed and gazed as the lumps of earth moving until the tusks of a mammoth emerged. This was what had cut the crust of the tundra. So he drew his bow and shot an arrow down into the ground a little behind and under the place where the tusks were sticking up. He did no more than that. Then he went home and lay down to sleep. Next morning he set out again, wide awake and fit, and returned to the same place. And there, lying right on top of the ground, was a big, big animal, a mammoth, which had fallen forward on its knees and had died of its wound.

The other tale we remember also deals with a man who was out hunting. He was going down through a gully when he saw a mammoth coming up out of the ground. Right on its heels was a dog chasing it and after the dog came a man who jumped into the mammoth's footprints deep down in the ground, armed only with a knife. It was all so incredible that it seemed like a vision. But just as quickly as they had appeared, so they disappeared again into the ground, the mammoth, the dog and the man following their tracks. They came and went like a landslide and rolling stones on a mountain slope. They did not come up to the surface again.

We who live today think these memories strange. But when we find bones or tusks deep down in the ground, and compare them to the land game we hunt now, we understand that it need not all be untrue, even if it is incredible. For in olden times many things in nature were much, much more enormous than what we are accustomed to see (Ostermann and Holtved, 1952: 151-53).

Told by Sagdluaq.

THE GALLAGHER FLINT STATION

AN EARLY MAN SITE ON THE NORTH SLOPE, ARCTIC ALASKA.

Introduction

The Gallagher Flint Station, an archeological site located in the arctic foothills provience, was named for Charles H. Gallagher, a graduate of the University of Alaska who noticed the first waste flakes which led to its discovery. The discovery occurred in the late spring of 1970 during the archeological survey and salvage executed by the Department of Anthropology, University of Alaska, along the proposed route of the pipeline and accompanying haul road planned by Alyeska Pipeline Service Company (APSC).

The site, situated on a large knoll of glacial drift, is the most prominent feature in the area. This knoll is located near station 1550 along the route of the proposed haul road in segment 6 south. The winter haul road fringes the northern half of the moraine; the surveyed centerline of the proposed road has been relocated by APSC to avoid destruction or damage to the site and now runs two hundred yards further south. As a result of this move, the safety of an extensive, and extremely important site, has been insured.

The knoll, rising approximately seventy-five feet above the surrounding tundra, is roughly two hundred yards in diameter. It commands by far the best view of the area, from the Brooks Range which lies about twenty miles to the south to the Sagavanirktok River valley forty miles to the north and east. The till of which the knoll is composed ranges in size from small gravel to large boulders five feet in diameter. Moss, lichens and rhyzomes comprise the surface vegetation and a few scattered willows grow in surface depressions.

Bands of caribou pass the site during the spring and late summer on their annual migrations across the Brooks Range. Moose are present the year round in sheltered stream valleys where willow thickets border the stream and provide an abundant food source. Occasionally grizzly bears pass through the area but are never present in groups of more than three and are not permanent residents of the immediate vicinity of the site.

Mountain sheep are abundant in the Brooks Range about twenty miles to the south, foxes are common the year round and occasionally wolves pass through the area. Ground, or parka, squirrels are common but scattered in small colonies over an extensive area. Greyling are also present in the small streams, and during late summer, char run the Sagavanirktok River, which is one and a half miles from the site at its closest point. Blueberries ore plentiful in August and a few ducks nest in the numerous kettle lakes nearby.

Three distinct localities have been recognized within the site. The artifacts recovered from Locality I are the products of a unifacial core and blade industry which lacks burins. This artifact assemblage has been radiocarbon dated 10,540 ± 150 B.P. An intrusive bifacial industry referred to as Locality I A, in Locality I has been radiocarbon dated 2,620 ± 175 B.P. Locality II demonstrates a bifacial technology which posesses burins but lacks a core and blade industry. On the basis of radiocarbon dating this Locality is approximately 2,850 years old.

Field Work -- Methods and Accomplishments

A grid consisting of four-foot squares was superimposed on the site and datum was placed directly at the highest point of the knoll in an effort to more clearly depict the radial distribution of the artifacts recovered. Because of the extreme irregularity of the surface of the knoll, laying out an accurate grid presented numerous problems.

In order to eliminate some of the inevitable errors and to compensate for the irregularities of the topographic relief, large twenty-foot squares were laid out and the corners of these used as control points. In other words, any "slop" resulting from the irregularities in the ground surface were taken up in the larger twenty-foot squares. When one of these twenty-foot squares is completely excavated it is conceivable that the last remaining four-foot square might actually measure five by six feet. There is little that can be done to eliminate this error unless expensive and time-consuming methods are used. When such a square is encountered it is merely noted in the field notes and attributed to surface irregularities, and the error is not extended beyond the control points of that particular 20 x 20 square.

The 1970 field crew consisted of three graduate students from the University of Alaska; Mr. David Derry, Mr. Peter Nelson and myself. Miss Jane Rice, an undergraduate student at Brown University, joined the basic three-man crew for a few days. Three other sites in the immediate vicinity of the Gallagher Flint Station were located, two of which were completely excavated and at the remaining one only four one-meter squares were dug.

A total of thirty days were spent at the site during the summer of 1970 and some of this time was necessarily consumed with activities other than actual excavation of the Gallagher Flint Station. Archeological survey of proposed borrow sources for APSC, the excavations at the three small sites in the vicinity of the Gallagher site, and the time necessary in recording the topographic relief of the site greatly limited the amount of time that could be spent in actual excavation. Nevertheless a large sample of the artifacts was procured (roughly three thousand catalog entries).

A four-man crew returned to the site during the 1971 field season and its members were Miss Mim Harris, Miss Kathy Koutsky, Mr. Terrance Stimpson and myself. Support for the field work was provided by the Department of Anthropology, University of Alaska, the Geist Memorial Fund and APSC. An additional twenty-one squares were added to the ten excavated during the previous season. Some survey work was done, but it was felt that the limited time available could most profitably be spent excavating and the additional survey work was not extensive. The crew arrived at the site on July 30, 1971, and remained until September 3, at which time frozen ground and snow forced field operations to a halt. The 1971 survey around the Gallagher site revealed five previously unrecorded sites.

The twenty-one squares excavated during the 1971 season not only greatly increased the number of artifacts recovered from the site but also increased the number of types. Side blades, burins, projectile points and drills were discovered for the first time at the Gallagher site, although none of these tool types were in association with the large core and blade industry which was originally responsible for bringing the site to the attention of the academic community. Of even greater importance was the procurement of charcoal samples of sufficient quantity for establishing the horizontal stratigraphy which was suspected to exist when work was originally begun at the site.

Because of the meager stratigraphy and frost action, time separation of the various artifact assemblages on a vertical plane is extremely limited. This necessitated careful and time-consuming mapping of all tool types including retouched flakes in hopes that if they occured with organics suitable for radiocarbon dating a reliable time range could be established for that particular assemblage. This method has established a horizontal as well as vertical stratigraphy and preliminary evidence seems to indicate that this method is reliable.

The squares were troweled to a depth of a about ten to twelve inches below the surface, for generally beyond this depth cultural materials were no longer found. Screening was not used because it most certainly would have resulted in causing a high frequency of retouch on the artifacts. The great number of small pebbles and larger rocks which occur naturally at the site would not only have clogged the openings in the mesh but have abraded and chipped the artifacts when shaken together in the screen.

All tool types were measured in for each square and waste flakes were bagged collectively by quadrants within squares. Preservation of bone was rare and consequently few problems were encountered in preserving such specimens. Features such as house pits and tent rings were totally lacking, although two hearths were noted. All squares and test pits were backfilled when the excavations were terminated.

Geomorphology

The knoll of glacial drift upon which the site is situated should more properly be termed a kame. "The term kame is restricted by W. Niewiarowski (1963) to forms that occur in association with dead ice; thus he eliminates forms laid down by meltwater around active ice margins. " (Embleton and King, 1968, :386). Flint also notes that kames are ice-contact features rather than proglacial deposits and are formed in contact with glacier ice (Flint, 1957, : 136). Meltwater, carrying glacial debris flowing through the stagnant ice, deposits its load in irregular openings, depressions and crevasses within the ice. When the ice melts these deposits are "dropped" to the ground surface in the form of gravel hills and knolls. On the ground they are a reflection of pockets, hollows and depressions which existed in the former ice. Kettle lakes express the opposite situation in which the areas around large blocks of ice have been filled by ablation debris and after the ice has melted a water-filled depression remains. Kames are also known to occur as deltas and fans which have been deposited against or outward from ice, which later melts leaving a knoll (Flint, 1957, : 150).

Ice-contact features can be distinguished from proglacial deposits by three diagnostic characteristics: "(1) extreme range and abrupt changes in grain size, (2) included bodies of till, (3) deformation" (Flint, 1967, : 148). The kame upon which the site is situated expresses all three characteristics, for well-sorted sands are immediately overlain by large gravel. Cobbles of till as well as large erratic boulders extend throughout the kame, and deformation which occurred when the deposit was "let down" to the ground surface is evident.

Kames have been divided into four separate categories by Embleton and King (1968, : 386) which are: " a) kame hillocks, b) flat hills and kame plateaux, c) kame ridges, d) kame terraces." Type b, or flat hills and kame plateaux, is further defined by the criteria that they "occur singly and their flat uniform summit surface is their most notable character" (:386). Although the kame upon which the Gallagher Flint Station is located is not a text book example of this form, it would fall into this category, for it stands relatively isolated from other ice-contact features in the area and even though its summit is somewhat irregular, its overall appearance is uniform.

The characteristic feature of this particular form of kame, namely the "uniform summit surface", is undoubtedly an important factor in the selection of this particular location by the early inhabitants in the area. The facts that it is large and commands an exellent view, would not in itself account for the frequency of its use and the amount of stone working activity which transpired here. The relatively flat areas of the kame most certainly provided the best working, and most probably, camping areas for the early residents. This is also supported by the fact that the major artifact concentrations are located in these areas.

The fact that the kame is an ice-contact rather than a proglacial feature is significant in estabilishing a maximum possible date for the human occupation which occurred following deglaciation. Because this particular ice-contact feature was formed within the margin of glaciation, man would not have been able to utilize such a location until deglaciation of the area in question was fairly well complete. If kames represented proglacial features it is quite possible that occupation could have occurred before the processes of ice wastage were complete. Consequently the assumption that the site was not occupied before deglaciation of the area was virtually complete, is well founded.

A blanket of moderate brown loess generally ranging in depth from eight to twelve inches covers the site. This eolian deposit most probably was formed during the final stages of ice wastage of the advance into this area before the vegetation had re-established itself. Cobbles of till are scattered throughout this zone. Frost churning has also resulted in some disturbance of the artifacts recovered from this deposit, for they are found to occur in every imaginable orientation to the ground surface.

It has been established that the kame upon which the site is located is an ice-contact feature located within the margins of the glacial advance which once covered this area. It can be safely assumed that man could not have inhabited the site until the processes of mass wastage were fairly well complete. In order to establish an accurate date for the deglaciation of the area particular advance to which the deposits are attributable must be recognized and then a date for the retreat of that particular advance must be established.

Original geological work carried out in the Sagavanirktok-Anaktuvuk region by R.L. Detterman revealed that the area had been glaciated on at least four separate occasions. The first and most extensive glacial advance was the Anaktuvuk which was believed to have extended forty miles north of the Brooks Range, ten miles further than the later Sagavanirktok. Both these advances were estimated to be of pre-Wisconsin age. The Sagavanirktok was followed by the Itkillik which was initially considered to be early Wisconsin, reaching maximum extent twenty miles north of the Range. A subsequent advance was called the Echooka and this advance consisted of nothing more than independent valley glaciers that did not coalesce; nor did they reach the front of the Range. Recent glaciations were recognized but unnamed (Detterman, 1953).

A more detailed and accurate study followed Detterman's original work, and in addition to the four originally recognized glaciations two more were added, the Fan Mountain and the Alapah Mountain. They were considered to be of Recent age and late-Wisconsin, respectively. The Itkillik and Achooka were provisionally described as no older than early-Wisconsin and the Sagavanirktok and Anaktuvuk as pre-Wisconsin. The ages for the sequences were based on the physical characteristics and distribution of the deposits and were not dated by radiocarbon analysis (Detterman, and others, 1958).

In this work the maximum extent of the Itkillik advance is mapped for the upper Sagavanirktok River drainage. A copy of this illustration has been included and the location of the Gallagher Flint Station added to it. As the map indicates, the archeological site is located within the outer margins of this advance (see Figure I).

A later and far more detailed study which mainly focused on the area of Anaktuvuk Pass also confirms the maximum extent of the Itkillik advance in this area (Porter, 1966, : 32), but the Itkillik is viewed as a late Wisconsin rather than an early Wisconsin event and this is well supported by radiometric dating. Four conseautive substages of the Itkillik were

GLACIATION ON THE ARCTIC SLOPE OF THE BROOKS RANGE

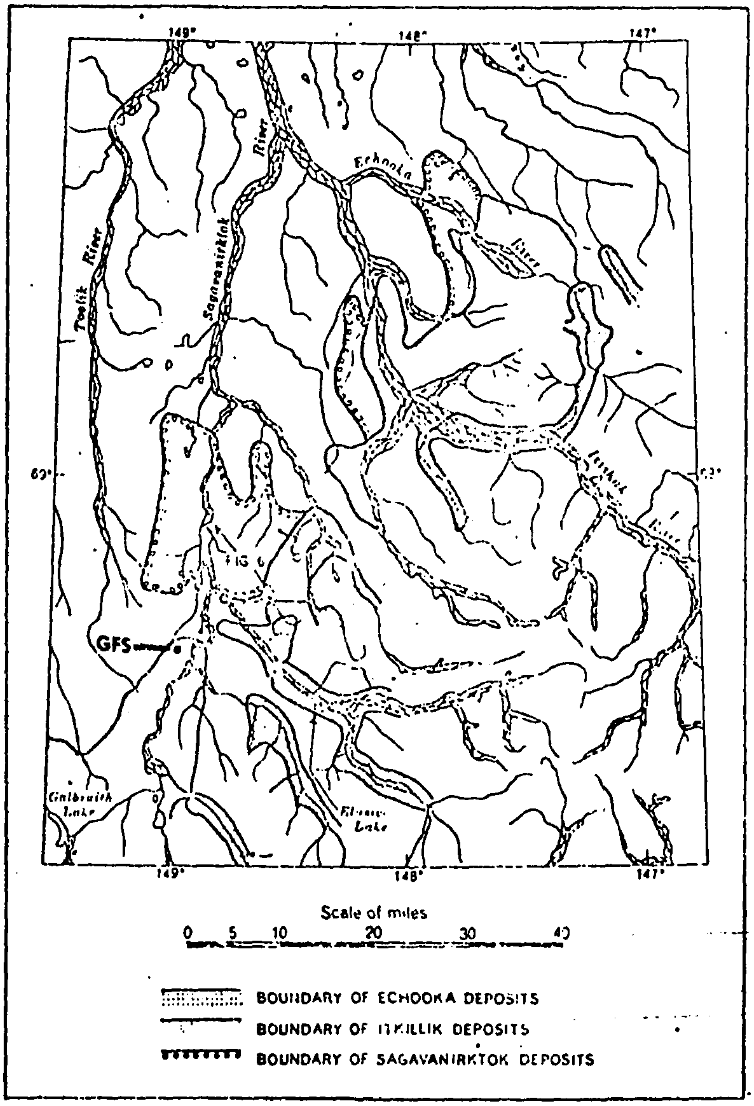


Figure 1. From Detterman, 1958.

recognized in the area of Anaktuvuk Pass: the Banded Mountain, the Anayaknaurak, the Antler Valley, and finally the Anivik lake. Following the Anivik Lake substage the Itkillik retreat continued into a warm period, which has been correlated by Porter to the Hypsithermal.

Hamilton's studies in the Lower Alatna confirms Porter's view that the Itkillik sequence is of late Wisconsin age. "A late Wisconsin age for the Itkillik Glaciation is supported by limiting dates of about 6700 to 9000 years on three postglacial samples; the 31,000-year-old wood fragments from Iniakuk Lake may provide a valid limiting date for influx of Itkillik ice into the Lower Alatna Valley". (Hamilton, 1970 :218). Four substages of the Itkillik in the Lower Alatna Valley were also recognized:- the Siruk Creek, Chebanika, Helpmejack and Range Front. These have been correlated with those recognized by Porter at Anaktuvuk Pass; the Siruk Creek with Banked Mountain, the Chebanika with the Anayaknaurak, Helpmejack with Antler Valley and Range Front to the Anivik Lake substage (Hamilton, 1970).

> Radiocarbon samples collected from late-glacial sediments associated with the Anivik Lake advance provide a minimum age of 7,241 ± 95 years for the advance at Anaktuvuk Pass. This is in close agreement with ages from a radiocarbon-dated pollen profile from Umiat that has been correlated with the Anivik Lake (Ecooka) advance (Livingstone, 1955,1957). The combined dates strongly suggest that the advance took place between 8,000 and 9,000 years ago. This would make it a very late Wisconsin event and suggests possible correlation with the Cochrane readvance of the central North American glacial sequence.
>
> A close limiting age for the Anayaknaurak readvance is provided by a radiocarbon date of 13,270 ± 160 years on organic matter beneath till. The date suggests that this event can be correlated with the Port Huron readvance of the Laurentide ice sheet in the Great Lakes region of central North America.
>
> The radiocarbon dates indicate that the Itkillik sequence in the Anaktuvuk Valley probably is broadly equivalent with the classical (late) Wisconsin sequence of the Great Lakes region and with the Naptaowne glaciation of the Cook Inlet region in southern Alaska, both of which have been rather closely dated by radiocarbon. The Alapah Mountain and Fan Mountain glaciations are post-Wisconsin events that fall within post-Hypsithermal time (Porter, 1964a, : 458-9).

It has been well established that the Itkillik glaciation of the Brooks Range is equivalent to the Late Wisconsin of the continental United States. This would also correlate it with the Sartan of Siberia (Kind, 1967 : 187). Upon inspection of high level aerial photographs it is apparent that the kame upon which the archeological site is located was formed during one of the three oldest stades of the Itkillik. This probably correlates with the maximum of the Sartan in Siberia. Final ice wastage and stabilization of the kame surface probably occured sometime between 16,000 and about 12,000 years B.P. (Hamilton, verbal communication, 1971).

Glacial events of the Late Wisconsin not only provide a limiting date for man's occupation of the Gallagher Flint Station, but also sculptured and formed the surrounding terrain in such a manner as to make the area well suited for use by early man. The glaciers quarried sources of workable stone and redeposited it in many kames and moraines of the foothills. They created a landscape well suited for pedestrian big-game hunting, providing firm solid footing for a hunter pursuing large herbivores. The numerous kettle lates formed by melting blocks of glacier ice assured a fresh water supply which was readily accessible. Finally, the formation of londforms of significant topographic relief furnished a visual dominance of the surrounding terrain which is essential to land mannam hunters. The Gallagher Flint Station, being the most prominent landform in the area and possessing a large deposit of workable stone, drew early hunters to it because it was an ecological magnet, and consequently witnessed a great deal of human activity which was not enjoyed by surrounding areas during the same periods of human prehistory.

Localities within the site

Three distinct localities have been recognized within the site. Localities I and I A are located in the northwest quadrant of the site and Locality II in the southeatern quadrant. Locality II is approximately one hundred feet from I and I A and is on the opposite slope of the kame. Neither I or I A is visible from II because the top of the hill rises between them.

They have been distinguished on the basis of spatial separation, typological differences, material types, flaking techniques, and radiocarbon dating. Locality I consits of eleven contiguous squares and represents a homogeneous collection of artifacts. There has been some mixing of younger material in the northeast portion of this locality and this superimposed material has been labeled Locality I A. Locality I contains cores, blades, platform flakes, unifacially retouched artifacts, retouched flakes, and waste flakes. Burins and bifacially chipped stone artifacts are lacking as well as any evidence of bone or other perishable material.

I A is characterized by bifacially chipped stone artifacts which have been manufactured from a fine-grained dark grey chert as opposed to the mudstone characteristic of I. The artifact inventory contains bifacial projectile points, a drill and waste flakes.

Locality II consits of ten contiguous squares in the southeastern quadrant of the site and differs greatly from Locality I, although it does bear similarities to I A. Burins and bifacially chipped artifacts are present as well as two hearths, around which the artifacts were distribued. Glassy cherts are common and pressure flaking is a characteristic of most of the specimens. Radiocarbon samples were procured from both hearths.

None of the isolated squares or test pits produced enough data to warrant designation as a separate locality, although several do appear to be of special interest. The text that follows treats each of these localities individually. Features were extremely rare and are discussed following the sections dealing with localities.

Stratigraphy and radiocarbon chronology

Three stratigraphic levels have been recognized at all three localities at the Gallagher Flint Station. Cultural material was recovered from only the upper two levels. These three stratigraphic units have been defined from the surface downwards as follows:

Level 1	(Surface Organic), dark brown-black soil ranging in depth between 1/2 and 3 1/2 inches. This level is sometimes absent in specific areas of the site where wind has inhibited plant growth.
Level 2	(Loess), moderate brown eolian deposit ranging in depth between 8 and 12 inches. No stratigraphic distinctions have been recognized within this unit. Subject to deflation if level I is absent.
Level 3	Culturally steril ice-contact deposits. Maximum depth exceeds 50 feet.

A total of six radiocarbon dates were obtained from the site. Four samples have been dated from Locality II, and one each from Localities I and I A. They are listed below by locality and referenced by stratigraphic position as well as their Smithsonian Institution sample numbers. A half life of 5,586 years, the Libby value, was used.

Locality I	SI-974	Level 2, depth 8-10	10,540 ± 150 BP
Locality IA	SI-975	Level 1 and contact zone levels 1 and 2 depth 2-3.	2,620 ± 175 BP
Locality II	SI-972	Level 1 and contact zone of levels 1 and 2, depth 2 1/2-3 1/2	2,125 ± 70 BP
	SI-972 A		2,920 ± 155 BP
	SI-973		905 ± 35 BP
	SI-973 A		3,280 ± 155 BP
	SI-971		too small

Although the stratigraphy at the site is quite meager, it does appear that generally speaking it is reliable as an indicator of relative age. It should be noted that the oldest date (sample SI-974) was not only the deepest, but the only sample recovered from level 2. The remaining samples, all collected from roughly the same stratigraphic position, yielded dates which were quite close together. Thus there exists a vertical as well as horizontal stratigraphy at the site. It cannot be overemphasized however, that the vertical stratigraphy is only reliable if applied with extreme caution. Deflation in certain areas of the site has obliterated the vertical stratigraphy and the steep slopes of the kame must also be avoided because of the obvious down hill movement of the soil as well as the artifacts. Possibly as much as 16,000 years may be represented by only a foot or so of soil, and only rarely is even this much deposition present. Vertical stratigraphic relationships are only distinguishable over a period of several thousands of years and consequently are unreliable as a tool in separating occupations which may have occured during comparotivately close temporal intervals.

It can be readily noted that a considerable range in dates has been derived from Locality II. All these samples were recovered from Hearth 1, and consequently should be of the same age. Samples SI-972 and SI-973 were not subjected to root removal pretreatment and therefore the dates have been biased toward the present because of contamination by modern roots. In reply to inquiries regarding these samples Robert Stuckenrath of the Radiation Biology Laboratory, Smithsonian Instituion stated, " You're quite correct in ignoring SI-972 and SI-973 as being root loaded; the dates on the two different fractions indicating that any dates not associated with the root removal pretreatment are misleading as well as useless." The remaining four samples were subjected to the acid pretreatment and are thus free of contamination by roots and provide reliable dates.

By discounting the dates derived from samples SI-972 and SI-973 because of their known contamination, the period of occupation of Locality II is consequently represented by samples SI-972 A and SI-973 A.

Both of these samples were merely portions of 972 and 973 which were split before dating. By doubling the errors of 972 A and 973 A the period of occupation of Locality II can be said with reasonable assurance to have occured between 2,970 and 2,765 B.P. (Robert Stuckenrath, 1972: personal communication).

Because separation of the various artifact assemblages was extremely difficult based on vertical stratigraphy alone, it was also necessary to carefully map all artifacts recovered. Thus their horizontal distributions were established and datable materials associated with these various assemblages have provided accurate dates for each occupation. Localities I and I A were easily separated from II on the basis of their spacial relationship alone. These localities are not only over one hundred feet apart but each is not visible from the other because the crest of the kame rises between them. There can be no doubt that Locality II is not associated with either I or I A on the basis of horizontal separation, typological comparison, and radiocarbon dating.

Localities I and I A presented a slightly more difficult problem, for I A is superimposed on the northeastern portion of I. Fortunately the occupations were temporally far enough apart that there was a vertical separation of the two assemblages, although there was some mixing of the artifacts at the contact of levels 1 and 2. Even if there had not been this vertical separation it would have been possible to separate the two components on the basis of the spacial distribution of the artifacts as well as the raw materials from which they were manufactured. Artifacts from Locality I were fashioned by percussion flaking calcareous mudstone while those from I A were produced by pressure flaking grey chert. Artifacts and waste flakes of grey chert occur only in the northeastern portion of Locality I and do not overlap the entire distribution of I (Figure 6).

All artifacts recovered from I A were found in level 1 and the contact zone of levels 1 and 2. None were recovered from level 2. Lying in direct association with sample SI-975 were two bifacial points fragments and a drill, all of grey chert. Thus locality I A represents a reoccupation of Locality I approximately 2,600 years ago, about 8,000 years after the earlier occupation. This is clearly the case as is shown by both the horizontal and vertical stratigraphy, typological comparison, and radiocarbon chronology.

Sample SI-974 was recovered in direct association with the large core and blade material which characterizes Locality I. The sample was pretreated in order to remove any roots which might result in contaminating the sample. It was collected well within level 2 of square N 12/W 60, the area of greatest concentration of Locality I artifacts, which did not contain any overlap of Locality I A. In short there can be no reason to doubt that this sample accurately dates the occupation of Locality I.

Based on geomorphological interpretation of the North Slope in general and specifically the area of the upper Saganavanirktok River, the site could not have been occupied prior to 16,000 B.P. Stratigraphic evidence coupled with radiometric dating shows that level 1 has been occupied within the last three thousand years. Level 2 was occupied about 10,500 B.P. Because the vertical stratigraphy is so meager it has been necessary to rely heavily on horizontal stratigraphy. (i.e. typological continuity of the artifact assemblages within spacial units which were then dated by radiocarbon).

Locality I

Waste flakes

A total of 5,160 waste flakes were recovered from Locality I. They represent the lithic debitage resulting from the manufacture of stone tools and core preparation. Their morphology is generally irregular in appearance and they possess little functional importance. They have been separated from retouched flakes because they lack any visible sign of use or secondary flaking on their margins.

It is an assumption of this section of the report that the waste flakes have not been transported from their original point of deposition by man, although natural agents such as frost action have undoubtedly resulted in some movement. Other artifact types such as projectile points, bifaces, blades and even retouched flakes were in all probability not left at the original location of their manufacture and were transported because of a definite intent to use such pieces elsewhere. In other words, the waste flakes provide an excellent in situ record of activity at the site and because they are found in large numbers spatial change in their frequency and weight may prove as valuable as standard typological methods used in handling functional artifact types.

A chronic problem in Arctic archeology has been in providing a temporal framework for flint stations, which are characteristically unstratified and, in general, possess little or no soil deposition since habitation of the site. If the site in question is of a multicomponent nature, then problems relating not only to its temporal but spatial character become extremely complex and have often resulted in "writing off" many sites which could possibly have yielded valuable information had the problem been well thought out. It is the numerical frequency, spatial distribution and in situ character that make waste flakes an extremely valuable tool in unraveling this problem.

The flake assemblage was divided into five major categories, or rock types, which were:

1. Coarse-grained black chert.
2. Mudstone.
3. White (or milky) glassy chert.
4. Glassy grey chert.
5. Glassy black chert.

It is true that these are somewhat ambiguous categories and that some specimens were rather borderline as to which type they belonged. In order to definitely determine in which category such a piece should be placed it would require preparing a thin section of that particular specimen. This is out of question, for the time and expense necessary to prepare such a large number of thin sections would be so considerable that it would make such a study impractical and it seems probable that the men making the tools were unaware of such finite differences. The investigator must subjectively decide to which rock type an individual specimen belongs, but generally speaking, most of the flakes were easily recognizable and could be confidently placed in their proper category.

The number of flakes has probably been increased to some degree by frost breakage and breakage resulting from caribou and moose walking on the site. Each rock type was tabulated separately for each individual quadrant. After the count was made the weight was recorded in grams by weighing the total number of flakes attributable to any single rock type for that particular quadrant. This was done so that an average weight for each material type within the quadrant could be determined and the changes of this average flake size could be studied on a spatial and, hopefully, temporal basis. Mean weight was rounded off to the nearest tenth of a gram.

Even though there is a difference in the density of various rock types, it is not sufficient enough to alter the averages, which, when analyzed statistically, show definite relationships to one another, It is also true that this is a somewhat crude mean size for any given quadrant, for specimens on either extreme can drastically alter the mean. Quadrants which express a high frequency probably produce more reliable means than those with only a few specimens.

A table is included which shows the frequences and mean weight for the squares in Locality I, as well as the rock types collectively (Figure 2).

Figure 2.

TABLE OF FLAKE FREQUENCY AND MEAN WEIGHT

Square	Type 1		Type 2		Type 3		Type 4		Type 5		Total	
	No.	x̄ Wt.	No.	x̄ Wt.	No.	x̄ Wt.	No.	x̄ Wt.	No.	x̄ Wt.	No.	x̄ Wt.
N12/W52	2	.5	26	.7	0	0	0	0	0	0	28	.6
N12/W56	2	.4	306	1.4	1	.1	0	0	1	.5	310	.6
N12/W60	29	1.6	1117	1.1	0	0	0	0	5	.3	1151	1.0
N12/W64	2	13	465	1.7	0	0	0	0	5	.4	472	.8
N16/W52	18	.2	71	.1	2	.1	9	1.2	0	0	100	.4
N16/W56	69	.5	1024	.5	4	.6	10	.3	5	.1	1112	.4
N16/W60	13	.4	918	.5	0	0	2	.1	0	0	933	.3
N16/W64	8	.7	757	.5	1	.1	0	0	0	0	766	.4
N20/W52	2	.2	103	.6	0	0	6	2.2	5	.3	115	.8
N20/W56	5	.2	200	.3	3	.1	1	.1	1	.1	210	.2
N20/W60	4	.1	58	.3	0	0	1	.4	0	0	63	.3
OTP	1	1.7	219	.5	0	0	0	0	0	0	220	1.1
TOTAL	155	.6	5264	.7	11	.2	29	.7	21	.3	5480	.6

OTP = Original Test Pit

$\bar{x}$ = Mean of means, rounded to nearest tenth

Figures 3 through 7 illustrate the distribution of waste flakes throughout Locality I. The area disturbed by the original test pit is represented by hatching. The test pit was not deep and therefore left some artifacts within its margins undisturbed. The in situ flakes have been recorded for their respective quadrants in the small boxes within the hatched area. In other words, the maps show a somewhat misleading picture of the amount of disturbance. It should also be noted that for the southeast quadrants of N 12/W 60 and N 12/W 56 that the flakes were lost in transit and consequently there is no count for these quadrants.

The highest frequencies of type one (Coarse-grained black chert) are in the north and southeast quadrants of N 16/W 54, and in the southeast quadrant of N 16/W 60. It may be assumed that these areas represent locations where this particular material type was worked. Because there is a high frequency of this type in both the NE and SE quadrants of N 12/W 56 it might be assumed that this material type may have been worked at near the dividing point between the two quadrants, but when the mean weight is added to the comparison it will be noticed that a sharp difference between the two populations exists. These two distributions may represent two distinct work areas which may very well have been used at different times.

A thin section was prepared from a large waste flake of material type two and it was found to be a calcareous mudstone (fine silt in powder) containing roughly 20% Cryptocrystalline Quartz spherules, 60% Cryptocrystalling quartz, 10% Carbonate, 5% Mica (muscovite) 5% Iron Oxide (Fe_2O_3) (Hematite), along with minor opaques, feldspar, and epidote. Fine bedding planes are also evident and have resulted in comparatively smooth flat natural fractures on both culturally modified and unmodified specimens. This is the only material type for which a thin section was prepared, for all the rest are readily recognizable from hand specimens. It is by far the most common rock type and perhaps a more appropiate name for the site would be the Gallagher "Mudstone" Station.

Because mudstone is most common, it is statistically more reliable. Once again the NE quadrant of N 16/W 56 and neighboring quadrants demonstrate a high frequency of flakes which gradually decreases as

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT (IN GRAMS)

MATERIAL TYPE-(1)

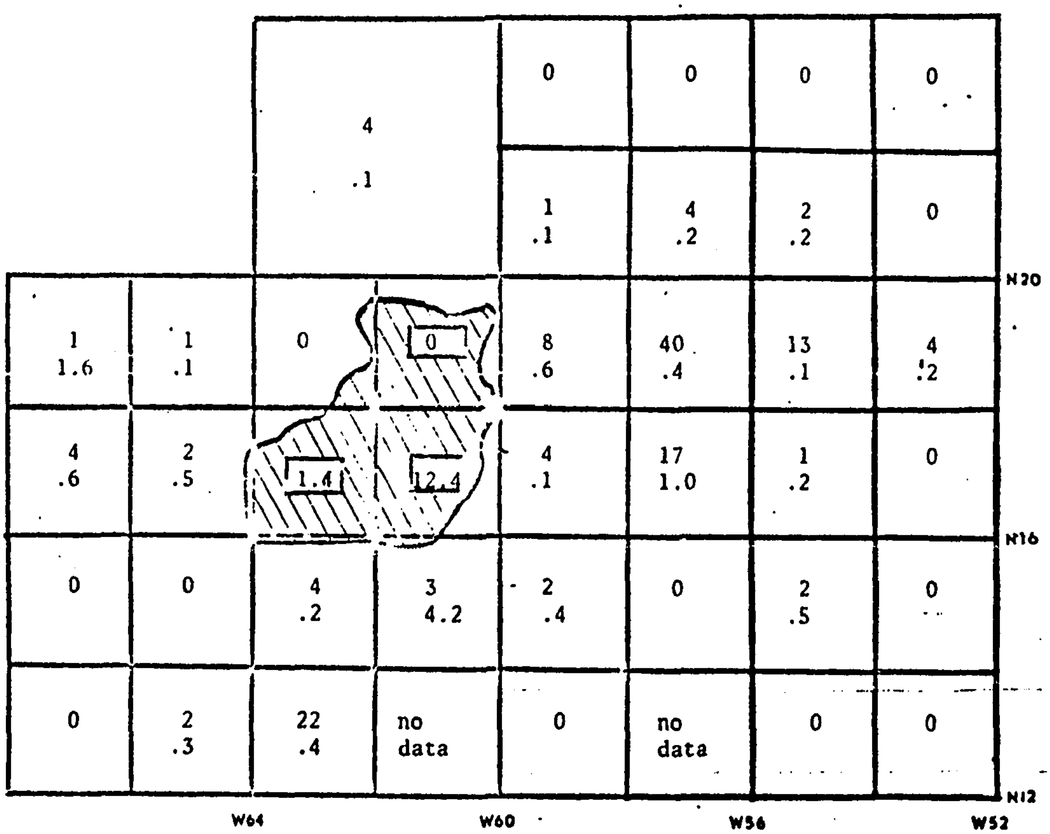
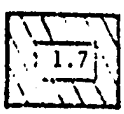


Figure 3.



ORIGINAL TEST PIT

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT
(IN GRAMS)

MATERIAL TYPE – (2)

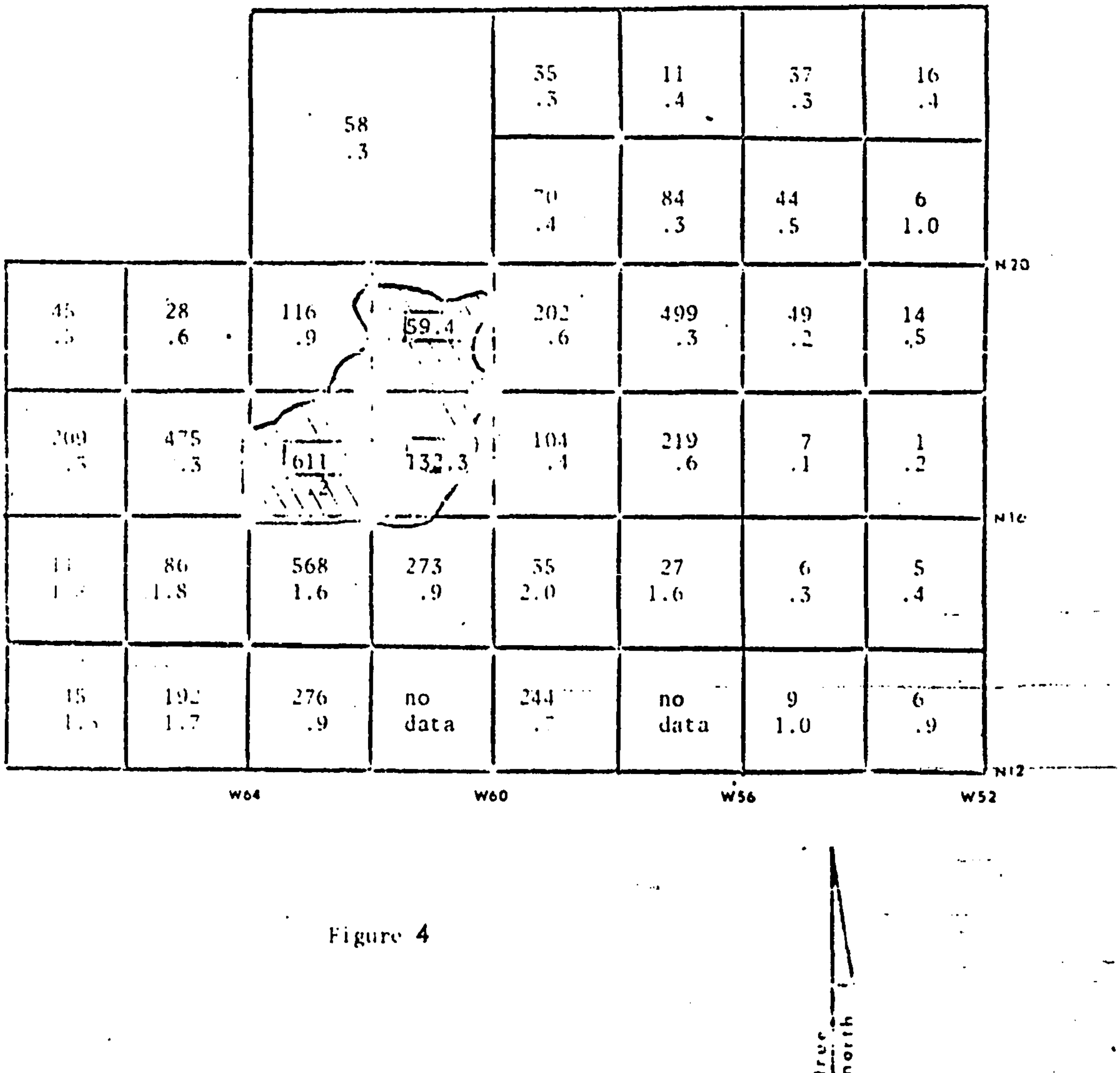


Figure 4

19
.5
TEST PIT

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT (IN GRAMS)

MATERIAL TYPE – (3)

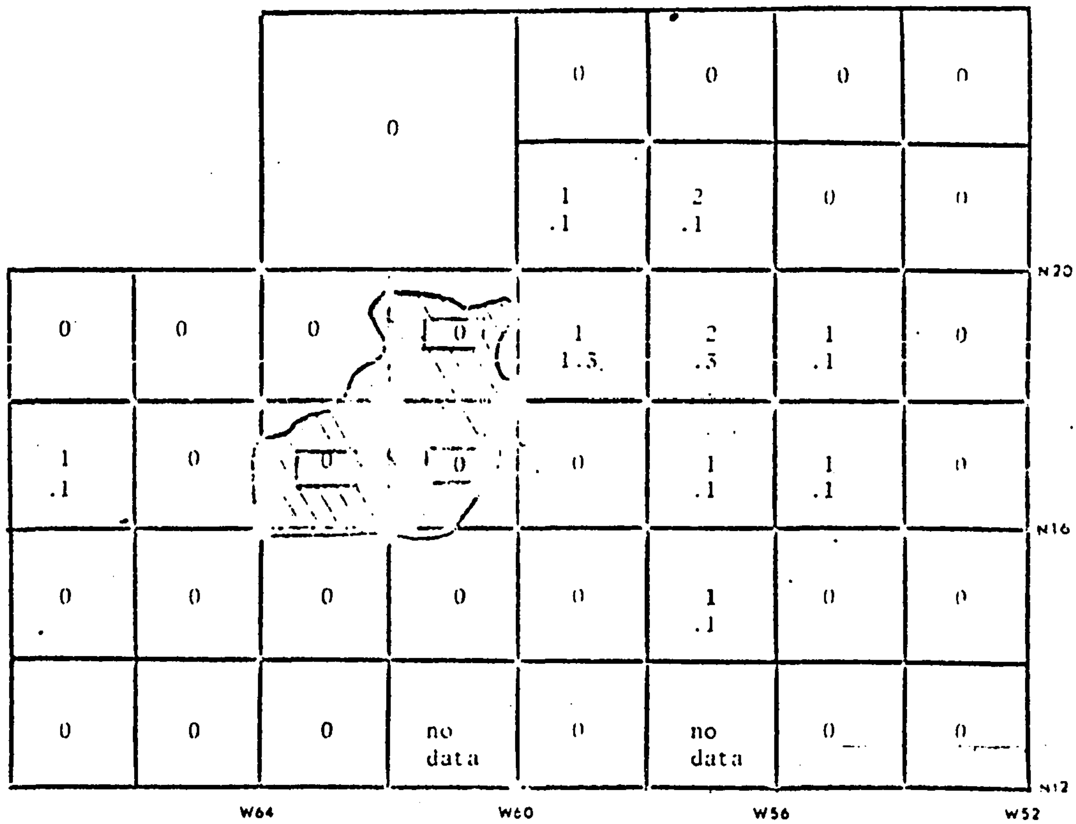


Figure 5

0 ORIGINAL TEST PIT

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT
(IN GRAMS)

MATERIAL TYPE-(4)

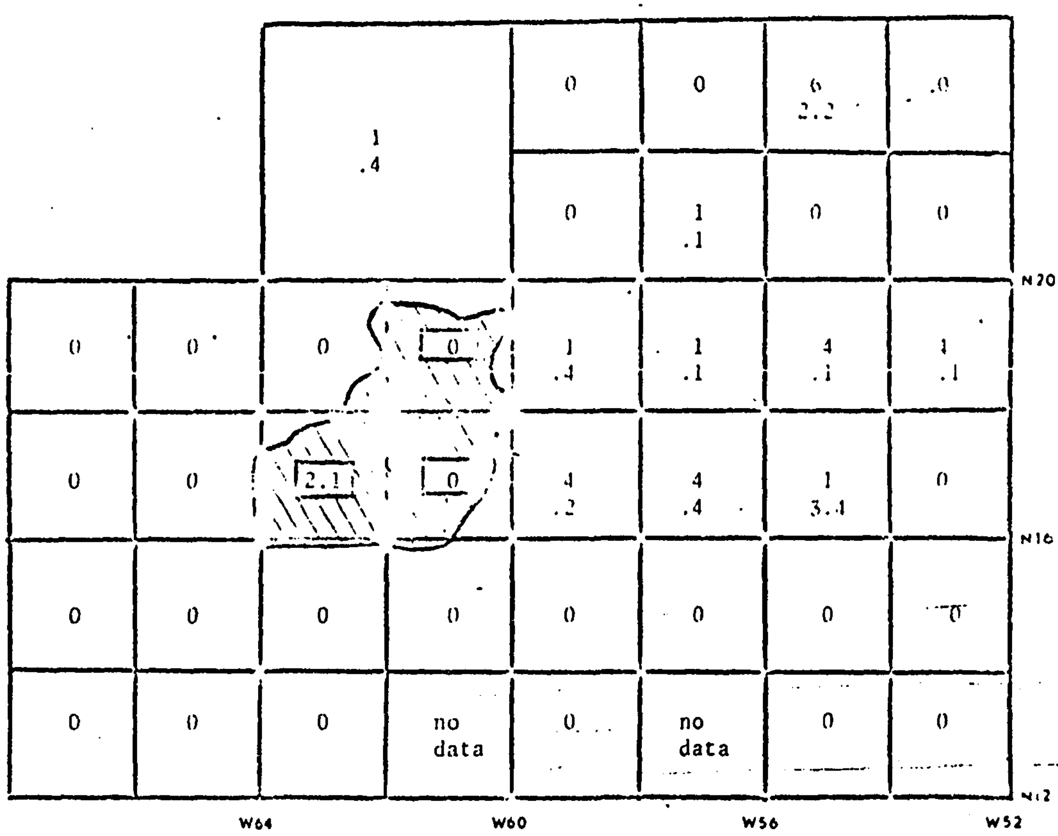


Figure 6

ORIGINAL TEST PIT

true north

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT
(IN GRAMS)

MATERIAL TYPE - (5)

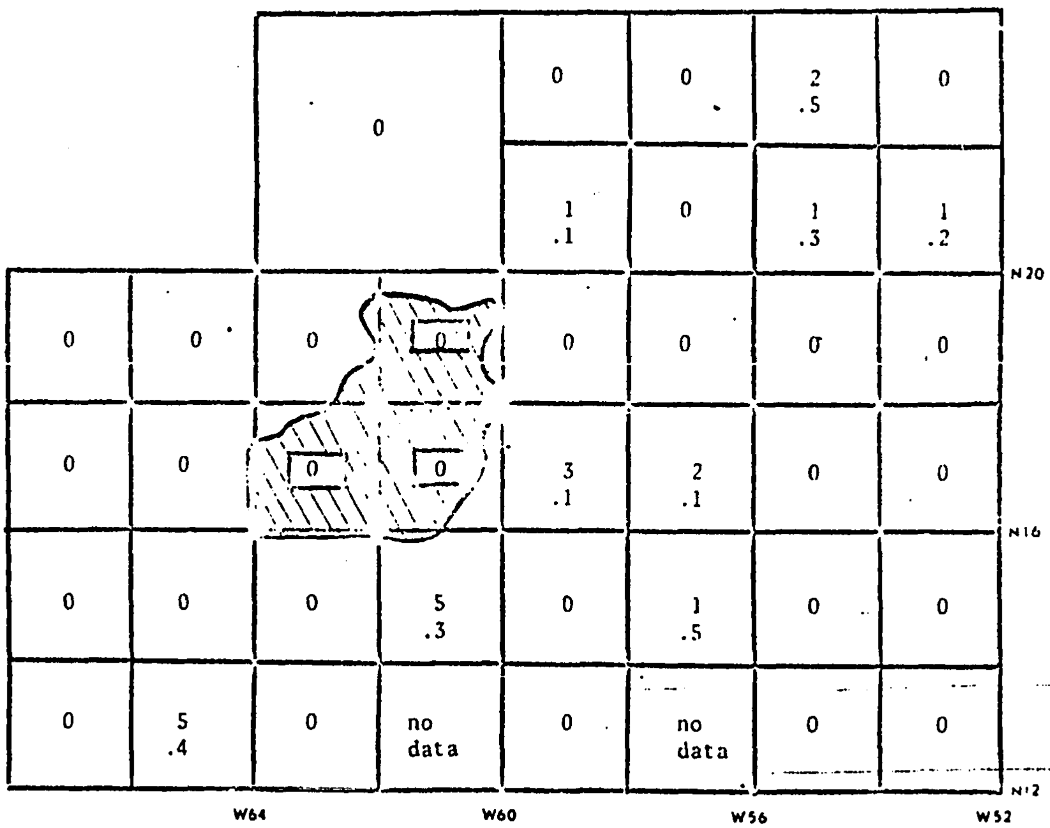


Figure 7

ORIGINAL TEST PIT

the distance from it is increased. The mean weight is quite small which probably indicates retouching and finer flaking for the preparation of tools. The sharp jump in mean weight in the NW quadrant may indicate that the greater force necessary to remove a large flake necessarily made it travel further from the manufacturer when detached from the parent core by the direct percussion method.

Another concentration is readily apparent in the SW quadrant of N 16/W 60 and nearby quadrants. Once again it can be noticed that the frequncy decreases as the distance from the quadrant is increased. The mean weight also tends to increase as the number decreases, and this would lend strength to the argument that, with direct percussion flaking, there may be a moderate correlation between weight and frequency.

Type three (glassy white chert) is extremely rare in this locality and is most probably intrusive. The flakes are widely scattered and are, in all but one instance, extremely small. With the exception of the one large flake, all are the result of pressure flaking and consequently differ drastically from mudstone not only in weight, but in method of manufacturing as well. The shifts in emphasis of raw materials may prove to be an excellent time indicator in the site, as can be noted when comparing Locality I with II.

Glassy grey chert (type 4) may be attributed to Locality I A. It appears in only the northeast area of Locality I and quite certainly may be attributed to this period of occupation. Not only are the flakes smaller than those of mudstone and their distribution more limited, but the bifacial artifacts recovered from I A are of the same material type. These flakes represent a reoccupation of Locality I approximately 2,600 years ago based on the radiocarbon sample which was directly associated with this material type.

Glassy black chert appears to be distributed over a larger area than the previous two material types. The flakes also tend to be somewhat larger as well. It should be noted that some of these flakes were produced by the direct percussion method and in both size and method of manufacture they bear more resemblance to the mudstone flakes than either type three or four. It may very well be that, during the period of reliance on mudstone, glassy black chert was used as well, although to a much lesser degree.

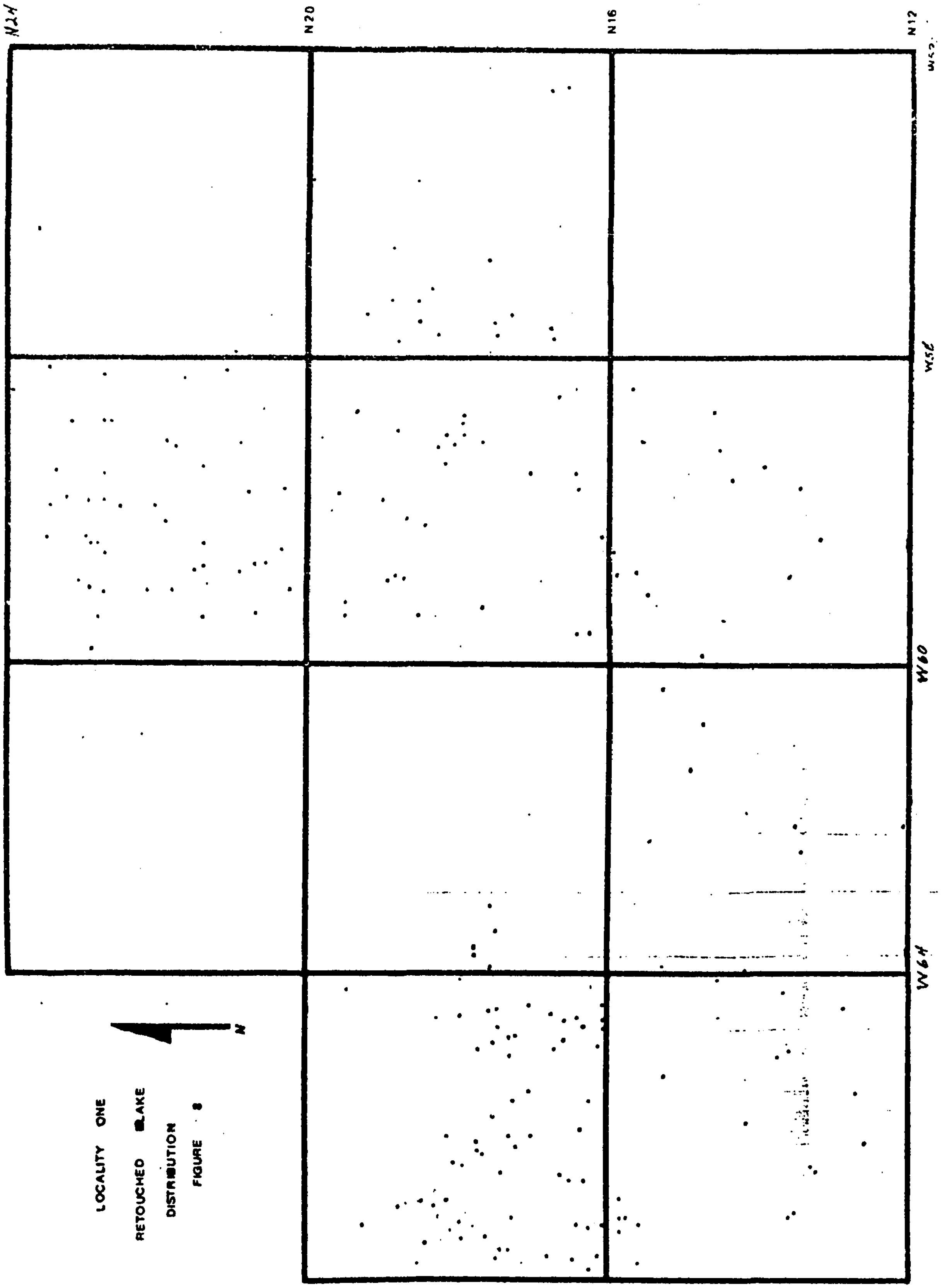
In conclusion, it appears that coarse-grained black chert, mudstone and glassy black chert may have been in use during the same time because their spatial distributions are comparable as well as their general size range and method of manufacture. Types three and four appear to be intrusive in Locality I for just the opposite reasons. Mudstone by far dominates this locality and the investigator would be deprived of any possible separation on a temporal basis if the five material types were analyzed collectively.

Retouched flakes

A total of 216 retouched flakes were recovered from Locality I, including those found in the original test pit. They have been recognized as flakes which have been used, retouched, or both. Their distribution has been plotted and can be seen in Figure 8.

There is roughly one retouched flake to every 24 waste flakes. When one considers that a number of these flakes have been retouched due to frost action and migrating caribou it would seem that waste flakes as a source of tools was not of grear importance to their manufactures. This is also reflected in the fact that the retouched flakes show no recognizable morphological patterns, and only rarely possess purposeful retouch. They are as morphologically diverse as the waste flakes themselves and they do not reveal any consistent patterns of use or retouch.

From Figure 8, it can be seen that two concentrations of retouched flakes are present. One in squares N 16/W 56 and N 20/W56 and another in N 16/W 64. It is possible that this represents two areas where the working of bone, antler, or other perishable material transpired. The waste flakes may have been randomly selected for their sharp edges, used briefly and discarded.



LOCALITY ONE
RETOUCHED FLAKE
DISTRIBUTION
FIGURE 8

Blades

Numerous problems were encountered in attempting to formulate meaningful criteria capable of accurately defining the blades in this collection, for they grade from text book examples of well-faceted prismatic symmetrical specimens to mere waste flakes (Plate 1). Because of the relative lack of morphological integrity within this artifact type, an attempt has been made to describe them in terms that can be readily comprehended and compared rather than attempting to establish a rigid typology. Types are in themselves rigid and for this collection extremely inapplicable except in their loosest form.

Many definitions have been advanced by many scholars in an effort to clarify the meaning of the word blade. The definitions are varied and appear to have been largely determined by the particular collections with which the individual advancing the definition has worked. Anderson, in attempting to separate blades from blade-like flakes, has stated:

> Flakes that are longitudinally parallel-ridged (arrises), and struck from nonpolyhedral cores are here termed blade-like flakes. Although it is occasionally impossible to distinguish between blade-like flakes and blades, an inspection of the facets on the core bifaces and polyhedral cores has suggested a number of indicators that can aid in identifying the former. First, often the parallelness of the dorsal facets and of the lateral edges on blade-like flakes has been produced by the intersection of facets from two different directions, whereas on blades the facets intersect from the same direction. Second, the presence of one ridge on the dorsal face, even though dividing two parallel facets (particularly if the flake is thick and if the arris forms a relatively steep angle) often indicates a blade-like flake. These flakes are apparently platform formed by any ridge on a large core, a technique I have noted in many of the Arctic assemblages. Third, a great width relative to the length (measured on complete flakes) is atypical of blades, but typical of blade-like flakes. And fourth, often the facets on the dorsal face, although parallel to each other, are not parallel to the axis of the single ventral flake scar. On the other hand, the striking platforms of both blades and blade-like flakes are indistinguishable both in the angle formed with the longitudinal axis and occasionally also in the kind of platform treatment given (Anderson, 1970 : 42).

Anderson has here been able to make the distinction between blades and blade-like flakes largelyon the basis of different core types. The core bifaces generally produce the blade-like flakes while the polyhederal cores produce blades. He distinguishes between blades and microblades on the basis of Taylor's statistical analysis of 293 blades and microblades from a pre-Dorset site on Mansel Island in the Northwest Territories (Anderson, 1970 : 34). Taylor suggested that a maximum width of 11 mm. as a criterion for distinguishing between blades and microblades, for at this width two separate modes were distinguishable in his plot (Taylor, 1962 : 425-6). It would seem that this distinction may be very applicable to pre-Dorset assemblages, but would prove irrelevant to assemblages from other areas and different periods.

Bordes (1961: 6) defines blades as flakes which should be at least twice as long as they are wide, have more or less parallel sides and parallel flake scars on their dorsal surfaces. Bordes also states that though the distinction is easy to adhere to in theory, it is more difficult in practical application.

In a study of Danish Early Stone Age Therkel Mathiassen defined blades as:

> Oblong, narrow flint flakes with almost parallel sides. The butt end formed of one end has the percussion bulb, caused by the blow which split the blade from the core; the fore end, which is more or less convex, displays scars of earlier blades, though sometimes there are larger or smaller areas of cortex; on well-shaped blades the fore end has one or more keels parallel with the sides. Length up to 26 cm., but rarely more than 15 cm. Width most often 1-3 cm. Presumably often used as a knife, the edges frequently being hacked and worn; nevertheless, most blades must presumably be regarded as raw material for the making of blade impliments. Irregular blades are called flakes. (Mathiassen, 1948 :51).

Mathiassen apparently does not draw a distinction here between ridge flakes ("keeled blades") and blades. Nor does he separate blades which demonstrate cortex from those which don't. His loose definition is most surely due to the fact that the majority of the artifacts with which he was working were from the Scandianavian Mesolithic, which demonstrates a very generalized core and blade industry. This is especially true during the earlier phases of the Mesolithic, therefore making it extremely difficult to set up rigid definitions.

Malmer (1969 : 25) has defined blades on the basis of their "relative width" as well as several other attributes. The relative width is defined as the maximum width measured at right angles to the direction of force implimented to remove a blade, which is then divided into the maximum length.

He has divided blades into two groups, A and B. Group A demonstrates a relative width which is up to 50% and the blades within this group must be shorter than 5 cm. The relative width of the blades in this group must also exceed 20%, and must have a ridge which runs the full length of the blade. They cannot be more than 1 cm. in thickness.

Group B is distinguished by the same criterion as Group A except the ridge does not have to be formed by two parallel blade facets and they must be 1 cm. or less in thickness.

Microblades are distinguished from blades by the criterion that they must be less than 5 cm. in length and demonstrate a relative width up to and including 20%. They should also demonstrate at least one complete ridge and must be 5 cm. in thickness or less.[1]

Laughlin and Aigner (1966 : 43) have stated that, " A prismatic blade may be identified by two sorting criteria: (1) a single ventral surface, convex in cross-section, bearing a bulb of percussion at the proximal end. (2) Two or more prismatic blade facets, concave in cross-section, on the dorsal surface." They also draw a distinction between blades and ridge flakes. Ridge flakes are recognized on the basis of the presence of cortex, the lack of concave blade facets on the dorsal surface, and the presence of flake or blade scars which do not parallel the long axis of the flake.

[1] Translated into English from Swedish, by Niels Christian Petersen, to whom I wish to express my thanks.

They do not follow Bordes suggested criteria which states that a blade should be at least twice as long as it is wide (43-44).

From the foregoing definitions it can be readily seen that confusion reigns when attempting to define the common term blade, and that it can mean many different things to many investigators. The only general agreement is that they are larger than microblades. This diversity in definition is largely the result of the diversity of the blade assemblages throughout the world. Each in turn giving rise to a definition which appears to define each individual assemblage the best. The blade assemblage from Locality I at the Gallagher Flint Station is no different than the others in that it too is unique in several respects.

A working definition for the blades in this collection may be said to be flakes which have 1) a length which exceeds the width on unbroken specimens, 2) one to three ridges running the full length of the dorsal surface of the artifact, 3) generally possess bilateral symmetry (Figure 9), and 4) are recognizable by the uniformity which they possess collectively. No distinction has been made between primary or secondary ridge flakes and "true" blades.

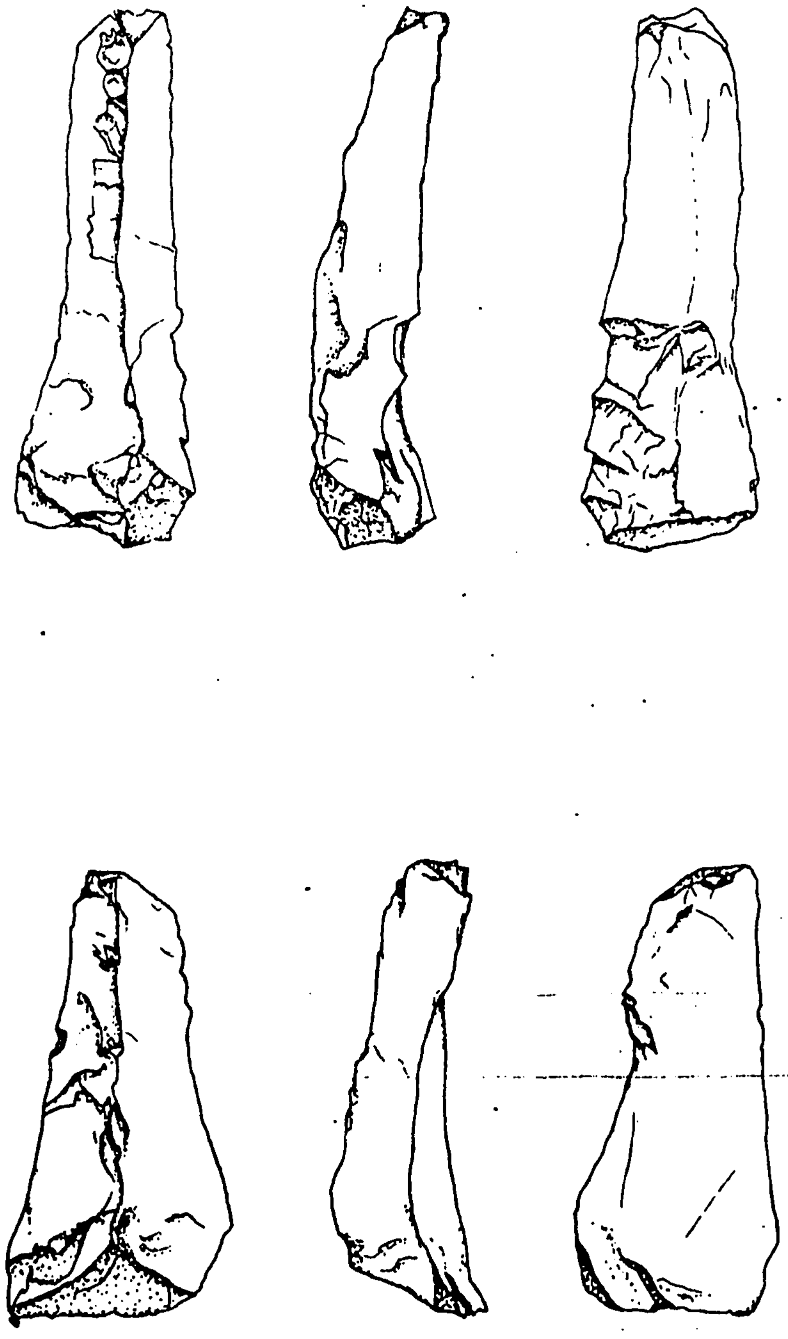


Figure 9

Locality I -- Blades, Actual Size

A total of 1027 blades and blade fragments during the 1970 field season were statistically analyzed. Those recovered during the 1971 season have not all been measured yet. The mean standard deviation, standard error of the mean, and range for the 1971 sample are listed below:

	Mean	S.D.	S.E.of Mean	Minimum	Maximum
Width	1,2950	0,5463	0,0170	,1	3,4
Thickness	0,5319	0,3465	0,0108	,1	2,7
Length	2,6625	1,4434	0,0450	,1	8,6

Width and thickness measurements were taken at the terminus of the positive bulbs of percussion, for it is assumed that at this point the knapper exercised his greatest control over his product. The measurement also avoids an area of increased thickness resulting from the positive bulb. Length was measured from the proximal to distal ends on fragments as well as complete specimens. Width and thickness were taken at the proximal ends of medial and distal fragments.

The attributes considered pertinent for the statistical analysis were retouch, ridges, section, latitudinal or opposing flake scar, frost breakage and retouch, and finally cortex. These are defined as follows:

1. Retouch -- presence of small flake scars along the margins of the artifact.
2. Ridges -- point of intersection of two parallel facets.
3. Section -- proximal, medial or distal fragment of complete blade.
4. Latitudinal or opposing flake scar -- flake scar which does not parallel the long axis of a blade, and generally exceeds an intersecting angle of 30° from the proximal end of the blade.
5. Frost breakage and retouch -- break or thermal spall, lacks smooth flake scar characteristic of flakes removed by the application of a direct physical force.
6. Cortex -- presence or absence of culturally unmodified rind or weathered surface noted on dorsal surfaces.

By repeatedly producing flakes which all assume a standard form, the manufacturer is establishing a modal curve (Cook, 1969), which is essentially recaptured by a statistical treatment of his product. This curve is only a reflection of the final product and not necessarily what the manufacturer intended to produce. Limitations due to the rock types available, the material available from which hammers or punches can be made or even the knowledge, experience and motor skills of the knapper himself can greatly limit the frequency with which the "ideal" flake can be removed. Consequently, the highest frequency of blades of a certain length, width, or thickness does not necessarily mean that blades of that size were the culture's ideal concept of what this particular tool type should look like. It merely states that a greater frequency of that size or shape of tool was manufactured. The reasons for the occurence remains a matter of interpretation.

Figure 10 shows a histogram which illustrates the distribution of blades based on width. Although there are some rather sharp dips and peaks, it appears that there exists a single mode and no distinction can be made between blades and microblades. There is one unexplainable dip in the graph which occurs at 1.8. There seems to be no plausible explanation for this, for it seems unlikely that the manufacturers of the blades would make a millimeter distinction between populations if bimodality were truly present. It is possible that the investigators for some reason unconsciously avoided the 1.8 increment when measuring the artifacts, but this also seems unlikely for the blades were measured by two different individuals. A single skewed mode exists and that a distinction between blades and microblades cannot be made at this site.

Figures 11 and 12, histograms of thickness and length respectively further support the single mode character of the blade collection. Both histograms are positively skewed, conforming well with Figure 10. The mean thickness of .5319 is large and tends to rule out the possibility that the blades were being manufactured to serve as insets along the cutting edges of bone tools.

FIGURE 10

FREQUENCY POLYGON

FOR BLADES BASED ON WIDTH

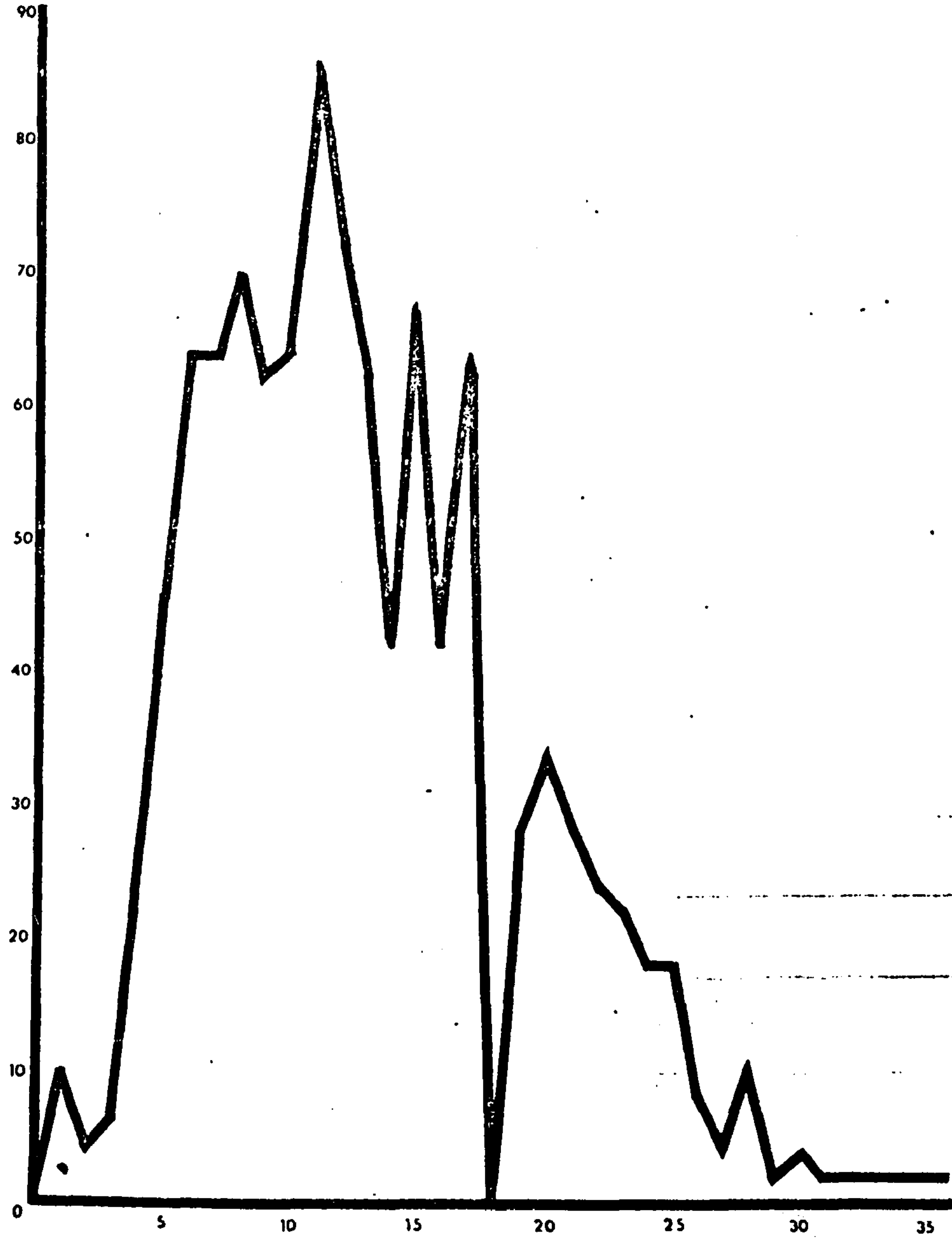


Figure 11

THICKNESS IN CENTIMETERS

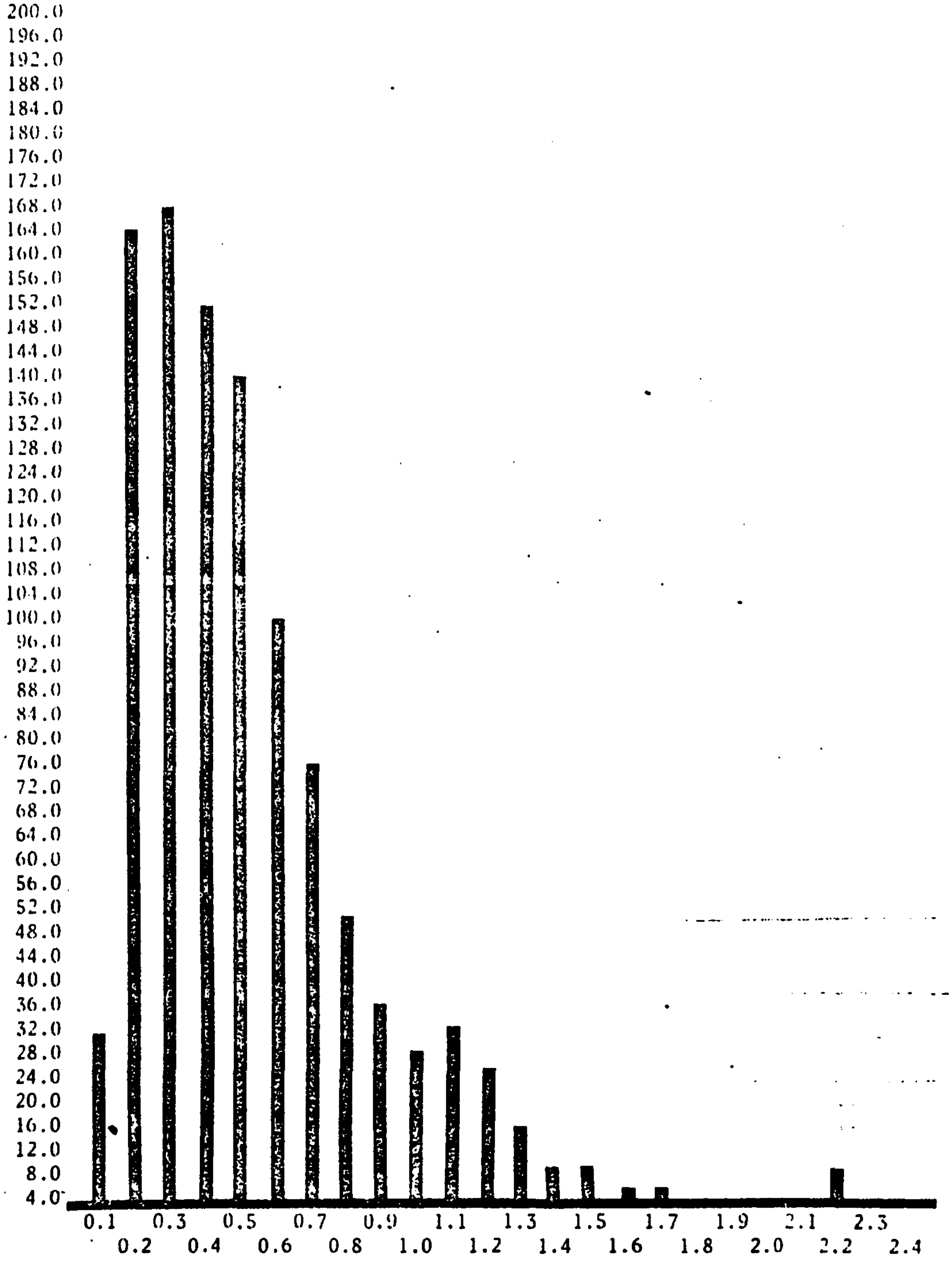
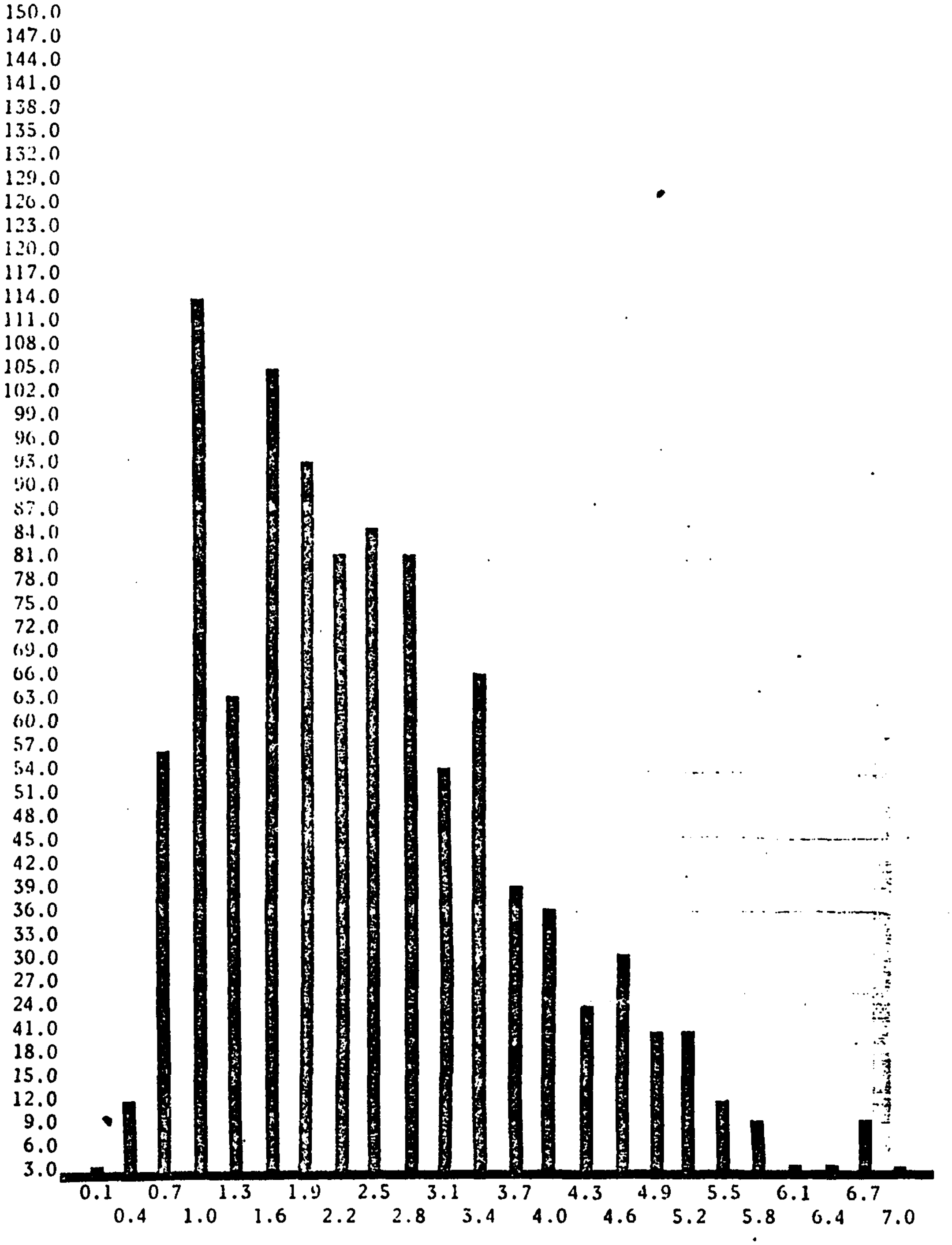
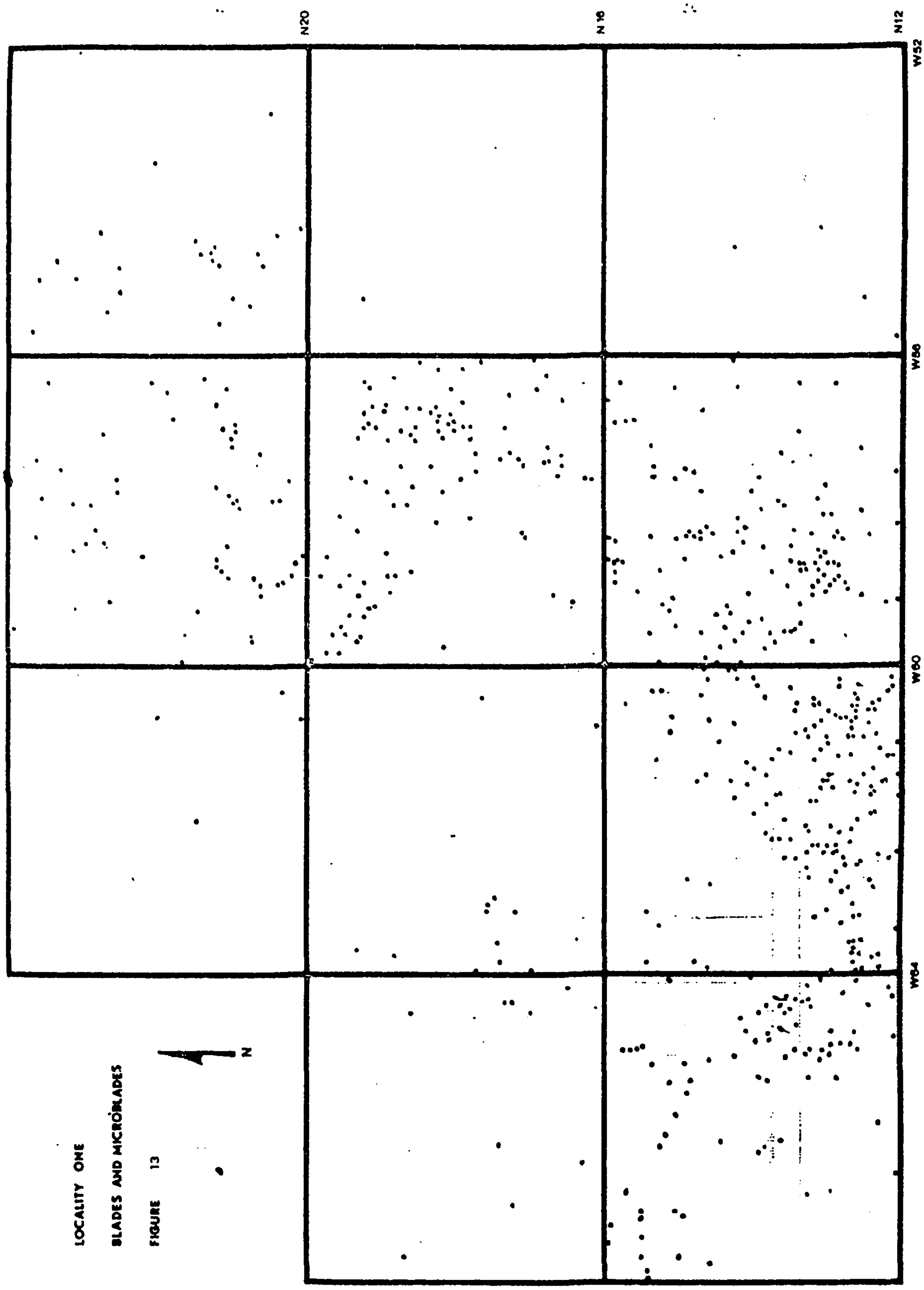


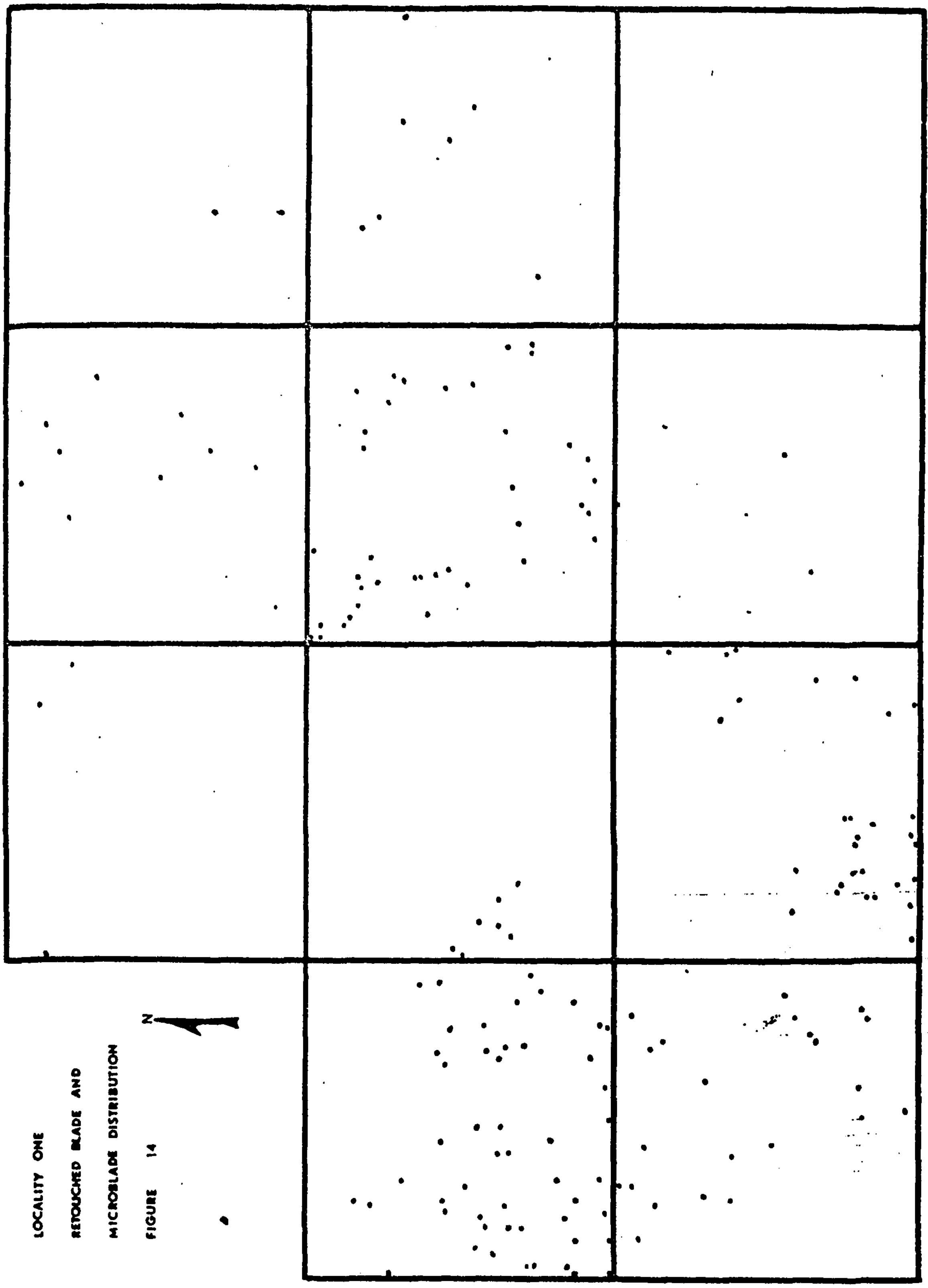
Figure 12

LENGTH IN CENTIMETERS





LOCALITY ONE
BLADES AND MICROBLADES
FIGURE 13



LOCALITY ONE
RETOUCHED BLADE AND
MICROBLADE DISTRIBUTION
FIGURE 14

As can be observed from Figure 15, over half the blades possess use retouch while purposeful retouch is extremely rare. The unretouched and retouched blade distribution has been plotted in Figures 13 and 14. They were plotted separately in the event that the blades possessing use retouch were transported, even if only for an extremely short distance, from the location of their manufacture and that some patterns relating to their significance might emerge. When their distribution is compared with that of unretouched blades, there appears to be little, if any, differences. This either casts serious doubts on the actual cause of use retouch, or implies that the blades were used at the location of their manufacture. The fact that over half the blades possesses this attribute and only one in twenty flakes demonstrate evidence of this form of retouch lends strength to the argument that use retouch is truly the result of use and that blades played a significant role as a tool type. It may be because blades were mass produced and provided an abundance of sharp cutting edges, that they were readily discarded and replaced when they were even slightly dulled. In short, blades may have been the equivalent of a disposable knife.

There are nearly twice as many blades possessing one ridge as those demonstrating two ridges (Figure 16). Three-ridged specimens are extremely rare. This supports the data evident in thickness, for two ridged specimens generally tend to be thinner than single ridged pieces. The facet running down the center of a three-ridged blade tends to make it thinner and thus more likely to be selected as an inset. There would appear to be little, if any, preference to manufacture thin blades as insets, but this could mean that blades suitable for such purposes were transported from the site and consequently the sample is biased and favors single-ridged and thicker blades. Disregarding this negative argument, it would appear that the flint knappers at the Gallagher Flint Station were deliberately manufacturing a greater proportion of thick, single-ridged blades, which were probably not intended to be used as insets in bone tools.

Figure 15

RETOUCH -- 0 = Absent; 1 = Use; 2 = Purposeful

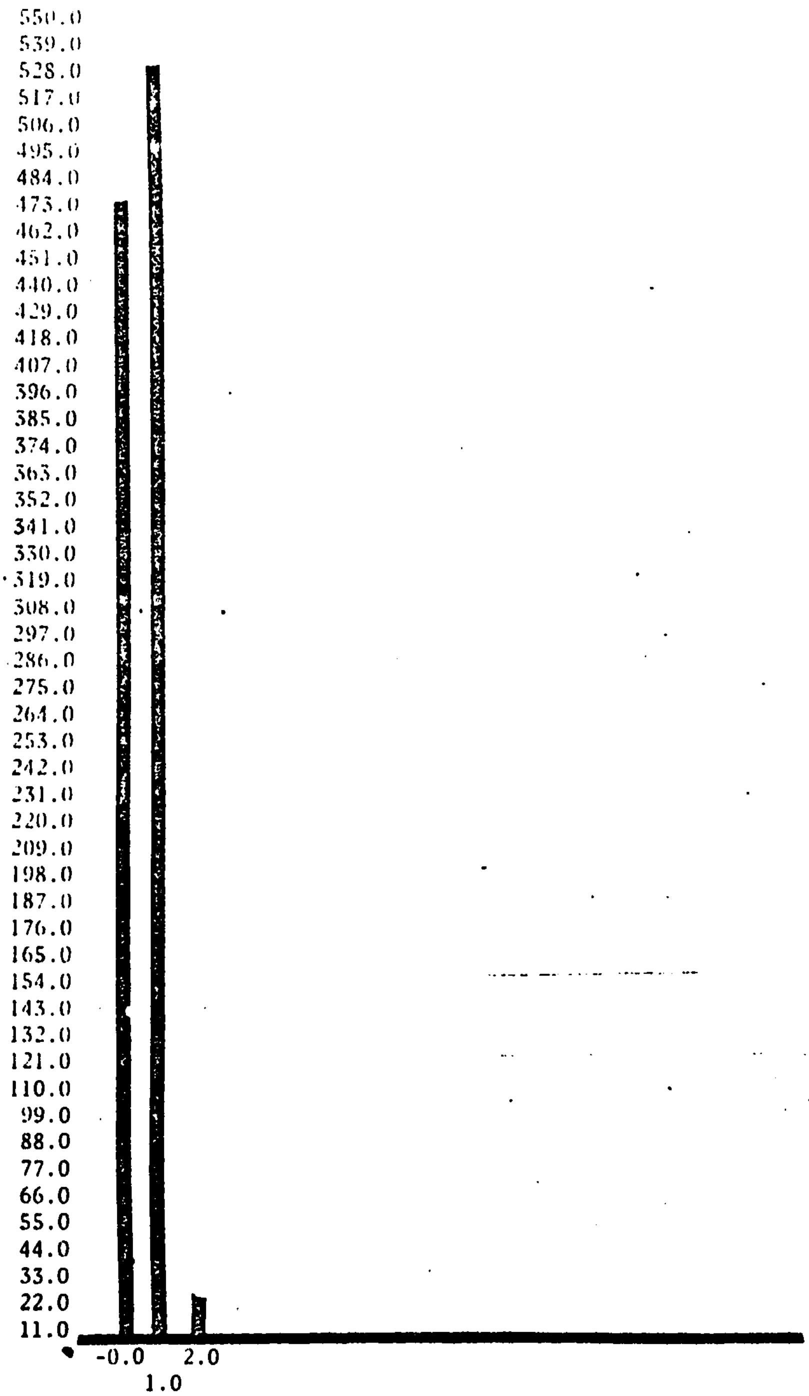


Figure 16

NUMBER OF RIDGES -- 1 = one ridge; 2 = two ridges; 3 = three ridges

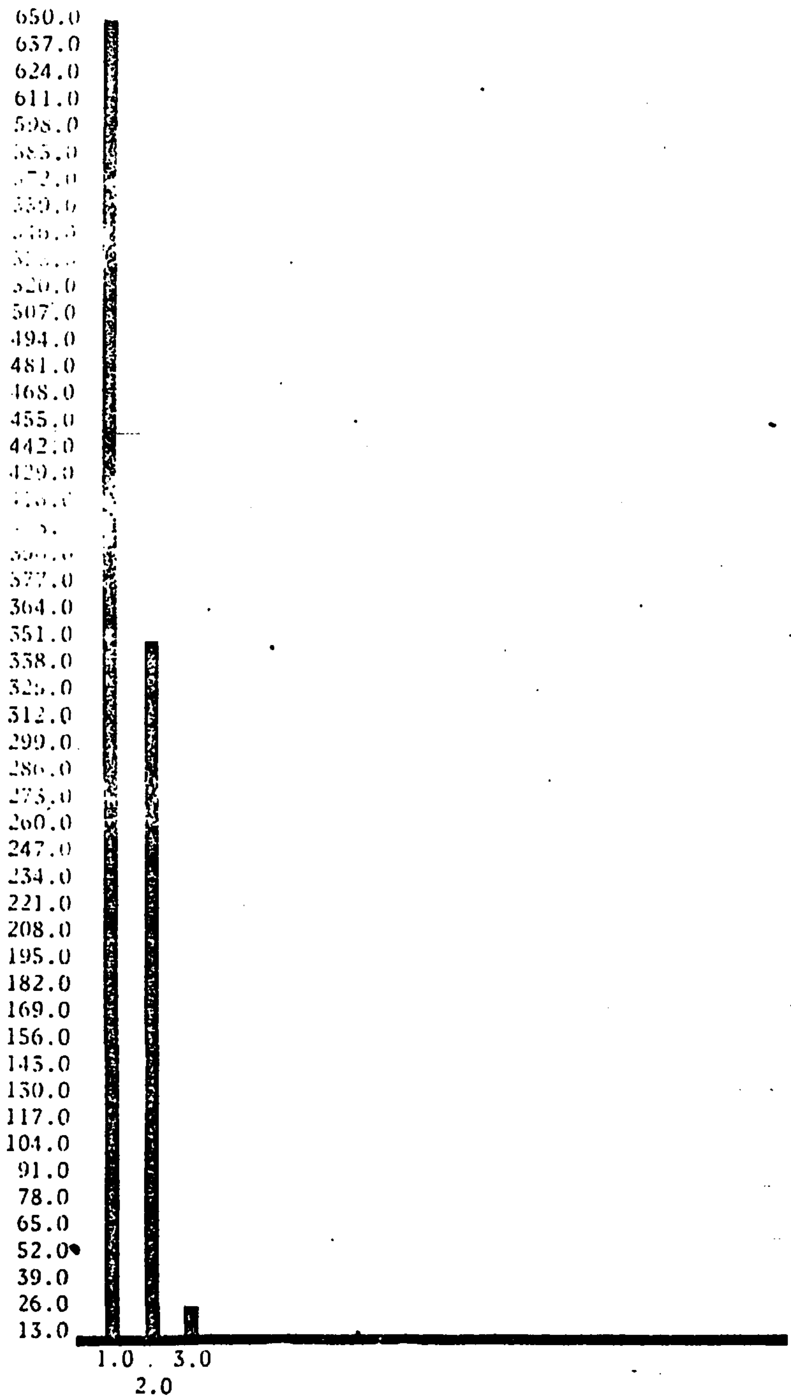


Figure 17 depicts the proportion of proximal, medial, distal and complete blades recovered from Locality I. There is a slight tendency for proximal fragments to be more common than either medial or distal fragments. This may indicate a slight preference for the selection of medial and distal fragments as tools or components of composite tools. Even if this is indeed the case, the selection is extremely minor, for the frequencies of the three segments are extremely similar.

When the proximal, medial, and distal fragments are totaled and divided by three it can be found that over half the total blade sample have been broken. This is of course based on the assumption that these fragments are from the same blades rather than individual fragments from many different blades. As can be noted in Figure 19 frost breakage is responsible for only a little less than twenty percent of the fractures. Some of the breakage has, in all likehood, been caused by migrating caribou as well as by man walking upon the artifacts but this still leaves a considerable portion of the sample broken. It must therefore be assumed that the remaining broken pieces have been broken in use or deliberately snapped to be used as fragments.

A histogram illustrating the presence or absence of latitudinal or opposing flake scars may be seen in Figure 18. These flake scars are viewed as the result of blade manufacture from rotated cores. Slightly less than twenty percent of the sample possessed this attribute, and this may in the future prove valuable in comparative purposes.

It is because this attribute is so common that no distinction was made between ridge flakes and blades, although the presence or absence of cortex was noted (Figure 20). Many times it is virtually impossible to distinguish between this particular attribute and flake scars resulting from core preparation; consequently blades possessing this attribute and ridge flakes have not been separated.

The ratio of width to thickness forms a relatively tight distribution.

Figure 17

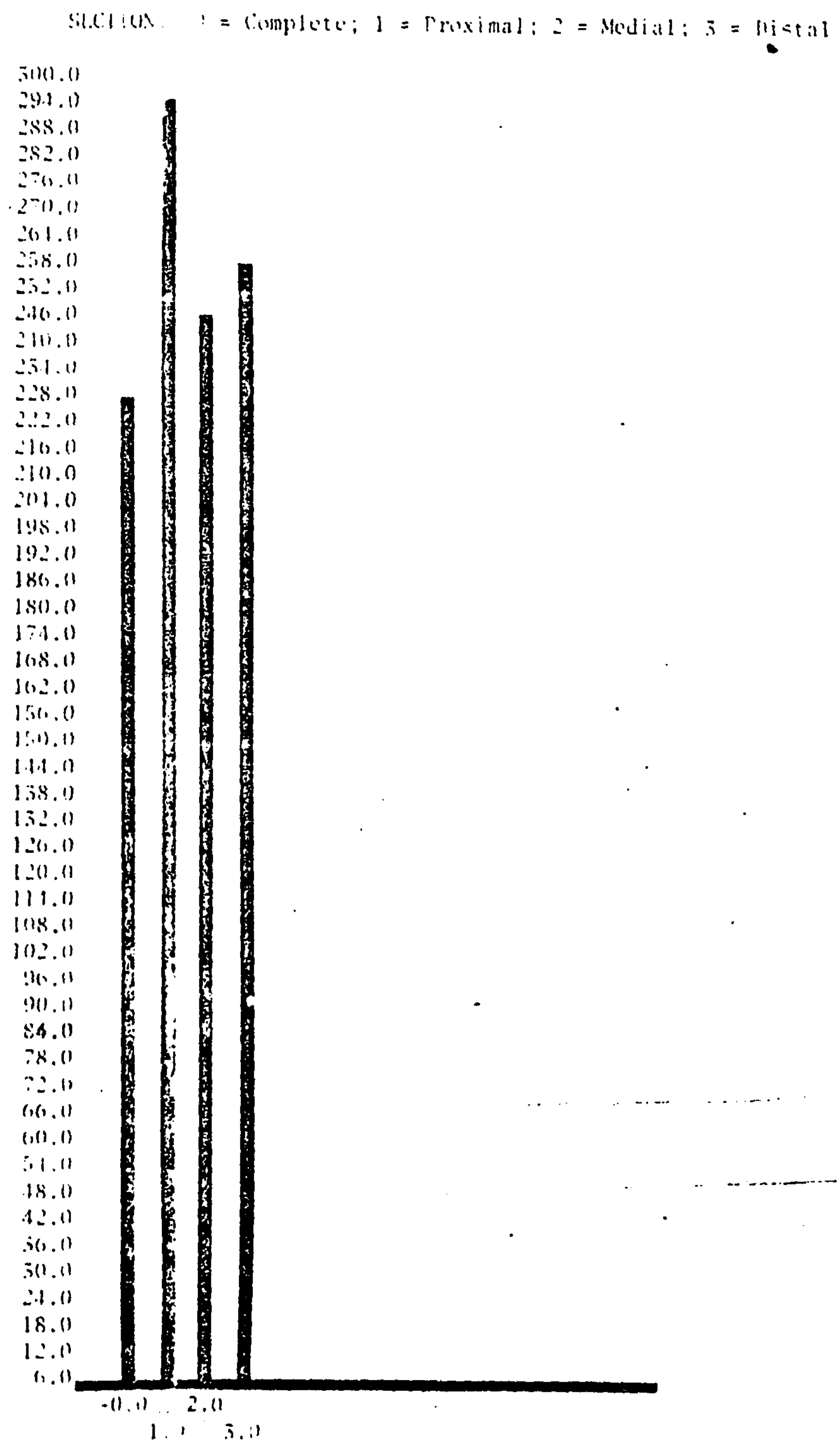

SECTION: 0 = Complete; 1 = Proximal; 2 = Medial; 3 = Distal
300.0
294.0
288.0
282.0
6.0
-0.0
1.0
2.0
3.0

Figure 18

LATITUDINAL OR OPPOSING FLAKE SCAR: 0 = absent; 1 = present

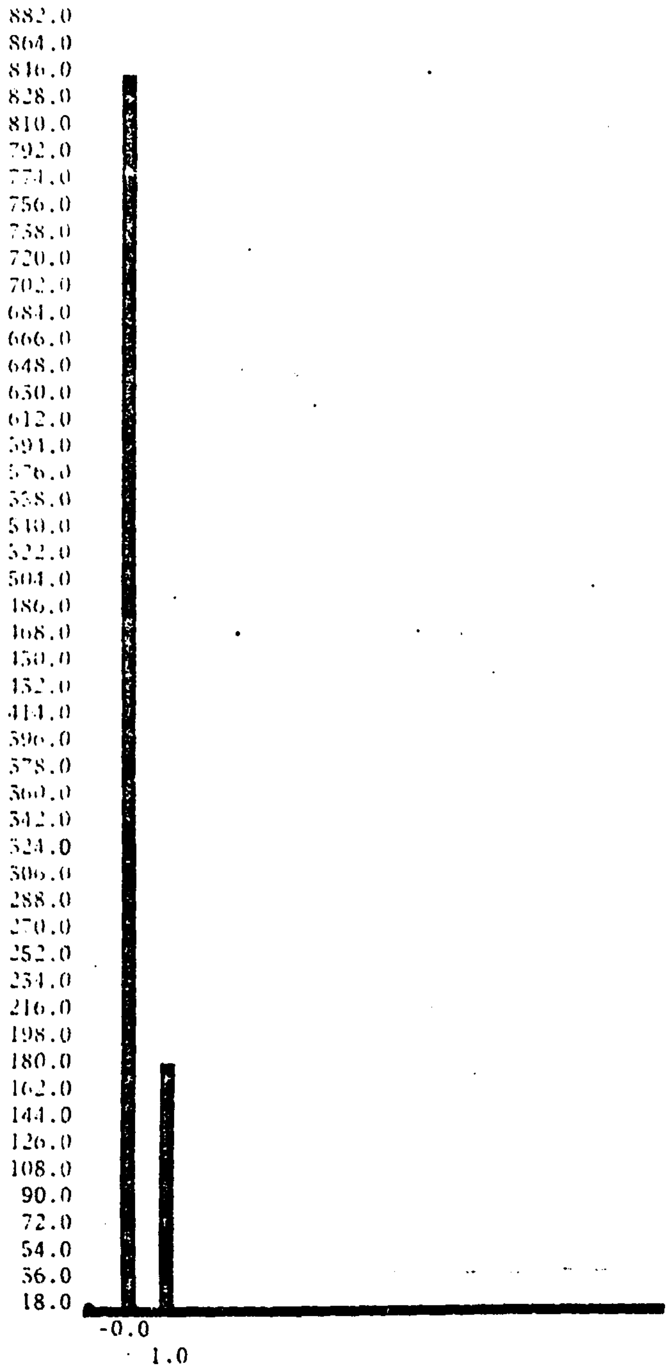


Figure 13

FROST ACTION: 0 = Absent; 1 = Breakage; 2 = Retouch; 3 = Breakage and Retouch

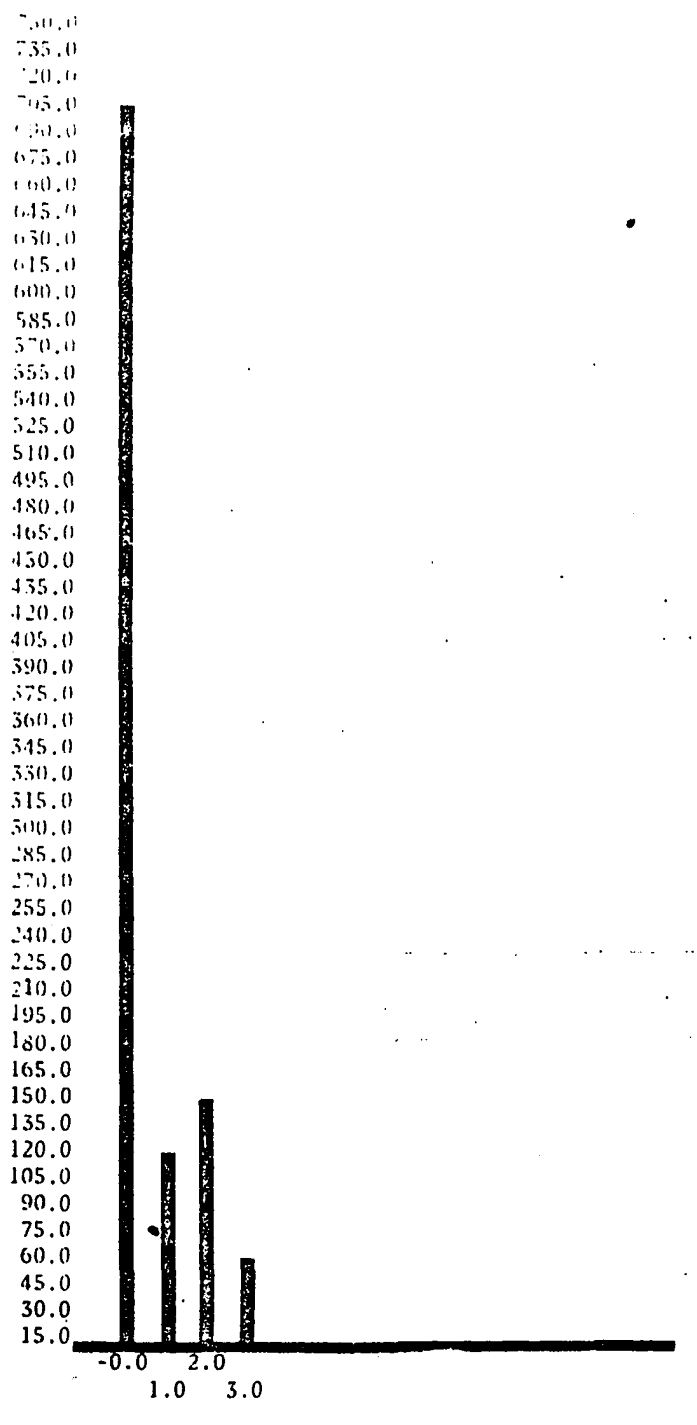


Figure 20

CORTEX: 0 = Absent; 1 = Present

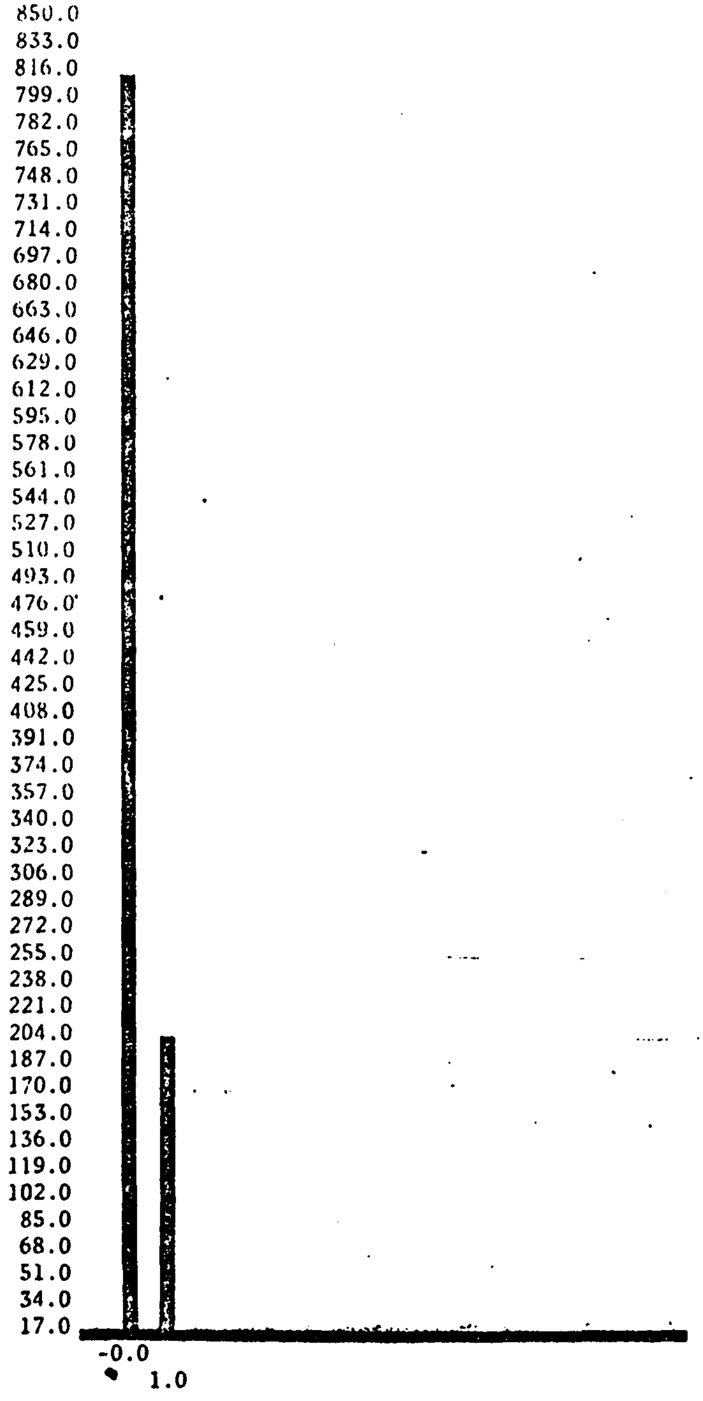
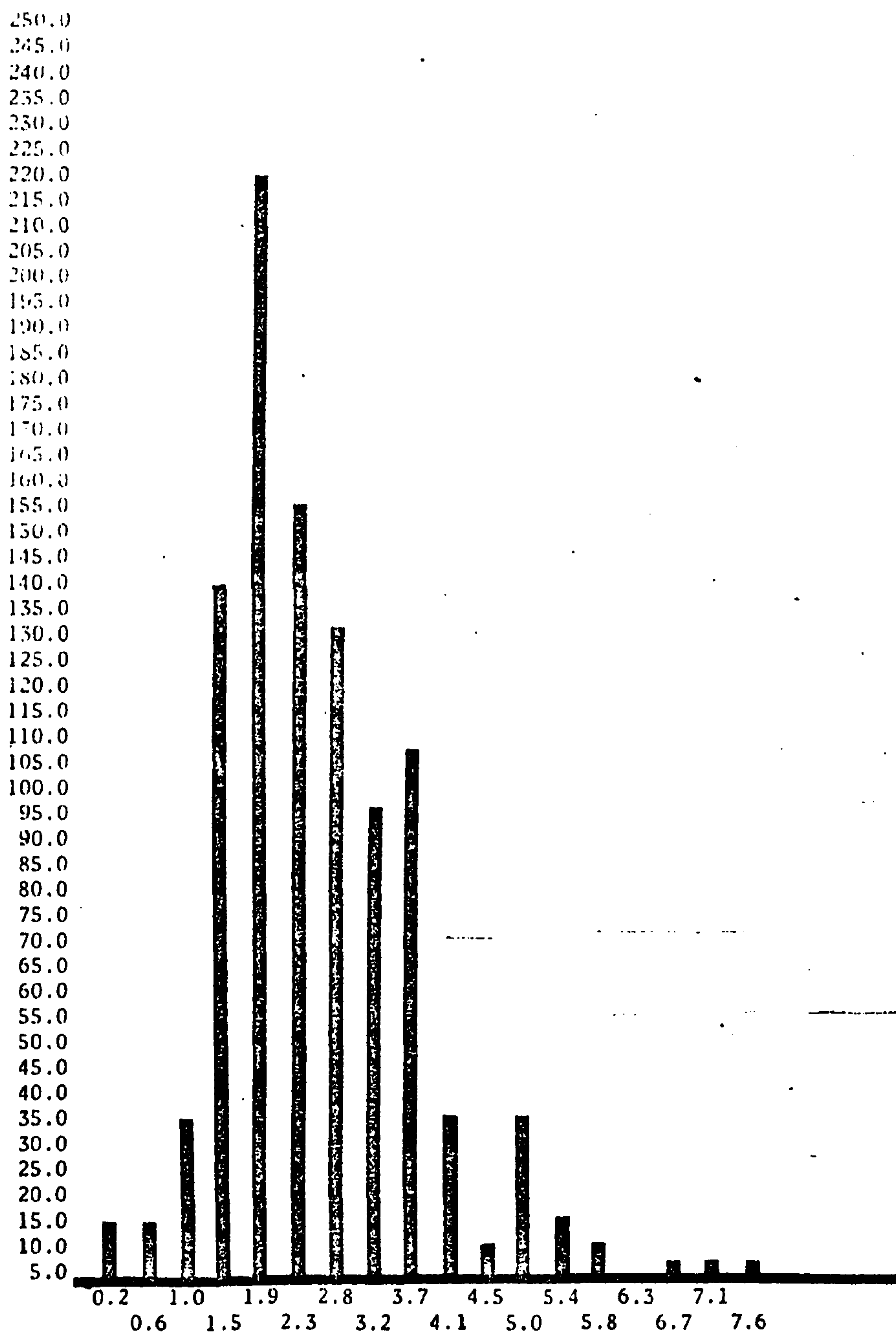


Figure 21

RATIO OF WIDTH TO THICKNESS - Interval is .4363



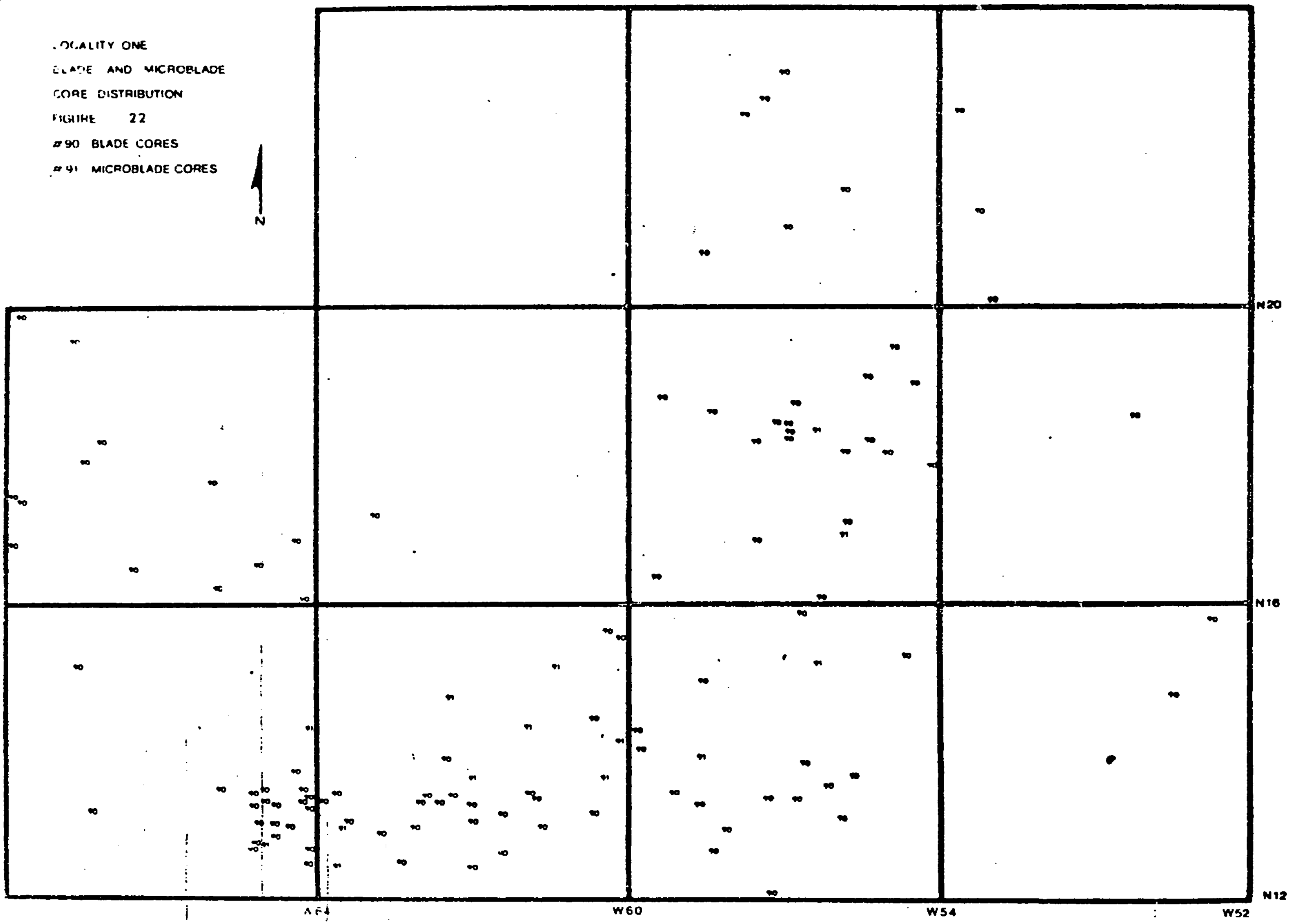
The blades tend to be extremely thick in relation to their width (Figure 20), and there consequently seems to be extremely little preference for the manufacture of thin pieces. This, as well as other attributes, indicate that blades were not manufactured (at least in great numbers) for the purpose of insetting them in composite tools, unless of course the sample has been biased by the removal of most specimens suitable for inset by their manufacturers.

Cores

One hundred and twenty microblade cores, blade cores, and core fragments were recovered from Locality I (Figure B-22). Sixty of these are recognized as either complete specimens or fragments which demonstrate enough facets and platform area to be considered nearly complete. As mentioned previously, their diversity is extremely great and many demonstrate evidence of rotation and multiple platforms. All have been manufactured from mudstone and many have been fractured by frost action along the numerous bedding planes present in these larger pieces (Plate 2).

Thirty-nine of these specimens possess two or more platforms or some evidence which indicates that blades were struck in more than one direction. This evidence includes such attributes as 1) hinge fractures which intersect or oppose blade facets extending from an existing platform, 2) remnants of negative bulbs of percussion along the margins of former platforms which have been all but obliterated by blade facets extending from other platforms, and, 3) traces of crushing or battering which is common along the margins of most platforms. Two of thirty-nine multiple platform cores possess three platforms, or at least evidence of a third. No specimens were noted to possess four or more platforms. It does seem quite possible that some of the two platform pieces may have at some stage of their development possessed three platforms.

To establish three core types on the basis of the number of platforms is extremely misleading, for all could have been rotated during some phase of their use. Blades as well as flakes have been manufactured from the same core in some cases. The range and diversity in the Gallagher cores is so great that almost every conceivable core type can be found in the collection. Tabular, conical, and wedge shaped blade and microblade cores are all common, and over half possess two or more platforms. In some instances both blades and microblades have been struck from the same cores and this is consistent with the fact that the blade distribution based on width reveals only a single mode. There is no standard method for the



LOCALITY ONE
BLADE AND MICROBLADE
CORE DISTRIBUTION
FIGURE 22
#90 BLADE CORES
#91 MICROBLADE CORES

removal of tablets or rejuvenation flakes and many times the cores appear to have been rotated when a platform was exhausted. In one word, the cores could most aptly be described as generalized.

The cores have generally not been used as tools; in only one instance do they show any signs of use, exept for the usual crushing or battering around the margins of the platforms. The one exception demonstrates fine unifacial use retouch on one margin opposing one of the platforms. It is a small core and may have been used as a scraper.

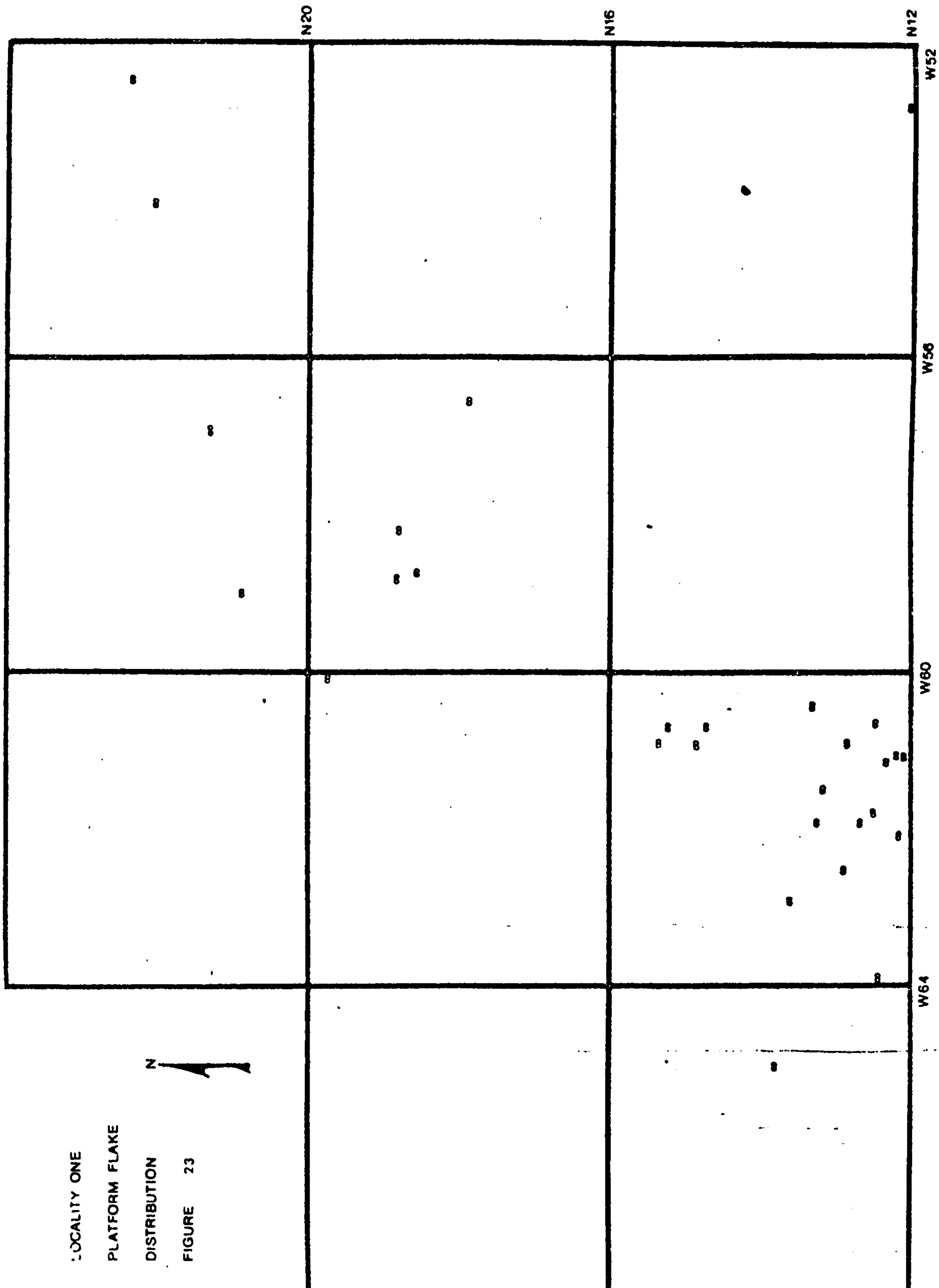
The spatial distribution of the cores is comparable with that of the blades and together they form a very cohesive unit. The cores themselves are extremely diverse and in many instances both large and small blades have been produced from the same core. No single type core can be recognized from Locality I.

Platform flakes

As might be expected from the previous discussions, no standard method of core rejuvenation is evident in the collection. The spatial distribution of platform flakes has been mapped and is illustrated in Figure 23. As can be noted, they are relatively infrequent when compared to the cores and blades, but are distributed roughly in the same areas as the cores.

There is a slight tendency to remove a core tablet from the front but many have been removed from the side as well. One of the reasons for the relative scarcity of platform flakes is that cores were often rotated rather than rejuvenated. When a platform became exhausted the core was often flipped over and blades struck in the opposite direction or from the side. There is no standard pattern in the way the cores were rotated and the location of a new platform seems to be totally reliant on where a flat surface might exist on the core. It could as easily be the opposite end of the core from the exhausted platform or anywhere along the margin of a large blade facet.

When examining the blades, many can be found to possess the remnants of former platforms. These platform remnants may appear anywhere on the blade, but generally are located at the distal end. During the blade analysis, blades possessing this attribute were handled as blades possessing latitudinal or opposing flake scars, for they are the products of rotated cores as well.



LOCALITY ONE
PLATFORM FLAKE
DISTRIBUTION
FIGURE 23

Burins

Only one burin was recovered from Locality I and the parent flake from which it was manufactured is of calcareous mudstone. This artifact has obviously been reworked by later occupants of the site and this is attested to by a difference in the patination between the outer surface of the parent flake and the freshly exposed inner surface of the burin facet. Three spalls were removed in order to produce the burin and all three were recovered. When all the spalls are placed in their original position on the parent the original flake can be reconstructed, and demonstrates an evenly patinated surface. As each spall is consecutively "peeled" away it reveals the unpatinated inner surface of the reused to manufacture a burin. No stratigraphic provience was recorded for this particular artifact, because it was found in the original test pit. Never the less it was most certainly a surface find, for the signs of lichen growth can be detected on its outer surface. Consequently this burin is undoubtedly not an artifact attributable to Locality I, although the parent flake from which it was manufactured most probably is.

Six flakes and blades were found to possess flake scars which resemble burin facets. There is no consistant pattern in the production of these flake scars nor in the selection of the parent flakes or blades upon which these scars occur.
It seems most probable that these flake scars merely represent "fortitious" facets which were apparently not produced through any deliberate intent to manufacture burins or burin spalls. No common pattern of use can be recognized on these six artifacts.

Projectile point

The only biface fragment recovered from Locality I is the medial section of a point. It has been fineiy pressure flaked and is 1,6 cm. long. It clearly demonstrates oblique collateral flaking and has fine secondary retouch on its margins on opposite edges of each face. (i.e., one side is the mirror image of the other). This fine retouch has produced extremely sharp cutting edges and it is somewhat denticulate.

It has been manufactured from a grey-brown chert which is not characteristic of Locality I A. It was recovered from the north east quadrant of N 16/W 60, the area of Locality I subjected to deflation and therefore could not be separated from the unifacial core and blade industry of I due to the comparative lack of vertical stratigraphy. Although the material type from which it has been manufactured could fall within the range of the various grades of mudstone represented in Locality I, it is "glassier" than most of the other specimens. It also lacks signs of weathering or patination which is characteristic of many of the Locality I artifacts.

Typologically this point fragment is one of a kind and resembles points attributed to the Denbeigh Flint Complex, which is characterized by oblique collateral flaking. Although it cannot be conclusively proven on the basis of stratigraphic evidence that this point fragment is not an artifact associated with the unifacial core and blade industry of Locality I, on the basis of typological comparison, lack of weathering and patination, and the slight difference in the raw material from which it was manufactured it must surely be intrusive into the Locality I assemblage. For these reasons it has been discounted as part of the artifact assemblage of Locality I. One would think that if endeed this point type were actually a part of the lithic tool kit of the Locality I inhabitants that more than one such point fragment would have been discovered among the thousands of artifacts recovered.

Summary of Locality I

Locality I produced an extremely generalized core and blade industry possessing no bifacial stone tools or burins. No distinction between blades and microblades can be made on the basis of widths or width-thickness ratio. The blades have apparently been used as knives for working materials such as bone, ivory, or wood, while playing only a minor role as inset blades. It seems most likely that Locality I was a quarry area where hunters commanded an excellent view northward from the site and waited for game while making artifacts. It is quite possible that the blades were used as knives which were discarded freely once the cutting edge was even slightly dulled.

Most of the cores have been rotated and no specific core type can be recognized at the site. The cores are of little functional importance and have been used almost solely for the manufacture of blades. They can be best described as being generalized and it appears that this type of core and blade technology may be the ancestral stock of the more refined microblade and core traditions which evolved at a later date in the coastal regions of the Alaskan arctic.

Locality I most probably did not serve as a habitation site, for no traces of any form of structure or dwelling have been discovered. In all probability it served as a quarry as well as a lookout for large land mammals, which were possibly caribou. By negative inference, it is assumed that the majority of the hunting tool kit was maufactured from perishable materials, for there is no preservation of faunal remains.

Comparisons with other sites in Alaska

The Akmak assemblage from the Onion Portage site on the Kobuk River is geographically the closest site to the Gallagher Flint Station which is of comparable antiquity. Although Akmak has been radiocarbon dated 7,907 $\pm$ 155 B.C. (9,857 B.P.), it should be realized that a half life of 5,730 was used which differs from the Libby value of 5,586 used to date sample SI-974 from Locality I. Consequently the two sites may be temporally further apart than might be expected at first glance. By multiplying by a factor of .9717 the Akmak date can be expressed in the Libby value as 9,570 $\pm$ 150 B.P.

The artifact assemblage of Akmak differs from the assemblage recovered from Locality I in the following respects:
a) type cores can be recognized at Akmak, b) core bifaces are present, c) burins are present, d) large biface knife blades, e) sandstone shaft smoothers, f) flake unifaces at Akmak differ from unifacial retouched blades and flakes at Locality I, g) raw material from which Akmak artifacts are fashioned consits of glassy cherts, h) indication that microblades were used as insets at Akmak, i) trimodality in blade and microblade assemblage based on width of artifacts, j) use of red ochre at Akmak, k) very few waste flakes present compared to Locality I, l) no core tablets recovered from Akmak, n) and m) there is an extremely high percent of use retouch present on the Akmak waste flakes.

The similarities between the sites are much fewer. Akmak type III A-1 and type III A-2 blades bear a resemblance to those from Locality I, although the Akmak blades are generally larger. Core types II A and III A-2 from Akmak resemble those from Locality I in that they have been used to produce broad irregular blades. The final similarity which the two sites share is the fact that they both command a panoramic view and are ideal locations for hunting caribou.

"The paucity of decortation spalls and the relative rarity of flakes from the initial stages of stone tool manufacture suggest that tools were manufactured elsewhere and brought to the settlement in their completed form" (Anderson, 1970 : 60). Just the opposite situation is characteristic of Locality I, and it is evident that the two sites served different functions. Locality I was a lookout for large game animals and a quarry for the manufacture of stone tools, while Akmak appears to be a settlement of a more permanent nature. Nevertheless, the differences are far too great to be accounted for on the basis of the function each site served.

Locality I should most surely possess some indication of bifacial or burin technology if these artifacts were part of the lithic inventory. The amount of flint working which transpired there would most certainly have resulted in discarding at least one biface during some stage of its manufacture as well as specimens broken during manufacture. Although some of the Akmak core types and blades do bear a vague resemblance to Locality I, there appears to be extremely little cultural continuity between the two assemblages. The most striking difference is that they share a bifacial tradition.

Directly above the Akmak assemblage at Onion Portage is Band 8 which contains a) campus-type microcores, b) burins and burin spalls, c) indications of the use of microblades as insets, d) a pounding stone, e) microblade midsections of more varied width and thickness than those present in Akmak, f) notched small blades, and g) a shift from the glassy-textured cherts in Akmak to poorer grade argillaceous cherts. Although Band 8 is also significantly different from Locality I, surprisingly enough it seems to bear greater similarity to it than does Akmak which it is temporally closer. It demonstrates a shift from the glassier chert used in Akmak to a poorer grade which is more similar to that used in Locality I, although they are by no means the same rock type. Also greater variability in width and thickness in the microblade component is more akin to the blades from Locality I. Finally and most importantly, there are no bifaces present in Band 8. Anderson believes that the lack of bifaces in Band 8 is more "apparent than real", for he reasons that if a larger sample had been secured then bifaces would most probably have been recovered (Anderson, 1968 : 30). Band 8 was occuped roughly around 8,000 to 8,500 B.P. This period of occupation has been established by five radiocarbon samples.

The Trail Creek Caves are located on the Seward Peninsula and have yielded the earliest evidence of Alaska's occupation by early hunters. Although the stratigraphy at the Caves was difficult to follow, it appeared that the lowest level yielded several bison calcanei and a horse scapula which appear to be associated with a small bifacial chalcedony point. Due to the pattern of breakage of the bison bones it appears that they were broken by man in an effort to extract the marrow. The level from which this point, as well as the bones, was recovered has been dated by radiocarbon at roughly 13,000 and 15,750 B.P. (Larsen, 1968b).

Stratigraphically above these faunal remains and bifacial chalcedony point were found bone projectile points and microblades. The bone points were slotted, apparently to receive the microblades as insets, and the microblade fragments do indeed fit the slots well. The level from which these artifacts were recovered lack bifacially flaked tools of any type associated with these antler points. The stratigraphy above these points becomes confusing, but there is apparently quite a time lapse before bifacial stone industries are encountered again in the Caves.

Although the microblades at Trail Creek were almost certainly used as insets in the beveled based antler points, the site does compare well with Locality 1 in that it is totally lacking in befacial stone projectile points during this particular time horizon. Of special interest is that a culture apparently lacking bifacial stone projectile points is superimposed on one which possessed them, as may be the case of Onion Portage.

The Denali Complex of interior Alaska is as yet undated and therefore comparisons between it and Locality 1 are very tenuous. Two radiocarbon dates derived for the Donnelly Ridge Site indicate that the complex may have been discounted on the basis that the charcoal from which they were derived may have been the result of a comparatively recent tundra fire (Hadleigh-West, 1967 : 372-3)

Evidence from Healy Lake seems to confirm the dates as being valid for the final stages of the Denali Complex, for an almost identical assemblage is also known to have been present in the Alaskan interior at a comparable date.

Nevertheless, on purely typological grounds the Denali Complex may be of considerable antiquity and does to a large extent resemble the Akmak assemblage at Onion Portage (Anderson: 1970 : 64-5). The complex possesses bifacial knives, burins, campus-type microblade cores, large blade-like flakes and blades, end scrapers, core tablets, microblades, and burin spalls.

The only artifact types within this inventory which even slightly resemble those from Locality I are the large blades and blade-like flakes. A bifacial technique is undoubtedly present and the remaining artifacts differ so drastically from those of Locality I, that it is inconceivable that there is any cultural connection between it and the Denali Complex.

The Chindadn assemblage recovered from the lower levels at Healy Lake offers even less room for comparison than any of the previously discussed assemblages.[1] Many of the artifacts attributable to the Chindadn assemblage are manufactured from agate and other fine grained rock types. A fully developed bifacial technology characterized by triangular projectile points as well as blade-like flakes is well documented from these lower levels. Eight radiocarbon samples have been dated from Chindadn and the assemblage is between 8,000 to 10,500 years old, and may possibly go back as far as 11,000 years (John Cook, 1972: personal communication). Blade cores are apparently not present.

1 Because there are absolutely no published descriptions of the Chindadn assemblage I have had to rely solely upon my memory in describing this material, and therefore there may occur some important omissions to the assemblage as well as some overemphasis on other aspects.

Only the blade-like flakes from the Chindadn assemblage bear an even remote similarity to Locality I, and there is almost certainly no cultural connection between these two sites. The presence of an unquestionably well developed bifacial technology and the absence of blade cores indicate. that there is even less connection between Locality I the Chindadn assemblage than there is between it and Akmak.

The only remaining site in Alaska which has been dated and which is comparable to Locality I is the unifacial core and blade site on Anangula Island in the Aleutians. Anangula has been radiocarbon dated at about 8,400 B.P. This date has been derived by averaging four out of seven radiocarbon dates derived from the site and has been computed using a half life of 5,730 years (Laughlin, 1967: 434). When this date is reworked using the Libby half life it appears as 8,160 B.P.

Although significant differences exist between Anangula and Locality I, it bears by far the most striking resemblance to it than any other dated site. No bifacial tools have been recovered from Anangula, no type core can be recognized, nor can any distinction be drawn between blades and microblades. These similarities bear a striking resemblance to Locality I.

Anangula also possesses many features which do not compare well with Locality I. These are the presence of a well pronounced burin technology, house or tent pit depressions, pointed tools on blades and ridge flakes, a stone vessel, rubbing stones, the use of red-ochre and both pummice and scoria abraders (Laughlin, 1967). These differences are no doubt significant but are not unreasonable when one considers the temporal and spacial distances between the two sites.

Summary of comparisons within Alaska

The diagnostic attribute of greatest importance in comparisons between sites in Alaska all falling within this general Late Wisconsin time horizon is the presence or absence of bifacial stone tools. As can be readily noted in Locality I and Anangula share this trait. Although the evidence is somewhat meager from both Onion Portage and Trail Creek Caves because of the small samples recovered from these two sites, it appears that at both sites culture lacking bifacial stone tools is stratigraphically superimposed on levels which have produced bifacially flaked artifacts. This occurs first at Trail Creek by approximately 10,000 B.P. and later at Onion Portage between 9,500 and 8,000 B.P.

The above mentioned four sites are all restricted to the coastal areas of Alaska while both the Denali Complex and the Chindadn assemblage from the lowest levels at Healy Lake contain bifacial stone tools. The Denali Complex may very well not be of Late Wisconsin age, but the Chindadn assemblage is well dated and demonstrates a well developed bifacial stone technology. Thus the coastal areas of Alaska demonstrate several sites which lack bifacial stone tools during Late Wisconsin times while the Alaskan interior was inhabitad by a people who manufactured bifacial stone tools. This significant technological difference in two geographical and ecological areas is also significant that it strongly implies that Alaska was occupied by at least two distinct cultural groups during Late Wisconsin times.

Locality I A

This area is located in the extreme northeastern squares of Locality I and represents an intrusive element into Locality I. The artifacts have been manufactured from a fine-grained grey chert and have without exeption been pressure flaked. None were found deeper than three inches below the surface while the core and blade material from Locality I ranged as deep as ten inches. The artifacts do not demonstrate any evidence of weathering; nor have they been damaged by frost action. The flake distribution of type four (Figure 6) can be attributed to this locality.

Only four artifacts of any significance were recovered from this area and they were: the base of a stemmed point, the base of an end blade, the tip of a point and a complete drill. The point base is thin and tends slightly toward concavity on the sides of the stem, but this is not great enough to consider it notched. The point tip and the base of the end blade, as well as the other two artifacts from the locality, have been collaterally flaked and trend toward oblique flaking in some instances. In general, the artifacts from this area demonstrate similarity to those from Locality II, although the drill from Locality I A is thicker than those recovered from Locality II.

One radiocarbon sample was dated from this locality and indicates that I A was occupied approximately 2,600 B.P.

No hearth was evident and the fire had been built directly on the former ground surface. This intrusive element into Locality I most probably represents merely a brief camp, and, apparently, the period of occupation was extremely short. No evidence of a core and blade technology is associated with it, nor are burins or burin spalls present.

Locality II

This area is located approximately one hundred feet southeast from Locality I and is not visible from I because the crest of the knoll rises between them. The artifacts have been manufactured from fine-grained cherts, and bear no similarity to those from Locality I. The artifact distribution for Locality II has been mapped and is illustrated in Figure 29.

Flakes

The distribution of type one (Coarse grained black chert) has been mapped by quadrants and is illustrated in Figure 24. Comparing the distribution with that of Locality I, there are fewer flakes of coarse grained black chert and they tend to be somewhat smaller. Their distribution is almost entirely restricted to the northern half of Locality II.

The major significance of mudstone (Type 2) in Locality II is that it is almost nonexistent. Only two flakes of this material appear here (Figure 25) as opposed to 5,254 in Locality I. This sharp transition in the type of stone used as raw material for the manufacture of tools may well be an important time indicator.

Material type three (white glassy chert) is more common to Locality II than in I. Eighty-three flakes were recovered from II and only eleven from I. Once again this is significant in that it demonstrates a shift to a much higher grade material type than was used in Locality I.

Glassy grey chert (type 4) is fairly evenly distributed througout Locality II. It appears in the northeast area of Locality I and can be considered to be remnants from the occupation of Locality I A. This material type enjoyed a prominent position in the inventory of raw material during the time when Locality II was occupied.

Type 5 (glassy black chert) is by far the most common type encountered in Locality II. It is most heavily concentrated in the northern half of this area, although it does make a fair showing throughout the excavated squares. As can also be noted from the distribution, the flakes of this material tend to be very small. This distribution is illustrated in Figure 28.

When comparing the waste flakes in Locality II with those from I several striking differences become apparent. There are not only fewer flakes in II but they are much smaller as well. They are pressure flakes of fine-grained cherts as opposed to the dominant percussion flakes of mudstone in Locality I. This drastic difference in raw material is probably attributable to the fact that Locality II was

Figure 24

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT (IN GRAMS)

MATERIAL TYPE—(1)

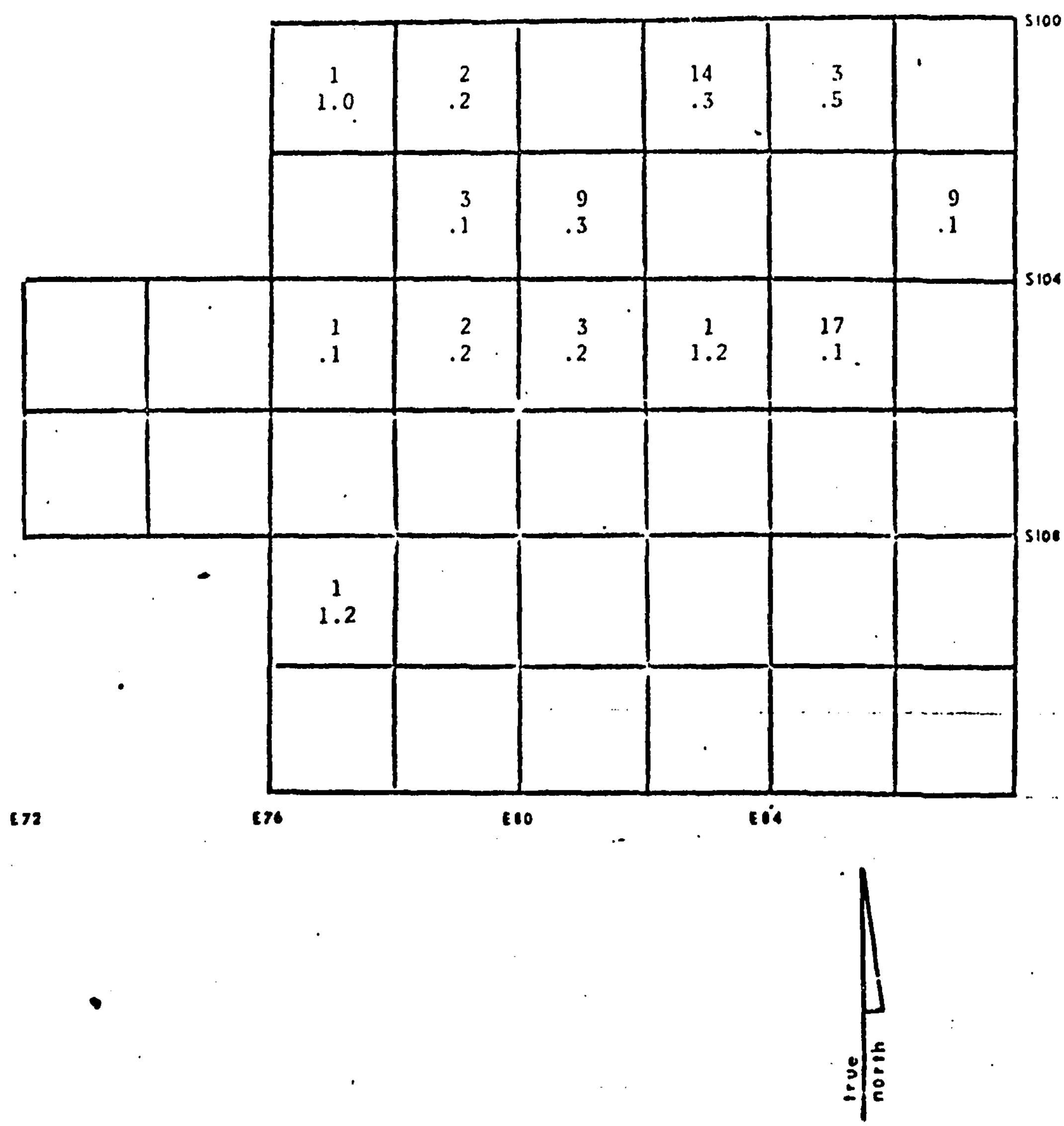


Figure 25

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT (IN GRAMS)

MATERIAL TYPE—(2)

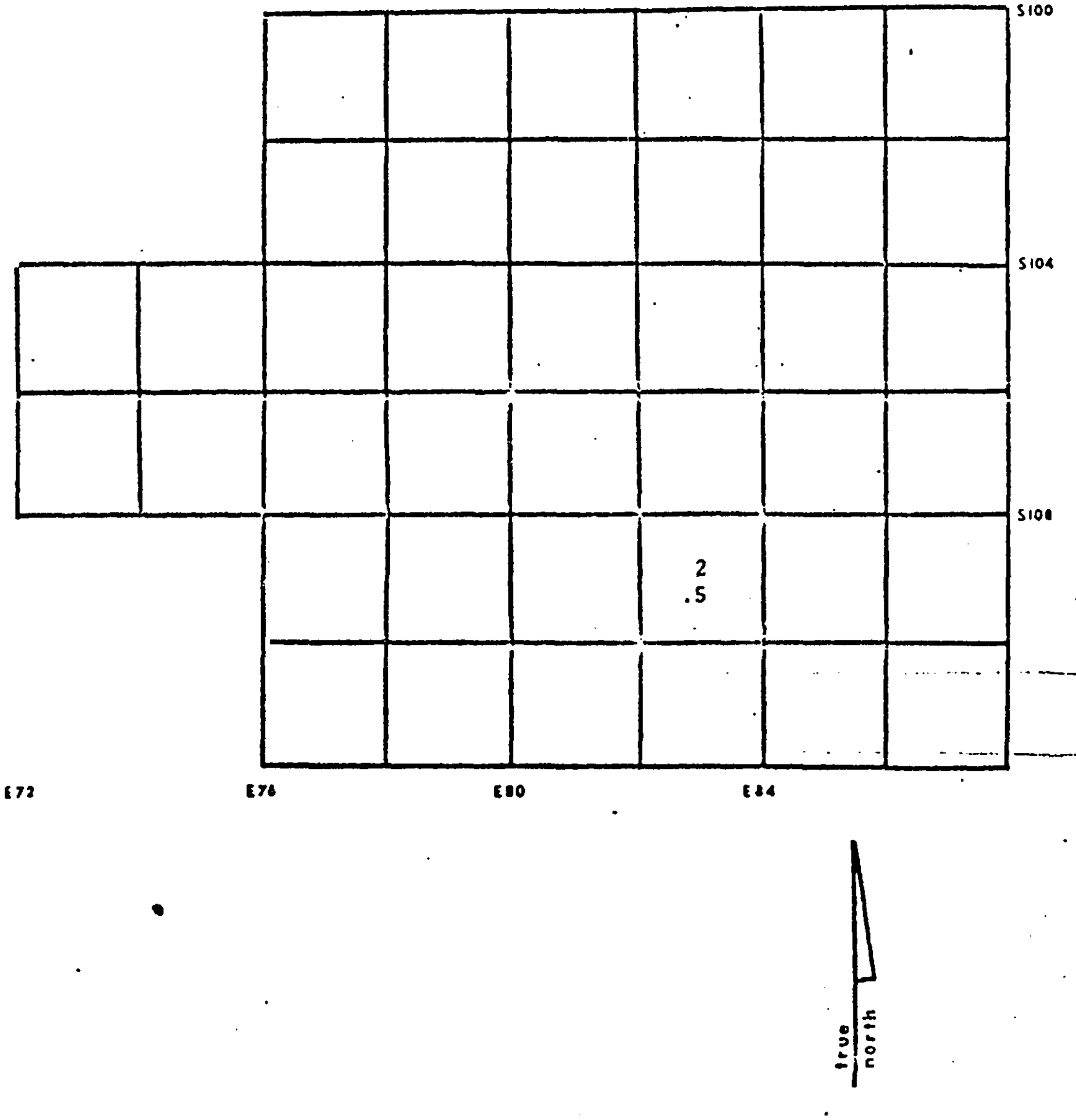


Figure 26

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT
(IN GRAMS)

MATERIAL TYPE—(3)

		4 .1	5 .1				
		11 .1	3 .1	2 .9			1 .2
2 .1	2 .1		4 .1		5 .3		
10 .1		6 .1		20 .1			
		7 .1	4 .1				
		3 .1	3 .1			1 .1	

S100 S104 S108

E72 E76 E80 E84

Figure 27

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT (IN GRAMS)

MATERIAL TYPE—(4)

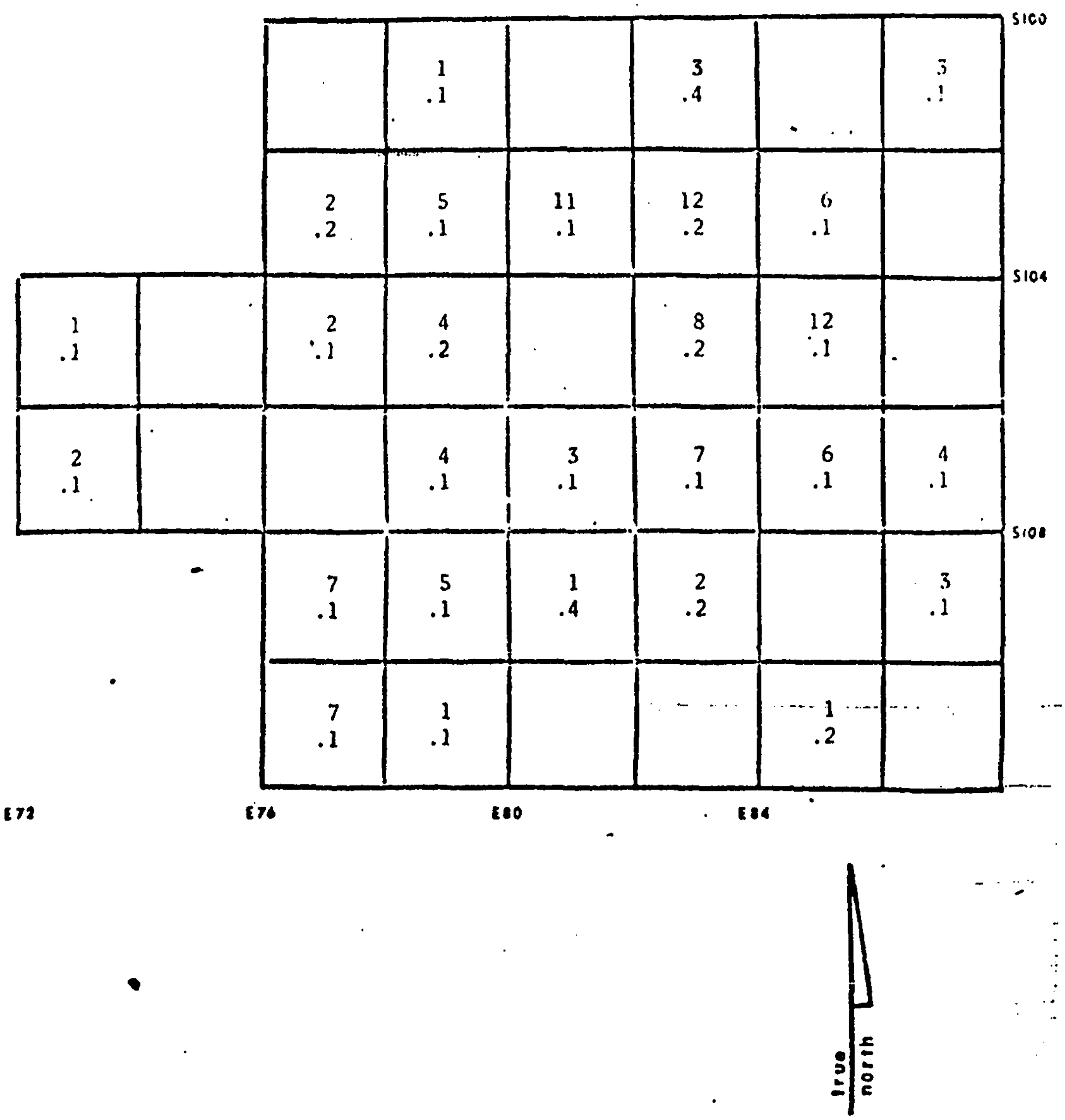


Figure 28

FLAKE DISTRIBUTION MAP

FREQUENCY AND MEAN WEIGHT (IN GRAMS)

MATERIAL TYPE—(5)

	E72		E76		E80		E84	
S100			4 .1	17 .1	21 .1	64 .2	1 .5	7 .7
			22 .1	177 .1	194 .1	55 .2	13 .1	6 .1
S104			3 .1	4 .1	1 .1	6 .1	6 .1	5 1.2
	3 .1		2 .2	8 .2	29 .1	19 .1	6 .1	11 .1
S108			2 .2	3 .1		2 .1		1 .3
			1 .1	3 .1	1 .1			

occupied later than Locality I, and that the production of bifacial stone tools was of extreme importance.

Retouched Flakes

Twenty retouched flakes were recovered from Locality II. Only four of these are significant enough to describe beyond the fact that they contain unifacial use retouch along their margins. The distribution of retouched flakes can be seen in Figure 29.

Three of the four retouched flakes worthy of mention have been manufactured from fine grained black chert. The largest is 4,o cm. in length and the smallest, which is only a fragment is 2,2 cm. long. They resemble platform flakes in that they possess what appear to be facets along their margins; yet if these were truly rejuvenation flakes, the angle between the facets and the flat surface comparable to a platform would have to be much steeper. They also lack the crushing or battering which is common of most platform flakes. It is possible that they could have been struck from the distal end of a blade core but this seems highly unlikely, for no blades were recovered from Locality II.

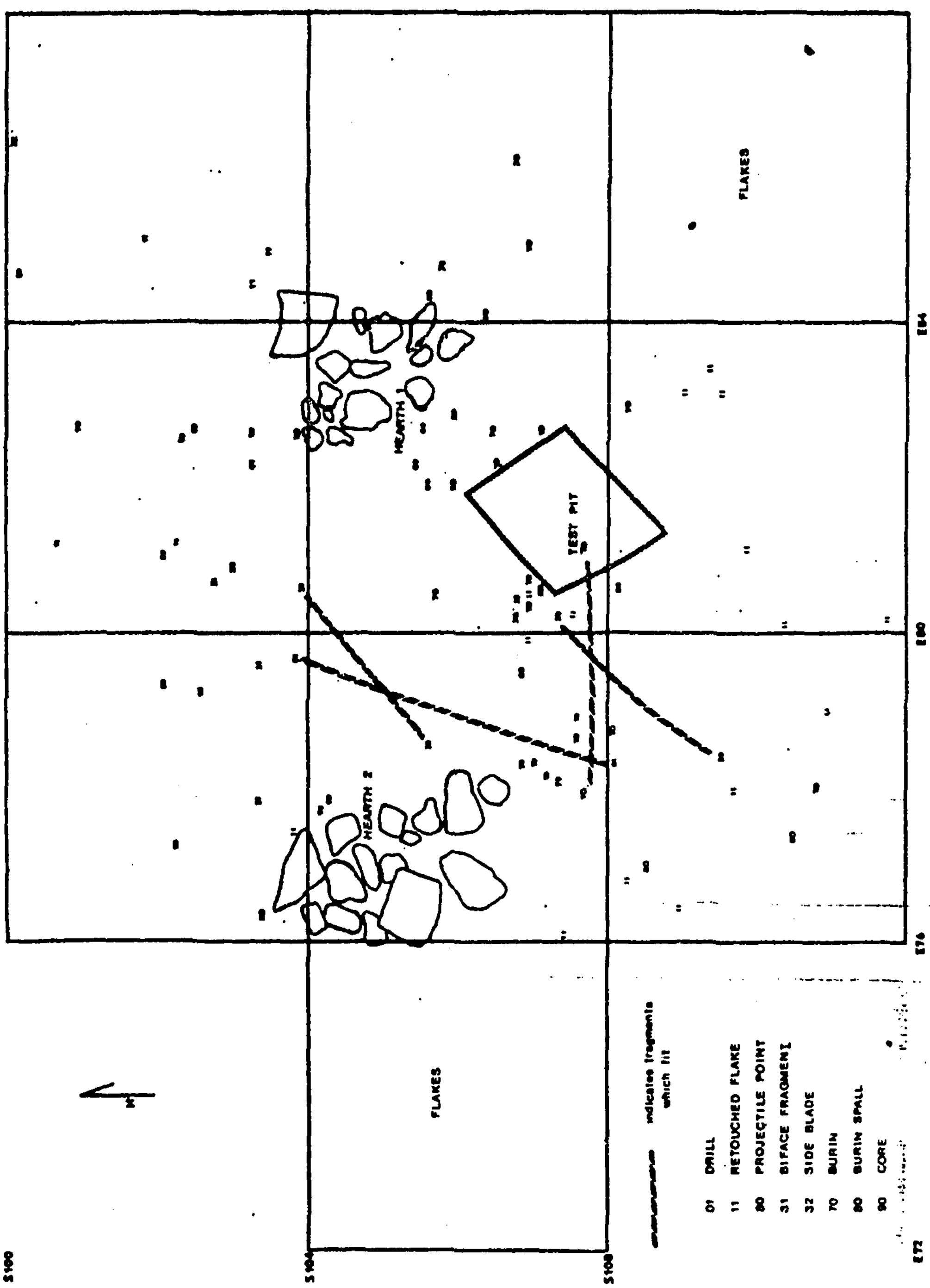


FIGURE 29 ARTIFACT DISTRIBUTION — LOCALITY 2

Unifacial Knife

Only one unifacial knife was found and it is 5,9 cm. long. The general form suggests that it may have been manufactured from a large blade, although flaking has almost completely destroyed the original dorsal surface making it impossible to determine its original form.

It is made from fine grained black chert and has been serrated at the proximal end; the edges are extremely sharp. The point is much duller than the base and it is possible that it was at one time hafted, thus explaining different degrees of sharpness between the two ends. If the "stemmed" portion had been inserted in a handle shortly after manufacture it may not have been dulled and later decomposition could have destroyed all trace of the assumed handle. Whatever the case, the pointed end of the knife shows extensive wear while the stemmed portion shows very little, although it does demonstrate fine secondary retouch.

Burin spalls

Seventeen burin spalls and spall fragments were recovered from Locality II. Only seven of these were complete. Four of the fragments and one complete spall have been recognized as burin spall artifacts; three have been manufactured from black chert and the remaining two from grey chert.

The one complete spall of grey chert is 1,1 cm. in length, .3cm. wide and . 1 cm. thick and demonstrates fine retouch on its distal end. It may have been inset and used as a graver. The second grey chert specimen is a secondary spall and may have received its retouch prior to removal. It is the distal fragment of a spall and shows fine retouch along what would have been the outer surface of the parent burin. The delicate retouch along this margin suggests that it was done after removal of the spall, but it is impossible to be absolutely sure.

Two of the remaining three black chert fragments fit and form a complete spall. This complete spall shows nothing more than use retouch and has not been deliberately fashioned into any particular artifact. It may very well be that it was broken in use. The third piece is a distal fragment and shows only use retouch.

Burins

The burins represented in the collection have been recognized solely on the basis of the technique of their manufacture. This has been done to avoid the possible confusion which would result if criteria relating to function were employed to distinguish this artifact category from other types. Relying on a purely functional approach would most certainly lead to much confusion, for almost every artifact type from retouched flakes to projectile points could conceivably be used for graving, incising, or the innumerable other functions which have been attributed to burins. Although these artifacts have been recognized solely on the basis of the technique of their manufacture, a comprehensive functional analysis is also being performed but is not yet complete.

The diagnostic attribute in recognizing burins is the burin facet, which is distinguishable by the negative bulb present at the proximal end of the facet. This appears as a long, narrow, flake scar located on the edges of the parent flake. It is the orientation of these facets which has dictated the following classification. To establish uniformity in examining the specimens all were referenced according to their long axis with the dorsal surface of the parent flake facing the viewer. In Plate 7 the proximal end of the facets have been oriented at the top of the page, and when multifaceted pieces have been encountered, the end of the parent flake which demonstrates the greatest number of facets has been oriented upward.

The major types established under this class are lateral, bilateral, dihedral, transverse, and polyhedral. Each of these types have a number of subtypes which further define variations which exist on individual specimens within each type. To more clearly describe and order the types and subtypes, a list follows with accompanying definitions for their morphological typology.

I. Lateral -- facet parallels the long axis of the parent flake

   a. Right Lateral -- facet located on the right side of the parent flake from viewer's point of reference
   b. Left Lateral -- facet located on the left side of the parent flake from the viewer's point of reference.

c. Right Opposing Lateral -- two or more facets located on the right side of the parent flake which have been struck from the opposite ends from the viewer's point of reference.
d. Left Opposing Lateral -- two or more facets located on the left side of the parent flake which have been struck from opposite ends from the viewer's point of reference.

II. Bilateral -- facets parallel to the long axis of the parent flake which have been struck in the same direction on both the right and left edges.

a. Right Opposing Bilateral -- one or more facets on both sides of theparent with an opposing facet on the right side.
b. Left Opposing Bilateral -- one or more facets on both sides of the parent with an opposing facet on the left side.

III. Dihedral -- one or more facets on both sides of the parent which have been struck in the same direction and which extend outward from the center at approximately forty-five degree angles.

a. Opposing Dihedral -- one or more facets on both sides of the parent flake which have been struck in opposite directions and which the distal ends of the opposing facets meet.
b. Right Opposing Dihedral -- one or more facets on both top and bottom of the parent which have been struck in opposite directions and which the distal ends of the opposing facets meet.

IV. Transverse -- facet runs at right angles to the long axis of the parent flake.

a. Right Transverse -- proximal end of the facet located on the right side of the parent and runs at right angles to the long axis of the parent.
b. Left Transverse -- proximal end of the facet located on the left side of the parent and runs at right angles to the long axis of the parent.
c. Right Transverse with Right Opposing Lateral -- attributes of IVa and Ic combined.
d. Right Transverse with Left Lateral -- attributes of IVa and Ib combined.

V. Polyhedral -- multifaceted pieces on which the facets are not restricted solely to the edges of the parent flake but which appear on either or both faces -- grading into cores.

As can be readily noted in Plate 7, there are almost no two burins of the same type. Nevertheless, most all do fall into the same relative size range and tend to have more than one facet. All have been manufactured from fine grained cherts; some of which are rather exotic and are not present in the waste flake collection or elsewhere in the site.

There are a total of twenty-two complete burins and one fragment from Locality II, a number which far exceeds the number of burin spalls and spall fragments. This implies that the production of burins at the site was not heavily emphasized and that more were carried to the site than were manufactured there. Also of interest is the fact that to date, none of the spalls can be matched to any of the burins. Both these facts coupled with the fact that many are made from parent flakes of rather exotic raw material., suggest that burins were transported from place to place and not readily discarded.

Another important attribute is notching. Fifteen of the twenty-two specimens demonstrate notches or at least purposefully flaked concavities. Generally, although not always, they appear at the proximal end of the burin facet. They may have served as platforms from which the spalls were struck and possibly as deliberately fashioned notches created for working bone or wood. The fact that not all occur at the proximal end of the facet implies that they were deliberately fashioned for reasons other than service as a platform. Use retouch is generally concentrated around the proximal end and lateral margins of the burin facets.

One artifact has been typed a polyhedral burin, but may very well be a microblade core. Eight individual facets can be recognized on the piece and they extend well on to the face of the specimen and are not restricted to the edge. No notch or use retouch is evident on the piece and the margins of the platforms demonstrate crushing or battering which is common of many core platforms. Because no microblades were recovered from this Locality it has been included in the burin typology, but typing it on the basis of negative evidence may be misleading.

Cores

Two cores were found in Locality II. One is of grey chert and the other of black chert and both have been exhausted. Surprising as it may seem, neither are blade or microblade cores.

The black chert core is 3,0 cm. long and has had flakes struck from three different directions. The flakes removed from it may have been somewhat bladelike, but the flake scars indicate that they were extremely wide in relation to their length and rather irregular. No use retouch is evident on the piece.

The grey chert core has been fractured and consists of two fragments. One of the pieces was flaked after it was broken, but the two pieces can still be fitted together. Irregular flakes have been struck from it in a somewhat random manner, but two striking platforms which existed before the artifact was broken are evident. They opposed each other and were on opposite faces of the core, and it is possible that before the core became so diminished it was somewhat discoidal. When the two fragments are fitted the piece measures 5,8 cm. by 4,4 cm. Some use retouch is evident on one margin but is extremely minor.

Drills

Three drill fragments were recovered from this locality; all are fashioned from black chert. As can be seen in Figure 29 two of the fragments fit, and when the artifact was restored it measured 3,2 cm. in length and is .3 cm. thick and 1,4 cm. wide where the bit widens into the shank. The flaking on this specimen tends to be parallel, oblique but is, nevertheless, somewhat irregular.

The remaining fragment is merely a bit which has been snapped where it joined the shank. It measures 2,4 cm. in length and has been only marginally retouched. Because the retouch does not extend beyond the margins, both the dorsal and ventral surfaces of the parent have survived. A single ridge runs the full length of the dorsal surface and the flat aereas on either side tend to be somewhat concave. This hints that the drill may have been manufactured from a microblade, but not enough of the original parent has survived to be sure. The width and thickness of this artifact at the point of fracture , 1,0 and .3 cm. respectively.

Side blades

Two side blades are present in the collection. One is of grey chert and the other of black chert. Both specimens are similar in that they each have had the extreme tips of both ends snapped off. It seems likely that this was done for inset purposes.

The grey chert side blade is 2,1 cm.long, 1,0 cm.wide and .2 cm. thick. It demonstrates fine secondary retouch along both margins and tends to parallel oblique flaking.

The black chert side blade has been irregularly flaked and is larger than the example previously described. It is 2,2 cm. in length 1,2 cm.wide and .3 cm. thick. Both artifacts can be seen in Plate 8.

Projectile points

Eleven projectile point fragments were recovered from Locality II. Not one complete point was found, although several bases are present. Two of the fragments fit together, but even when restored do not constitute a complete point.

The two fragments which fit form an almost complete grey chert and blade demonstrating parallel oblique flake scars on both surfaces. Only the extreme tip of the artifact is missing, and without the tip it measures 2,1 cm.in length, maximum width of 1,0 cm. and is .2 cm. thick. It possesses fine secondary retouch along its margins but is not serrated.. It is illustrated in Plate 8 along with the other projectile point fragments and side blades.

The bases of two stemmed points, both manufactured from black chert, were also found, although there is some question as to whether one of the bases is actually a knife or point fragment. The tip is missing and one side of the stem has two small notches. It is not shouldered as the other point base is and, as it begins to taper toward its tip, it begins to curve sharply; suggesting that the point has been assymetrical or possibly even rounded. The notches on one side of the stem suggest that it may have been hafted to a handle.

The other stemmed point also has a missing tip. It is 2,8 cm.long, .4 cm.thick and 1,7 cm. wide. Width and thickness measurements were taken at the shoulders, which are far more prominent than those present on the previously described artifact. The stem tapers only slightly. Both these artifacts have been irregularly flaked.

The medial sections of three points are also present; two are fashioned from grey chert and one from black chert. Two of them are so small that it is even difficult to assess the flaking characteristics. All three appear to possess irregular flaking.

Four point tips were recovered; two of black chert, one of grey chert, and one of grey-white milky chert. The grey-milkyand one of the black tips both demonstrate parallel oblique flaking and the remaining are characterized by irregular flake scars. Little more can be said about these fragments without the diagnostic bases.

Bifaces and Biface fragments

Nine biface fragments have been recognized from this locality. Once again only two of these fragments can be fitted and they form a large point or point blank of grey chert which measures 4,0 cm. in length, 3,3 cm. maximum width and .6 cm. maximum thickness. The artifact exhibits no secondary retouch, is leaf shaped, and has a straight base. If this artifact is indeed a point blank, it may very well have broken during manufacture, and the fact that it differs drastically from the other points and point fragments not only in size but in the lack of secondary retouch also supports this point of view.

Another large biface fragment manufactured from the same grey chert consists merely of the tip. It is 2,3 cm.long, 2,7 cm.wide, and has a maximum thickness of .7 cm. There is little more that can be said about it other than the fact that it has been irregularly flaked.

A small biface fragment of black chert resembles a rounded point tip or the tang of a notched point. It is so small thaf very little can be said about it, for it is .9 cm. by .5 cm.

The remaining five biface fragments are illustrated in Plate 9. They are of interest because they are all very similar, for all are hinge fractured slivers derived from the very edges of bifaces. They are very definitely not burin spalls, for they all exhibit very prominent hinge fractures which invariably parallel their long axis.

They range in length from 1,0 to 2,1 cm. and from .1 to .4 cm. in thickness. It is plausible that they represent the remnants of side blades which were broken. The broken fragments have been discarded or left in the shafts, which later decomposed leaving only the side blade fragments to testify to their existence.

Summary and discussion of Locality II

As can be seen in Figure 29, two hearths were located within the excavated squares. They consisted of little more than a few flat stones placed directly on the ground surface upon which the fires were built. The two radiocarbon samples which have not been discounted from Hearth 1 indicate that the occupation took place sometime between 2,970 and 2,765 B.P. No evidence of a tent ring or other structure was found, although the artifact distribution forms a circular pattern.

This locality was apparently used as a brief hunting camp. Because it is located on the south side of the kame, the occupation may very well have taken place during the spring for at that time of the year caribou approach the site from the south. The numerous artifact fragments imply a considerable amount of hunting activity.

Although Hearth 2 has not been dated, it seems probable that Locality II represents a single period of occupation. Two major artifact concentrations can be noted, one in the northern and another in the southern portion of the locality. It can also be readily seen that artifact fragments can be fitted with others from both these concentrations. There is also no typological or stratigraphic differences between the two concentrations.

Both the drill frugment and the polyhedral burin hint of a blade technology but no indisputable microblades or microblade cores were recovered. It appears that although there existed a strong burin technology, microblade production was rare if at all present. The burins are morphologically diverse and no "type" burin can be identified, although the parent flakes from which they were manufactured all fall into fairly consistant size range.

That the site is within the Eskimo cultural continuum is apparent because side blades, the end blade, Norton-like drills, and the unifacial knife, all bear strong resemblances to archeological finds from the coastal areas of Alaska and Canada during the same time period. Choris is the last appearance of a burin technology on the

Alaskan coast and is also lacking microblades. The Choris site also lacks type burins and many times they are manufactured on bifaces and biface fragments. Often they also possess deliberately flaked concavities similar to those at Locality II (Giddings, 1957 : 128-29, 1967.)

During the late pre-Dorset horizon in eastern Canada sites are often found to possess diverse burin type and lack microblades. Later in Dorset culture microblades once again become an important part of the tool kit (Jørgen Meldgaard, 1972: verbal communication). Although pre-Dorset and Choris cultures are roughly contemporaneous, microblades are not revived in the western arctic. Locality II cannot be considered pre-Dorset; nor can it be called Choris, but it does show a strong relationship to both.

Typologically and geographically it falls somewhere between both. It is of the same general time period and is not extremely different than what might be expected considering its geographical position and noncoastal orientation. Why the microblade technology dies in the western arctic, as does the burin technique shortly thereafter is a question yet to be answered. Nevertheless, Locality II may be considered part of this pan Eskimo culture occupying all of arctic North America during this time period which is engaged in comparatively rapid technological change.

Discussion

As has been demonstrated by the foregoing presentation, the Gallagher Flint Station possesses three distinct localities which are spacially, temporally and typologically distinct. Although Locality I does possess an intrusive element it has been shown that this is not contemperaneous with the unifacial core and blade industry on the basis of stratigraphic position, radiocarbon chronology, and typological considerations. Artifacts from Locality I and I A are clearly distinguished from one another. In short, there can be little doubt of the existence of a unifacial core and blade industry existing on the North Slope of Arctic Alaska sometime around 10,590 radiocarbon years B.P.

In order to gain an understanding of what the life of these early inhabitants of the arctic must have been like it is necessary to obtain an understanding of the environmental conditions which existed during their occupation of the North Slope. This information is valuable in reconstructing economic patterns which in themselves are limiting factors of population density and settlement patterns. It has been well established that during the late Wisconsin the Arctic Ocean was completely frozen. Bryson and Wendland have stated regarding the period between 13,000 and 10,000 years ago that, "In winter the continental glacier must have been a barrier holding the very cold, low level Arctic air in the Arctic Basin, forcing outbreaks of true Arctic air to be through the Bering Sea and the North Atlantic." .... "It is inconceivable in this circumstance that the Arctic Ocean should have been ice-free or even partially open" (Bryson and Wendland, 1969 : 284). Other authors are in full agreement that the Arctic Ocean represented a solid ice mass during late Wisconsin times (Colinvaux, 1967, Laughlin, 1967, Scheffer, 1967) and this consequently rules out any possibility that open salt water was accesable to the earliest inhabitants of the Gallagher Flint Station.

Although there is some difference of opinion as to what time the Bering Land Bridge was severed, Hopkins states,"A rapid rise in sea level drowned the Bering Bridge for the last time about 10,000 years ago and isolated St.Lawrence Island from the mainland soon afterward (Hopkins 1967 : 465)". Hopkins also speculates that connections with Siberia were briefly severed 14,000 years ago, reestablished 13,000 years ago, severed again about 12,000 years ago, and finally reestablished for the last time about 11,000 years ago (Hopkins, 1967 : 464-5). On the basis of Hopkin's data it seems reasonable to assume that during the Locality I occupation of the Gallagher Flint Station that there existed a land connection between Asia and North America.

"The pollen record suggests that the Bering Strait region has never supported forest, from one time in the interglacial interval that preceded the Illinoian Glaciation until the present". (Colinvaux, 1967 : 228). " A three-zone pollen chronology has been established for the region surrounding the central Brooks Range in northern Alaska. The oldest of these zones, characterized by herbaceous tundra vegetation appears to be contemporary with the Eschooka glaciation". (Livingstone, 1955 : 599). As has already been mentioned elsewhere in this thesis, the Eschooka has been correlated to the Anivik Lake advance in Anaktuvuk Pass by Porter, and this coupled with radiocarbon dates from a pollen core near Umiat and correlated to Zone I at Chandler Lake by Livingstone represents a period of herbaceous tundra occupying the North Slope some 7,000 or 8,000 years ago (Colinvaux,1967, Livingstone, 1957, Porter, 1964 a). Colinvaux summerizing a pollen record collected by the Cold Regions Research and Engineering Laboratory near Pt.Barrow states:

> The sample from 9,500 years ago includes no alder pollen At this data there was apparently no alder in the arctic foothills. Older samples, from as far back as 25,000 years ago,have no significant alder content, and also lack birch. These spectra are even more "herbaceous" than those of the Chandler Lake zone I. They represent an herbaceous tundra that was far more remote from the nearest alders and dwarf birches than was Chandler Lake at any time in Livingstone's records. The radiocarbon dates show that such a tundra prevailed on the arctic coastal plain during the time of the "classical" Wisconsin Glaciation (Colinvaux, 1967 : 215).

The surface of the land bridge has been described as "a flat -to-slightly-undulating tundra plain whose primary plant constituents were lowland species - cottongrass, sedges, grasses, and moisture tolerant herbs and low shrubs" (Johnson and Packer, 1967 : 263). From the preceeding information it is feasible to reconstruct to a large degree the geography which existed during the occupation of Locality I at the Gallagher Flint Station. An undulating tundra plain streched from Siberia to Alaska and was bordered on the north by a solid ice mass. Wood was scarce at best and existed only in the form of small shrubs which were probably altogether absent along the northern portion of the land bridge.

This reconstruction places serious limitations upon the economic resources available to the inhabitants of the region and to a large degree dictates much of their life pattern as well as technological development. Owing to the severity of the climate, vegetable products must have necessairly comprised an almost negligable portion of the diet. Fish may have contributed only slightly to the economy, for we may be fairly certain that annual runs of various species such as char did not occur during this period because of the frozen state of the Arctic Ocean. Marine mammal exploitation can also be ruled out for this same reason. Only the hunting of large land mammals could possibly have sustained a human population under these severe conditions, and if man is to survive by hunting large herbivores he must be well adapted to their range and habits.

Large herbivores must constantly be on the move to new grazing land and men hunting these animals must move with them, or more properly ahead of them, in order to intercept the animals. What species were hunted at the Gallagher Flint Station is not known, for no faunal remains were discovered from the site. Nevertheless, we may assume that whatever species were the quarry of these early hunters, they did not permit man the luxury of permanent settlements.

We know by analogy with modern arctic hunters that a large territory is necessary to sustain comparatively small populations and that these hunters must move readily in order to exploit the far flung resources of their territory. On the basis of this information it seems reasonable to speculate that the occupants of the Gallagher Flint Station are representatives of a culture which consisted of small bands of migratory hunters. They must have necessarily relied on some portable form of dwelling due to the severity of the climate and the nature of subsistance activities.

The artifact inventory from Locality I is extremely disturbing if one is to regard these peoples strictly as a hunting population. There exists no projectile points, knives, or other impliments which must necessarily be present in the tool inventory of hunters. Cores, blades and waste flakes in themselves do not constitute enough of the matrial culture to enable man to successfully hunt large land mammals and thus insure survival under such harsh conditions.

The only possible explanation for this paucity of material remains is that they consisted largely of perishable materials which have not been preserved in the archeological record. Because of the absence of wood on the north slope during the late Wisconsin, the only remaining resource from which artifacts can be manufactured is the bone, ivory, skin, and sinue of animals. On these grounds it therefore does not seem unreasonable to postulate that we are dealing with an essentially Aurignacoid industry which lacked bifacial stone points and possessed a rich bone artifact inventory which due to the circumstances of nature has not survived to the present day. Müller-Beck provides valuable insights into the origin and nature of this Aurignacoid culture.

> Toward the end of middle Late Pleistocene, the industries with stone projectile points were replaced in many areas of Europe by locally differing aspects of industries close to the classical Aurignacian. . . Typical of all these Aurignacian industries - in reality theearliest aspect of a long and locally distinct technological tradition that might be called Aurignacoid to set it apart from Mousteroid - are bone points with split bases. The percentage of blade tools is relatively high, the bone working technique is markedly improved, and the first well-worked figurines appear (Riek, 1934). It seems that the early Aurignacoid technology spread rapidly toward the west, at least partially as a true migration (Müller-Beck,1961), and formed in southern France the classical Aurignacian (Sonneville-Bordes, 1960) . . .
>
> With the beginning of the late part of the Late Pleistocene more developed Aurignacoid industries were established in most of the open plain areas in the European lowlands as well as

> on the loess steppes. The Pavlovian industry, which belongs to this complex, is well dated and stratified in southern Moravia and neighboring areas (Klíma,1961). The two best known sites are the Pavlov (Pollau) site and the near by Dolni Vestonice site, both situated in the solifluction layer that postdates the climatic oscillations mentioned above. Pavlov has yielded a radiocarbon date of 25,020 ± 150 years (GrN-1325) B.P. and DolníVestonice a date of 25,820 ± 170 years (GrN-1286) B.P. (Klíma,1963)...
>
> I must emphasize, however, that bifacially retouched stone projectile points were produced and used even during the late part of the Late Pleistocene, especially in areas of less severe climate (Müller-Beck, 1966), such as some parts of southern France, some areas in southern Russia, and locally in Hungary and probably even in the southern part of Central Siberia. But the influence of generally Aurignacoid technologies is evident in all of these regions, even though the local industries differ from one another in many aspects and evidently were no longer in contact with one another. (Müller-Beck, 1967 : 387-90).

Having thus defined the area and character of this early Aurignacoid industry, Müller-Beck goes on to state that, "During the part of the Late Pleistocene that can be documented by dated archaeological remains, there is no doubt that Siberia was technologically an extension of the subarctic areas of Europe (Müller-Beck, 1967 : 391)". Müller-Beck continues his discussion by stating that this Aurignacoid industry continued to push eastward through Siberia and that we find the oldest manifestation of the technology in Alaska at the unifacial core and blade site of Anangula Island in the Aleutians. Through several other lines of reasoning he also states that this Aurignacoid diffusion or migration was necessarily preceeded by an earlier Mousteroid migration or diffusion into the new world which was characterized by bifacially retouched stone projectile points. "That the projectile point horizon of the northern Eurasian plains is definitely older than the classical Aurignacians as represented in the Vogelherd site is proved by stratigraphic superposition in several sites."(Müller-Beck, 1967 : 399).

Other authors have long seen a strong technological continuity in the circumpolar region. Helge Larsen has suggested the term Circumpolar Side Blade Tradition to encompass sites extending east from Scandinavia all the way to Greenland which have used microblades as insets in bone points. Later bifacially chipped side blades have replaced microblades as insets in some areas. A final stage of this tradition occurs in Eskimo culture (Larsen, 1968). "There is hardly any doubt about that there is a connection between these finds: in the first place, it is a composite impliment the manufacture of which presupposes the knowledge of the production of microblades from prepared cores and the making of the shafts and the grooves, the latter probably done with a burin. Secondly, it is significant that most of the finds mentioned are roughly on the same time level, that is contemporary with the European Mesolithic." (Larsen, 1968 : 338).

The use of microblades as insets in bone points is not an early trait of the "Aurignacoid" industries in Scandinavia, but represents a later addition to the existing bone points approximately 8,000 years ago. (Søren Andersen, personal communication, 1972). The earliest blade cores from the Scandinavian Mesolithic which date roughly 9,500 years ago have been used to produce broad irregular blades and the lithic artifact inventory of this Early Mesolithic material compares very well to that of Locality I at the Gallagher Flint Station. If we do indeed accept a diffusionist model it would appear that the use of microblades as insets in bone points is a comparatively late Aurignacoid trait.

Based on the statistical treatment discussed earlier in this thesis it is appearent that the blades from Locality I were not used as insets, for the b ades are not only too large for such purposes, but also demonstrate no pattern of selection for medial or other sections which would be expected if they were intended to be used as insets. If, as Larsen has suggested burins are indeed the tool necessary to produce the slots in the bone points into which the microblades are set, then the fact that no burins were recovered from Locality I at the Gallagher Flint Station may support this argument. The fact that the wedge shaped microblade cores or "handle-cores" become the standard core type in Scandinavia at the same time as microblades are used as insets in bone points is no coincidence. It may well be that the wide distribution of the wedge shaped cores in the Aurignacoid tradition hallmarks the advent of the use of microblades as insets in the already existing bone points of the Aurignacoid industry. Cores capable of producing blades which could be used as insets are extremely rare at the Gallagher site.

The oldest evidence, documented, of slotted bone points with microblade insets in Alaska is from Trail Creek Caves on the Seward Peninsula. These points are considered to be about 10,000 years old, for the level from which they were recovered was radiocarbon dated 9,070 ± 150 B.P. (Larsen, 1968 : 54). If the preceeding line of reasoning is correct, it may well be that the introduction of the technique of using microblades as insets in Alaska ocurred between 10,500 and 10,000 B.P. and possibly earlier in the western areas of the state.

The occurance of a bifacial point tradition in the interior of Alaska during a time horizon roughly comparable to that of Locality I at the Gallagher Flint Station has already been mentioned in this work. This bifacial technology present in the Alaskan interior may in fact represent a late phase of the Mousteroid tradition which Müller-Beck has theorized reached Alaska prior to the later Aurignacoid industry (Müller-Beck, 1967). It may very well be that the bifacially flaked stone point from the lowest level of Cave 2 at Trail Creek (Larsen, 1968 : 56) and the Akmak assemblage are in reality artifacts from this earlier Mousteroid migration or diffusion. It is quite probable that the bifacial tradition present in the lower levels at Healy Lake represents the "purest" early Mousteroid site, for it is apparently lacking the core and blade technology of other earlier Alaskan sites.

It is conceivable that when the Aurignacoid technology diffused to the interior populations of Alaska that it was incorporated with the then existing bifacial technology, thus giving rise to the "Bifacial Aurignacoid" of the interior of Alaska. On this basis the Bifacial Aurignacoid of the interior can be distinguished from the coastal Unifacial Aurignacoid at this early time horizon. A possible explanation as to why the bifacial technology was preserved in the interior of Alaska and not in the coastal areas such as Trail Creek is that wood was a readily accesible resource to peoples dwelling in the interior. Although the lithic tool kit of the coastal Unifacial Aurignacoid may have been readily adopted, the emphasis of the complex bone technology probably never reached the heights present in the more coastal areas because another fluid media was readily accessable. Consequently interior inhabitants did not have to rely as heavily on bone. This is a possible explanation as to why bone projectile points never completely replaced the bifacial stone projectile points of the interior. A similar situation is also noted by Müller-Beck in which peoples dwelling in more moderate climatic conditions retained the use of bifacial stone projectile points although at the same time demonstrating strong Aurignacoid traits. (Müller-Beck, 1967).

Bifacially flaked sideblades are a characteristic artifact of the coastal areas and can quite safely be regarded as artifacts of the Eskimo culture. If indeed, these bifacially flaked sideblades can be derived from the inset microblade tradition as Larsen has suggested, then we are dealing with a purely coastal trait, for the use of bifacially flaked sideblades has not been reported from the interior of Alaska. The presence or absence of these bifacial sideblades is probably excellent criteria in distinguishing between Indian and Eskimo populations during the late phases of the Alaskan Aurignacoid.

As Müller-Beck has pointed out, a characteristic of these early Aurignacoid cultures in Eurasia are bone points with split or bifurcated bases. (Müller-Beck, 1967 : 387). It is suggested here that the bone points recovered from Trail Creek possessing beveled, wedge shaped, bifurcated and conical bases are all an outgrowth of the original split based bone points of the early Eurasian Aurignacoid tradition. All these forms of bone points merely represent variations of the original bifurcated base hafting technique and could easily have been derived from the original split based bone points. The fact that various modifications of this same technique have enjoyed popularity during different periods of time is not at all surprising nor inconstant with the discussion presented. These same hafting techniques for bone points were present in both Eskimo and Aleut cultures up until historic times.

On the basis of the foregoing discussion it is quite reasonable to assume that Locality I at the Gallagher Flint Station represents an early migration or diffusion of the Aurignacoid culture into Alaska. This culture was a well adapted one to the harsh environmental conditions of a tundra biome which stieched from Alaska to Siberia and was bordered on the north by a solid ice mass.

These peoples most probably consisted of small bands of migratory land mammal hunters who possessed few, if any permanent settlements. It is quite probable that seasonally reoccupied camps existed, and skin tents were the major form of dwelling structure. Bone supplied the major raw material from which the tool kit was fashioned. Unifacial blades served as knives with which the bone artifacts were fashioned and animals skinned. These blades probably did not serve as insets in bone points. Wood was extremely rare in the cultural inventory.

To assume that the Gallagher Flint Station is the only Unifacial Aurignacoid site of its kind in Alaska is unrealistic, for obviously other similar sites exist on the North Slope and quite possibly on some of the remaining islands in the Bering Sea. There are two known sites which are technologically genetically connected ~~to~~ the Gallagher Flint Station. One is situated on the North Slope approximately 20 miles of the Gallagher Flint Station (Bacon, 1972) and the other is the unifacial core and blade site located on Anangula Island in the Aleutians. Although the unifacial core and blade site on the North Slope is as yet undated, the site on Anangula dates 8,400 years ago, thus placing it not only 2,000 years younger than the Gallagher Flint Station but over 1,000 miles away. As has been noted earlier in this paper, significent differences do exist between Anangula and the Gallagher Site, but this is only what might be reasonably expected because of their spacial and temporal differences. Laughlin's argument that hte site at Anangula is in the ancestoral line of the Aleut culture (Laughlin, 1967) seems perfectly reasonable and that adaptation to a marine oriented economy was well under way about 8,400 years ago seems well founded based on the geographic location of the site alone.

If a tecnologically genetic relationship does endeed exist between the Gallagher Flint Station and Anangula, some common ancestor must exist for both. It is suggested here that this ancestor is to be found in the large land mammal hunters which were well adapted to the conditions of the tundra biome and who originated in Eurasia at the end of the middle Late Pleistocene.

It has been well established that there is a strong linguistic relationship between Eskimo and Aleut and that the two languages are probably the descendants of an extremely similar linguistic stock (Swadesh, 1962). It therefore seems reasonable to assume that at some time in the past the artifact inventory of these two cultures should be similar, if not identical. Consequently it is conceivable that Anangula represents a settlement of descendats of an early Aurignacoid culture which was economically based on hunting large land mammals which had by 8,400 years ago already made great inroads to adapting to a marine economic base. At what time this marine adaptation began, and where it first began, pose questions which cannot be answered with our present state of knowledge, but it does not seem unlikely that it originated along the southern margin of the Bering Land Bridge where mammal resources would have been available earlier (Laughlin, 1967).

Quite possibly when land connections between Alaska and Siberia were severed for the last time about 10,000 years ago and the large open herbaceous plain was gradually inundated by the sea, the Unifacial Aurignacoid big game hunters were forced to seek new

new resources in order to insure their survival. The fact that the large megafauna of the Pleistocene were engaged in the final throws of extinction may have also placed an even greater pressure on these early Aurignacoid hunters to seek out new economic resources. In fact, it may have been quite fortunate for the land bridge inhabitants that the sea made its appearance when it did, for it brought with it riches unknown to them at a time when it may have been crucial to their survival.

In short, the evidence seems to indicate that about 10,000 to 11,000 years ago an Aurignacoid culture occupied the area which is now the Bering Sea as well as parts of Alaska and Siberia. This culture was based on large land mammal hunting and gradually moved inland as the water advanced while adapting to a marine based economy with the flooding of the Land Bridge. If Hopkin's theory as to the rising and falling of sea level is correct, then these hunters may have first inhabited the area as early as 13,000 years ago. On the basis of this argument it does not seem unreasonable to assume that these peoples represent the ancestors both of the Aleut and Eskimo cultures. This conclusion is supported by linguistic evidence, and more importantly, by a high degree of technological continuity between this early Aurignacoid industry and archeological remains known to be within the Eskimo-Aleut continuum.

This model which has been proposed in itself necessitates an earlier migration or diffusion into the new world in order to explain the differences which exist between artifacts of the coastal Unifacial Aurignacoid as represented by the site on Anangula and the Gallagher site and the Bifacial Aurignacoid of the Alaskan interior which consists of the Akmak Horizon at Onion Portage, the Denali Complex, and the bifacial industry existing in the lower levels of Healy Lake. In order to explain the presents of bifacial stone points in the interior of Alaska during the same time horizon as the Unifacial Aurignacoid culture occupying the tundra of the Land Bridge, the roots of these interior cultures must be derived from an older migration of peoples into the new world, or at least an earlier period of diffusion.

This migration had to have taken place prior to 13,000 years ago, and possibly much earlier (Müller-Beck, 1967).

It is quite apparent that I have constructed a pyramid of assumptions and now that I am balancing precariously at the apex, I would like to stress that this thesis has only presented a theory based on what meager evidence is at hand. I do not feel that this presentation is iron clad in all its theoretical assumptions for some are reinforced with only small amounts of empirical data while others are virtually indisputable. Nevertheless, I do put forth a hypothesis which can be tested and one which can gain acceptance only through rigorous testing. Additional Unifacial Aurignacoid sites must be found in the coastal areas of Alaska and possibly on the islands in the Bering Sea. The bone tools which I have referred to as well as the faunal remains must be recovered in association with this unifacial core and blade industry before we can obtain a realistic picture of this as yet theoretical culture. Also our understanding of the climatic situation during this time will undoubtedly be refined as well as will the geological interpretations of the Bering Sea and the Land Bridge. In short, I would like to stress that there is a great deal of flexibility within the model which I have here attempted to construct.

PLATE 1
Range in Length of Blades

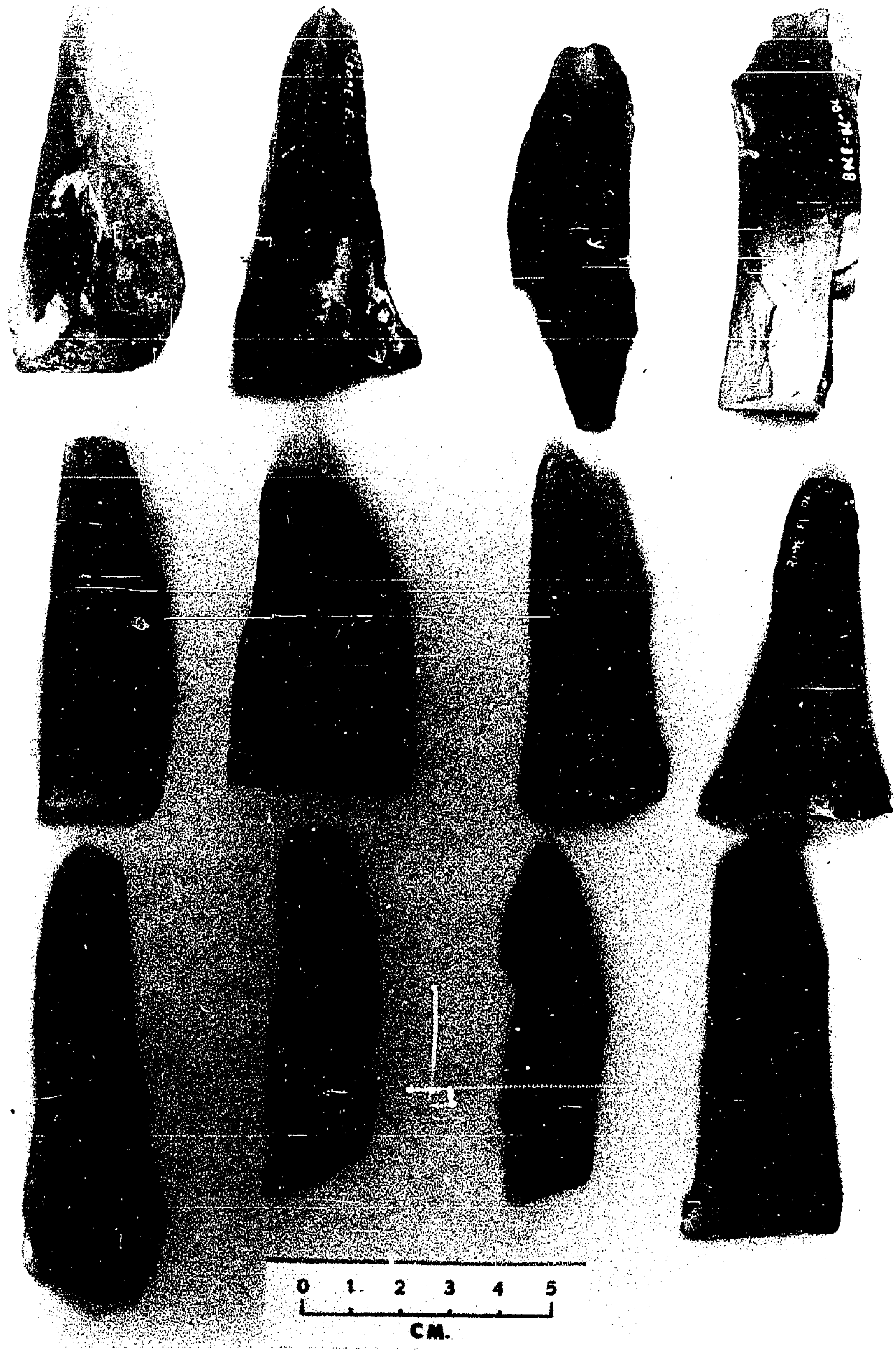


PLATE 2
Large Blades

PLATE 3
Variation in Blade Cores

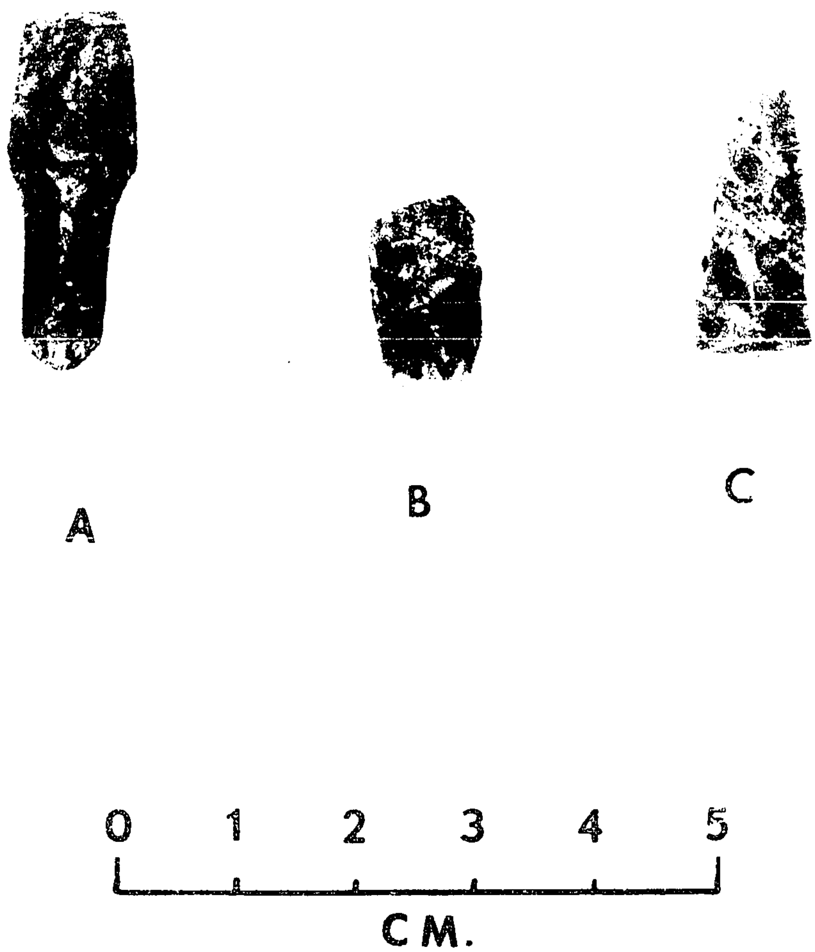


PLATE 4
Locality IA Artifacts

PLATE 5
Unifacial Knife, Dorsal View, Locality II

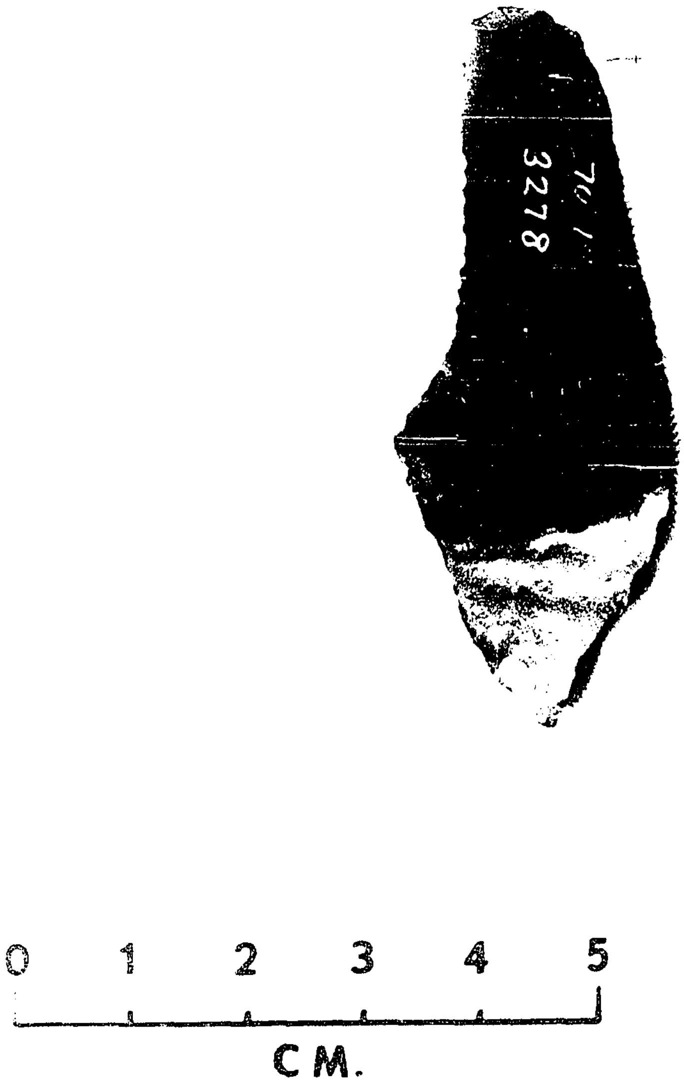


PLATE 6
Unifacial Knife, Ventral View, Locality II

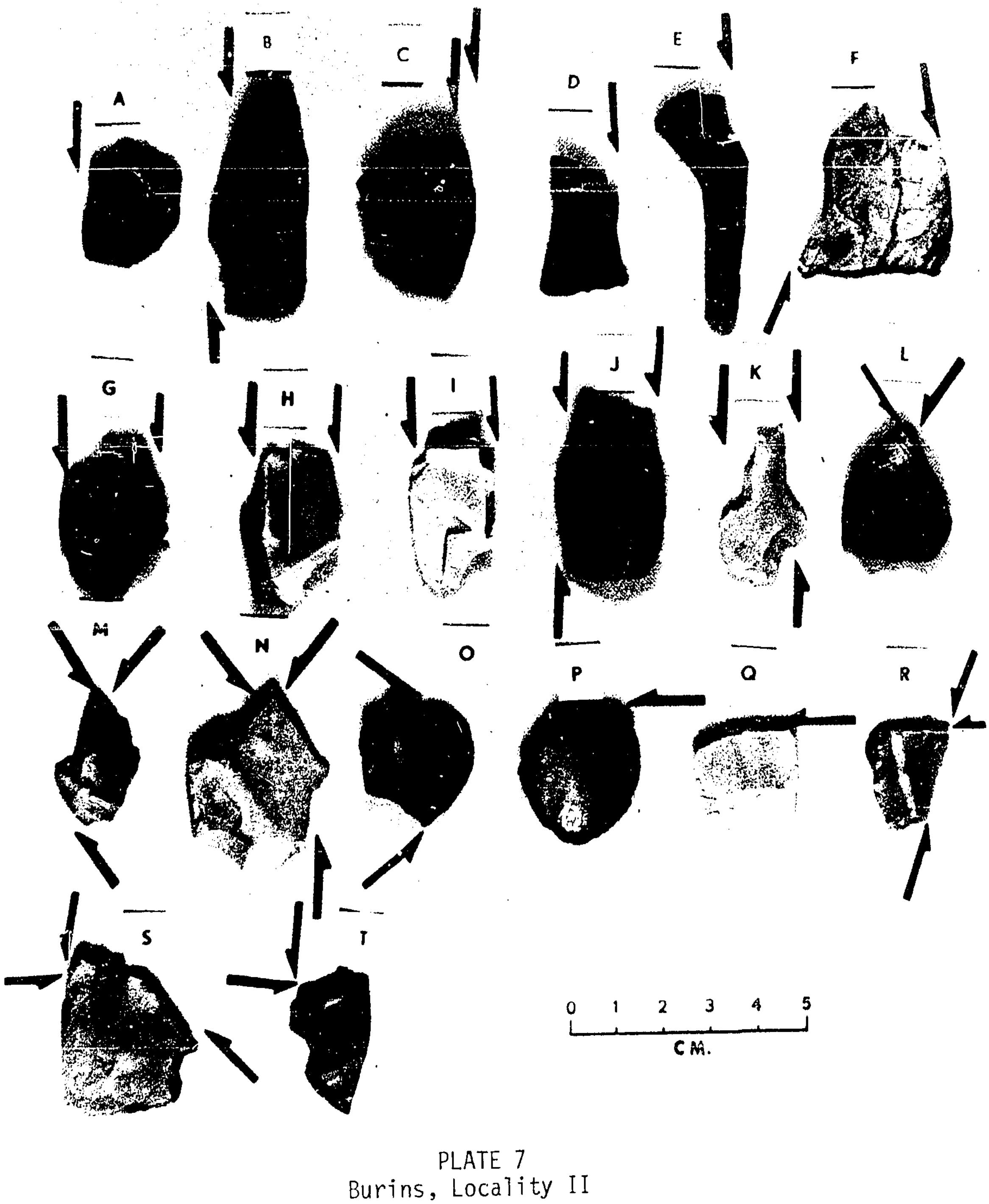


PLATE 7
Burins, Locality II

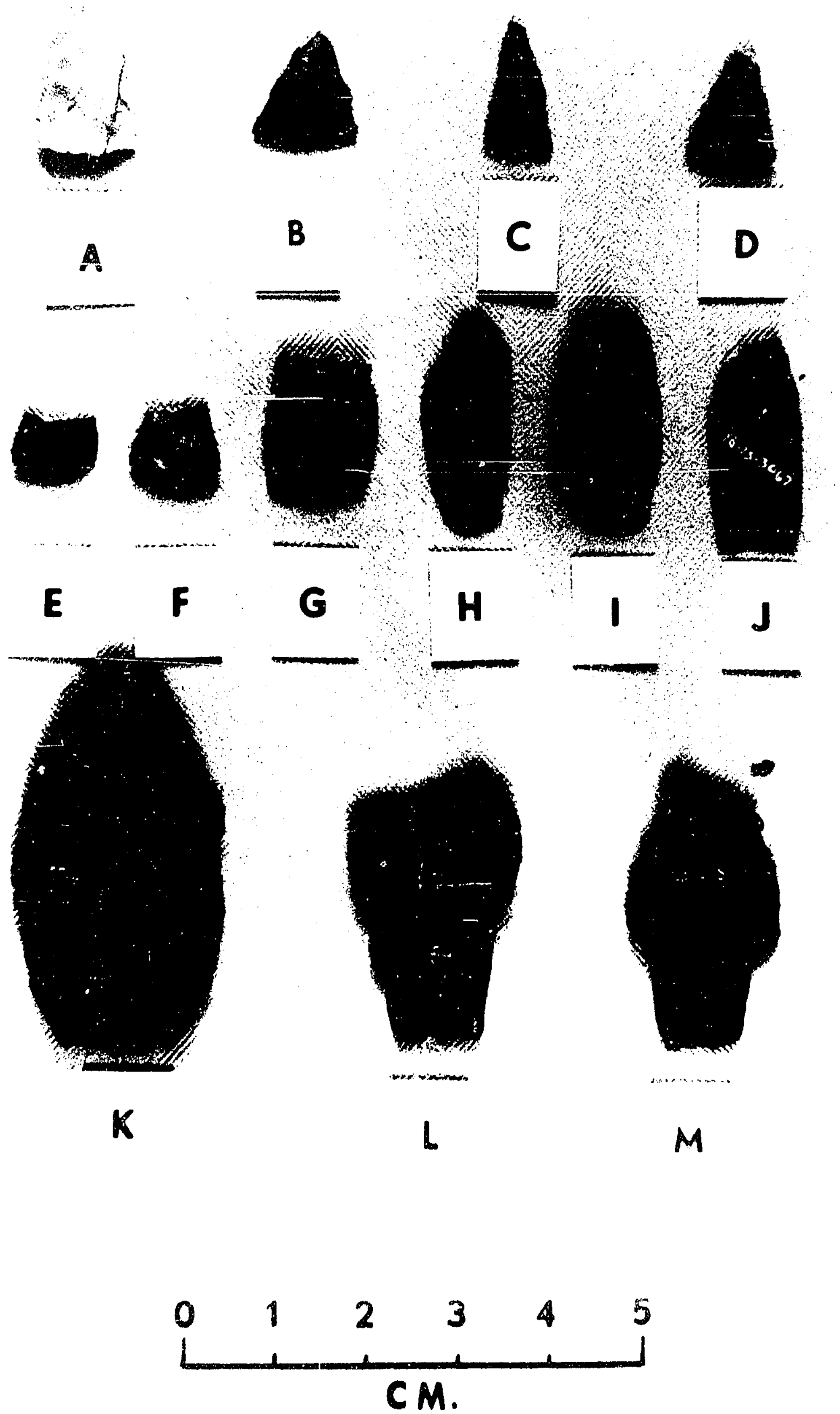


PLATE 8
Projectile Points, Locality II

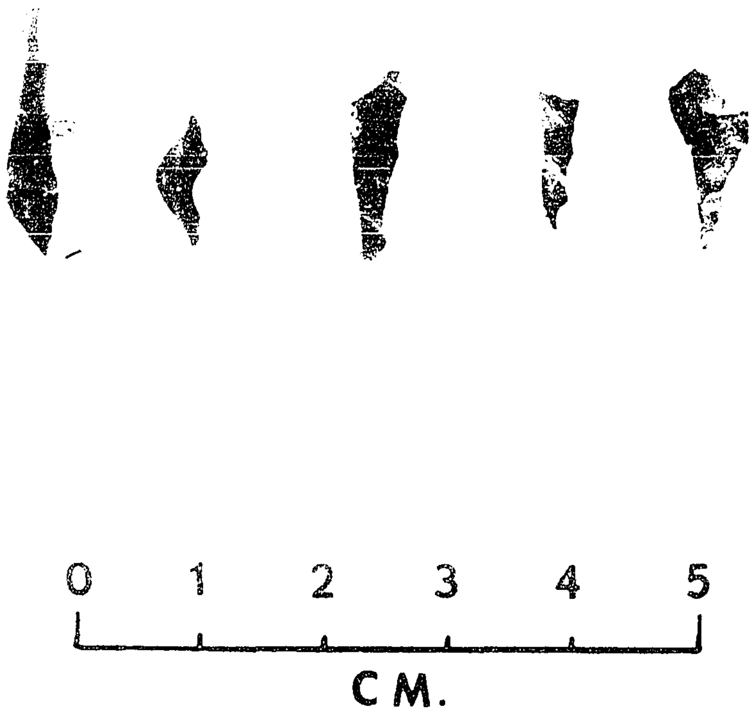


PLATE 9
Biface Fragments, Possible Side Blade
Remnants, Locality II

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