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MICROBLADE COMPLEXES AND TRADITIONS IN THE INTERIOR NORTHWEST, AS SEEN FROM THE KELLY CREEK SITE, WEST-CENTRAL YUKON

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With contributions from Paul Gregory Hare

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MICROBLADE COMPLEXES AND TRADITIONS IN THE INTERIOR NORTHWEST, AS SEEN FROM KELLY CREEK, WEST-CENTRAL YUKON

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ABSTRACT

This report describes the microblade industry from the Kelly Creek site, KbTx-2, which is located in the Frenchman Lakes area near Carmacks, Yukon. Testing and excavation was done at KbTx-2 during several seasons from 1981 to 1994. The site produced one of the larger samples of a microblade industry to come from the Yukon, with more than 20 cores. The microblade cores are mainly classic examples of the Campus type, also referred to as Denali type. Abundant evidence was recovered of the Campus mode of platform rejuvenation through longitudinal detachment of platform tablets.

In the broad context of northwestern North American prehistory, Kelly Creek is an American Palaeo-Arctic or Denali complex, or Late Denali or Northwest Microblade tradition assemblage, or possibly even Northern Archaic tradition site. These tradition constructs only partially overlap or duplicate one another. In an attempt to deal with and resolve what is plainly a systematics problem, we review and discuss these organizational constructs as they are used in the greater region. In preparation for this analysis, we review the distribution of microblade sites in the Yukon, western Mackenzie District and part of Alberta and British Columbia, especially focussing on the occurrence of wedge-shaped cores of the Campus type. Kelly Creek and related sites in the Yukon would best be considered within the American Palaeo-Arctic tradition, or as will be proposed, as a preferable label in this work, the Denali tradition (usually termed "complex"). The term Northwest Microblade tradition has primary utility east of the Rocky Mountains but may also be used for the Yukon with the understanding that there it differs little from Denali.

SOMMAIRE

Le présent rapport décrit l'industrie de microlames au site du ruisseau Kelly, KbTx-2, situé dans la région du lac Frenchman, près de Carmacks (Yukon). Des tests et des travaux d'excavation ont été effectués sur plusieurs saisons, de 1981 à 1994, au site KbTx-2. Le site a produit un des plus grands échantillons d'industrie de microlames au Yukon, avec plus de 20 nucléus. Ces nucléus sont des exemples classiques du type Campus, aussi appelé Denali. De nombreux spécimens du type Campus de rajeunissement ont été recueillis par détachement longitudinal de tablettes.

Dans le contexte de la préhistoire du nord-ouest du continent, le site de Kelly Creek est un complexe paléo-arctique américain ou de Denali, ou un assemblage de la tradition Denali supérieur ou de la tradition des microlames du nord-ouest, voire un site de culture archaïque nordique. Ces traditions ne se chevauchent et se dédoublent que partiellement. Pour régler un problème qui relève clairement de la classification, nous avons révisé ces structures organisationnelles telles qu'elles sont utilisées dans l'ensemble de la région. En préparation pour la présente analyse, nous avons étudié la distribution des sites de microlames au Yukon, dans l'ouest du district du Mackenzie et dans une partie de l'Alberta et de la Colombie-Britannique, en nous penchant tout particulièrement sur les occurrences de nucléus cunéiformes de type Campus. Le site du ruisseau Kelly et les autres sites qui s'y apparentent au Yukon devraient faire partie de la tradition paléo-arctique américaine ou, comme il sera proposé, et comme il sera utilisé dans le présent ouvrage, de la tradition Denali (communément appelée «complexe Denali»). Le terme «tradition des microlames du nord-ouest» est surtout usité à l'est des Rocheuses, mais il peut également servir au Yukon, en tenant compte qu'il se distingue peu du Denali.

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PREFACE

Frenchman Lake and Tatchun Lake, in south-central Yukon near the village of Carmacks, have been since 1981 the focus of ten archaeological investigations. This volume had its inception in a final report on the Canadian Museum of Civilization (CMC) surveys and excavations done during four seasons between 1983 and 1994 (Clark and Gotthardt 1997). The presentation of the data on the Kelly Creek microblade sample, however, encourages a more systematic identification of the technology of Campus-type core and microblade production for comparative purposes and distribution studies. Thus, it was decided to expand the original comparative survey of microblade industries in the Yukon and adjacent territories and to grapple with the problem of the status of the Northwest Microblade, Denali and American Palaeo-Arctic traditions, and tangentially the Northern Archaic tradition, in the variously defined and organised archaeological traditions and complexes of northwestern Canada. Careful definition of variations in microblade production technology and associated implements stand to improve these taxonomic efforts. General survey aspects of the archaeology project, focusing on the precontact settlement pattern in the central Yukon, will be presented in a separate study (Clark and Gotthardt n.d.).

In Chapter 1 we provide a context consisting of environmental and historical description, an introduction to the Northern Tutchone inhabitants of the central Yukon region and a prehistoric summary.

Chapters 2 and Chapter 3 describe the Kelly Creek site, KbTx-2, which is characterised by microblades and their cores--a technology of the early and middle millennia of prehistory. The collection from this site is the largest assemblage of this type material thus far described from the Yukon.

Chapter 4 defines various types of microblade cores, briefly discusses the pattern (range of artifacts) in assemblages from major sites, and then gives a data base of sites with microblade industries found in the Yukon, the western District of Mackenzie and, to a lesser degree of completeness, portions of Alberta and interior British Columbia.

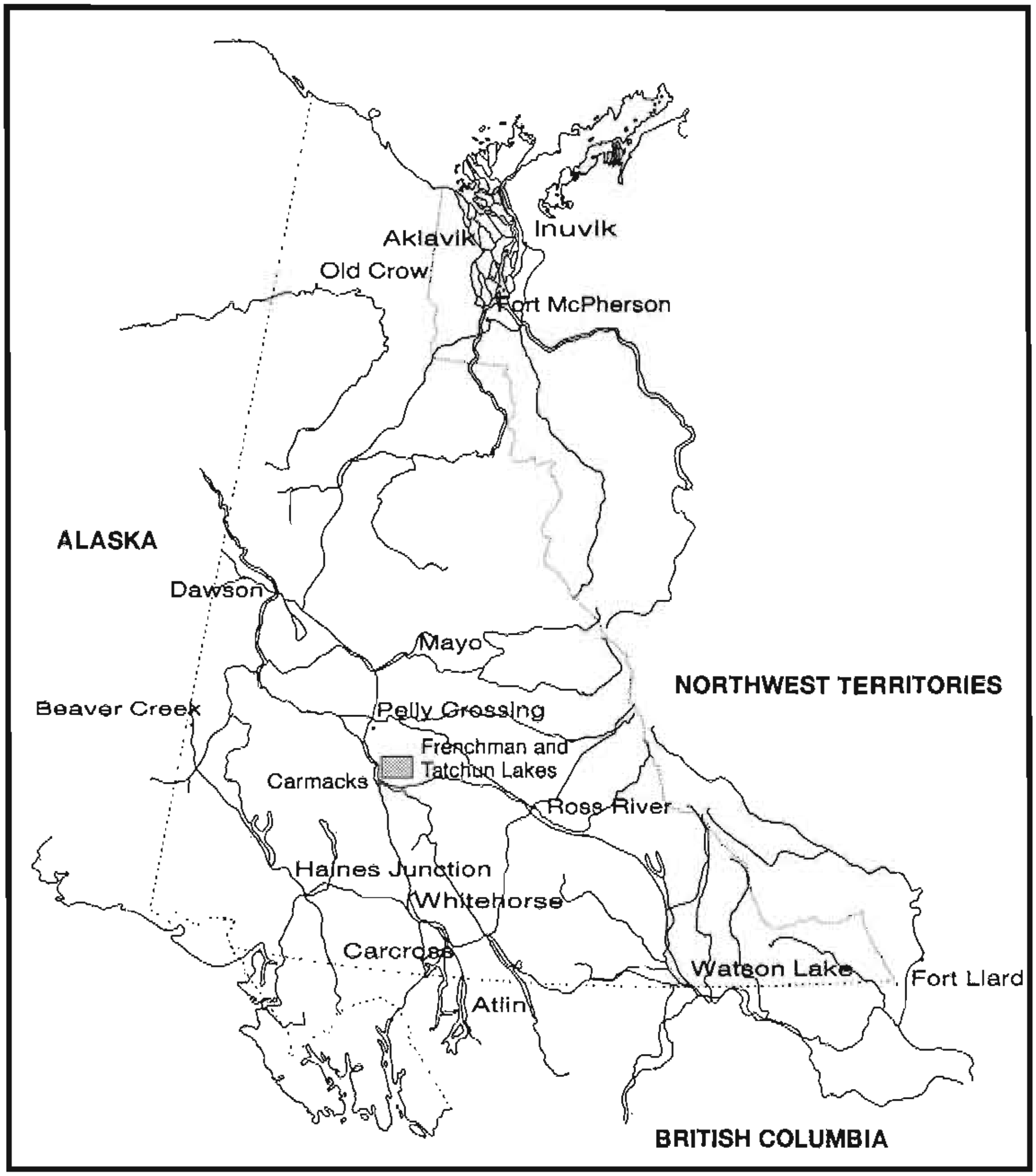
Chapter 5 is devoted to taxonomy employed by archaeologists to organize and interpret the past of this region. Overlapping or conflicting constructs such as the Northwest Microblade tradition, American Palaeo-Arctic tradition, Denali culture, Late Denali culture and Northern Archaic tradition are discussed. Recommendations are made for the cultural-historic schema to be employed for the Yukon, and the past of the region is interpreted accordingly.

Acknowledgements

We owe thanks for their logistical support, courtesies and encouragement of the archaeological investigations, and participation in the project to Dawn and Wilfred Charlie. The Charlies further provided information on the resources and traditional history of the Frenchman/Tatchun area.

Archaeological research in 1992 was carried out as a joint project of the Little Salmon and Carmacks First Nations and the Archaeological Survey of Canada (CMC) assisted by the Government of Yukon Heritage Branch. Major funding for the project was provided through the Access to Archaeology Programme of the Department of Communications (DOC), Government of Canada. The primary goal of the archaeological investigations was to provide the Little Salmon and Carmacks First Nation students and community members with an introduction to the methods and objectives of archaeology. Field operations were based at the Tatli Wilderness Camp where Dawn Charlie was project co-ordinator, Wilfred Charlie operations assistant and traditional resource person, and Dolores Lindstrom cook. Student participants were Jeffery Jonathan, Martina Jonathan, Ragene LeBlanc, and Veronica Skookum (see also Charlie and Clark 1993:2-3).

Appreciation also is extended to the Canadian Museum of Civilization, which supported the fieldwork and analysis, Lennie and Cindy Charlie, volunteers, staff of the Little Salmon and Carmacks First Nations, Olga Luvsandorzh, who drew the artifacts, Sylvia Neschokat for her graceful hospitality in Whitehorse, and the Yukon Heritage Branch.



Map of the Yukon showing the location of the Frenchman-Tatchun study area.

CHAPTER 1
INTRODUCTION: THE LAND AND THE PEOPLE

This chapter describes a contemporary Western Subarctic natural setting and Native culture. The fact that this chapter applies specifically to the region in which the Kelly Creek site is located is a matter both of design and of convenience. The authors decided that it would not be feasible to present an overview of the entire Northwestern Canada region surveyed in the microblade distribution study (Chapter 4). Libraries are for that. Nevertheless, we felt that the present work needed some accompaniment to tie it to the land and the Native peoples of the North. The area in which the KbTx-2 excavation took place was chosen as a case study. The Tatchun Lake-Frenchman Lake example actually has a considerable degree of relevance to the greater interior Yukon region and adjacent parts of Alaska. Elsewhere, the berries and muskeg bog may not be the particular ones found in the vicinity of the Kelly Creek site, similarly, nor are the gravel kame terraces, glacial lake basins, the fishery at the lake narrows, the salmon spawning streams, the migrating caribou and the mosquitoes. But they constitute close parallels. Indigenous lifeways, which to a large degree are timetables for gaining a livelihood from the land, also have many aspects that are similar from band to band and from tribe (language group) to tribe (cf. VanStone 1974). The employment of common technologies to exploit common and often shared resources according to the dictates of nature's universal northern seasonal cycle have been powerful factors for uniformity among the self-sufficient societies of the North.

We will operate on the assumption that lifeways and natural contexts or ecosystems were not substantially different during the time of the Microblade people, from about 10 000 years ago (earlier in Alaska) to about 2000 or 3000 years ago. Nevertheless, some noteworthy changes occurred in the vegetation and fauna during that span and it is possible that there also has been major evolution in or realignment of northern linguistic groups. Early postglacial (Holocene) climate was warmer than that of today. Forests spread into the Yukon as soon as the Pleistocene ended, though throughout their history microblade users, excepting some early Alaskans and Arctic Coast dwellers, were mainly dwellers of the boreal forest. Animal species and abundance changed. Evidence for hunting bison and also elk is widespread in the Yukon, and not limited to early times though the data for relatively late occurrence of bison are scantily published, while moose, though present early in the Holocene, appear to have gained prominence only very lately; and caribou are ever present.

Description of the Area and its Natural History

Tatchun-Frenchman Country

A summary of the area's natural history can be gleaned from published overviews (Morison and Smith ed., 1987:7-30; Oswald and Senyk 1977). Here, we will examine it in non-technical terms.

Frenchman and Tatchun Lakes lie in the Yukon Plateau physiographic region, within a narrow hill-flanked valley. Maximum elevation of the hills is about 1200 to 1500 m to the northeast and 600 m to 1000 m to the southwest. The valley bottom is relatively flat, though uneven with hillocks and terraces. Flat areas in the valley occur between Frenchman Lake and Tatchun Lake. From the Little Salmon River to Frenchman Lake elevations are about 30 m above the Yukon River; then from Frenchman Lake elevations gradually decline northwest to Tatchun Lake, dropping to 545 m at the lake and to 500 m at the confluence of Tatchun River with the Yukon River.

To canoeists descending the Yukon River, the approach to Little Salmon is heralded by the appearance of a large hill called *Shratthégän Ddhäw* (Bear Skull Mountain), its cliffs plunging down to the level of the river. Upon closer approach it is possible to pick out individual trees from among the stand of cottonwood trees (balsam poplars) lining the bank and filling the lowland around the mouth of Little Salmon River. Here we will go no farther by boat, and will not pass the giant frog's lair in the limestone face of Eagle Rock or Eagles Nest Bluff (*Ts'aw Cho An*) nor brave the giant snake that lives at Carmacks in Tantalus Butte. Pulling ashore a short distance below the Little Salmon River to avoid the sloughs and willow thickets, we scramble up the bank. It takes only a moment to pass through the gallery of cottonwoods into a mixed forest of white spruce and aspen, the occasional patch of lodgepole pine, and clumps of large willow shrubs. Paper birch trees are absent, though they were present in the region within the last century. Before ascending old Yukon River terraces, we cross a gully where it is possible to make a bountiful catch of grayling and jackfish (pike) when they are migrating through the trickle of water lost to us in the willows at the bottom. A few hundred metres to the east, at the top of a steep scarp cut by the Little Salmon River, we stand on an old archaeological site and look down on two islets in the river that create the "Three-Way Channel," a traditional site for fish traps.

A northwesterly course inland into the valley crosses undulating terrain--ancient sand dunes now forested and carpeted with shrubs. There also are old gravel kame terraces and hillocks: these were formed during the period when the Pleistocene glaciers that once lay over this country were melting. Pike and grayling are found most of their year in three small lakes along the route.

Several kilometres into the valley there is a rise (watershed), then the head of Frenchman Lake. This narrow lake stretches like a river, not quite reaching the horizon before it disappears from view around a bend (Fig. 1.1-1.2). The complexly embayed shores are encumbered with alders and willows and rose bushes that mantle low areas between the steep faces of forested hummocks and benches. There are many old campsites on knolls and terraces along the shore.

Surprisingly, the outlet stream at the north end of the 18-km-long lake is only a small creek. The low hill there, which affords a panoramic view of the lake and valley, is a place where people have camped for thousands of years. The valley bottom north of Fisherman Lake then becomes a boggy thicket of scrub black spruce and labrador tea shrubs. From firmer dry ground along the sides of the valley one can glimpse the high gravel terraces to the north and northwest, now deeply cut by the side valleys of the Tatchun River and Kelly Creek (Fig. 1.3). The terraces were left at the end of the Ice Age when rivers of gravel-laden glacial meltwater flowed through the valley piling up deposits alongside ice that still occupied the centre of the valley.

In this area there are a number of edible berries, some of which can be harvested for storage. Certain species are found principally along the road or around old cabin sites and may be historic introductions. The berries include the following:

Alpine bearberry (*Arctostaphylos alpina*)
Kinnikinnick (*Arctostaphylos uva-ursi*)
Crowberry (*Empetrum nigrum*, seedy but an expedient source of juice in alpine areas)
Cloudberry (*Rubus chamaemorus*, relished but does not keep unfrozen)
Lingonberry (*Vaccinium vitis-idaea*, lowbush cranberry, stores well, locally abundant in some years)
Alpine/bog blueberry (*Vaccinium uliginosum*, widespread but good patches are localized)
Bog cranberry (*Oxycoccus microcarpus*, diminutive, delicate, delicious and extremely sparse)
Red raspberry (*Rubus idaeus*, common in areas of human activity, yields well but stores poorly)
Wild (beach) strawberry (*Fraguria glauca*, found especially along the road)
Highbush cranberries (*Viburnum edule*, widespread along water courses, keeps well)
Soapberries (*Sheperdia canadensis*, red, ubiquitous)
Nangoonberries (*Rubus arcticus*, present in boggy areas but very sparse)
Currents (*Ribes sup.*, locally present near road at Tatchun Creek)
Gooseberries (*Ribes sp.*, rare)
Rosehips (*Rosa acicularis*, said not to have been used for food)

At this point the Tatchun River, which comes into the valley from the east, is a substantial stream. Its low banks are lined with thickets of cottonwoods, willows and alders. Less than half way to Tatchun Lake the valley becomes a flooded morass, especially when the beaver population is thriving (Fig. 1.4). The adjacent gravel slopes, though, have a desert-like appearance due to their xeric vegetation of sage and saxifrage, encouraged by the 30° C heat of summer. A noteworthy feature found at this point is a vigorous line of pure springs, source of the flood and perhaps the drainage of an ancient feeder valley from the east, now deeply buried under thick gravel. Here too, at the top of the first bench is a major archaeological site, the Kelly Creek site.

Several kilometres to the northwest is the upper end of Tatchun Lake. The terrain there is similar to that found along Frenchman Lake (Fig. 1.7). The trees are primarily old white spruce except where forest fires have resulted in regeneration by a mixed forest with aspen. At some places Tatchun Lake appears to end, but narrow passages open up into more lake. These narrows were good places for winter fishing as the current there reduced the development of ice. At the end of the lake a rapid, westward-flowing stream, the continuation of the Tatchun River, flows through mixed forest and thickets for 4.5 km to the Yukon River. The valley bottom now is very narrow but is flanked by high terraces that provided a better the route for travel. At the mouth of Tatchun River in the spruce-cottonwood bottom land are old campsites and trap sites for salmon fishing. The terrace on the north side is the reported site of a fort built more than a century ago by Tatchun people when relations with coastal Chilkat traders were tense.

Along this route there are moose and black bear, and during the high point of their cycles arctic ground squirrel and hare literally run underfoot. At one time southward-migrating caribou of the Forty Mile herd, their last appearance being in 1938, and a few woodland caribou still wander in from the flanking hills. A wolf pack also runs through.

Lest the reader have a Robert Service stereotype of the North, portrayed in the bitter experiences of Sam McGee, H. Bostock states:

> The climate of south-central Yukon is by no means as severe and unattractive as is generally believed. The winters on account of the northern latitude and interior situation, are rigorous, but though extremely low temperatures occur they do not as a rule continue for long periods of time. On no day in the winter does the sun fail to appear above the horizon. The summers are particularly delightful, as on account of the northern latitude practically continuous daylight prevails from the latter part of May well into July. The interior situation results in a relatively dry and sunny summer, though inclined to be more showery than in more southern latitudes. The rivers open in May and remain open until well on into October or even November. In the spring ice may remain on the larger lakes until tbe first week of June (Bostock 1936:3).

The annual mean daily temperature is about -3° C, and average annual precipitation, combining rain and snow water equivalent, is a very dry 300 mm or 12 inches, which is surprising considering that, as Bostock noted, there are many summer showers. The spring of 1990 was mild. By May 22 the ice had been off the lake for a week. All the snow had melted much earlier. The summer of 1994 was consistently sunny, except for the haze from forest fires, with afternoon temperatures rising to 30° C.

Geologic History

Glacial Times. Initial cutting of the Frenchman-Tatchun valley may go back to early Pleistocene times when the Yukon River flowed southward towards the Pacific Ocean (Tempelman-Kluit 1980). But long before people ever set foot in the region there was blockage of the Yukon and river reversals, the country was overridden by Late Pleistocene glaciers, outwash gravels were deposited in valleys and kame terrace deposits were formed along the valley sides as the glaciers began to melt and draw back to the east at the end of the Ice Age. Finally, modern streams dissected the alluvial and glacial outwash deposits.

At its maximum extent, the outer edge of the Late Pleistocene ice, locally termed the McConnell Glaciation, lay 10 to 15 km west of the Yukon River from near Carmacks to a point a few kilometres north of the mouth of the Tatchun River. Northward from there, the ice-free area made an eastward incursion so that Tatchun Lake was just barely buried by the glaciers (Hughes, Rutter and Clague 1989, Hughes et al 1969, Campbell 1967). In discussing the geologic history of Tatlmain Lake, located 40 km north of Tatchun Lake, Gotthardt (1992) reports that according to geologist Brent Ward (Ward: 1989), deglaciation began about 13 500 years ago. The Tatchun-Frenchman valley likely had become free of ice by that time. Campbell (1967:Fig. 2) suggests that Tatchun and Frenchman Lake and surrounding hills had become deglaciated while ice still lay to the north at Tatlmain Lake and to the south in the valley of the Little Salmon River.

Creation of the low area occupied by the two lakes can be attributed to Ice Age glaciers, but the basins were not simply scooped out by the ice. Instead, while residual glaciers lay in the centre of the valleys, sediment was deposited around the periphery of the ice which subsequently melted leaving the lake basins. Thus, both lakes are cradled in gravel deposits derived from the glaciers, mainly outwash and kame deposits. There was a major flow of meltwater out of the east (present valley of Tatchun River and Kelly Creek) and through the area of Tatchun Lake to the Yukon, which resulted in the deposition of thick outwash gravel deposits (Fig. 1.5). The meltwater turned thence towards Tatchun Lake and on down to the Yukon River, deposit its load of gravel to form thick deposits, especially along the sides of the valley. Other undulating, hummocked glacial deposits, kame terraces and even a small esker are found at lower elevation, suggesting that more than one episode of deposition and ice wastage may be involved. When the glaciers completed melting, the terraces were left along the sides of the valley, and portions of the valley floor below outlet level became lakes.

The land was ready for occupation, but several thousand years were to pass between the time of deglaciation and the oldest campsites thus far discovered by archaeologists. The area's topography today looks much as it did when the Ice Age ended, though it took time for the spruce forest to develop, pine did not arrive in the region until several thousand years later, and shallows have become bogs, especially at the end of Frenchman Lake.

Volcanic eruptions. In the first millennium of our era, a powerful volcanic explosion thundered across the headwaters of the White River. Trillions of tonnes of volcanic ash were blasted out of Mount Bona, located near Klutlan Glacier at the southern end of the present Yukon-Alaska border. This White River volcanic eruption figured prominently in the human history of the region. The ash plume blackened an immense area of sky, and today the fallout from this eruption, a cream-coloured volcanic ash, is visible nearly everywhere in the southern half of the Yukon, close to the surface, as far west as the Mackenzie River. Where it has not been partially washed away, the ash is an impressive half a foot or 15 to 20 cm thick at Frenchman Lake. Radiocarbon dates place the eruption at about 800 A.D. (Lerbekmo et al. 1975, Clague et al. 1995). The ash spread directly east-northeastward towards Tatchun Lake in a relatively narrow lobe. The only places where it was thicker were along a narrow transect closer to the vent. Some writers have proposed that this eruption, and its consequent adverse effects on game, forced the inhabitants of the southern Yukon to move away, significantly changing the distribution of several Athapaskan-speaking peoples, possibly including the Navajo (Derry 1975; McGhee 1989 Chap. 8; Workman 1973, 1978b, 1979). Certainly anyone living near Tincup Lake, where the ash fell between one and two feet thick, would have had to flee, if they escaped at all. Others, where the ash fell thinner and finer, as at Tatchun-Frenchman, may have weathered the ash fall only to be presented with a desolate landscape from which the game had fled. They too may have had to leave their homeland for a season, moving into the territory of a neighbouring group. If the eruption was during the winter, when moose and caribou could feed on twigs, salmon were not running, and ice would temporarily shield fish stocks in the lakes and rivers, its effects may not have been as disastrous as those of an open season eruption. Geologists reason that in accord with prevailing wind directions, a winter eruption is likely to account for the distribution of the ash blanket (Workman 1979, citing personal communication from Lerbekmo). Tall grasses, other vegetation and fisheries commonly survive ash falls of the magnitude experienced at Frenchman Lake, judging from revegetation after the Katmai and Mount St. Helens eruptions of the present century, but for people the short-term effect of one or two seasons' failure of a critical food resource could have spelled extermination or necessitated moving away. It might not have been easy to move, though, as other territories already were occupied. Some suggest that because of this, the solution for certain groups was to move far and fast.

At another time, the Northern Tutchone witnessed a less disastrous eruption. The source was Volcano Mountain, located close to the confluence of the Pelly and Yukon Rivers, 78 km from Frenchman Lake. The mountain is the most recent among a series of massive lava flows and eruptive features known as the Selkirk Volcanics (Bostock 1936:45 ff.). The last flow from Volcano Mountain is so recent that it is bare of soil. Lichens and a few plants are the only vegetation, excepting some birch growing in hollows. However, geologists propose an early date prior to 4200 BP for the most recent Volcano Mountain eruption (Jackson and Stevens 1992). Thus, it is possible that a local legend of a fire hole and of "snow" that was not snow but ash that dusted the vegetation, until washed off by rain, refers to a different event (Wilfred Charlie personal communication to Clark, June 1983).

Bedrock Geology. Bedrock seams are the ultimate source of stone used for tools and cooking. Familiarity with this resource helps provide an understanding of ancient procurement and logistics. No bedrock is visible along the heavily gravelled valley bottom. However, bedrock hills outcrop at a low elevation west and east of Little Salmon. At the opposite end of the valley, the Yukon River cuts bedrock just above the mouth of Tatchun Creek.

Most archaeological sites in the area show use of a great range of lithic materials, though some sites emphasize only one or a few stone types. We assume that when suitable local materials were not available deficiencies were rectified through imports coupled with increased use of lower quality raw material. A corollary is that where good quality local material is available but exotic material is present, there probably have been visitors from outside the group, or far-reaching travel by group members, or trade in artifacts in part fuelled by an interest in exotic things. Several variables are in play here and without detailed data it is difficult to reach any conclusions as to the significance of the suite of lithic stone varieties found in the archaeological workshops. Obsidian and native copper are obvious imports; agate and chalcedony come from the vicinity of Carmacks. The sources of the other raw materials used in the Frenchman-Tatchun area has not been determined.

Ideally the places to collect raw material are fresh exposed bedrock outcrops and high energy beaches and gravel bars. The first often provides the opportunity to obtain stone in tabular blocks that meet, without prior shaping, some of the requirements for tool blanks. But riverbar sources have the advantages of offering a varied assortment of rock types, both local and derived from distant points, from which the high energy environment has eliminated weak, soft and weathered stones. To find rock outcrops it is necessary to climb high flanking hills or see exposures where they are cut by the Yukon River at either end of the Frenchman-Tatchun trench. Access to cobble bars or unconsolidated deposits also is limited. The lakes have only narrow beaches, and often no beach at all. Similarly, along the Yukon River and other streams there are few exposed cobble shores and bars except during low water. In consideration of these limitations, it is probable that people relied on specific knowledge of a limited number of places where chert and other hard stones could be obtained for tools.

Cockfield (1928 [1957]) reported on the rock lithology in the southern part of the area along the Little Salmon River, while Bostock (1936) later dealt with the geology of the whole Carmacks district (map area), and Campbell (1967) described the geology of the adjoining Glenlyon Map Area. However, there is small chance of reliably identifying samples recovered from archaeological sites on the basis of these published descriptions. Similar stones may occur in more than one rock formation and locality.

The bedrock geology described below is complex, as seven different rock formations surround Tatchun and Frenchman Lake and Little Salmon and these are subdivided into many additional groups. Except where the Lewes River Series is locally present, many hills and low mountains extending from Minto on the Yukon River to the Little Salmon River (including Tatchun Mountain and Frenchman Ridge) belong to the Mount Nansen Group of volcanic rocks. Many rock varieties, mainly volcanics but also mottled grey limestone, are present in numerous colours. Most would be classified as "greenstone." Campbell (1967:62) also records grey chert pebbles in a conglomerate, a potential stone for tools.

Laberge Series conglomerates form the major hills that lie southwest of Tatchun and Frenchman Lake, extending from near Five Finger Rapids southeastward almost as far as Little Salmon. The Laberge series also comprise part of the bedrock in the hills east of the north half of Frenchman Lake. Immediately east of Carmacks this series outcrops along the Yukon, but north of Carmacks shales and coal-bearing formations, also classified as part of the Laberge Series, lie between the river and hills of

TABLE 1.1. ROCK FORMATIONS EAST OF CARMACKS

Name	Age	Location	Description
---	Tertiary	West of south half of Frenchman Lake south to highway	Blue-grey basalt flows, pale green tuff between, basaltic dykes and trachytic flows, breccia; conglomerate and shale
Carmacks Volcanics	Miocene or older	Carmacks	Basalt, andesite, trachyte, dacite, breccia, tuff, some conglomerate and sandstone
---	Upper Jurassic	Mountains north and east beyond Nansen Group	Granite, syenite, monozite, diorite, gabbro, etc.
Tantalus Formation	Jurassic/ Cretaceous	Tantalus Bluff	Conglomerate, sandstone, shale, coal
Laberge Series	Jurassic	Main hills to southwest of Frenchman Lake	Conglomerate, sandstone, arkose, greywacke, shale, coal
Lewes R. Series	Triassic	Southwest of Tatchun Lake, north and northeast of Little Salmon	Limestone, tuffaceous clastics
Nansen Group	Upper Triassic or earlier	Main hills to the north & east of Frenchman/Tatchun L.	Andesite, basalt, dacite, breccia, tuff, some tuffaceous argillite, quartzite, diorite

Laberge conglomerates. Varied sedimentary rocks are described for the series, in addition to conglomerates. Well-rounded pebbles of black, greenish grey and white cherty slate, sometimes as large as 8 cm, are reported for the Tantalus formation which outcrops immediately northeast of Carmacks.

Carmacks Volcanics occur widely in the vicinity of Carmacks and west of the Yukon River. A small area of outcrops is transected by the Klondike Highway north of Carmacks and south of Five Finger Rapids. This formation evidently is a source of agate and chalcedony found in archaeological sites. A small stream that joins the Nordenskiold River south of Carmacks has late Tertiary rhyolites that resemble cherts. Wilfred Charlie identifies a yellow-brown stone found at the Kelly Creek site as from Nansen Creek. Millers Ridge has an additional agate/chert deposit, now accessible by a "gem" trail. The Plume Agate Gem and Mineral Trail leads to another bedrock source located a kilometre east of the Klondike Highway, several kilometres south of Carmacks. All these sources occur in basaltic bedrock which must be mined to obtain the agate. Reportedly, there is workshop debris around the source of red agate west of Carmacks (Lenny Charlie personal communication to R. Gotthardt).

Overview of Human History in the Archaeological Mode

This section very broadly interprets the past according to archaeological evidence recovered from the Frenchman-Tatchun sites and from adjacent areas (Clark 1991).

The Ice Age: A New Land for an Old People

During the Ice Age the southern and eastern Yukon were buried under glaciers, but much of west-central and northern Yukon and interior Alaska was free of ice. The edge of the glaciers was not far west of Carmacks. Beyond, the open lands of eastern Beringia extended northward and westward. By about 12 000 radiocarbon years ago, the Ice Age (specifically, Wisconsin stage of the Pleistocene) was coming to an end.

The end of the Ice Age was a time of major change, and people saw and adjusted to changes in the game they hunted and in the terrain over which they travelled. Rivers were swollen because of the melting glaciers and sometimes changed their courses as ice blocks disappeared or they cut through thick gravel. Old basins where once glaciers lay now became lakes, soon to be populated with fish stocks. Many large animals disappeared, sometimes to be replaced by modern species of the same genera. Originally, there may have been only shrub tundra, willows, and a few stands of poplars or aspen, especially on the old lands beyond the edge of the ice. But about 9000 BP the spruce forest arrived and blanketed the region. Pine trees followed later and today are found in well-drained settings.

The Most Ancient Inhabitants?

As yet, there is no direct evidence that anyone lived close to Carmacks in the ice-free area during the earliest era of their presence elsewhere in the Americas, which was more than 11 000 years ago. Nor have we identified the first camp sites in the lands that at this time were just coming out from under the glaciers. But rivers wash away old camp sites and others gradually are disturbed beyond recognition through thousands of years of freezing and thawing, landslides and other processes of nature. Camp sites as much as 11 600 years old (uncalibrated radiocarbon years) have been found in the Tanana River valley of Alaska west of Carmacks. These very ancient hunters, often referred to as the Nenana complex, probably also lived closer to Frenchman Lake. During this period game was different from the animals found today in the Yukon. There were still giant bison and elk, and possibly people hunted woolly mammoths and North American horses before they became extinct. Present evidence indicates that the last mammoths in the Yukon expired 12 000 or 13 000 years ago, horses somewhat earlier, but elk and evolving bison persisted until relatively modern times. Many of the same small game animals that people hunt and trap today also were sought, according to evidence from the Broken Mammoth site in Alaska.

The Microblade People of the Palaeo-Arctic Tradition

These people, noted here by the term used for their distinctive technology, variously are referred to as the Palaeo-Arctic tradition, Denali culture, Northwest Microblade tradition or Beringian tradition, especially at older sites (in some localities microblade technology evidently persisted to a relatively late time). Microblades are the topic of the greater part of this volume.

During early times the use of microblade-edged tools and points spread to northwestern North America from Siberia. This new technology may have been brought in by migrants from the west or simply was adopted by resident populations. Probably both situations occurred, respectively, in different areas. The new population, if that was the case, joined Northern Cordilleran people who had come into the Northwestern Subaractic region at an even more ancient time. The Northern Cordilleran culture, which is as yet only tentatively defined, may have been an eastern aspect of the Nenana complex though it also persisted in the Yukon for about another 2000 years after the Palaeo-Arctic tradition had succeeded the Nenana complex in Alaska. It has been identified in some 10 500 to 8 000-year-old southern Yukon sites. Undoubtedly, the several peoples of the north interacted, adopting technologies from one another.

These events started near the end of the Pleistocene in eastern Siberia and Alaska. Microblade use likely spread eastward gradually towards the central Yukon, and also southward along the Pacific Coast. At present though, the earliest evidence is uneven. Dated microblade finds 10 700 years old, and at a few sites as early as 11 600 years old, from the northern Yukon and eastern Alaska are coeval with the fluted point horizon of Palaeoindian occupation in North America. Judging from the occurrence of dated finds from localities in the Yukon, Microblade people should have reached Frenchman Lake at least 10 000 years ago, perhaps to find the valley already occupied by Northern Cordilleran people though there is no recognized evidence of the latter at the Kelly Creek site.

The main microblade production site in the Frenchman/Tatchun area is the Kelly Creek site where hundreds of examples of their technology have been discovered. Broken and imperfect microblades and usedup (exhausted) cores were discarded on the spot. One can visualize two or three flint knappers keeping company while they sat and worked, expressing disappointment when a core was found to be flawed and fractured. One specialized, but simple, carving tool bit occurring with microblades at Kelly Creek is the "burin." It is appropriate to draw a comparison between the plain looking stone burins and nondescript carbide steel bits for metal lathes. Such arcane objects are parts of important composite tools. People likely camped some distance from the workshops. The site might have served as well as a lookout and a place to scan the valley for signal smokes. From this location, at the edge of the terrace, it is possible to see far to the southeast to Frenchman Lake and some distance in the opposite direction.

Our picture of this camp is incomplete as only stone has survived. We know from later times, though, that Yukon peoples made most of their implements and accessories from bone, antler, bark, wood and hides. In the Yukon there were only certain ways to make a living off the land, certain animals to hunt, and ways to travel in summer and winter and to stay warm. Logical inference leads us to believe that traditional life thousands of years ago may have not been very different from traditional life recorded by explorers and Native elders.

Northern Archaic Tradition

About 5000 years ago people with notched spear points appeared in the Yukon. In some areas the Microblade tradition adopted tool types of the Notched Point people, referred to as the Northern Archaic tradition. To some degree the two technologies amalgamated but the details vary from area to area.

The adoption of hafting notches on stone spear tips and knife blades is one of the most obvious tool attributes of the continent-wide Archaic stage. In the northern interior region notched points characterize a group of seemingly related peoples or technologies, the vaguely defined Northern Archaic tradition (Clark 1992). Other common tool types associated with the notched points support the supposition of relationship between peoples across the northern interior region.

The main camping ground of Northern Archaic people in the Frenchman/Tatchun Lakes area was the hill at the northwest end of Frenchman Lake. The small collection of tools obtained through limited excavation at this site can be supplemented by information from elsewhere in the Yukon. As was the case for the antecedent microblade culture, most tools would have been of perishable materials and except under rare circumstances they have not survived.

Common Northern Archaic implements include side-notched spear points and lance tips. Some lopsided "points" actually are knife blades. There also were leaf-shaped points that are not notched. Stone scrapers were made in various styles. During tanning hides also were worked with the same type of stone slab and split cobble scrapers that were used until recently, *tthe chaew* in the Northern Tutchone language and widely termed *tci-tho* by archaeologists. Some knives, shaped like an Eskimo *ulu*, were broad and sharpened along one edge only. Others were formed along two edges that came to a tip.

Since these people lived in the forest, it would be interesting to know how they used wood for construction and manufactures. Adze bits, made from tough rock, with ground cutting edges, were used to shape wood, but people rarely lost or discarded these tools. The earlier microblade people evidently did not have this implement. Most splitting of logs, as for making stringers used in canoe frames, was done with wedges. For making holes and slots there were flaked stone gouges and bits, and carving tools with beaver and porcupine teeth cutters. Small holes could be made in soft wood with sturdy bone awls. Finally, there were blocks and tablets of sandstone for "sanding" or finishing wooden and bone implements. It must have taken considerable time to process timber with these tools, and prepared straight-grained spruce and birch presumably was an item traded to areas where timber grew with a twist.

The Post-Ash Period

Gradually, through time many styles of implements changed. A convenient time marker is the cream-coloured White River volcanic ash which dates close to 800 A.D. Some archaeologists refer to remains from the post-ash period as the Athapaskan tradition. In areas lacking the tephra, 500 A.D. sometimes is set to mark the beginning of this tradition.

In most places only a thin layer of soil and turf covers the White River ash. Where the vegetation is sparse it is possible to see exposed clusters of fire-cracked rock and other remains of the Post-Ash period. Fire-cracked rock is found on the terraces or benches around Frenchman and Tatchun Lake. The "burned" rock may be from hearths and ovens, which often also are marked by fragments of burned and calcined bone. Much of the burned rock, though, probably comes from the stone boiling technique of cooking. Large heated rocks also were used for sweat baths. Nothing may remain today from some overnight camps, other than the hearthspot and some fire-cracked rock. At other camp sites, though, broken tools, chips left from making stone tools, and occasionally even some once-prized object may lie within the ground or even be exposed on the surface.

One prominent camping place of the Post-Ash period, used also during Northern Archaic tradition times, is the Frenchman Hill site at the northwest end of Frenchman Lake. One location on the hill excavated in 1992 yielded small fragments of native copper, pounded thin from nuggets and intended for making tools or ornaments. There also are a small cobble that had been used as a hand-held grinder, possibly to pulverize red paint stone (red ochre) though the grinder is not stained; a notched cobble that may have been a net weight; two types of whetstones; a small flint scraper; and part of a large, thin stone slab hide scraper. Tiny fragments of burned bone and scattered fire-cracked cobbles from ancient hearths and bits of fractured bone left from making bone grease (bone boiled to extract marrow fat) complete the traces of the camp. A badly corroded iron arrow tip also was found with the other artifacts. The iron may have been traded inland soon after Europeans reached the coast of Alaska two and a half centuries ago.

During the last thousand years before the arrival of Europeans, copper tools and ornaments became popular in the western Yukon and interior Alaska. To a significant degree, tool technology had gone from the stone age to a bone and metal age. The raw native copper was obtained by expeditions to a headwaters tributary of the White River in the extreme southwestern corner of the Yukon. Another source of copper nuggets was across the mountains in the Copper River drainage of Alaska. Those returning from the source deposits then traded pieces of metal to others. The finds from Frenchman and Tatchun Lakes do not include any finished copper implements but several unfinished fragments metal pounded flat for fabrication have been found. Elsewhere, knives, daggers, ornaments, arrow points, prongs for hook barbs and other uses, and even scrapers were produced from native copper.

Living From the Land

Resources

Many species of birds and waterfowl were eaten. Some also provided feathers, down and bone which were used for adornment or ritual purposes, especially swans, ravens and bald and golden eagles.

Mammals hunted or trapped for food were moose, woodland caribou, barrenground caribou, mountain sheep, mountain goat, beaver, lynx, hare, porcupine, ground squirrel ('gopher'), muskrat, marmot, red squirrel, black bear and grizzly bear. Among these, the moose, caribou, beaver, hare and 'gopher' were especially important providers. Historically, the appearance of barrenground caribou herds was an unexpected side effect of the intensive prospecting activities around Dawson, Sixtymile and Fortymile which altered the paths of the Fortymile barrenground caribou migration from about 1907 to 1938. Animals traditionally hunted or trapped for their fur, included most of the preceding and several others that were not eaten, among them wolves, wolverine, foxes, marten, lesser weasel and ermine. Virtually no part of a game animal was wasted or discarded. For example, in addition to food, moose provided a variety of materials for use as tools, clothing and utensils (Legros 1981:516-526).

Several species of fish are common to Frenchman and Tatchun Lake and the Yukon and Little Salmon Rivers. Most were harvested. They include pike (jackfish), grayling, ling cod, broad whitefish, lake whitefish, round whitefish, long nose sucker, and lake trout. Inconnu (shee), lake herring (least cisco), pygmy whitefish and slimy sculpin also are known in the greater region but evidently are absent or were not commonly exploited at Frenchman Lake and Tatchun Lake. The two lakes differ somewhat in their fish stocks: in recent years grayling crashed at Frenchman Lake as also did lake whitefish. Tatchun is poor for trout but has chum salmon though there does not appear to have been any effort recently to catch them (D. Charlie personal communication to Clark).

King (chinook) and chum (dog) salmon run up the Yukon River from the sea. The kings arrive in July, chum salmon somewhat later, usually in September. Preferred salmon fishing locations for king salmon were small rivers just upstream from their confluence with the Yukon, for instance the mouth of Tatchun River, and the lowermost reaches of the Little Salmon River for dog salmon. Some species of the freshwater fish also migrate seasonally. Spawning grayling were caught in the spring, during their travels, at the outlet of Kelly Lake and the mouth of Little Salmon River (and particularly in the small water that comes down the gully from Black Duck Lake).

Berries were harvested for food, as also were certain roots, young plant shoots and mushrooms. Many other plants and plant products were collected for their medicinal value, and, according to modern accounts were quite effective for treating wounds and infection and in promoting healing. Birch wood was preferred for implements, such as bows and arrows, toboggans and snowshoes and (the bark) for covering canoes and for baskets, but birch has not been available locally in recent times. The nearest birch groves now are at Little Salmon Lake. Spoons and ladles could be made of either birch wood, birch bark, or from sheep horn and antler. Spruce and spruce roots were used for making fish traps.

The Seasonal Round

People formerly ranged over extensive territories to find the scattered game and to adjust to fluctuations in the local availability. Legros (1981:826) has calculated that the area regularly hunted and trapped by a single hunter might have been as much as 1000 square miles. The following is a reconstruction of traditional land use based on discussions with members of the Little Salmon/Carmacks and Selkirk First Nations by Legros (1981) and Gotthardt (1987).

Spring – From about mid-April to the end of June, people stayed mostly in the valleys and lowlands to hunt and trap. While hunting moose and trapping small game continued from the winter months, beaver and muskrat hunting and trapping now were especially important. Groups of people who had stayed at the good fishing lakes during the winter split up at this time. One good muskrat lake is the second lake below Frenchman ("Scout" Lake or *Ts'andlia Män*). Beaver could be found on most lakes, ponds and feeder streams. For a while in April people moved to lake and creek outlets to net or trap grayling that were moving to spawning beds. Pike spawn in June, and were taken together with their roe. Ducks and geese returned in the spring and were hunted and their eggs collected. Spring was also the time to dig for roots and collect birchbark when it was easy to peel from the tree. Spring camps tended to be more mobile than the winter camps. A few Coast Indian traders might come inland to rendezvous points during the spring.

Summer – The summer months of July and August were spent at king salmon fishing camps next to the Yukon River. Fish traps were built at the prime fishing areas: above the mouth of the Little Salmon River where the river is split by islets into three channels (allowing two channels to be fenced off), and on the Tatchun River close to its mouth. As many as ten families gathered together at each camp to build the trap and split and dry fish. Smaller camps also were set up by one or two families each at less favourable locations. Before and after the main salmon run, small groups of hunters went out to hunt moose, and the women gathered plants and berries. This was the main season for traders to come in from the coast, when they would find many people assembled at well known localities.

Autumn – September and October was the peak hunting season: game was in prime condition, and it would keep in the cool air. About the end of August, groups split up and left the salmon fishing camps to travel to the hills to hunt sheep, caribou and moose. The largest hunting parties comprised as many as five families, centred around a very good hunter who knew the best game areas; the smallest hunting group consisted of two families, or one family with two adult men. Hunting areas were discussed by hunters in advance to avoid overlap. The hills north, east and west of Frenchman and Tatchun Lake, and also those immediately west of the Yukon River all were hunting areas. Game taken in the hills was dried and cached. In early October, some people returned to the Yukon River, sloughs and tributary streams to fish for dog salmon and whitefish. The best location for trapping or netting spawning whitefish was Frenchman Lake; Tatchun Lake also was good. Fish were cached on dry hillsides (in ground caches excavated into gravel) near the fish camp, or in high elevated caches.

Winter – Early November to mid-April was a time of trapping, lake fishing and moose hunting. In the hardest part of winter, January and February, many people moved to the good whitefish lakes, and particularly to the narrows on Tatchun Lake, which stayed open late and developed only thin ice, and at Frenchman Lake. Usually, three or four families (about 20 people) would camp at these narrows for the entire winter. Most of the same people had been together at the summer king salmon fishing camp. Legros (1981:828) reports that winter life unfolded from these camps through a series of short hunting and trapping expeditions within a 15 to 25 mile radius, as well as at the fishery. The best fish camps were located close to the same country where people hunted moose and cached dry meat in the fall, but the cached food lasted only part of the winter. Older people usually stayed at the winter fish camps for the entire winter, and trapped hare and grouse to supplement their fishing, while able persons went out, from time to time, in search for game.

For other people, much of the winter was spent continually travelling in small groups, often single families, in search of moose and other game and fishing the less productive lakes. They trapped marten and wolverine and searched for bear dens in the hills. In the valleys they trapped grouse, ptarmigan, hare, lynx and beaver and hunted moose. In late winter moose became the main focus of hunting. Some people also went to the lands of the neighbouring Selkirk people, for about a month, for jackfish when winters were particularly hard and no moose could be found.

People travelled most of the time by foot, using dogs for packing. Traditional toboggans were made of the leg skins of caribou, sewn together with the hair left on. After breakup, rafts, mooseskin boats and, less commonly, dugout canoes made from cottonwood trees were used for river and lake travel. Birchbark canoes were used as well.

Hunting and Fishing

Hunting equipment consisted of spears, thrusting lances, and bows and arrows. Bone and antler were favoured for arrow and spear points. Different point styles were used, depending on the intended prey. The beaver spear actually was a harpoon with detachable head that remained attached to the shaft through a sinew line. Gaffs and three pronged leister spears were employed for fishing as also were nets and traps. Large copper knives were used both in hunting, lashed to a shaft, and in warfare.

Many of the techniques for capturing game and fish used in the past–the traps, deadfalls, snares and nets and drives/corrals–were 'automatic' devices, or partially so, which did not require active pursuit or continuous vigilance on the part of the hunter or fisherman (Legros 1981). The ability to successfully use these facilities, however, depended very much on a person's skill in their construction and knowledge of how and where to set such devices. Moose, sheep and lynx were regularly snared, traditionally only by men. Women more frequently snared muskrat, squirrel, ground squirrel ("gopher") and hare. Only men built deadfalls. They were used on wolverine, marten, weasel, beaver, marmot, fox, wolf and bear. More active techniques also were employed if the situation warranted. Among all neighbouring tribes, such as the Upper Tanana and Southern Tutchone, moose, caribou, and in some cases sheep, were hunted in drives with a number of hunters together forcing the animals into an enclosure where they became caught in snares and were killed with spears or by bow and arrow.

Fish traps were set for various species in smaller streams and channels off the main river. Before the introduction of commercial yarn and large fish nets, short sinew or willow nets supplemented trapping and spearing fish. Ice fishing with a lure and spear was common, particularly for jackfish and lake trout. People from Carmacks went to Tatlmain Lake for this. Fish also were gaffed when they congregated to spawn, and also were taken by hook and line.

Shelters. People lived year-round in brush camps. These were described to Legros (1981:798) as a tripod framework constructed of poles and covered with spruce boughs. One side was left open and the fire was located there. The size varied depending on people's needs; normally, however, the shelter was a little less than 2 m high and 2 by 2 m at the base. The floor was covered with spruce branches, and cross-poles lashed high in the framework supported a storage rack. Two related families camping together would set two shelters facing each other and share a common fire. The intervening common area could be roofed over. In winter, the outside of the shelter was covered with moose hides. Snow was piled up along the sides for added insulation. Similar Northern Tutchone shelters, or a variation, were seen along the Yukon River by Schwatka (1885). Domed skin-covered tents also have been reported for the Northern Tutchone. Legros suggests that mooseskin tents may have become less common by the mid- to late 19th century as people became interested in marketing their skins in the Coast Indian trade (personal communication to Gotthardt, 1987).

Figure 1.1. View looking southward from KaTx-4, east side Frenchman Lake, towards hummocks at the lake narrows.

Figure 1.2. Frenchman Lake, the middle reaches.

Figure 1.3. Bluff edge at the head of Tatchun Lake.

Figure 1.4. Spring-fed flood near the Kelly Creek site.

Figure 1.5. Hummocky kame terrain at the head of Tatchun Lake.

Figure 1.6. Esker at the Tatchun River culvert near Kelly Creek.

Figure 1.7. Frenchman Ridge or *Gum 'Rá* upland, east of Frenchman Lake.

CHAPTER 2
A MICROBLADE PRODUCTION STATION: THE KELLY CREEK SITE

This chapter describes and interprets the Kelly Creek site, KbTx-2. A detailed description and analysis of the artifacts from KbTx-2 appears in Chapter 3. The Kelly Creek site was the major focus if investigations by the Canadian Museum of Civilization. Two contiguous microblade and core distributions were excavated there in 1983, 1990 and 1992. Each is interpreted as the work area of a small group of knappers, representing brief moments in the history of persons of the same, small group. Though KbTx-2 is not dated, the microblade cores are of the Campus or Denali type which in Alaska occurs through a broad time span extending from 10 700 to about 1500 years ago. In addition to the microblade industry, a few implements including burins were recovered. Utilization of troweling, coarse screening and fine screening excavation techniques allows a comparison of how different procedures affect the recovery of small artifacts.

The major anthropological significance of the Kelly Creek site, inferred from the highly localized nature and small size of the microblade production localities, is that it illustrates techniques proper to a particular, brief moment in time and the variation present at that moment among a small group of artisans. In other cases, a site assemblage often represents an amalgam and palimpsest arising from intermittent camping over the centuries and millennia and fails to portray any single discrete entity. In prehistory the individual not only is anonymous but often is homogenized into the group. Cases such as the microblade clusters at the Kelly Creek site permit us to identify more closely the individual in prehistory.

Discovery and Description of the Site

History of Field Work

KbTx-2 was discovered in 1981 by Jon Damp during an impact survey by Lifeways of Canada, Calgary, for the Northern Canada Power Commission (Lifeways 1983). Only surface collection at a road scrape was done at that time, but their report recommended excavation.

In 1983 The National Museum of Man (now Canadian Museum of Civilization) undertook survey and excavation in the vicinity of Frenchman Lake and Tatchun Lake. Donald Clark, assisted by student Deborah Thayer, came to the lakes to follow up on the Lifeways of Canada recommendations that several sites be further examined. Clark also was responding to a request by Dawn and Wilfred Charlie of Carmacks that an archaeologist visit the area. Portions of the Kelly Creek site (KbTx-2) were excavated, other sites were reexamined, and limited survey was done to locate additional sites.

Later in 1983 plans were announced for upgrading the dirt road that ran along Frenchman and Tatchun Lakes between Highway 9 (Robert Campbell Highway) and Highway 2 (Klondike Highway) and for the construction of new campgrounds. The dirt road already had truncated the outer edge of KbTx-2. In order to minimise potential impact on archaeological sites, the Yukon Parks Planning Branch (Department of Renewable Resources) and the National Museum of Man (Canadian Museum of Civilization) contracted the Council for Yukon Indians (CYI) to do intensive archaeological survey along the route and in campground areas. The survey and testing was done by Jeff Hunston while he was CYI staff archaeologist. This work was done in two phases, the main project in July, August and September 1984 was preceded by preliminary work done late in 1983. Many new sites were discovered (Hunston 1983, 1984), but the main impact of Hunston's surveys vis-à-vis the Kelly Creek site was his recommendation to the Parks Planning Branch that the road be rerouted slightly to avoid destruction of the remaining portions of the site.

We returned to the site in 1990, while doing archaeological surveys in the area, and reexcavated and screened the dirt from the small 1983 excavation. Screens had not been employed during the first season. An additional microblade workshop area, the Southeast (SE) cluster, also was discovered and excavated at that time. Field work in 1990 was a collaborative effort of the Canadian Museum of Civilization and the Heritage Branch of the Yukon Government. For this work, D. Clark was joined by Ruth Gotthardt and Greg Hare of the Yukon Heritage Branch. The 1983 and subsequent field work was assisted by Dawn, Wilfred and Lennie Charlie of Carmacks and Frenchman Lake. The results of the 1983 and 1990 excavations at the Kelly Creek site were published in the *Canadian Journal of Archaeology* (Clark 1992a) and a more detailed report, including later investigation of the site, is given in the present volume.

After a sustained effort at refitting fragments, Clark concluded that important material, including missing pieces, still lay outside the excavated area. Accordingly, the 1992 community-based Access to Archaeology Programme with the Little Salmon and Carmacks First Nations was seen as an opportunity to investigate the fringes of the Kelly Creek site. Figure 2.7 shows the distribution of the new (1992) sections. The most significant results in 1992, comprising a strong recovery of artifacts, came from the area "west" of the Southeast Cluster. This area produced a strong distribution of lithics that stopped just short of the old dirt road.

In 1994 Donald Clark and Ruth Gotthardt, assisted by Dawn Charlie, returned to Frenchman Lake for a brief schedule of survey and excavation. Further small sections were excavated at KbTx-2 to correct the failure of previous excavations to clearly reach the edge of the site at two points.

Primary excavation was by troweling. As well, the spoil was screened. Cores and implements were recorded two dimensionally and, in 1990, also by depth and soil matrix (excepting some specimens recovered on the screens or in flake lots). Flakes were collected in various one-metre square and half-metre (50 x 100 cm) or other size sections.

Description of the Site

The site and vicinity. The Kelly Creek site is located near the edge of a high alluvial bench or kame terrace along the valley between Tatchun and Frenchman Lake. Below, Kelly Creek and the Tatchun River flow northward through the valley, at places lost in a morass of beaver floods. The site commands a good view of the tree cloaked valley including, in the distance to the south, the outlet end of Frenchman Lake, first seen at this point by a person travelling along the bench from Tatchun Lake (Fig. 2.2). Although details of the lake are not discernible at this distance, the site would have made a good point from which to send or spot signal fires, the mode of distant communication used by the Northern Tutchone. Vegetation at the site is very limited in variety and consists of a forest of mixed spruce and small aspen, some willows and a few other shrubs (Fig. 2.3, 2.5). The vegetation probably differed in the past inasmuch as this area is subject to frequent forest fires. A dry (xeric), largely unforested slope leads to the bottomland where thickets and spruce and large poplars (cottonwood and/or balsam poplar and aspen) become more prominent. There are no balsam fir, pine and birch trees in the immediate vicinity.

The spatial relationships of test pits, excavated areas and areas of lithic concentration at the site are indicated in maps Figures 2.6 and 2.7. The site is slightly benched or terraced in front. A dirt road followed and partially destroyed the surface and part of the site at the edge of the upper bench. This surface drops approximately one metre to the lower bench from which a steep, sparsely vegetated slope drops to the valley bottom. The top edge of the slope is approximately 40 m out towards the valley bottom from the microblade clusters. Disturbed flakes found on the roadbed extended for approximately 100 m, but their extent may be in part a secondary result of bulldozing the site. Flakes found in place along the inner edge of the roadcut were limited to the vicinity of the microblade clusters and extended over a distance no greater than 15 m, with rare occurrences beyond that. Possibly, except at the microblade loci, the lithic material followed a long narrow band nearly completely destroyed when the dirt road was cut. The lower bench occurrences, however, add greater breadth to the site and are not disturbed by construction. But remains in that area are very sparse.

The combined area of microblade production extends for only eight metres. Beyond that area, soil deposits, where tested, contain only the occasional flake or implement. Initial surface collections in 1983 were not encouraging, and it was only through trimming the slight, 20-cm-high, inner edge of the road cut to inspect the soil profile that the Northwest microblade locus was discovered. With the possible exception of sparse, disseminated flakes and microblades, the 1990 (SE) locus and the Southwest extension excavated in 1992 did not extend to the road cut, though they stopped not many centimetres short. An undetermined portion of the Northwest cluster was destroyed by the road and interpretation is complicated because within the 1992 (SW) excavation there is asymmetrical overlap of Southeast and Northwest clusters. Less abundant materials collected from the dirt road bed either were bulldozed out of the Northwest cluster, or are from scattered occurrences around the excavated loci or come from additional lithic clusters that were completely obliterated during road construction. Flakes but no microblades or cores were found in test pits located on the lower terrace.

Natural and cultural stratigraphy. Flakes, microblades, and cores were found throughout a red oxidized sandy soil or mixed (mottled) red and tan "B" soil (zone) horizon and in the top of the underlying light brown to yellow brown loess, the "C" soil horizon (Fig. 2.4). The red soil was present immediately below a very thick, clean deposit of White River volcanic ash. For this tephra, a depth at the base of 17 cm is representative. In a sense, the soil below the White River ash is a paleosol, but there is little soil development above the essentially unaltered ash and therefore the ash is treated as an event unrelated to local pedogenesis. Patches of red-brown matrix also were observed in the roadcut at places where there was no cultural material. The red soil thus is not an exclusive indicator of human occupation and the close fit at KbTx-2 may be coincidental. If it instead indicates forest fires or a dense forest cover one may query why this soil is not universally present. Locally, the red soil occurs as deeply as 35 cm with artifacts, but generally the base of the red soil and artifact horizon is shallower. Frost action may be responsible for the uneven, downward penetration of the artifact horizon as well as the vertical or on-edge orientation of tabular specimens that one would expect to be found lying flat. Above the White River ash, there is a well-knit layer of turf rooted in thin brown soil, the "A" horizon.

The thickness of these soil layers varies, there being generally about 3 centimetres of organic litter and top soil, 7 cm to more than 13 cm of White River tephra, 9 cm to 18 cm of red or mixed red and brown soil, and below that the light brown substrate. As observed elsewhere in the site, the "C" horizon grades within a few centimetres into greenish yellow-brown sandy sediment that overlays gravel of probable glaciofluvial origin. The site has been spared from excessive disturbance by ground squirrels, locally called "gophers", an animal that is cyclically very abundant in the Yukon. A single burrow, marked by a fill of White River ash, was recognized in the excavations.

An impression received during trimming of the road cut in 1983, that there was some lithic material on the site above the White River ash, is not reliable and was not born out by the excavations. In 1990 and 1992, though, the turf was cut, stacked to the side of the excavation (and later was replaced) without being broken up and processed through the screen, so it is not possible to assert conclusively that no artifacts were present above the ash. However, some artifacts, mainly flakes of no diagnostic significance, were found at the very base of the ash. These are interpreted as part of a vertical distribution of artifacts within the soil effected by frost action and tree growth that may have diffused any discrete, narrow, occupation layer once present.

Charcoal-stained or dark organic streaks are absent from the microblade locus except for one occurrence sampled in 1992. There is no direct evidence of hearths, such as an ash deposit, charcoal that cannot be attributed to a burned tree, cluster of fire-cracked rock, or cluster of calcined bone. However, a few microblades, lithic shatter and a number of flakes, and one microblade core are "burned"; i.e., highly altered through heating. The burned material is largely limited to contiguous sections comprising one third of the area excavated. Burning might have occurred during a hot forest fire before the stone had become buried below the tephra, but the burned lithics are accompanied by a greater amount of unaltered material (suggesting that heating was not uniform). Cobbles and fire-cracked rock are relatively uncommon. Fourteen cobbles were present in the 1983 excavation. Two of these, including a possible hammerstone, were collected. Cobbles were present only at the eastern edge of the 1990 (SE) excavation, and these consisted of fragments of three or four broken cobbles. In one case, the fragment obviously had been split out of the centre of a large cobble and is, in a sense, an artifact. The other broken cobbles may or may not be artifacts. None was recovered in 1992 and a single unburned cobble was found in the concluding test of 1994. Fire-cracked rock also is nearly absent in the dirt road exposures.

Artifact Recovery and Clusters

There are 121 catalogue entries for the 1981 collection; the 1983 collection and a small lot picked up from the road surface in 1984 add 468; the 1990 collection provides more than 900 entries; the 1992 excavations bring the total to 1595 catalogue entries, and finally the 1994 recovery caps it at nearly 1700 lots comprising more than 6404 specimens including 4888 flakes. These include items from test pits and the road surface not part of the microblade clusters. Microblades and cores and implements are numbered individually, one entry per specimen, while the flakes are recorded in lots of one flake to a few hundred flakes. The breakdown by area of excavation is as follows:

The Northwest cluster (N = 2355) includes the 1983 excavations, recovery from the screens in 1990, a small unit dug in 1990 to square up the 1983 excavation, and Unit 2 excavated in 1994. The 1994 unit, which may be mixed, produced only nine microblades five of which were measurable but are not included in the metric summaries, 13 flakes and a platform tablet. A substantial part of the 1983 matrix was not fine-screened so the number of microblades and flakes is substantially underrepresented.

The Southeast cluster (N = 2760) includes the 1990 excavation, contiguous units along the northwest side dug in 1992, and units 3, 5, and 6 excavated in 1994 (33 microblades, 1 core, 145 flakes in 1994). It also includes 1994 Unit 1 which is positioned next to the Northwest cluster but yielded a core tablet that fits a series of tablets from three Southeast cluster units. The lithology of the Unit sample (23 microblades and 32 flakes) best matches that of the Southeast cluster.

The Southwest Area (N = 1312) comprises units excavated in 1992 plus 1994 units 4 and 7 (9 microblades, 93 flakes, 1 burin spall, 1 triangular ridged spall fragment, 1 split quartzite cobble in 1994) that lay between the Southeast cluster (or west of the baseline) and the old dirt road, although the basis for this partitioning is somewhat arbitrary. Artifacts from the Southwest area are linked variously by refitting with the Southeast and Northwest clusters.

The total mass of material from the Northwest location is somewhat greater than that from the Southeast locus (Table 2.1). The definition of a microblade used here includes any fragmentary, malformed or undersize portion of a microblade. The weight of the assemblage and its technological com-

TABLE 2.1. KBTX-2 COLLECTIONS ACCORDING TO EXCAVATION AREA

Description	NW Cluster[1]	SE Cluster[2]	SW Area	Total
Microblades	395	682	291	1368
... measured	(214)	(337)	(214)	(765)
Microblade core	11	10	3	24
Core fragment with part of fluted face	1+	2+		3+
Core blank	1	1	3	5
Platform tablet[3]	37	36	8	81
Other implement	7	9	5	21
Burin spall	2	4+	+	14+
Flakes	1901	2016	994	4888
Total	2355	2760	1312	6404+

1. Does not include flakes recovered through trimming the roadcut prior to controlled excavation.
2. Includes 1992 Section 1-5, 8 collection with 54 measured microblades, 17 other microblades, 5 core tablets and flakes. The 1994 collection is apportioned among loci as noted in the text.
3. Some tablets are fitted to other tablets or cores, fitted stacks can comprise the greater portion of a core but are not counted as core fragments.

ponents may provide better understanding of what was happening at the flaking station than a count of specimens which is likely to be biased according to the care taken in collecting and counting tiny flakes. Table 2.2 gives data on the weight by cluster of the 1983 and 1990 collections. Weight provides a reasonably accurate measure of the amount of material discarded at the site, though, because we do not know how much has been carried away for use elsewhere, it is not possible to determine the balance between material imported, material expended at the site, and material carried forward. Nevertheless, it is possible to construct a feasible scenario on the basis of incomplete information. A serious problem is that part of the Northwest Locus had been removed through road construction. Too, only a small part of the backdirt from this cluster was passed through the fine screen, but that is not a major concern as there would be little weight to the very tiny flakes and microblades not recovered.

Even although material has been lost from it to the roadcut, there is nearly twice the amount of debitage from the Northwest cluster compared with the Southeast cluster. As well, the mass of Northwest cluster microblades outweighs those from the Southeast cluster.

The frequency of cores is closely comparable but Northwest locus cores tend to be larger. The average weight of cores, tablets and microblades from the Southeast locus, (based on 11 cores including two incomplete, fragmentary ones, but excluding the 1994 finds with one core) is 18.4 g. This would be the original average core weight minus the microblades that were removed from the manufacturing site, however there is evidence that additional, missing cores also were being utilized. The corresponding figure for the Northwest cluster is 28.5 g.

Considering the thickness of core tablets, for the Northwest cluster 30 tablets (seven others rejected for this calculation or not located for measurement) have a combined height at the fluted end of 141.6 mm or 11.8 mm per core (based on 12 cores including fragments with part of the fluted face), but two of the tablets actually are fitted to a core from the 1992 Southwest area, so if averaged out over 13 cores the figure is 10.9 mm of rejuvenation per core. For the Southeast cluster 34 tablets out of 36 were measured, giving a combined height of 143.6 mm or 12 mm per core (based on 12 cores). Again, there is a tablet that fits a core from the 1992 Southwest area, so if averaged over 13 cores the value becomes 11 mm rejuvenation per core. Thus, the two areas compared have nearly identical amounts of rejuvenation per core, unexplained differences in average core and aggregated microblade mass notwithstanding. It would be useful to compare these findings (11 mm average rejuvenation per core, 18.4 g and 28.5 g average weight of cores plus core products) with those from other microblade workshops, but few comparable data sets have been published.

Dating

The site is not dated, and there no very satisfactory prospects of dating it. No hearths or charcoal were uncovered. The one radiocarbon date obtained on charcoal, discussed below, also does not appear to date the occupation. The best estimates of age come from comparisons with other microblade sites in the greater region, though these encompass a broad time range.

Not far to the south of KbTx-2 at the Otter Falls site, microblade and core technology similar to that found at Kelly Creek is dated to approximately 4500 years ago (Workman 1978, Cook 1968). Several additional dates are available for sites in the southwest and west-central Yukon. These include site KaVa-3 which is located at Carmacks and could have been within the territory of the same group that occupied the Kelly Creek site. The KaVa-3 date is 5890±40 BP (Beta-86359; Gotthardt Heritage Branch data; cf. Gotthardt 1995). Sites JeVc-20 and JeVb-15, located in the southwest Yukon near Champagne, not a great distance from Otter Falls, have returned dates of 7030±60 BP (Beta-85913) and 3480±70 BP (Beta-85598) respectively (Yukon Heritage Branch data, Hammer 1996, Hare 1996). This range of dates partially mirrors the situation in the greater northwest interior region, especially Alaska, were uncalibrated radiocarbon dates suggest that seemingly similar microblade industries existed between 10 600 BP, or earlier, and 1500 years ago, for instance at Healy Lake (see Chapter 3) and Dixthada (Shinkwin 1979).

TABLE 2.2. SUMMARY OF ARTIFACT WEIGHT[1]

Category	NW Cluster	SE Cluster
Flakes --total weight (grams)	821	390
Shatter (most from core preparation)	136	78
Microblades --total	78.5	59.4
--average weight (N=374 & 565)	0.192	0.107
--1983 excavation only	72	
--1990 coarse screen (N=7)	2	
--1990 fine screen (N=64)	4.5	
--average weight (N=64)	0.070	
Core tablets --(N NW=36, N SE=30)	89	55
Cores[2] --total	175	88
--average weight	14	9
Subtotal without flaked tools	1301	673
Flaked tools	73[3]	41
Total weight (grams)	1374	714

1. These frequency and weight data do not include items recovered in 1992 from a strip of excavation units located along the north edge of the SE cluster, nor do they include those recovered in 1994. These additional 560 flakes, 139 microblades and 7 platform tablets thus excluded will modestly increase the weight shown here in the order of about 11 percent for microblades and 13 percent for flakes. The SE cluster core recovered in 1994 weighs 8 g incomplete (estimated 9 g complete) and its inclusion would not change the average core weight.
2. Cores include 1 blank and the fluted face fragments. Excluding the fragments, average weight of the cores is 13.9 and 8.6 g, respectively, for the two clusters.
3. A single large retouched flake weights 58 g, otherwise flaked implements are rare in the Northwest cluster.

A wood charcoal sample excavated in 1992 returned the uncalibrated radiocarbon date of 1340±360 years B.P. (S-3487) or A.D. 610 (between A.D. 970 and A.D. 350 taking the one sigma error range into account). The date has not been calibrated as that would change it very little. The sample dated is from a thick charcoal streak that occurred generally 18 to 22 cm but locally as much as 28 cm below the White River ash within a matrix of artifact-bearing red-brown soil, which is the context to be dated. A soil involution may have carried both the red-brown site soil and charcoal downward. At the time of excavation, some concern was given to interpreting the charcoal occurrence and it was decided that it could not be realistically identified as a hearth and could be from the burned out roots of an old tree. Because the charcoal occurred within the artifact-bearing horizon, and at its shallowest point it was 18 cm below the White River ash, it was felt that even is it came from a tree, the tree should have grown close to the time when the site was occupied and substantially before the ash fall of about 800 A.D. The analysis should provide a stopdate forward. But the reconstruction or sequencing of events at KbTx-2 to place the date in context strains the chronology to such a degree that the date seems to be so late that it is of uncertain value, even as a stopdate.

Screening at KbTx-2

During four years work the deposits were processed to differing standards:

1983–troweled, all reprocessed (in 1990) through 3/8 inch (9.5 mm, 1/4 in. not available) mesh screen, and part reprocessed (in 1990) through 1/18 inch (1.4 mm) mesh screen

1990–troweled, and processed through 1/18 (2/9) inch (1.4 mm) mesh wire screen

1992–troweled, and processed through 1/9 inch (2.84 mm) mesh wire screen.

1994–troweled, and processed through screen as above.

In 1990 the backdirt form the 1983 season was coarse screened and a portion of it was rubbed through a fine window screen. A modest number of flakes–about two per pail of dirt, seven microblades (none sufficiently regular to use in measurement statistics), several microblade core platform tablets, and two small microblade core fragments that fit a 1983 specimen were recovered in the coarse screen. We also retrieved a microblade core that may have come from *in situ* deposits where excavation previously had been too shallow.

It was very difficult to shake and rub the dirt through the very fine mesh used in 1990. The problem was aggravated by rain which moistened the soil the night before screening started. Eventually approximately ten percent of the 1983 backdirt was processed through the fine screen. This resulted in the recovery of a substantial number of tiny flakes and microblades. As we knew that many microblades would be lost if we did not utilize a fine screen, all of the soil from the new 1990 excavation was rubbed through the 1/18 inch mesh.

Without complete processing, only qualitative conclusions are possible concerning the results of fine screening: these, nevertheless, are clear. Under circumstances similar to the present case, and given the small size of microblades, the utility of a coarse 3/8 inch screen is limited. One-quarter inch mesh likely would produce better results. Approximately one quarter of the flake collection for the NW cluster, by weight, was recovered during the screening exercise, 90 percent of that with the coarse screen (Table 2.1). But in order to recover microblades it is also necessary to pass the dirt through a smaller mesh. One as fine as that employed in 1990 is extremely difficult to work with. In 1992 we used a larger mesh (1/9 inch) that provided reasonably good recovery of small objects while at the same time it allowed dry soil to pass through relatively freely. It appears, though, that some tiny microblades–we call them "spruce-needle microblades"–may have passed through. As was thus expected, the average size of microblades recovered in 1992 is larger than was the case with a finer screen in 1991 (Table 2.3; data in Chapter 3).

TABLE 2.3. COMPARATIVE RECOVERY OF MICROBLADES

Technique (coarser to finer)	Recovered Size (microblade width)	
1983 trowled	4.8 mm average	(unscreened collection)
1992 2.8 mm mesh screen	4.46 mm average	(whole collection)
1990 1.4 mm mesh screen	4.12 mm average	(whole collection)
1983 1.4 mm mesh screen, reprocessed fraction	4.07 mm average	(screened fraction only)

The average width and thickness for 27 measured microblades from the 1983 backdirt recovered on the fine screen are low–4.13 mm and 1.04 mm respectively (excluding a single thick series microblade, or 4.07 and 1.074 mm with the stout). This size is smaller than that of the trowel-excavated specimens for which the 1983 average is 4.80 mm width and 1.22 mm thickness. These observations are strikingly paralleled by the average weight of the microblades which is 0.07 g for specimens (including those excluded from measurements) recovered on the fine screen and 0.19 g for the 1983 trowel excavated collection. From this exercise we conclude that statistics given for microblade size and frequency may be strongly biased towards recovery techniques, especially when the microblades tend to be small, as they are at KbTx-2.

Refitting

Inasmuch as the collection represents nearly complete recovery of the lithic remains from one apparent work station and the major portion of another locus, it was anticipated that refitting of fragments and flakes would be a profitable enterprise. This required a major, tedious effort involving many days spent at the task. Eventually, refitting substantially increased the number of complete artifacts, and enhanced the interpretation of microblade and core production technology. Refitting has several objectives:

- to mend broken artifacts to improve the quality and size of the implement sample;
- to provide information on the steps used by knappers to produce artifacts;
- to provide information on the refurbishing of artifacts, especially the rejuvenation of microblade cores;
- to provide data on the clustering and dispersal of fragments. This may reflect the way people used each location, or it may point to disturbance of the site.

Considering the excavation effort normally required to recover a microblade core, fits that result in the reassembly of cores from their fragments are particularly worthwhile. There are seven such refitted cores. In addition, it was possible to fit one or more platform tablets to nine cores. Finally, there are eight groups or stacks of tablets that cannot be rejoined to any core. As many as eight tablets and other pieces, forming the greater part of a core, have been refitted. One difficulty in matching tablets with cores occurs because after renewal through a frontal blow, detaching a tablet, the tops of cores often are retouched from the side. And as the platform is worked back through detachment of microblades, the area where tablet and platform surfaces match is reduced. Significantly, one platform tablet from the Northwest cluster screenings was attached to a core from the Southeast cluster. In two instances platform tablets from the Northwest cluster were reattached to cores from the Southwest (1992) area (KbTx-2:379+607 to 1488; and KbTx-2:379 No. 2 and 1478 to core KbTx-2:1477). A tablet recovered in two pieces from the Southeast cluster (in 1990) also fits a core from the Southwest area (KbTx-2:716 and 717 to core base KbTx-2:1549 and 1536). One core is traced from 1994 Unit 2 where a side-blow flake detached in forming the core top was recovered, to the 1983 excavation (No. 727, screen recovery) from which a whole platform rejuvenation tablet was recovered, and thence to the Southeast cluster where the spent core remnant was found in two fragments. Nevertheless, of 37 core tablets recovered from the Northwest cluster, seven only have been refitted to cores. Most stand alone, fitting neither cores nor other tablets. The frequency of fits is higher for the Southeast locus.

Lithic Material Distributions and their Bearing on the Separateness of Activity Clusters

The Distribution of Black Chert

A black microblade core tablet found by screening the 1983 Northwest deposits fits a core excavated in 1990 at the Southeast cluster. We wanted to know what interpretation to place on this find: did microblade production begin in the one locus and continue at the other locus where the core finally was discarded? Or were the fragments dispersed secondarily through natural processes? Accordingly, black microblades were examined for fits that might explain this dispersal (bearing in mind that the two areas are thought to represent discrete events). For the Northwest locus there are only 15 black microblades in the analysed set. There also are several tablets, including one, together with a platform side-blow trimming flake, that fits the core from the Southeast locus. From the Southeast locus there are two black chert cores, five stand-alone tablets, and 143 black microblades constituting 25.3 percent of the microblades recovered from that area (1990 data only, see 1992 below). About the same proportion of black to other microblades was found in the Southwest area in 1992. For the strip of five sections excavated along the northwest edge of the Southeast cluster in 1992, 54 percent of the 69 microblades are black, suggesting a stronger tendency for work with black chert cores in one part of the Southeast cluster. These Southeast cluster values (25% and locally 54%) are considerably greater than the incidence of black microblades in the Northwest locus where they make up only 3.6 percent of the microblade sample.

TABLE 2.4 . DISTRIBUTION OF MICROBLADES AND FLAKES BY AREA

	NW Area	SE Cluster (locus) 1990	1992	1994[1]	SE totals	SW Area
Microblades, black						
First analysis	15	143	37	---	---	82
Second analysis	17	154	47	25	226	93
Area excavated[2]	7.7 m^2	8.5 m^2	3.0 m^2	1.9m^2	13.4 m^2	7.15 m^2
Density (second)	2.2/m^2	18.1	15.7	13.2	16.9 average	13.0
Microblades, all						
First analysis[3]	395	564	74	56	694	295
Density[4]	51.7/m^2	66.5	24.7	29.5	51.8 average	41.3
Flakes, black						
Second analysis	95	93	110	107[5]	410	95[5]
Density	12.3/m^2	22.7	36.7	56.3	24.3 average	3.3
Flakes, all						
First analysis[4]	1910	1489	350	279	2048	964
Density	248/m^2	175	116	147	121 average	135

1. Units 94-1, -3, -5, -6; the SW area includes units 94-4, -7; the NW Locus includes 94-2.
2. For SE and SW areas (loci) a sterile half metre section in each is excluded; from the SW area a sterile 0.3 m sterile area is excluded.
3. Data are in Chapter 3.
4. Recovery for the NW area is depressed because only part of the matrix was fine screened.
5. Most "black" flakes are grey. This may be original or they may have become bleached. Otherwise, the number of black flakes is about one third the number indicated and the area densities of 56.3 and 13.3 per square metre fall accordingly.

This information is plotted in Figures 2.10 and 2.11. The distribution of microblades shows unequal black clusters in the Southeast and Southwest areas. Black microblades clearly are not a feature of the Northwest cluster, and the core tablet found there may reflect dispersal from the Southeast cluster. Black flakes have a somewhat stronger presence in the Northwest area than do black microblades, though the Northwest flakes are isolated from the Southeast cluster. Flakes result from the preparation of microblade cores while microblades result from the use of the cores, so there may be reasons why the flake and microblade distributions do not coincide. Cores and core tablets again parallel the distribution of microblades. One clue, indicating overlap between these areas and suggesting that the Southwest area is not a separate independent cluster is provided by two cases of refitting of cores and tablets (not black chert) linking Southwest to Southeast and Southwest to Northwest areas.

The distribution of black microblades by segment for the Southeast cluster (not counting the small 1994 sample) is: proximal 58, medial 48, distal 30, complete 5, uncertain 2. This is as even as one should expect especially as some medial segments end in hinge fractures and never had a distal end. A search was made for fits, matching width, thickness, arris number, arris alignment, and angle of fracture. There were 17 fits (7 pairs, 1 triple) leaving 121 incomplete microblades.. Many proximal and medial specimens are of appreciable length and, accordingly, the missing portions would have been too short to be utilized and should have been discarded at the site of manufacture, but their recovery appears to be incomplete.

We also have plotted the distribution density of all microblades and all flakes (Figures 2.12–2.14). High numbers of flakes and microblades are present in the Northwest area. The low occurrence of black flakes and microblades in one context thus cannot be attributed to sample size.

The flake and microblade plots in Figures 2.12 and 2.14 show that relatively little was recovered from the sections intervening between the Northwest locus and the Southwest area. As well, recovery was low at the back or east edge of the Northwest cluster. Sections with reduced recovery also separate the Northwest locus from the Southeast locus. But the lull in the intensity of lithics between the Southeast locus and Southwest area is of lesser magnitude. We are left, then, with Southeast and Northwest activity clusters and a hybrid explanation for the Southwest area. The last appears to be an area of overlap.

The Distribution of Flecked and Banded Grey Chert

The Northwest locus is characterized by a light chert with black streaks, veinlets and mottled areas that is rare in other excavation areas (other lithic varieties also are present). This chert was classified as three varieties: (Lithology 1) light grey chert with red, black, red and black or no hair lines; (Lithology 2) very light grey chert with black flecks and streaks broader than hair or fracture lines; and (Lithology 3) very light grey chert with substantial areas or solid zones of black chert. The modest amount of material of this nature from the Southwest (1992) area was scrutinized for the clues it might hold to the relationship between the Southwest area and other areas of microblade production.

Altogether, lithological differences support the interpretation that the two microblade clusters are discrete, exclusive of the Southwest area where there appears to be some overlap. In the case of the latter area, the following flecked and banded grey chert (Lithology 1–3) specimens were recovered:

microblade core	3
fitted core tablet	1
core blanks	2
microblades	3

sideblow flake from shaping the top of a core	1
other flakes	8
Total	18

This contrasts with the recovery of hundreds of microblades, flakes, core tablets, cores and core fragments of the same lithologies from the Northwest locus but virtually none from the Southeast area.

Recovery of only three microblades leads to the suggestion that although certain cores were found in the Southwest (1992) area there actually was little production there of microblades from these cores. But one of the cores (KbTx-2:1477) is refitted with a platform tablet from the same area. Prior to its rejuvenation, the top of this core had been reshaped through detachment of a side-blow flake (KbTx-2:379) found in the Northwest area; so it appears that core KbTx-2:1477 was prepared and spent its early life outside the Southwest area, probably at the Northwest locus, then was moved into the adjacent part of the Southwest area where it was rejuvenated, was used to a small extent, and finally was abandoned. But casting and random dumping of debris by the craftsperson could render this reconstruction meaningless. There also are two apparent core blanks of flecked and banded grey chert from the Southwest area, but the incidence of Lithology 1–3 flakes there is so low that preparation of these blanks likely took place elsewhere. Thus, although cores and blanks apparently were moved from the Northwest cluster (and elsewhere?) to the Southwest area, the latter area was not a site of microblade production from Lithology 1–3 cores.

Elsewhere, only in the case of the sparse microblade industry at Frenchman Hill was this chert found to be common. It remains to be determined where people obtained these raw materials. When that is known it should be possible to consider procurement during trade, hunting and travel circuits.

Excavations Outside the Microblade Clusters

Test pits placed the microblade production area did not discover further areas that warrant excavation but they help define the extent of the site. They consist of the following:

1. Trimming along the inner edge of the old road cut (1983)

Very little was recovered except where the road cuts the microblade loci. In 1990 a retouched flake was found in place in the roadcut, about 65 metres south of the microblade clusters, associated with a mass of red soil. The exposure was cleaned up and expanded but no flakes, calcined bone or fire cracked rock suggestive of human activity were found. In 1992 the edge of the road northwest of the Northwest locus was further investigated and excavated along the reach 12.2 m to 14.9 m north of the iron pipe datum for the core area, or a little more than 6 m northwest of the excavations. Eleven flakes and a small cobble were found below the White River ash, but no microblades were recovered.

2. Test northwest of the Northwest locus (1992)

The "N Inland Test Pit" was approximately 1.50 m east of the roadcut and 10.25 to 12.25 m north of the iron pipe datum for the core area. It yielded a cobble spall, which probably is an intentionally produced implement, and a single chert flake (not collected). The cobble spall occurred deep and on edge, presumably due to cryoturbation, its top edge 12 cm below the White River ash in a local lens of red soil. Clearly, site activity was sparse and discontinuous north or northwest of the microblade clusters.

3. Test southeast of the Southeast locus (1992)

Another test pit was placed 2 to 3 m south and 0 to 1 m west of the "0" datum stake; i.e., 1 m south of the excavations. This test produced 2 large chert flakes – possibly unidentifiable implement fragments – and 12 other flakes from below the White River ash. Additional flakes could have been overlooked as the matrix was not screened. Although no microblades were recovered, these are regarded as part of a "halo" or diffused distribution around the microblade clusters. The closest unit of the Southeast cluster, one metre away produced a number of flakes. The southern edge of the microblade clusters thus fades gradually.

4. Test Pits 3 and 4 on the lower terrace (1983) and extension of Test Pit 3 (1992)

Test Pit 3 is at the outer edge of the terrace where it is convex outward, at a position 4 m NW of a tagged metal survey rod identified as "UU 494". It was a relative large excavation about 1 by 2 m. The soil sequence here consists of 7 to 14 cm (at inner edge away from terrace edge) of White River ash, 16 cm (inner edge) to 23 cm (at outer edge towards valley bottom) of streaked brown, red brown and charcoal-stained soil, at an uneven or undulating interface, yellowish brown soil grading down into green-yellow brown matrix overlying gravel at 36 to 43 cm depth. A moderate number of flakes was recovered from below the White River ash though there were no diagnostic implements. A row of five 50 by 100 cm sections (i.e., a 1 by 2.5 m strip) was added to the inner edge of Test Pit 3 in 1992. Only the outer sections yielded anything, and then very few flakes. The soil became thinner inward from the terrace edge, though one might expect the opposite to have been the case because of erosion. Test Pit 4 was positioned between Test Pit 3 and the old road, but not in line. It yielded three flakes. The lithics at the outer edge of the terrace, in Test Pit 3, appear to be isolated from other areas of the site, the sparse occurrence of flakes in Test Pit 4 notwithstanding, and may be from unrelated occupations.

5. Tests into the dirt road surface (1992).

Test probes along the outer side or shoulder of the road, south of the microblade loci, 24 m south of the iron pipe datum, revealed White River ash underlain by sterile sand. There is no B horizon at this location. Farther south, at approximately 34 m, there is road fill over red and brown sandy soil, though the soil sequence appears to have been truncated. One flake (not collected) was found. At 50 m south there are mottled orange-red and yellow green soils which may represent the base of the B horizon. One flake (not collected) was found. Flakes also were found on the disturbed surface in this area.

Artifacts

Chapter 3 provides a detailed analysis of the artifacts. Here we give a brief overview.

Microblades

The original lot of microblades from the Northwest cluster has a relatively high frequency of dorsal ridges or arrises, averaging 2.09 with a mode of 2 Data for all clusters are given in Table 3.2. Width tends to be narrow, ranging from 2.2 to 8 mm and averaging 4.8 mm for the Northwest locus and 4.12 mm for the Southeast locus. The average thickness is 1.29 or 1.22 mm depending whether not a group of thick, stout specimens or spalls are excluded, and 1.17 mm for the two areas respectively. Almost no microblades are complete and well formed. Less than perfect complete specimens are 23 to 28 mm long excepting a 36 mm specimen, similar to the height of exhausted cores. Fragments combining proximal and medial portions tend to be 19 to 22 mm long. Retouched microblades are absent.

Microblade Cores

Almost all the cores are of typical Palaeo-Arctic or Denali (Campus core) wedge-shaped format with platforms formed by flaking from one side of the core and rejuvenated by detaching tablets–often the whole top of the core–through a blow directed to the fluted front of the core. Cores with the same technological features have been found elsewhere in the Yukon and Alaska.

Other Implements not Part of Microblade Production Technology

The list of implements in Table 2.5 needs little explication here.

TABLE 2.5. IMPLEMENTS FROM KbTx-2

Class	NW Locus	SE Locus	SW Area	Elsewhere
Flake core or large core tool			1?	2
Biface, point fragment			2	1
Retouched (bevelled) flake or true blade	3 or 4	2	2	3
End scrapers	1	1		1
Other uniface				1
Transverse burin or other flake burin	1	4	1	
Burin spall	2	8+	4+	
Cobble spall (boulder chip), split cobble	1	3	1	1
Hammerstone? (may be natural)	1		1?	
Abrader? (may be natural)	1			
Total	10	18+	12+	9

Interpreting the Occupation of KbTx-2

Overview

Two adjacent microblade technology clusters are interpreted as work sites. Because of differences in the cherts utilized at the two clusters, it is unlikely that together they represent only the shifting of work areas during a single occupation. People came to the site on at least two occasions. Each time, the artifact knappers among the group, possibly a couple of men, worked close together, leaving the discards found in each area of roughly three by four metres. They, and their families if they were travelling together, then moved on to another destination. Judging from the recovery of burins and scrapers, their work was not limited to making cores and striking off microblades. The broader distribution of implements and stone chipping debitage at KbTx-2 provides evidence of other activities or occupations at the site. However, major portions of the site were destroyed by the dirt road along the terrace, so additional work areas like those where the microblades and cores were found may have been eradicated. Recovery of microblades in the road suggests that that actually may have been the case. Whether families actually camped at the microblade workshops, or whether their shelters and hearths were elsewhere has not been determined.

The Definition of Discrete Activity Areas or Loci

The Northwest and Southeast artifact clusters appear to be separate activity areas, although the two areas are not totally discrete and wholly isolated. Identification of separate activity areas thus is based on three lines of evidence: (a) major clusters of microblade cores and stone implements, (b) the decreased incidence of microblades and waste flakes decreases in a zone separating these clusters, and (c) differences between the most common varieties of chert utilized.

The refitting of cores and tablets linked the Southwest area with the Northwest cluster in two cases and in a third case with the Southeast cluster. The chert lithology points to the Northwest cluster as the primary origin of these items. But the link is asymmetrical, perhaps little more than "contamination" inasmuch as the lithology of microblades shows that there was little use or production from these other-area cores in the Southwest area. Nevertheless, there is no firm basis for identifying a third cluster in the Southwest area, but we cannot exclude the possibility that there were further, minor, episodes of artifact production at KbTx-2.

The distribution of black chert marks the Northwest cluster as distinct for its very low incidence of black microblades. This distribution constitutes a fourth line of evidence for separating the Southeast and Northwest clusters.

Evidence of Forest Fires and Camp Fires

No hearths were found although uncommon burned microblades, more numerous burned flakes and a few heat-altered cobbles were recovered. The distribution of burned flakes was examined. Only a single example was found among the large number of flakes from the Northwest area. The majority come from contiguous sections in the Southeast locus and Southwest area. These include a burned core and several burned "chunks" or pieces of shatter and core blanks. Such chunks and the core were found in eight contiguous half-metre sections and may be the product of a single localized burning event. However, the total seven square metre area with burned stone is too great to be from an *in situ* hearth distribution. The distribution might be attributed to localized heating by forest fires (but there only a small part of the lithic material present is altered), or it may be a secondary naturally dispersed distribution. In most sites calcined bone and fire-cracked rock are components of hearth refuse, but none of this material is associated with the burned flakes at KbTx-2, therefore anthropogenic evidence of fire at the site is highly uncertain.

We note in the discussion of lithology in Chapter 3 changes in the colour of lithic artifacts from green to dull red-brown. It is not clear that heating is involved in this colour change. Sometimes fragments of the two differing colours are fitted together. It was observed that soil colour and lithic colours had an inverse correlation: green chert was found in red-brown soil, red-brown chert in brown soil. Although the red soil horizon at KbTx-2 is strongly correlated with the archaeological deposit, it is not localized in the manner of deposits around hearths. Nevertheless, its occurrence off the site or outside the artifact loci is sufficiently uncommon that an explanation attributing the soil to oxidation induced by forest fires seems inadequate.

Nonrandom Distribution of Conjoined Pieces

Given the lack of identified hearths or other structural features, there is reason to believe that the clusters were not formed as a floor scatter within the shelters. The distribution of cores and of fitting pieces can be drawn into this discussion. The fits show a predominately northeast-southwest orientation. The pattern may be related to the manner in which each cluster was formed. There is a tendency for platform tablets to be more widespread than the cores. If the tablets did not, so-to-speak, fly off the cores when they were detached, they were at least items to be discarded. The cores, however, were kept, except when eventually they were discarded. There is some question as to whether the ground distribution represents material dropped as it was produced or abandoned, or whether this is a secondary distribution produced, for instance, by shaking out a hide on which the craftsman had worked. On the basis of the dispersal of fitting fragments, the clusters may be cast-out waste. But some of the evidence seems to refute this interpretation.

In seven cases where flakes or platform tablets are fitted to cores, the core lies more or less at the southwesterly side (ranging from south to west) of the conjoined set.. Other pertinent evidence is the tight cluster all but one of the fitted fragments of core 898-901. The group of six fitted fragments (location of one not recorded) was recovered from an area about 20 cm in diameter. As all but one, seventh, fragment of this unfinished core were found as a tight clutch, they probably were left on the ground that way by the knapper.

Numbers and Ratios Similar between the Two Microblade Loci

Some flake ratios may be of interest. From the Northwest excavation units there are approximately 1790 flakes and 447 microblades: 4.0 flakes per microblade, 149 flakes each for the twelve cores (including core fragments) and 37 microblades per each of 11 recovered cores and fragments. These values are depressed by incomplete small flake and microblade recovery on the fine screen.

From the Southeast cluster there are 2016 flakes and 682 microblades: 3.0 flakes per microblade, 168 flakes each for the 12 cores and 59 microblades for each core (counting two fluted face fragments as cores). Production at the two clusters appears to have been at comparable levels.

Similar results are obtained when the weight of the collection is compared. Cores and products (microblades, tablets) recovered from the Northwest locus account for 29 percent of the lithic recovery by weight, excluding flaked implements. At the Southeast locus they account for almost the same proportion of the lithics. These data suggest that similar work sessions were carried out at each locus.

Some microblade and platform tablet are of lithic types not matched in any of the cores. This suggests that some cores were taken from KbTx-2 to the next camp site. For the most part, though, there is good correspondence between debitage, cores and microblades. Most of the microblade cores appear to have been discarded for obvious reasons of faults, exhaustion or breakage.

People arrived with the raw material or blanks to produce these cores, or brought cores already in an early stage of production. We found that the lithics (excluding tools) at KbTx-2 are about thirty percent core and core products and seventy percent debitage. Comparative data for evaluating this statistic are limited. It appears, though, that all stages to produce a core were undertaken on the site. However, the raw material evidently already was in the form of blanks or selected pieces so that little primary reduction of cobbles and gross chunks of stone was necessary at KbTx-2. Too, no unexpended or reserve stock of raw chert slabs or cobbles was recovered, though core blanks were found.

Data from other sites are, within wide limits, more or less comparable. At the Otter Falls site, Yukon, Workman (1978: Table 8) recorded 6 cores associated with 150 microblades and with other core products. The microblades, amounting to 25 per core, are a measured series and presumably form a more restricted group than the microblades and microblade-like flakes that occurred at KbTx-2 (37 and 57 per core). The debitage is slight. At Bezya in Alberta, (Le Blanc and Ives 1986) there are 26 measured microblades per core, and debitage frequency of more than 999 pieces (after refitting) slightly exceeds 200 flakes per core. At Dixthada, in Alaska, there were 85 measured microblades and 4 cores (excluding 5 flakes thought to be fragments of cores) or 21 microblades per core, though some of the cores are not well formed (Shinkwin 1979).

The Place of the Kelly Creek Site in Prehistory

An assemblage limited to stone artifacts gives only a very incomplete picture of culture or even of technology. Nevertheless, the lithic remains from various cultures have distinctive signatures. But northern sites are activity stations: variously stone flaking stations, fishing camps, travel or hunting camps, etc., and the remains from a site may be specialized and mainly technological. Biface blanks, scraping tools and microblade cores identify and characterize particular technologies. However, the tools of a technology may have styles of a particular culture or people, or a technology may overwhelmingly characterize a particular culture. In these terms, the KbTx-2 assemblage appears to represent something between an encampment within which a range of activities took place (considering the full range of items recovered) and a workshop area focused on one activity, production of microblades. We interpret the site as being at least in part a camp inasmuch as burins (carving tools), occasionally other tools and two point fragments were found there.

In Chapters 1 and 5 we discuss microblade use in the Palaeo-Arctic tradition (Denali complex) and point out that in some regions microblade use persisted in the company tool types of the Northern Archaic tradition, especially notched points and knives. To some degree two peoples and technologies amalgamated (Clark 1992 and references). That does not appear to have been the case in the southern Yukon. The Kelly Creek site also may be a pure Palaeo-Arctic culture site. Table 2.6 compares the

TABLE 2.6. COMPARISON OF THE PALAEO-ARCTIC AND "PURE" NORTHERN ARCHAIC

Trait	Denali/Palaeo-Arctic	"Pure" Northern Archaic	KbTx-2
Microblade industry	Wedge-shaped cores, tablets, small microblades abundant	Absent	Pre-dominant
Blade industry	Sometimes present	Usually absent	Absent
Burins	Notched transverse	Usually absent	Present
	Other burinated flake		Present
Main type point	Presume had hafted microblades	This type absent	No data
Lanceolate point	Present, sometimes a knife	Leaf-shaped format	Fragments
Notched point	Absent	Common	Absent
Notched pebbles	Absent or rare	Characteristic	Absent
Pebble choppers	Absent	Characteristic	Absent
End scrapers	Rare or present, not abundant	Very abundant, often tabular with cortical dorsum	Present, un-common
Gravers on flakes	Present at some sites	Usually absent	Absent
Large bifaces	Often present, not characteristic	Sometimes charac-teristic & abundant	Absent
Pièces equillées or bipolar flaking	Rare or absent	Rare before about AD 1000	Absent

Palaeo-Arctic and "pure" Northern Archaic. The amalgamated culture has elements of both. It is seen that there is virtually nothing at KbTx-2 that is characteristic of the Northern Archaic tradition

Microblade technology has a complicated history in the north which entails, among other things, waxing and waning of their interior distribution in complementary apposition to the distribution of non-microblade using Northern Cordilleran peoples. Later, where not replaced by Northern Archaic technology there was seeming amalgamation with the Northern Archaic. Between 9000 and 7000 years ago non-microblade assemblages of the Northern Cordilleran tradition are characterized by lanceolate points, for instance in the Flint Creek component of the Engigstciak site in the northern Yukon (Cinq-Mars, Harington, Nelson and MacNeish 1991). During the millennia 7000 and 8000 years ago these lanceolate point or Northern Cordilleran-derived people of the northwestern interior were expanding into Alaska where previously Denali culture microblade industries had prevailed. The distribution of microblade industries in the interior regions became increasingly restricted, especially in Alaska. The latest occurrence of a pure microblade industry seems to have been about 4500 or 5000 years ago. Tentatively, the Northern Cordilleran prevailed in the southern Yukon 8000 years ago. The Kelly Creek microblades, then, should be less than 8000 years and more than 4500 years old.

The only substantial published assemblage from the central and southern Yukon comparable to KbTx-2 is the Little Arm phase, first described by MacNeish (1964:404) and later by Workman (1978). In the largest sample, from Level 5 of the Little Arm site, there are in addition to 405 microblades and 4 cores or fragments of cores the following items:

4 microblade core tablets
6 projectile points
1 large biface
12 burins
3 gravers
7 end scrapers
15 unifaces or bevelled flakes
5 apparent utilized flakes
1 notched cobble

This set is smaller than the one from the Kelly Creek site but Little Arm has yielded a more abundant repertoire of non-microblade tools. The only types of implement not present at KbTx-2, though, are the gravers, a notched cobble and the single large biface. The notched cobble, however, is very uncharacteristic of the Palaeo-Arctic tradition. It is hazardous to generalize on the basis of this limited sample, but it appears that KbTx-2 was more focused on the microblade industry than other Palaeo-Arctic components. As has been stressed here, that may be because we uncovered actual microblade production workshops. This question invites further comparison of site assemblages, especially the assemblage configuration at general camp sites where microblades also were produced.

To add perspective to our discussion of Kelly Creek, Table 3.7 compares the Kelly Creek site with Little Arm Level 5 (discussed above), Dry Creek Component II in Alaska (Powers, Guthrie and Hoffecker

1983) and Lake Minchumina MKK-4 (Holmes 1986). These sites are characterized by cores of the Campus or Denali type, but at Minchumina there also are side-notched points, numerous end scrapers and other implements with late radiocarbon dates indicating that the culture there belongs to the amalgamated aspect of the Northern Archaic tradition (called the Northwest Microblade tradition by some archaeologists). The number of utilized flakes is anomalously high at Minchumina (35.3%) considering that the number of such specimens at Little Arm is five (10%) and probably only one at KbTx-2 (2%). At Dry Creek the "unshaped flake tool" category accounts for nine percent of the assemblage. Accordingly, Minchumina percentages and totals are calculated with and without utilized or lightly retouched flakes.

Collections from Dry Creek and Minchumina are substantially larger than the KbTx-2 assemblage, as is to be expected from the larger excavations at these sites (compare 91 m^2 at MMK-4 with 33 m^2 at KbTx-2, including tests outside microblade clusters, and more than 347 m^2 at Dry Creek). The Kelly Creek site is a smaller site representing fewer camping episodes than the others. Removal of part of KbTx-2 by early road construction also effectively reduced the amount of material available for recovery there. Minchumina was the richest site (3.4 artifacts per square metre for the classes totalled in Table 4 exclusive of utilized flakes) and Dry Creek the least rich (0.67 artifact per square metre), At KbTx-2 only a small core area of 24 m^2 was sufficiently rich to support excavation effort. It produce two artifacts per square metre but that figure would have been reduced if effort had been expended on nearly sterile areas. The Dry Creek and Minchumina assemblages are essentially artifact pools from numerous camping episodes, whereas KbTx-2 microblade clusters are thought to represent only two intact episodes of microblade production, or two discrete events. This comparison shows that the microblade industry dominates the Kelly Creek assemblage more so than it does that at other sites. The site was to a substantial degree a microblade workshop. A corollary to the strong representation of microblade cores is the relative weak presence of bifaces, scrapers and other tools.

Summary

The Kelly Creek site is located at the edge of a terrace from which it overlooks the valley through which Kelly Creek flows. The terrace forms part of a route of travel along the Tatchun-Frenchman trench connecting two bends of the Yukon River. Over the 40 metre extent of this lithic site artifact distributions are intermittent and sparse, with the exception of an area of microblade production workshops seven metres in diameter. Only a modest number of artifacts that do not pertain to microblade production were recovered. Two discrete workshop areas are recognized, but others removed by the dirt road may have existed. No features, such as hearths, were uncovered during the excavations which took place during the course of five seasons.

The site is not satisfactorily dated, but the presence of Campus wedge-shaped core type coupled with the failure to recover artifacts attributable to the Northern Archaic tradition indicates that the site probably can be attributed to the Palaeo-Arctic tradition of extreme northwestern North America and concomitantly it can be equated with the Little Arm phase of the southern Yukon. Accordingly, it is likely to be more than 4500 years old.

The assemblage of 722 measured microblades, 23 essentially complete microblade cores, numerous core fragments and 79 platform tablets is one of the more substantial collections of its type thus far recovered from the Yukon.

The microblade production loci represent brief stopovers of a small band or family group. But over the long duration of microblade technology in the Yukon, this band, its precursors and successors likely had camped many times in the Tatchun-Frenchman vicinity and left similar workshop traces elsewhere. That even one of their camp sites was found may be a chance event.

The Kelly Creek microblade industry has many characteristics in common with other northwest interior microblade industries found in the Palaeo-Arctic culture and amalgamated Northern Archaic traditions. Retouched microblades are almost completely absent. The microblades have a high frequency of dorsal ridges, are narrow and small, and tend to be short. Microblades with these attributes are linked with the narrow, wedge-shaped Campus type of core which was recovered in substantial numbers at KbTx-2 and occurs widely in the Yukon and interior Alaska. Kelly Creek site amply illustrates the manufacture and rejuvenation of this type of core. The core preform usually was a large flake or piece of stone bifacially trimmed at the base or keel only. Rejuvenation was by frontal blow-type detachment of platform tablets preceded and sometimes also followed by lateral retouch of the top of the core, which are defining attributes of the Campus-type core.

Other artifacts form only a minor part of the assemblage. Bifaced projectile points are weakly represented by two fragments, and the lithic debitage fails to support the presence of any bifacial flaking industry at KbTx-2. Burins, including the notched transverse variety are present. Cobble spalls and split stone slab tools are present, but their lack of formalization and clear retouch of the edges is bothersome. It is on the basis of their context that they are identified as implements. Bevelled flake side scrapers and end scrapers are almost universally present in northwest interior assemblages. KbTx-2 is no exception though these implements are not common there and stylistically the end scrapers are most generalized. The small size and limited variety in the implement assemblage presents a poor case for comparison with other assemblages from the Yukon and Alaska. Nothing was recovered, though, that would be out of place in a microblade culture phase, such as the Little Arm phase of the southwest Yukon (see Workman 1978), part of the Palaeo-Arctic tradition. Other sites usually have stronger representation of biface technology (points, knives, etc.). We are alert to the possibility of "contamination" of the assemblage with artifacts left from antecedent use of the site or subsequent use after the people responsible for the microblade industry left. The lithic scatter at the front of the lower terrace at KbTx-2 actually appears to be the result of another occupation. Too, some artifacts noted in Table 3.5 as coming from "elsewhere" contexts should not be included with the microblade assemblage. But burins are very much an expected accompaniment of the microblade culture, and if other occupations had been represented to any notable extent we would expect to find more evidence of a bifacial industry. The lithology of burins, the Southwest area point fragment, and many retouched flakes is the same, as if a single people were responsible for these artifacts. Any non-microblade occupations at KbTx-2 thus have had negligible effect on the integrity of the assemblage.

TABLE 2.7. COMPARISONS OF ASSEMBLAGES WITH MICROBLADES

Artifact class	Little Arm Level 5 No.	%	Kelly Creek No	%	Dry Creek No.	%	Minchumina MKK All except sod No.	%	%[1]
Microblades per core	101		31.4 meas. 59.4 total		62.9		18.5		
Microblade cores[2]	2	4	23	45	29	12.4	11	2.1	3.2
Tablets per core	1		3		1.6		1		
Burins, all types	12	2.3	6	11.7	37	15.9	39	7.4	11.3
Gravers	3	5.8	0	---	0	---	5	1.0	1.5
Side scrapers, large flake tools, utilized flakes, unshaped flake tools, etc.	20	38.0	9	17.6	49	21.0	252	47.6	18.9
End scrapers	7	13.0	3	5.9	0	---	54	10.2	15.7
Points, small pointed knives, & fragments	6	11.5	3	5.9	27	11.6	47	8.9	13.7
Large bifaces, excludes 47 MKK preforms	1	2.0	0	---	26	11.2	14	2.6	4.1
Bladelike-flake tools			1[3]		18	7.7			
Cobble tools & spalls, abraders, unique items	1	2	7-9	13.7-17	47	20.2	108	20.4	31.4
Total (without micro-blades & tablets)	52		51-53		233		530		

1. Second MKK-4 column is calculated on the basis of 344 items which excludes 187 utilized flakes, reducing the scraper category to 65 items.
2. Not counted in these calculations are two core fragments from Little Arm, three fluted face fragments and many other fragments from KbTx-2, 24 "miscellaneous wedge-shaped core parts" from Dry creek, and three fragments identified as from wedge shaped cores at Minchumina
3. The tool on a blade-like flake tool is described among the scrapers.

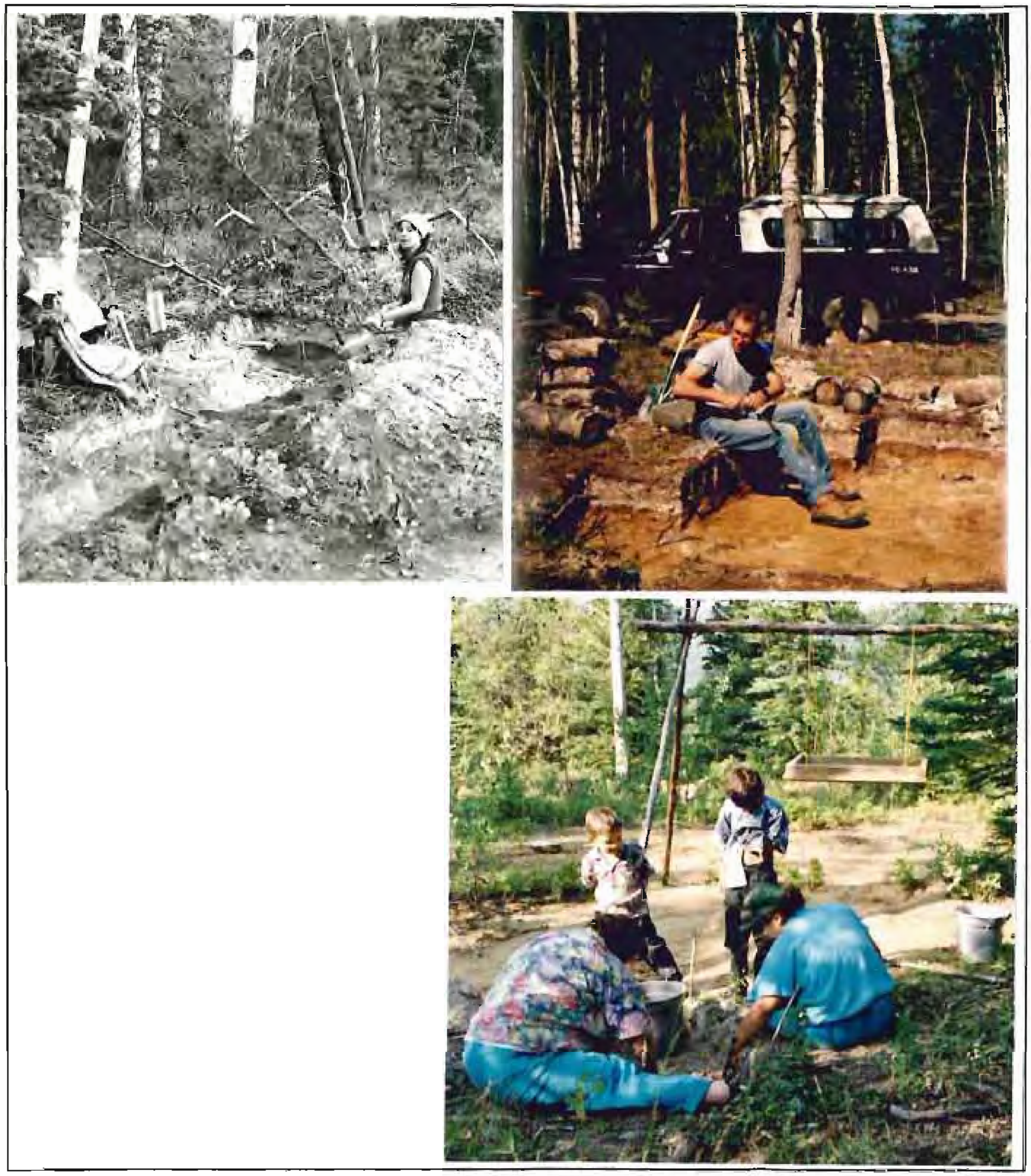


Figure 2.1. Crews at KbTx-2. Top. left: D. Thayer opening up the site at edge of road in 1983. Right: Greg Hare at Southeast area in 1990. Bottom: Many Charlie hands open up a square in 1994.

Figure 2.2. The Frenchman Hill site, located at the northeast end of Frenchman Lake, is the principal site in the region. It is approximately 2 kilometres from the Kelly Creek site.

Figure 2.3. Kelly Creek site. The excavation is to the right of the old road; new gravelled road is in the background. Trees at the left grow on road berm and at the edge of the upper terrace.

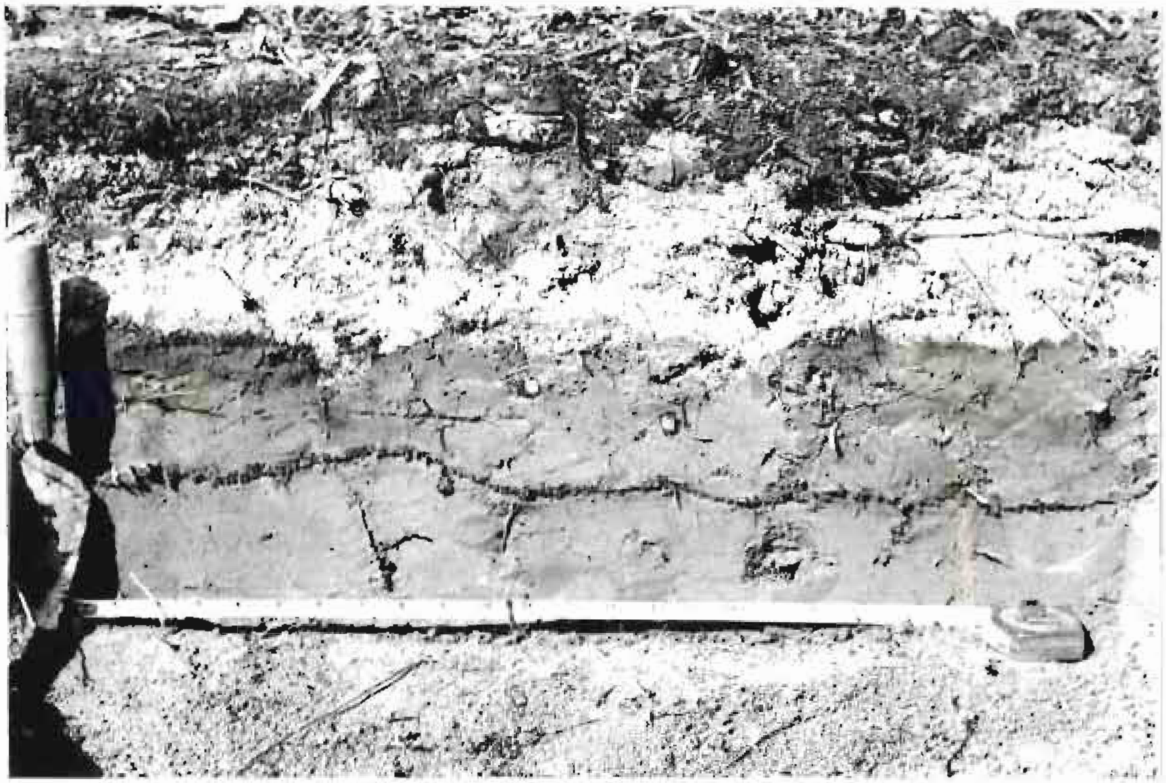


Figure 2.4. Stratigraphic section showing turf, White River Volcanic Ash and soil strata. Artifacts occurred primarily above the scribed line.

Figure 2.5. The Northwest Locus, after the fill was removed in 1990 for screening. View looks from edge of dirt road towards gravelled road in the background.

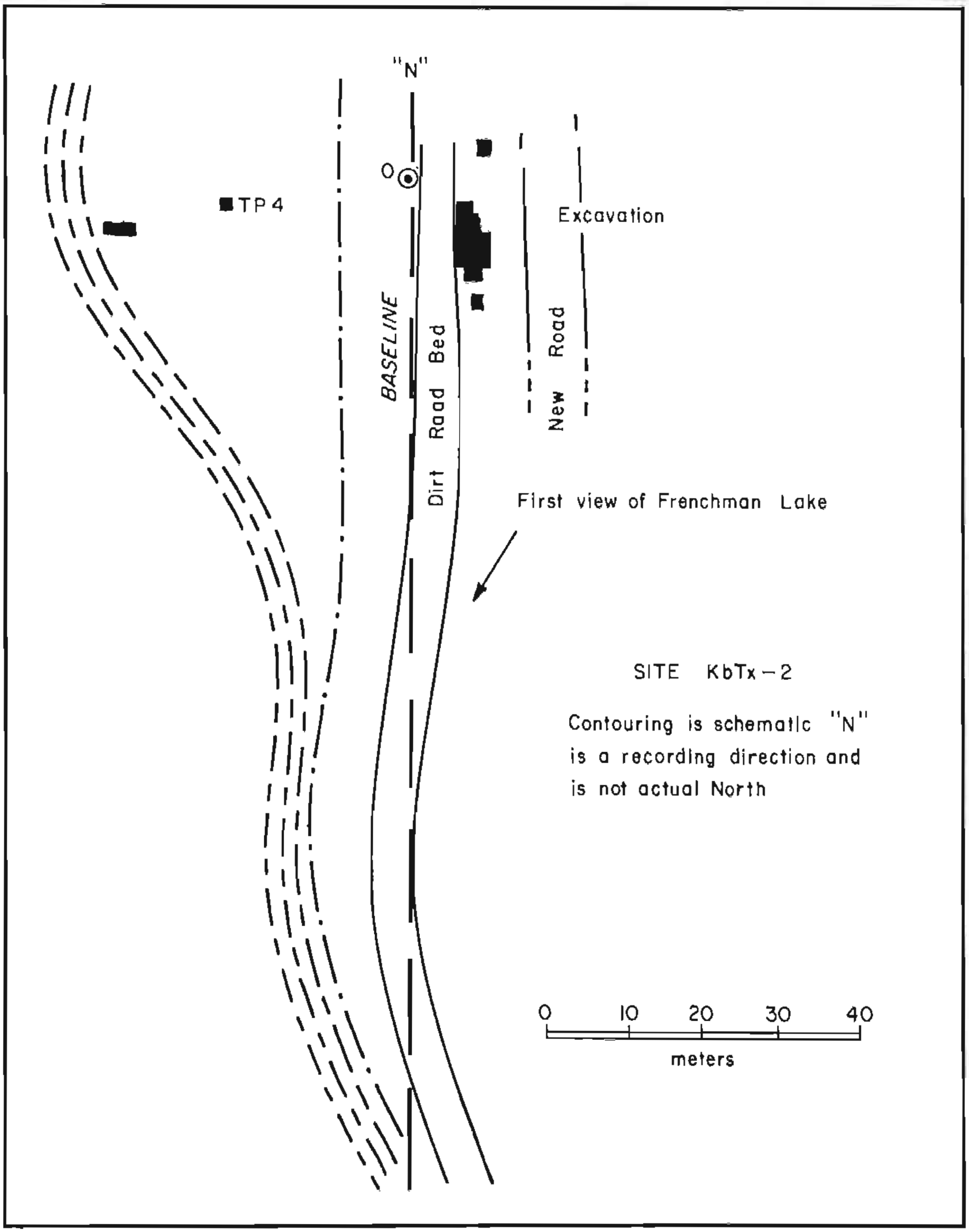


Figure 2.6. Map of KbTx-2. Baseline and datum (bullseye) shown are for 1983 only. Later, a local datum was set within the excavation area.

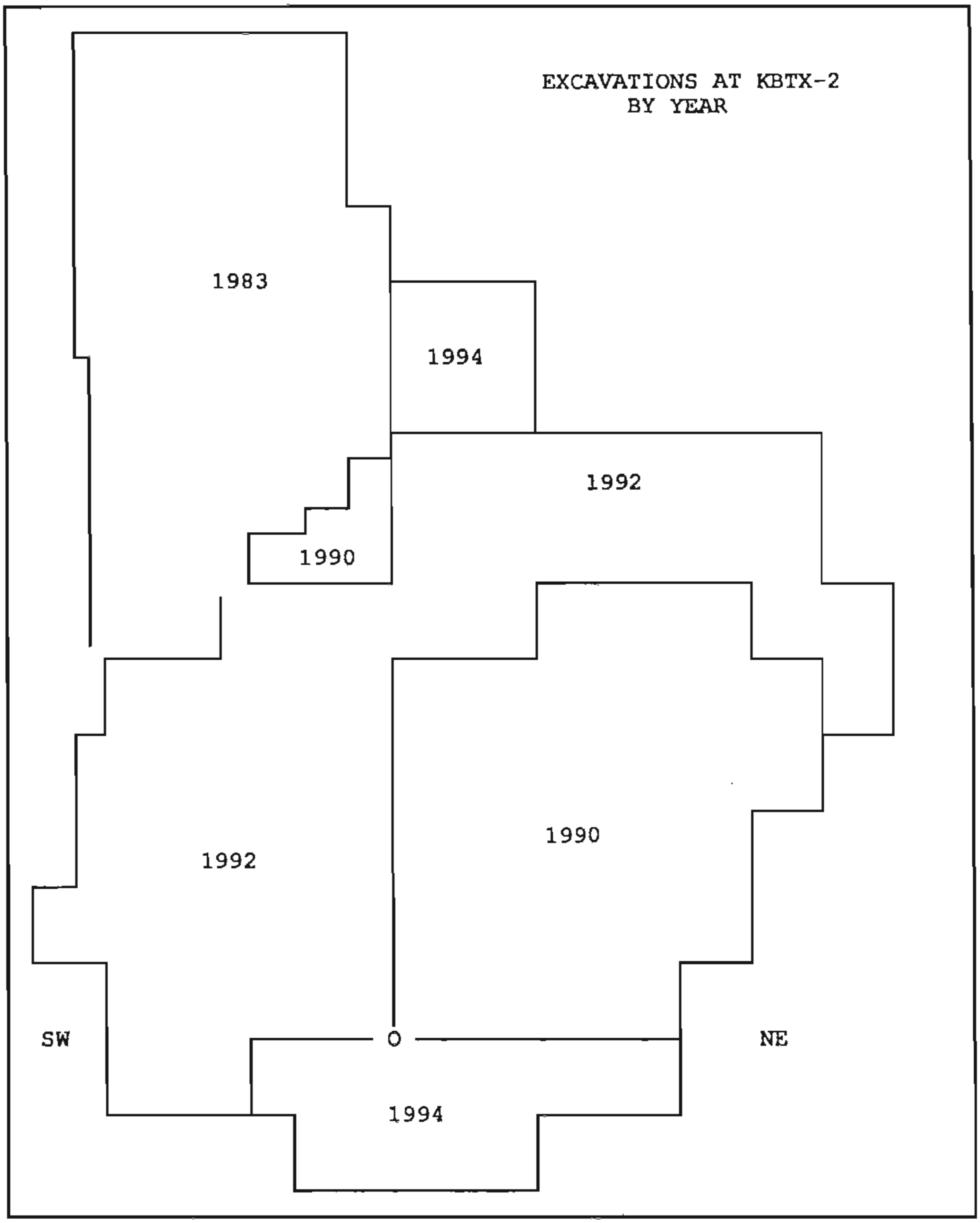


Figure 2.7. Kelly Creek site excavation area showing seasons worked.

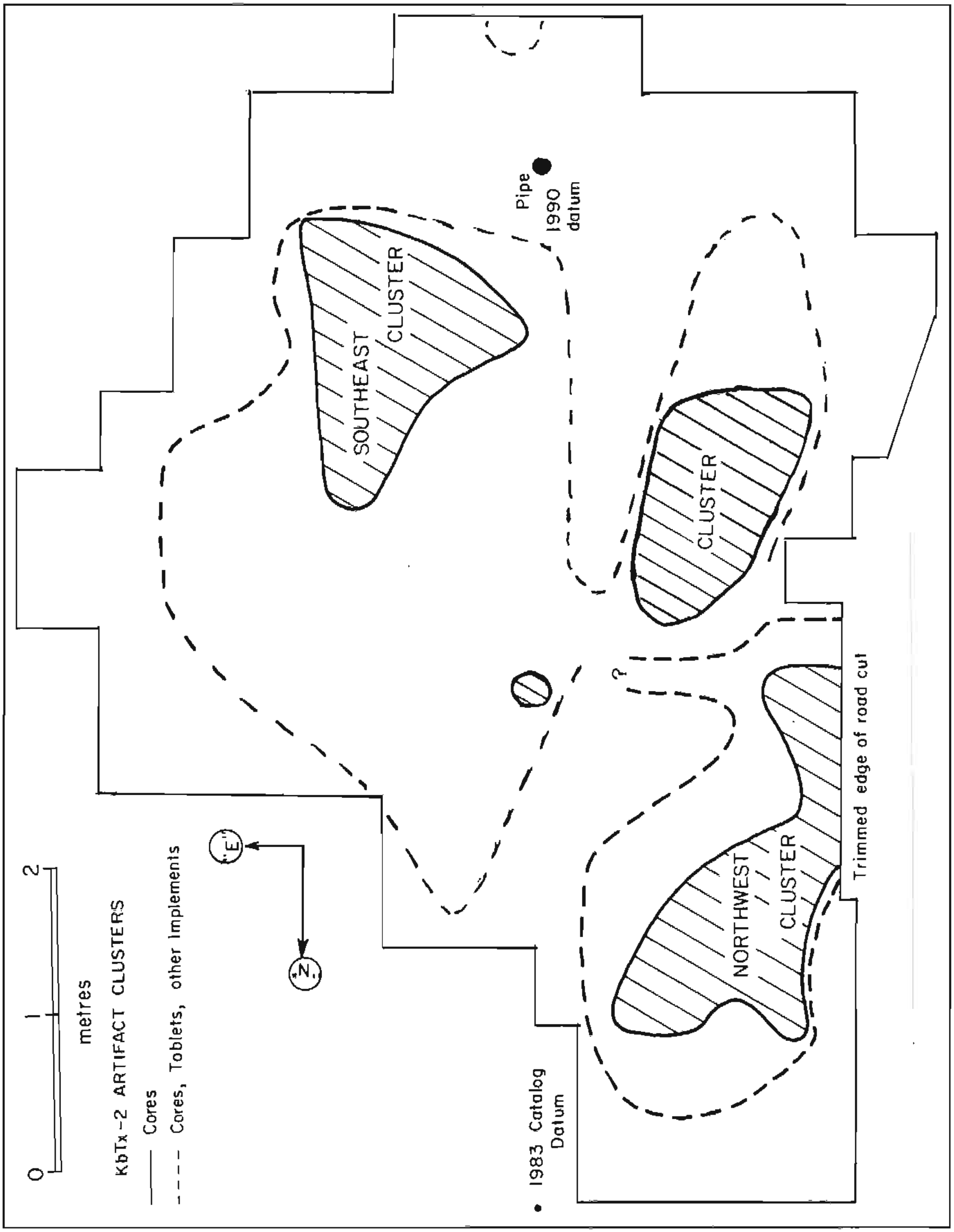


Figure 2.8. Excavation area 1983–1994 with definition of microblade industry clusters, KbTx-2.

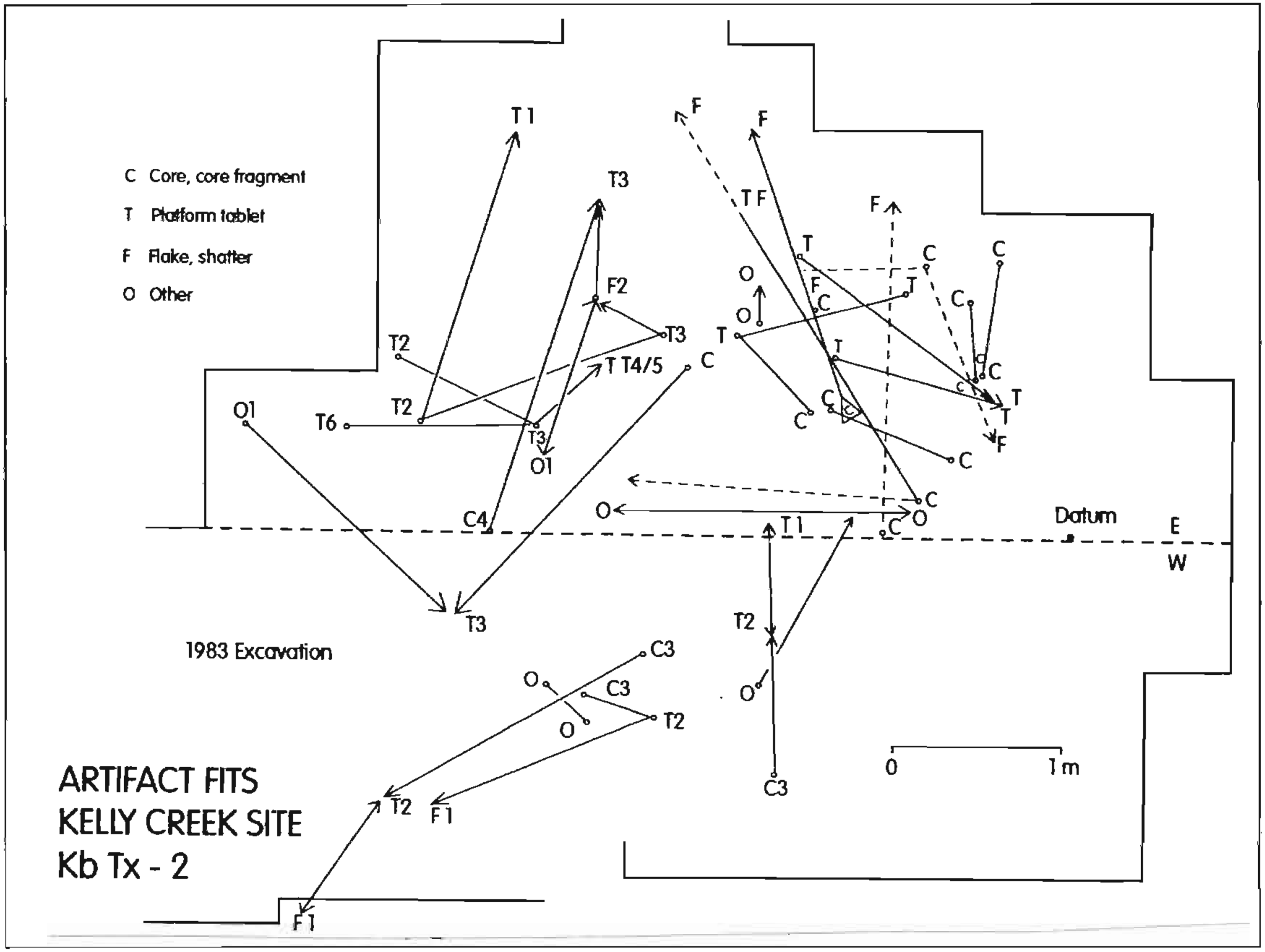


Figure 2.9. Artifact fits across KbTx-2.

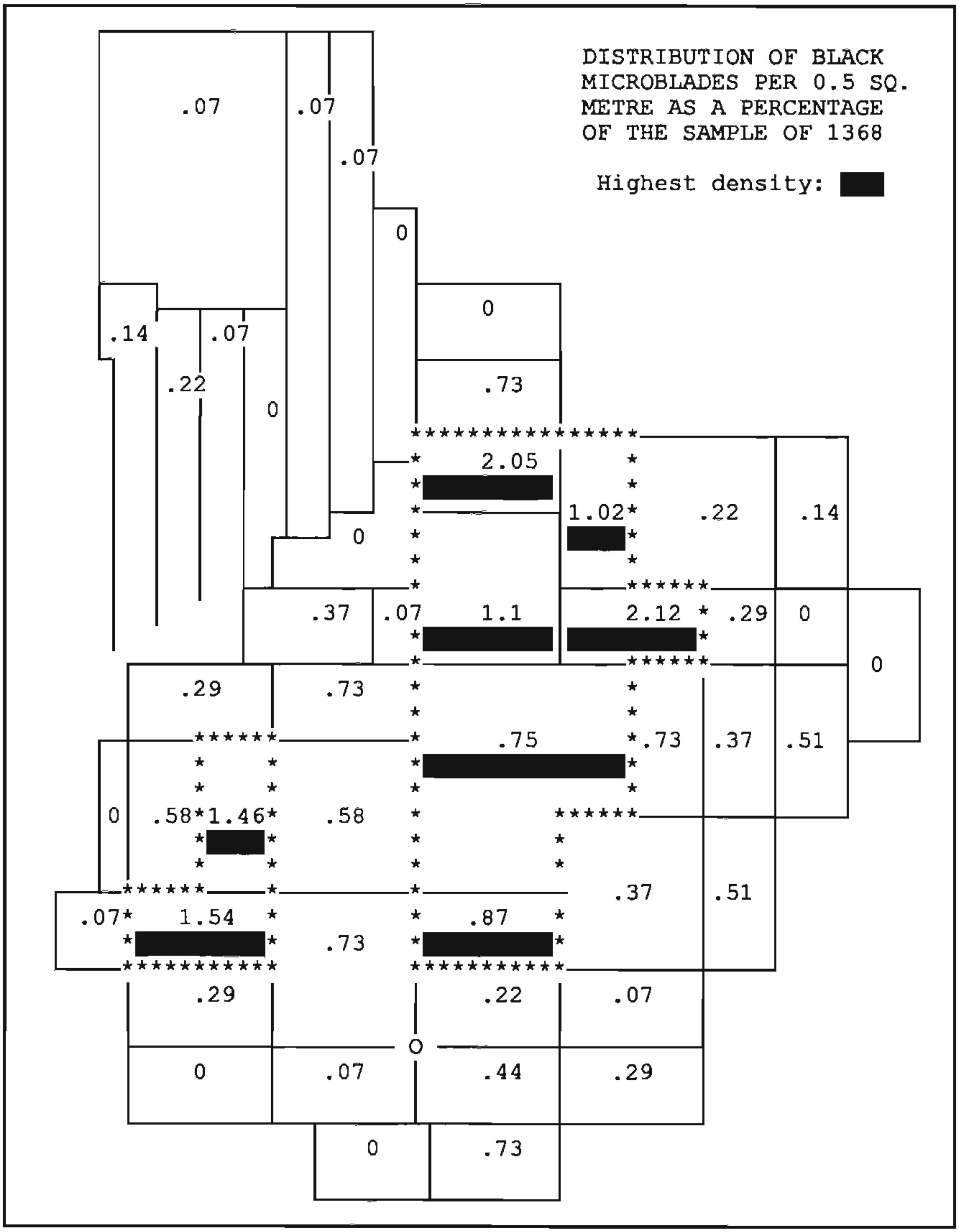


Figure 2.10. The distribution of black lithology microblades, density per 0.5 square metre as a percentage of the sample of 1368 microblades.

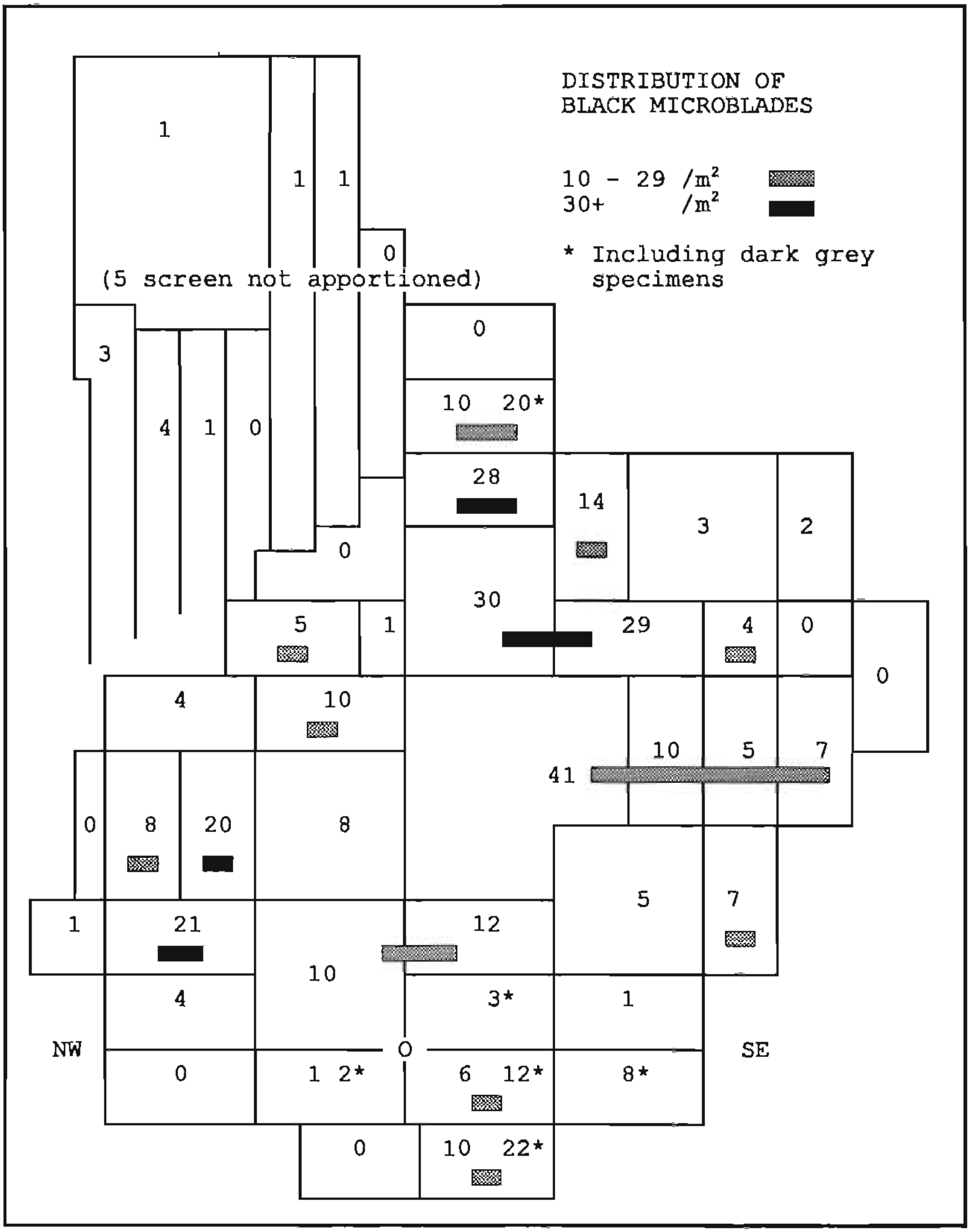


Figure 2.11. Black lithology microblades, frequency per excavation unit.

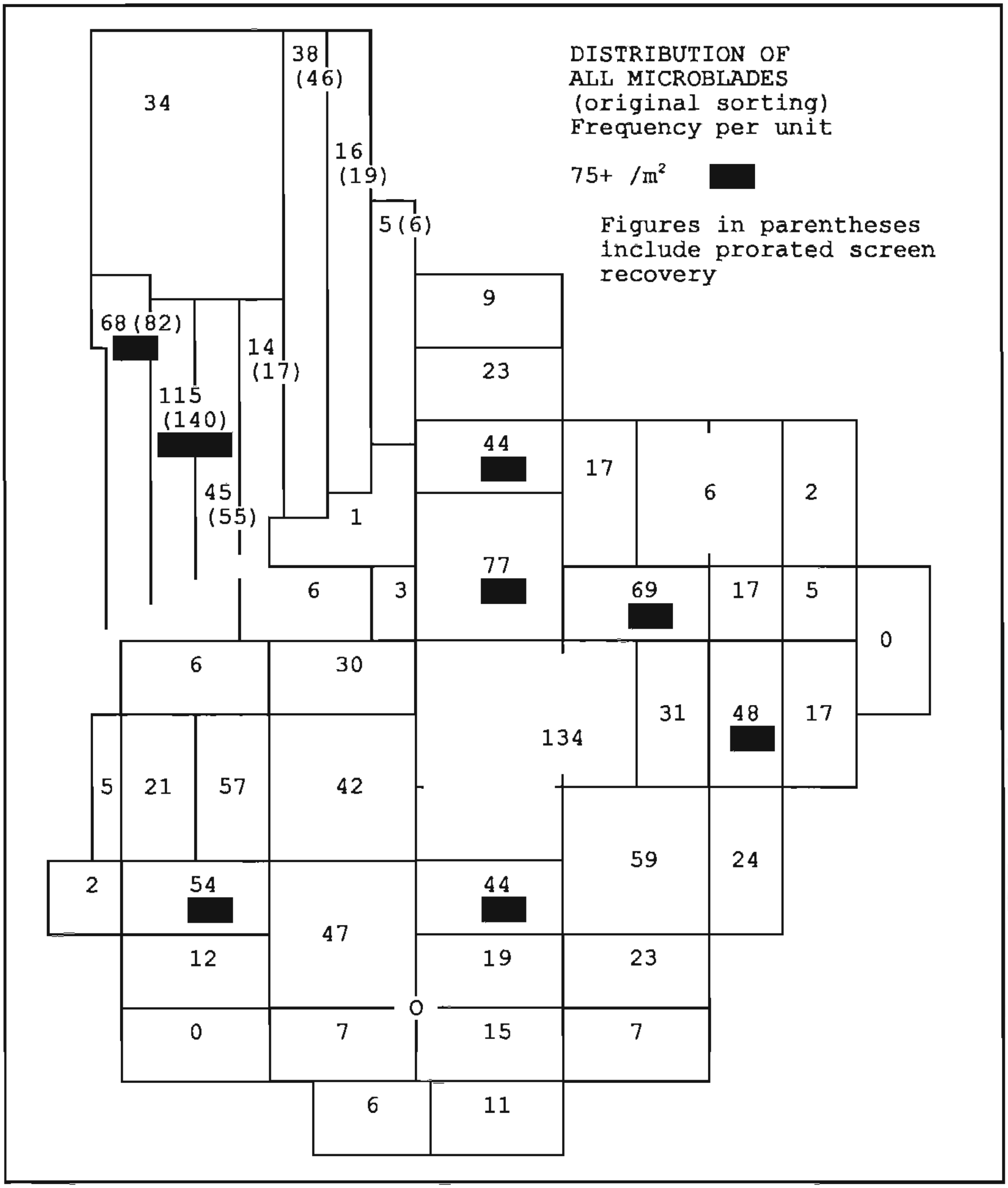


Figure 2.12 Distribution of all microblades (original sorting, with and without prorated screen recovery).

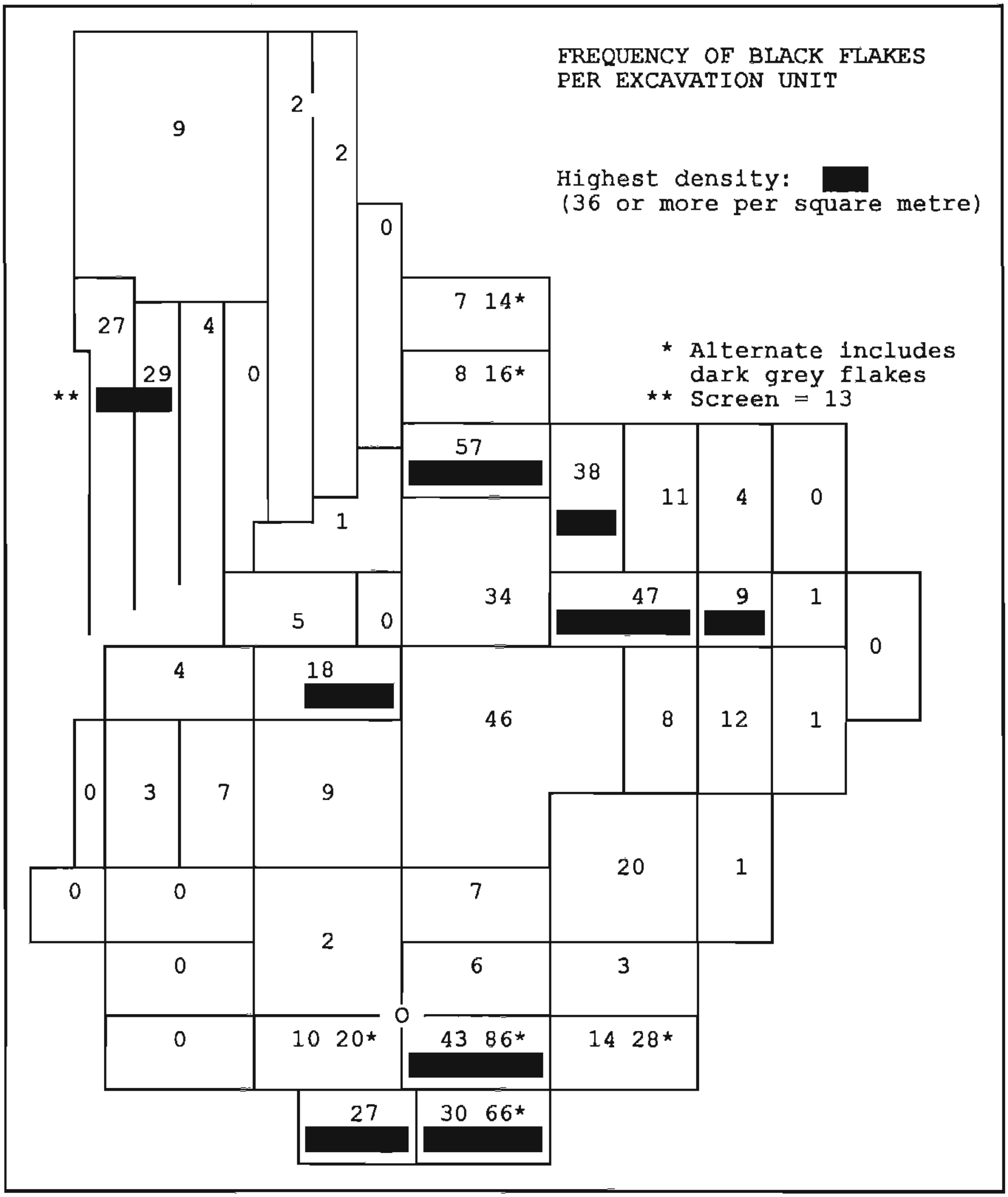


Figure 2.13. Frequency of black lithology flakes per excavation unit.

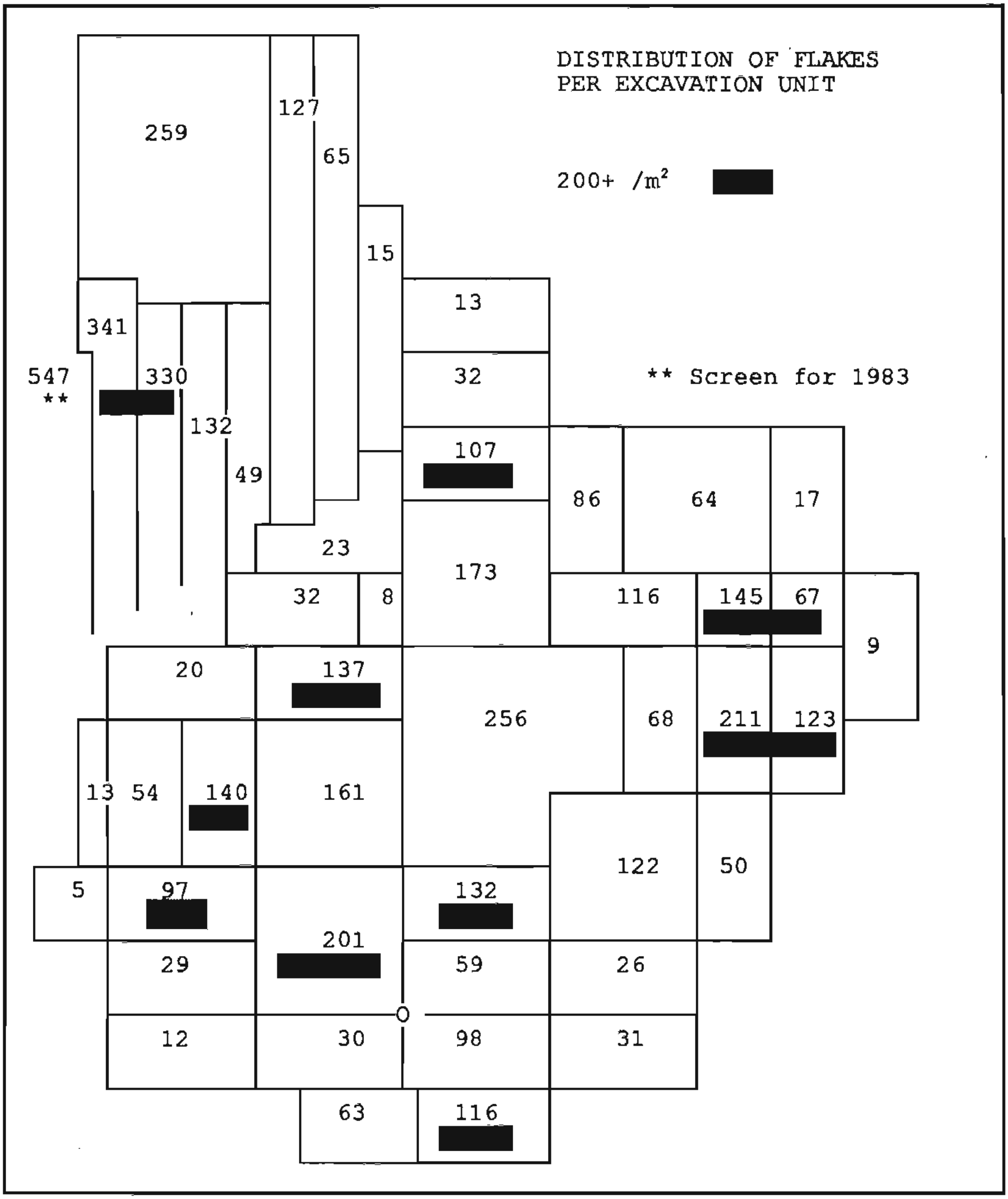


Figure 2.14. Distribution of all flakes per excavation unit.

Figure 2.15. The Kelly Creek site as first seen in 1983.

CHAPTER 3.
KbTx-2 ARTIFACT DESCRIPTION AND ANALYSIS

In Chapter 2 we described the Kelly Creek site and discussed the character of the site assemblage. Here the collection will be described and analyzed and we will relate the assemblage to broader cultural patterns or archaeological traditions in the greater region. Most of the information presented here is in the form of data, but the discussion of microblade and core technology may be of broader interest. The detailed descriptions help us address such questions as whether the microblade cores were made, exhausted and abandoned on the site.

Microblades

Defining the Sample (Fig. 3.1)

Exclusive of a number of distal end segments and many extremely irregular fragments, 722 microblades were analyzed for width, thickness and other attributes. Including specimens poorly suited for metric analysis there are 1438 microblades from the site. (Table 2.1 shows 1368, but does not include those recovered through trimming the roadcut.) Logically viewed, the sample consists primarily of discards and broken items, even after the worst examples or about half are excluded. Those not analyzed tend to have highly uneven edges, or very pronounced taper towards the distal end. Less frequent are those which are highly arched or have feathered, ragged edges. There are few perfect microblades.

An additional small lot of 74 microblades excavated in 1994 has been added to the total specimen count and distribution analysis, but was not included in the metric analysis. As well, in some instances the 1992 collection is reported separately from the designated loci. The reasons for this are that analysis and compilation of data had been completed prior to the recovery of additional specimens in 1994. That also is essentially the case for the 1992 collection. The 1992 collection was derived mainly from what we are calling the Southwest locus. Nine microblades, and other artifacts noted in Chapter 2 recovered in 1994 complete the Southwest locus inventory. However, among the 1992 collection there also are a number of specimens that belong with the Southeast locus excavated in 1990. The 1983 and 1990 collections already had been studied and compiled, and the 1992 collection had been studied as a whole before it was partitioned into component clusters. These subsets now have been assigned to their loci as explained in the notes to Table 2.1, but certain statistics previously had been compiled for the undivided 1992 collection (and for 1990), thus the need in some cases to report a 1992 composite.

Segment Representation

For every microblade there is a proximal end bearing the bulb of percussion. There also is a medial or midreach area, and microblades that extend the length of the core face also have a tapered distal end. Some break off or hinge out short, and thus the number of segments with distinct distal tip morphology is fewer than the number of proximal ends. Most microblades are broken,, and they are variously represented by proximal, medial and distal segments, or segment combinations. In combining data from both proximal and medial segments there is a risk of duplication as the two segments could come from a single microblade, although the study of the black chert microblades in Chapter 2 revealed relatively few of proximal-medial fits.

Segment analysis is pertinent to the question of whether microblades were broken for use, with certain segments retained and others discarded, though we do not derive any conclusions for KbTx-2. For example, for the Southeast locus there are 79 proximal segments in the analyzed sample (exclusive of specimens that bear both proximal and medial portions) which does not include a small number of specimens collected in 1994, and there are 115 medial segments (including ones combining medial and distal portions). Fragmentation of the medial segments, some of which are less than one cm long, could account for part of their excess. Owen (1988:59) notes other cases where medial segments outnumber proximal ones.

The short length of recovered segments has been noted. Because of the uncertain usefulness of such data, only a small sample was measured for length. The sample of 54 microblades (mainly proximal and medial segments) in Lot 1563 is distributed as follows.

TABLE 3.1. MICROBLADE LENGTH

For One Natural Lot Sample of Proximal and Medial Segments															
L (mm)	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Frequency	0	6	8	8	13	6	2	4	1	2	1	1	0	2	0
Average					8.5										

Retouch

Retouch on microblades may arise from natural processes in the ground, trampling, trauma during excavation, from use, or intentional modification. The frequency of retouch varies greatly between assemblages, ranging from nil to present on almost half the specimens. Frequencies between 3 percent and 15 percent are common (Owen 1988:72). Arctic Small Tool tradition assemblages generally have a high percentage of retouched microblades, interior assemblages a low percentage. Examples are 7 percent at Otter Falls, and about 14 percent at Little Arm (Workman 1978), but at Bezya in Alberta retouch appears on 27 percent of microblades (Le Blanc and Ives 1986:76). In strong contrast, there are no retouched microblades from the Northwest locus of KbTx-2. For the Southeast locus, few microblades are retouched, and those display an unconvincing lack of regularity which suggests that the retouch may be natural or other damage. The lack of retouched examples at KbTx-2 presumably reflects the fact that microblades were made there but were utilized elsewhere.

Arrises

The average number of linear dorsal ridges is 2.09 per specimen from the Northwest locus, 2.04 from the Southeast locus, and 1.82 for the 1992 collection (Table 3.2). The ridge count at KbTx-2 may be high, though comparative information is scarce. Le Blanc and Ives (1986) note that for the Bezya site in Alberta 38.1 percent of the collection has one arris (compared to about 12 percent for the first two samples at KbTx-2), and only 2.9 percent of Bezya has three or more arises. For KaVa-3 at Carmacks, among the sample of 28 microblades, 68 percent have two arises, which is virtually identical to KbTx-2 (considering that for this comparison the 2 arris blades should be combined with the 1-2 arris specimens in Table 3.2 and possibly also with some 2-3 arris specimens) (Gotthardt unpublished data). Owen (1988:64) cites a range of values for Alaska and the Yukon indicating that the incidence of single arris microblades ranges from 10 percent up to 44 percent, a range in which KbTx-2 tends to be low.

TABLE 3.2. FREQUENCY OF MICROBLADE ARRISES

Arrises	1	1-2	2	2-3	3	3-4	4	
NW Locus, 1983 Lot								
Number	22	10	100	12	32	2	2	Total: 180
Percent	12.2	5.6	55.6	6.7	17.8	1.1	1.1	
SE Locus								
Number	29	11	156	9	37	0	1	Total: 243
Percent	11.9	4.5	64.2	3.7	15.2	--	0.4	
1992 Collection								
Number	87	13	205	8	28	0	0	Total: 341
Percent	25.5	3.8	60.1	2.3	8.2	--	--	

Size

Information on width and thickness is tabulated below. A standard procedure is to measure the width and thickness of microblades just below the bulb of force at the proximal end. An alternate point is used here if that location is grossly unrepresentative. Approximately half the microblades lack the bulbar end, being in most cases medial segments. In the present study these also were measured.

Northwest cluster data (1983 collection) also are given with a "stout" group of 13 specimens excluded. This group is not simply the thick end of the range of variation but is a seemingly discrete subseries having proportions different from other microblades. Though they are thick, these are not large microblades, nor do they appear to be burin spalls or core face rejuvenation flakes. They average only 4.46 mm wide (one additional stout recovered on the screen is only 2.6 mm wide). This produces a high thickness to width (T/W x 100) index (using averages) of 48.4 for the stouts compared to 26.8 for the

TABLE 3. 3. AVERAGE WIDTH AND THICKNESS OF MICROBLADE SEGMENTS

Segment	Sample	Average width (mm)	Average thickness (mm)	Notes
I: Northwest Locus, 1983 and 1990 Collections				
1983 collection				
Proximal	N=94	4.76	1.31	With proximal-medial segs.
Medial	N=87	4.84	1.27	With rare medial-distal segs.
combined	N=181	4.80	1.29	
w/o stouts	N=168	NA	1.22	
Stouts only	N=13	4.46	2.16	
1990 collection from the screen[1]				
Combined	N=28	4.07	1.07	All segments
w/o stout	N=27	4.13	1.04	
II: Southeast Locus, 1990 Collection (screened)				
Proximal	N=114	4.29	1.19	Includes 3 complete and 32 proximal+medial segs.
Medial segments	N=115	3.95	1.15	Includes 9 medial+distal
Distal	N=14	4.04	1.14	
Combined	N=243	4.12	1.17	Includes rare "stouts" T/W ratio: 28.37
1992 Collection (screened), includes two subsets below				
Proximal	N=112	4.51	1.11	
Medial	N=153	4.42		
Combined	N=265	4.46	1.09	
1992 Subset from NW side of SE Locus				
Combined	N=54	3.82	1.03	
1992 Subset from between SE Locus and Old Road, called Southwest locuus				
Combined	N=21	4.61	1.10	

[1] 1983 dirt from the screening operation that was passed through the coarse screen but not through the fine screen was transported to the Charlie's garden at their house at Frenchman Lake. A number of flakes and microblades subsequently were found in the garden dirt by the Charlie family. This material can be combined with that recovered on the fine screen, and inclusion of the five best microblades from the secondary garden locus produces the following modifications:

Combined	N=33	4.00	1.05
w/o stout	N=32	4.04	0.99

whole 1983 collection (excluding the 1990 lot from the screen for which the ratio is 26.4). The stouts are not single arris specimens, a category which tends to be thick and triangular in section. The average of 2.31 arises for stouts exceeds that of the collection as a whole. There were fewer stouts in the southeast cluster and 1992 collections, and these were not segregated.

For the 1983 collection, width was measured to the nearest tenth of a millimetre and thickness to the nearest two-hundredths of a millimetre, and for the 1990 collection both were measured to 0.02 mm, and in some cases 0.01 mm, with the aid of a hand lens to read the calipers. A digital caliper was used to record the 1992 collection at 0.01 mm. Measurements at this scale of fineness are not duplicatable because of wide variation over the slightest distance along a specimen, but such differences are likely to average out in a large series.

Specimens recovered from reprocessed backdirt on the screen in 1990 tend to be smaller than the 1983 excavated lot. Precise characterization of the assemblage requires combining these lots, but little more than ten percent of the old matrix was fine screened. If all the dirt had been reprocessed on the fine screen, the number of microblades in the screened lot might equal that recovered by troweling. To form a rough estimate of the actual dimensions of the Northwest locus microblades, the 1983 value for 180 specimens and the 1990 value for 28 specimens can be averaged together: 4.43 mm wide, 1.18 mm or 1.13 mm thick, respectively with and without the stouts. We consider the width of 4.8 mm and thickness of 1.29 mm representative of an unscreened collection. For comparison, the smaller unscreened sample from site KaVa-3 at Carmacks has an average width for all segments of 6.1 mm and a thickness of between 1.4 and 1.5 mm.

For thickness, which ranges upward from 0.45 mm, the population is fairly evenly distributed around the median and the mean for 265 microblades (Table 3.4). Width is less tightly clustered than thickness and ranges from 1.8 to 9 mm. Widths are given in Table 3.5 in 0.3 mm intervals chosen for comparability with the number of intervals used to report microblade thickness. There is a weak bimodality for the Northwest cluster. Its significance is undetermined but we do not think it is because of sampling error. For the completely screened Southeast locus only 4.1 percent of the sample falls in the three intervals 5.5–6.1 mm (extending up to 6.4 mm) whereas for the Northwest cluster 25 percent of the sample (1983 plus 1990 screenings) is in this range.

Almost no complete specimens are sufficiently regular for inclusion with the measured sample. The examples in Table 3.6 may be compared with the length of the faces of the cores. Presumably, most microblades retained for utilization were in the size range of those described below. These figures suggest that a core face length of 26 to 28 mm was common. The recovered cores tend to have shorter faces, probably reflecting exhaustion of the cores. Short face length also is common to the wedgeshaped cores from Dry Creek and the Campus site in Alaska where the means are 24 and 21 mm respectively (Owen 1988:100, 102).

Thickness/Width Ratio

In the KbTx-2 collection a wide microblade is not necessarily a thick one. One would expect to find, consequently, a spread in Thickness/Width (T/W) indices. Highly curved narrow core faces are thought to produce relatively thick microblades. However, we are not aware of any actual demonstration of these relationships between T/W ratios and core shape. Wyatt (1970:101) cautions that "the validity of inferring microcore form from microblade thickness/width index is questionable." T/W indices were calculated in Table 3.7 for samples from three subsets of the KbTx-2 assemblage. For comparisons, Wyatt (1970:100) cites Irving's (1964) Alaskan data indicating a mean index of 31 for the interior Campus site collection and 23 to 27 for two Arctic Small Tool tradition collections. Anderson (1970b:Fig.5) gives similar indices for several northwest Alaskan Denbigh Flint assemblages. Cook (1968b:Table 1) gives the coefficient of variation of T/W ratios for eight interior assemblages. This ranges from 22 to 43. Collections derived from localities closest to KbTx-2 include the Otter Falls and two Healy Lake microblade series which have coefficients of variation of 36, 36 and 43 respectively. The KbTx-2 assemblage conforms reasonably well with these figures.

Size Comparisons

KbTx-2 microblades, like those from several other sites of the interior region, are small. Selected comparisons are presented in Table 3.8. Owen (1988:81, 85, 109 ff) also provides summary descriptions and measurements, on North American microblades and cores, including independent sets of data for some of the assemblages listed here.

Researchers have pointed out that the microblades of certain cultures are distinct (Cook 1968:Fig. 1; Owen 1988; Workman 1978). For example, Denbigh Flint complex microblades are relatively wide. Within the interior region, however, both large and small (narrow) microblades are present and do not clearly point to distinct cultural traditions or temporal trends. As had been observed some time ago, broad cores tend to produce broad microblades. This is shown by the selected data presented in Table 3.9 which reorganizes material from Table 3.8 into categories based on core form. The microblades mirror core width and thus sometimes type: narrow blades indicate narrow and especially classic Denali or Campus cores; wide microblades indicate ones with wider oval platforms and other broad cores. Intermediate width blades may represent assemblages with both cores, or a core form that produced intermediate size microblades. Dimensions alone fail to convey adequately the differences in size. A 4-mm-wide microblade is a very delicate item compared to one 7 or 8 mm wide, and we would not be surprised is there were cultural and historical differences in their utilization. Gal (1982a:77) discusses the problems of correlating microblade width with history. He states that "the clustering of microblade collections [by certain size attributes]...can probably best be explained by the exigencies of blade manufacture than by common cultural norms." In one sense Gal's comments point to our conclusion, that microblade width correlates with core width, but there may be cultural norms for core width.

"Others" in Table 3.9 is a mixed entity: Bezya cores are not classic Campus-Denali cores; for Bonanza Creek K25, Holmes (1971) notes the recovery of four cores of both Campus and Tuktu format,

TABLE 3.4. MICROBLADE DISTRIBUTION BY THICKNESS

Interval	Northwest Locus			Southeast Locus	Collection
(mm)	1983	1990	Total	1990	of 1992
0.4		1			
		1	1	1	
0.5					
	3	-	3	3	6 (2)[1]
0.6					
	4	4	8	6	15 (8)
0.7					
	11	1	12	23	32 (6)
0.8					
	9	3	12	24	27 (3)
0.9					
	17	4	21	39	36 (5)
1.0					
	21	4	25	43 -- median	42 - median (9)
1.1		-- median			
	20	6	26	25	27 (8)
1.2	-- median				
	22	2	24	18	20 (5)
1.3					
	15	3	18	13	18 (3)
1.4					
	14	3	17	12	13 (2)
1.5					
	15	1	16	11	7
1.6					
	11	-	11	3	7
1.7					
	7	-	7	4	3 (1)
1.8					
	3	-	3	5	2
1.9					
	3	-	3	3	2
2.0					
	3	1	4	4	3
2.1					
	2	-	2	-	2 (1)
2.2					
	2	-	2	3	2 (1)
2.3					
	3	-	3	3	-
2.4					
	5			5[2]	1[3]

[1] In parentheses, data for SE locus Sections 1-5, 8. [2] 2.4-2.5 mm (N=1), 2.6-2.7 (N=1), above 2.7 mm (N=3).
[3] 2.8 mm

TABLE 3.5. MICROBLADE DISTRIBUTION BY WIDTH FREQUENCY

Interval (mm)	Northwest Locus 1983	1990	Total	Southeast Locus 1990	Collection of 1992
				1	1 (1)[1]
1.9					
	-	-	-	1	-
2.2					
	1	2	3	6	3 (1)
2.5					
	7	4	11	16	4 (3)
2.8					
	7	1	8	24	23 (8)
3.1					
	8	5	13	32	22 (5)
3.4				average	
	10	4	14	30	40 (10)
3.7					
	18	3	21	25	26 (9)
4.0		median		median	
	16	2	18	18	23 (2)
4.3	median				
	15	2	17	17	23 (3)
4.6					
	16	2	18	19	21 (2)
4.9					
	11	4	15	17	19 (1)
5.2					
	9	1	10	15	12 (1)
5.5					
	13	2	15	5	16 (5)
5.8					
	19	2	21	3	11
6.1					
	16	-	16	2	1
6.4					
	5	-	5	5	5
6.7					
	5	-	5	4	6
7.1					
	2	-	2	-	3
7.4					
	1	-	1	-	1
7.7					
	2	-	1	2	-
8.0					
	1	-	1	6[2]	6[3] (1)

[1] See note 1 to Table 3.4. [2] 8.0-8.3 (N=2), above 8.3 to 9 mm (N=4). [3] 8.1, 8.5, 8.8, 9.0, 9.1, 9.3 mm.

TABLE 3.6. SELECTED COMPLETE MICROBLADES AND MAJOR SEGMENTS

Length (mm)	Description
Northwest Cluster	
17	2 hinged-out short microblades
19-22	Several proximal + medial segments
23	Irregular complete
24+--26+	3 specimens, lack part of distal end, 2 are twisted
26	Irregular, fitted to core 370, not in microblade analysis
27	Stout curved microblade and 1 irregular specimen
27+	Irregular, lacks part of distal end, not in microblade analysis
28	Spall from core fluted face, not in microblade analysis
36	Complete, fitted 454+457, black chert
Southeast Cluster	
17	Complete, relative thin and narrow, not functional?
16	Nearly complete, thin
33	Complete, relatively large, extended to base of core
1992 Collection	
17	Irregular edges, not a usable microblade, single arris
21++	Incomplete, lacks ends, flat, 2-arris, 6.1mm wide
49+	8.9 wide, 2.76 thick, distal end snapped, 60 mm long complete, possibly largest microblade from the site, 1549+1552

TABLE 3.7. THICKNESS/WIDTH INDEX

Sample	N	Range	Mean	Standard Dev.	CV
NW All fine Screen	28	15.9-76.9	27.82	11.45	41
NW Excavated	65	10.9-50.4	26.67	8.26	31
SE Excavated sample	53	18.6-69.0	29.37	7.56	25
All samples combined	146	10.9-76.9	27.9	8.86	32

but we do not have any pure sample of microblades from tabular or Tuktu-type cores for comparison; and Minchumina has both Campus-type and broader subcylindrical cores. The intermediate microblade width at Minchumina reflects this nicely. Wide microblades in the Kobuk complex, a late Palaeo-Arctic tradition component (Anderson 1970a, 1988) may indicate that its cores differed from Akmak or other classic Palaeo-Arctic cores. Pointed Mountain, located in the southwest corner of the Northwest Territories, is a type site for MacNeish's Northwest Microblade tradition, and Little Arm is an important Yukon member of that tradition. Though microblade production was based primarily if not exclusively on wedgeshaped cores, microblade width in this interior tradition differs notably from its presumed progenitor, the Palaeo-Arctic tradition and from KbTx-2 and Otter Falls to which it is thought to be closely related.

TABLE 3.8. COMPARISON: MICROBLADE ASSEMBLAGE WIDTH AND THICKNESS

Collection	Sample	Average width	Average thickness	Provenience
Early Interior Palaeo-Arctic/Denali				
Dry Creek	Large N	3.8 mm	NA	Alaska, *c* 10,700 BP
Akmak Complex	N=28	5.6	1.4	OP site, earlier than Kobuk
Kobuk Complex	N=49	7.1	1.8	Onion Portage, *c* 8000 BP
Middle Millennia Interior Denali				
KaVa-3	N=22	6	1.45	Yukon at Carmacks, *c* 5900 BP
Little Arm L4	N=63	6.9	1.6	SW Yukon, *c* 4000-6000 BP
Little Arm L5	N=363	7.2	1.6	" "
Middle Millennia Interior, Amalgamated Northern Archaic or Late Denali?				
Otter Falls	N=150	4.4	1.3	SW Yukon, *c* 4500 BP by 14C
Bezya	N=83	4.62	1.18	NE Alberta, 3990±170 BP
Campus	N=239	5.0	NA	Central Alaska, Denali
RkIh-28	N=38	7.83	1.8	NW Alaska
Late Interior, N Archaic with Microblade Industry				
Pointed Mtn.	N=80	7.3	NA	SW Mackenzie, *c* 2500-4000 BP
RlIg-37	N=31	7.34	2.11	NW Alaska, *c* 2000-3000 BP
Unassigned or Undated Interior				
KbTx-2 NW loc.	N=181	4.80	1.3	Yukon, this study, Table 3.3
" " adjusted		4.43	1.2	Kelly Creeek, " "
KbTx-2 SE loc.	N=243	4.12	1.17	" "
Donnelly Ridge	N=286	4.8	NA	E Central Alaska, Denali
Bonanza Cr. K25	N=122	5.5	1.5	NW Alaska
Denbigh Flint focus of Arctic Small Tool tradition				
Iyatayet	N=380	6.9	1.7	NW Alaska coast, type site
Onion Portage	N=300	7.3	1.8	NW Alaska
Proto-Denbigh	N=102	7.73	1.8	Onion Portage
Coast or Plateau Microblade Tradition				
Paul Mason	N=106	6.22	1.64	Central BC, 4500-5000 BP

Sources: Dry Creek: Powers, Guthrie and Hoffecker 1983:111. Akmak, Kobuk, Onion Portage DFC, Iyatayet DFC, Proto-Denbigh: Anderson 1970b, note also 8.3 W by 2.0 T Proto-Denbigh from Cape Krusenstern which, however, may be biased through surface collecting. Little Arm, Otter Falls: Workman 1978 Table 9, see also Cook 1968. Bezya: Le Blanc and Ives 1986, Table 5, recalculated to exclude distal segments. Campus, Pointed Mountain, Donnelly Ridge, Bonanza Cr. K25: Holmes in Univ. of Alaska 1971:387, pertains to collection from early work at this site; K25 is in Koyukuk River drainage and is included to illustrate collections with intermediate-size microblades. Paul Mason site: Coupland 1996, data from three sample sets combined. RkIh-28 and RlIg-37: Batza Téna locality, Koyukuk River. RkIh-28 illustrates maximum size in the group range, author's data, a blade and microblade site, obsidian hydration supports middle-range dating. RlIg-37 small notched point and 1.49 micron obsidian hydration suggest 2000 to 3000 year age, technology is wedge-shaped core.

TABLE 3.9. MICROBLADE WIDTH CORRELATED WITH CORE TYPE

Site	Microblade width (mm)	Core width (mm)	Notes
Associated With Classic Campus/Denali Cores			
Dry Creek	3.8	14 (10-18)	Large set out of N =1772
KbTx-2, Yukon	4.1	12 (9-17)	N=243, fine-screened locus
Otter Falls, Yukon	4.4	8[1]	N=150, *c* 4500 BP 14C date
Donnelly Ridge	4.8	10.6	N=286, Denali type site
Campus	4.9	9.5	N=604, Campus type site
Akmak	5.6		N=28
Associated with Broad Cores not of Classic Campus Type			
MiRi-2 Horton L.	7.2	11, 32, 35	N=56, width is for the 3 cores each
RlIg-37 Batza Tena	7.3	10, 18.7	N=31, width is for 2 core fragments
O.P. Denbigh	7.3		N=300
MgRr-1 Colville L.	7.6	21 (13-28)	N=27, width for 4 cores
O.P. Proto-Denbigh	7.7		N=102
RkIh-28 Batza T.	7.8	28	N=38, width is for one complete core
Norutak Lake	7.9	25 (21-33)	N=173, core width is for 4 cores
Others			
Bezya	4.6	10.5 (9-12)	N=83, 3990±170 BP, width for 5 cores
Bonanza Cr. K25	5.5		N=122
Minchumina MMK-4	6.5	Wide & narrow	N=203
Kobuk Complex	7.1		N=49, 1 wedge core
Pointed Mountain	7.3	c 12-24	N=80, NWMTradition type site
Little Arm, Yukon	7.2		N=363, Level 5 JiVs-1, 11 cores.

[1] Measurement is chord distance (4.3 to 11.4 mm) across fluted end, may be slightly less than core maximum thickness, for five specimens mainly but not all from Otter Falls (Workman 1978:243).
Sources: see Table 3.8 and Donnelly Ridge: West 1967; MiRi-2 and MgRr-1: Clark 1975 (the sites located inland north of Great Bear Lake may be affiliated with the Northwest Microblade tradition or with the Arctic Small Tool tradition); Minchumina: Holmes 1986; Pointed Mountain: core width scaled from drawings of four cores in Morrison 1987. Some collections have been studied by more than one person and variant data may be available.

Lithology

Delineation of stone varieties was critical to the refitting exercise and for the recognition of missing cores. We discussed the occurrence of Lithology 1-3 and Lithology 5 (black) in the preceding chapter. Initially 17 varieties or nuances of lithology were recognized for the Northwest locus. These also account for most material from the later excavations. Some varieties later were merged as distinctions made for large flakes and cores often could not be applied to small, thin microblades. As well, some varieties intergrade within the same specimen. It was discovered through refitting that there have been secondary changes in colour: a refitted artifact can have parts of differing colour.

The lithological sorting categories employed for the microblade industry are as follow:

1. Very light grey chert, fine red fracture lines.

1a. Very light grey chert, fine black fracture lines. Some specimens have both colours of fracture lines.

1b. Very light grey chert, no fracture lines. There also is one core of this lithology, with fitting tablets, from the southeast locus.

2. Very light grey chert, translucent, with black streaks, lines or flecks of black colouration.

3. Like lithology 2 but with large areas of solid black colouration. The margin of black to grey is "soft," but in subvariety 3b...

3b. (like lithology 3) black areas have sharp margins.

Groups 1, 2 and 3 are largely limited to the Northwest cluster.

4. Is made up of patches of medium grey and light grey chert, generally of dull lustre.

5. Black only; fine red fracture lines or none. Two complete cores and several tablets show a solid, uninterrupted black mass. On the basis of very subtle distinctions, the black colour appears to come from two or three different stone varieties.

6. Light colour density with a hint of olive, tends to be semi-lustrous, i.e., not dull but not as glossy as high quality cherts. Some specimens have a very light olive or green colour, a hint of tan colour, and tan-olive intergrades. Colours in this group are subject to secondary changes.

7. Colour most commonly like Lithology 6 and darker; diagnostic feature is the presence of scale-shaped refraction flecks evidently due to "stressing".

8. Medium grey chert, may be a darker variant of group lb.

10. (Group 9 was deleted) Waxy chalcedony or agate, slightly honey coloured.

11. Dark grey, with a few dirty inclusion specks, dull to semilustrous.

12. Green, Olive Green; a high density green without any pale shades as there are in Group 6.

13. A dull to semi-lustrous *red-brown* is common in the Southeast cluster. It is a facies of Lithology 6. Conjoined fragments sometimes displayed both. In two cores a red flake from the platform is sandwiched between an olive brown platform shaping flake and the core body also of olive brown colour. In one of these instances, the red platform tablet (whole upper half of core) came from brown sandy soil, while the brown-coloured portion came from red soil. The colour differentiation is sharp and is a secondary feature that developed after the cores were made and fragmented. The two colours occur separately, never together on the same piece (prior to refitting).

TABLE 3.10. LITHOLOGY OF NORTHEAST CLUSTER MICROBLADES

Lithology	Number	Percent
Lithology 1	19 \	18.0%
Lithology 1a	15 /	
Lithology 1b	54	28.6
Lithology 2	40	21.2
Lithology 3	11	5.8
Lithology 4	5	2.6

Lithology 5	13	6.9
Lithology 7	17	9.0
All others	15	7.9
Total	189	

The Microblade Cores and Byproducts

Summary

In Tables 3.12 and 3.13, each core and core tablet is described. There are several ways a core can be oriented for measurements (see figure on page 101). The measures used here are defined below:

Dimensions a, b. Height (a) is the distance from the bottom to the very top of the core perpendicular to the platform. Except in cases where the angle between the platform and fluted face is 90 degrees, the length of the fluted face (dimension b) is potentially greater than the height of the core (a). However, often there is a zone of the face extending upward a slight distance from the base of the core that does not figure in microblade production and thus the effective length of the fluted face may be less than b.

Dimensions c, d, e. Three different measures are used to express the distance from the fluted face towards the back edge. One, two or all three may be required to adequately describe a core. Core platform or top length (c) is the retouched area at the top of the core that forms the platform. Sometimes the platform encompasses the entire top of the core, in which case platform length and the maximum front-to-back length of the core (e) are the same. This parameter may consist entirely of the surface left by removal of a platform tablet. Minor retouch also may be present. The prepared top of the core is the platform area but often extends beyond the functional platform and sometimes it is not possible to clearly separate the platform from the remainder of the top of the core, hence the maximum front-back measurement (dimension e, platform held horizontal). But where the fluted face is acutely angled to the platform, this maximum measure with platform held horizontal can appear to be unrepresentative, hence the application of the third measure, the minimum distance from the front to the back of the core (dimension d).

For core width, there are two possible measures. One is the maximum side-to-side thickness. The other is the width of the platform and is the one given in Table 3.11, for the widest part of the platform which, if there is, variation, usually is at the front.

Platform Tablets

In addition to being byproducts of the rejuvenation of cores, platform tablets provide information on microblade cores inasmuch as they represent a portion, in some cases all, of the top of the core. "Platform tablet" refers to a platelike flake detached from the top of the core that removes an area of the core back from the fluted face. A small transverse section of the fluted face forms the front edge of the tablet except where it has been obliterated by crushing. Some tablets extend from the front to the back of the core. Others are short and out and renew the surface back from the face for only a few millimetres.

TABLE 3.11. SUMMARY DESCRIPTION OF MICROBLADE CORES

Cat. No. KbTx-2:	Height mm a	Face length b	Top or platform length c	Front to back d	e	Width platform	Platform angle	No. of flutes	
Northwest (1983) Locus									
1. 169+570	26	11+	—	48	47	15	56°?	2-3	
2. 244+L12	20	= a	32	32	= d	13	79°	5-6	
3. 255	23	= a	14.7	16.5	= d	10.5	93°	4-5	
a. —+451	29.3	—	36	---	38	11.5	---	4-5	
4. 370	29	= a	32	33.8	= d	11.7	76°	3-4	
5. 426+430	23	17	27.2	33	= d	15	90°	4	
6. 431	36	---	51	52	= d?	13.7	90°?	---	
7. 449	36	---	---	40?	—	15	---	---	
8. 495+497[1]	23?		41?	36?	41?	12?	—	---	
9. 518	26	= a	28	29.3	29.5	15	76°	3	
10. 563	27	21	53?	Irr.	53	14	73°	2	
11. 564	29.4	31	31.3	32	= d	14	59°	5	
a. 564+245+379	39	39-44	29	32	36	15	—	---	
12. 615+376	32	15	25	27.0	35	7-10	60°	4-5	
13. 562	15+	---	20+	---		17	78°	3	Incomplete
Average	28.8			36		13.4			
(N for Average=12, excludes cores 562 & 495; with core 495 Average = 27.5 mm)									
Southeast (1990) Locus									
14. 725+726	21	23.5	18.4	17.5	= d	10.5	63°	4-5	
a —+727+94-2	27	-	35.7	-		11.0			
15. 728	18.2	19	27.5	23.4	28	9.3	59°	5	
a 728+729+730	24	24	30.3	27.5	30.6	10.1	60°	5	
16. 895	19.6	= a	19.7	23.3	= d	11.2	90°	4	
17. 858+1074	35.5	32	29	29	= d	17	90°	9±	
18. 1076	32	= a	21.5	25	= d	10	88°	4-5	
a —+1077	36	= a	33.5	37	= d				
19. 1083	25	26	26	26.6	= d	13 max	60°	5-6	
a 1082+83	27	---	31.6	32	= d	13 max	---	---	
20. 1209	29.5	26-28	41	41.4	= d	17	85-90°	9	
21. 1388	23	= a	27.7	27.1	28.3	11	75°	5	
22. 855[2]	—	17+	---	---	---	—		4	
23. 1204[3]	---	---	26+	---		20	---	---	
24. 1205[2]	16+	---	—	---	---	—	---	—	
25. 1994-3	28.3	27.2	20.8	23.5	23.5	12	90°	4?	
Average	25.6			26.8		12.1	(N = 10, excludes frags. & “a” nos.)		
1992 Collection									
26. 1477	25	25	40.5	37	41	15.6		5	
a ---+1478	32	40	15	43	48.5	---		3	
27. 1488	25.4	23.7	23.5	36.3	= d	12+	90°	3	
a --+379+607	29.3		30.0	42.3	= d	13.2			
28. 1549+1536+	28.4	28	39.4	37.5	39.4	14.4		3	

[1] Partially refitted from fragments, connecting part missing. [2] Fragment with upper fluted face & part of platform.
[3] Major fragment missing fluted face, possibly not from functional core.

In some cases these differences express the intent of the knapper either to refurbish only the font of the platform or to radically remove the top of the core. In other cases, tablet removal evidently did not proceed to the extent intended. Such instances usually are followed immediately by further attempts at rejuvenation. There are nearly 90 tablets in the collection. Some specimens are ambiguous and it is difficult to determine the exact number because on many the diagnostic fluted edge is missing due to breakage or obscured by crushing of the edge.

There is another type of core platform rejuvenation product, the "platform flake", which is one of a series of small flakes detached to trim or adjust the platform These were not segregated and studied.

A third type of platform flake common in the present assemblage is the side-blow flake produced both from the initial shaping of platforms and from lowering or reshaping the top of the core, after rejuvenation (Fig. 3.8 k-l). Side-blow removals usually were directed to areas back from the front fluted face and thus the detached flake almost never bears part of the fluted face. They complement rejuvenation (and possibly shaping) by frontal platform tablet removal, sometimes almost in tandem as evidenced by cases of frontal platform tablets being fitted to side-blow flakes. Some side-blow flakes, evidently more likely to arise from initial shaping of the core than from adjustment after rejuvenation, take the classic "gull-wing" format (Fig. 3.9).

On the average, the tablets represent a less depleted state of the cores than the exhausted cores recovered by the archaeologist (some cores were discarded for reasons other than exhaustion, hence the qualification "on the average"), and consequently they are expected to show slightly greater dimensions for the top of the core. But the length and width of ten tablets that comprise the whole top of the core bear this out imperfectly, being less than expected in several instances. From among the 81 tablets, a number of outstanding examples and refitted sets are described in Table 3.12.

Other Byproducts from the Manufacture and Use of Cores

There are additional products in a microblade industry that result especially from the shaping of cores. These include blocky and roughly bifaced preforms, cortical and secondary flakes resulting from the shaping of preforms, ridged spalls representing the first stage of converting a bifaced edge to the fluted face, microblades bearing on one facet part of the surface of the original core blank, and possible face rejuvenation represented by one fitted example and probably two other specimens. The quantity of this material bears importantly on indentifying the site as a locus of core manufacturing.

Blanks or preforms. The identification of these pieces is largely circumstantial For instance, no other implements requiring large blocky blanks were produced at KbTx-2. The blanks vary considerably in degree of preparation. The most advanced specimen in this group is core KbTx-2:449 (Fig. 3.3). It is

TABLE 3.12. SUMMARY DESCRIPTION OF SELECTED CORE PLATFORM TABLETS

Cat. No. KbTx-2:	Width mm	Length mm	Wedge X-sect.+	Top shaped from side**	Plat. ret. from fluted end	Notes
Northwest (1983) Locus						
246*	12.3	38.5 Top?	Yes	*	*	
253	12.3	20+[1]	Yes	Right	No (unclear)	
254	11.9	53+	Yes	Right	Yes	Fits KbTx-2:427
372	11-12.6	30.9	Yes	Right	Yes	
373	13.3	32 +?	Yes	Right	Trace	
376	8.3-10.8	27+	Yes	Right	Undetermined	Missing scalloped end
				crushed, broken or never more than vestigially present		
379 (a)	13	22+	No	Right	Yes	Fits tablet KbTx-2:607
379 (b)	13.1	22.2+	No	Undet.	Yes	
427*	13.5	24 +?	No	*	*	
427+254		31.5				
428	13.3	16.4+	No	Undet.	Trace	
429	14+	24+	Yes	Undet.	Yes	
451	10.7	32 Top	Yes	Right	Yes	Fits KbTx-2:255 (Fig. 3.8f)
491	12	29.7 Top	Yes	From end	Yes	
492	18.7 irreg.	32+	No	Not distinct	Unclear/removed	
607	11 irreg.	38 Top	Yes	No	Yes	See description of core 27.
610	11.8	26.5	No	Right	Yes	See Note 2
603	13 max.	27+	Yes	Undet.	Yes	
609	9.8 max.	22	Yes	*	*	
727	10.5-11.5	36.3 Top	No	Left	Yes	Fits SE core 725-726
707	10.3	24+	No	*	*	
707	with ridged spall 706+708, removed before microblade production (Fig. 3.8a)					
		32.3	Yes	Left	NA	
709	11	21.5+	No	Left	Unclear	
Southeastern (1990) Locus						
716-17	14.4	34.4+	No	*	*	Fits core 1549
935	15.4 max	31.3+	No	Right	Unclear	Overlays short tablet 936
729	9.1	29.5	No	Right	Yes	Fits tablet 730 & core 728
721	13.7 max	26+	No	Right	Yes	Fits 1293+1431 (Fig. 3.8m)
937	13 max	32+	No	* Crushed		(Fig. 3.8d)
939+	8.7	33 Top	No	Right	Yes	See Note 3
+1291	12.5	36.5 Top	Yes	Left?	Yes	See Note 4.
1075	10.5	27.7	No	Right	Yes	(Fig.3.8e)
941	17	18+	No	Both	Slightly	
1077	10.4	30.2+	No/Yes	Right	Yes	Fits core KbTx-2:1076
1203	11.1	16.6+	No	Right	Yes	Overlays shorter tablet 1202
1992 collection						
—	9+	53+ Top	Yes	Left	Missing (broken)	
1478	16.0	49.0 Top	Yes	Right	Not clear, R?	Fits core 1477
			mainly from R.		Fits core 1477	
1507	15.0	59.0 Top	No	Left	Uncertain	
Average	**11.8**	**40.5**	**For 10 specimens identified as "Top."**			

* Morphologically, these specimens are secondary tablets (where two tablets were removed in sequence without the top of the second one having served as a functioning platform), or otherwise have a largely smooth top surface formed by earlier tablet removal. The offset fit of KbTx-2:247 with 254 and of KbTx-2:707 with KbTx-2:708 show that some apparent secondary tablets actually were primary tablets. For this variety of tablet the observations in the right two columns do not apply.

** "Top shaped from side [indicated]": for this observation the viewer faces the fluted end of the tablet.

+ When planes of either the ventral or dorsal surfaces of the tablet are inclined the spall is truncated laterally, producing the wedge or triangular cross-section noted in the fourth column. In some cases these tablets may resemble or be confused with ridged flakes removed from a biface edge or a flat bevelled surface.

1. "+", under length, indicates that tablet terminates by feathering-out, by a hinge fracture or other break, without extending to the back of the core.

2. Tablet KbTx-2:610 (to which a smaller tablet also is attached at the front) overlays sideblow flake 255, indicating that platforms sometimes were reflaked from one side of the core after having been rejuvenated from the front end. Half of the surface subsequently removed by the sideblow flake was exposed by the tablet removal while the other half of this specimen already formed part of the top surface of the core as shaped by an earlier generation of lateral flakes. Above data are for the main tablet only. The assembly of three pieces is 45 mm long, but the side-blow flake evidently did not reach the back end of the core which must have exceeded 45 mm from front to back. Similar evidence is provided in the fit of core KbTx-2:1076 and tablet 1077 (Fig. 3.8j).

3. Whole-top tablet KbTx-2:939 has two noteworthy features. First, the width of 8.7 mm indicates a core narrower than any recovered whole core. Second, the disparate colour combination of light, bright green (chert) and dark, drab olive grey that exists between this tablet and a smaller attached tablet shows that major secondary changes have occurred in the colour of some KbTx-2 lithics (Fig. 3.8b).

4. This is an unusual case example combining front-blow initial platform formation, front blow rejuvenation and sideblow reshaping or rejuvenation. (a) Initially, the upper surface of the core blank was prepared through coarse flaking from the right side. (b) A lesser part of the top of the blank was removed a side-blow directed from the left (flake recovered). (c) The top of a greater part of the blank, which now was humped at the front, was removed by a frontal blow to what was to become the front of the core. This removal, recovered as fragment 1451, left a flat smooth platform, as is common to cores prepared or rejuvenated by removal of tablets by means of frontally-directed blows. (d) Next, a few small microblades were detached from the smooth platform. (e) Then, for reasons not apparent, almost the entire top of the core was removed as a massive side-blow flake. This portion, tablet 1025, came off the core at a very slanted angle, crossing the face of the core and removing only part of the platform and leaving most of the fluted face at the front of the core. (f) The new top of the core remained highly inclined, and, evidently in an attempt to correct this condition, platform tablet, KbTx-2:1027, was detached in the customary frontal-blow manner. The new platform from this 17-mm-long tablet remained highly inclined. (g) Before there was any (or significant) further microblade production a thin tablet (No, 1468) was removed, which did little to modify the slant of the platform, and then (h) another small short tablet to trim the platform (KbTx-2:1291), and finally (i), still before there was significant microblade production, another thicker tablet (94-1) was removed. The fragments come from four adjacent sections of the SE cluster. Two were point plotted and a minimum dispersal of 90 cm and a maximum of 123 cm is indicated for the stages extending from shaping of the blank through microblade production and core rejuvenation. Subsequent to removal of Tablet KbTx-2:1025 (step f) further tablet removals hinged out, but no part of the rear of the core is recognized.

described below among the complete cores, and in Table 3.12 as Core No. 7. It likely had not reached a final stage of preparation for microblade production before it was broken. The missing evidence of the unrecovered portion is critical inasmuch as the present piece lacks any fluted face.

Specimen 1518 is roughly discoidal in form, measuring 48 x 47 x 21 mm (Fig. 3.9e). A flat fracture surface along one edge may be a potential platform.

Blank KbTx-2:1555 (Fig. 3.9f) is made from a light grey chert streaked with black. It measures 31 mm high by 55 mm long and 16 mm wide when the remnant of a surface possibly intended for the platform is held horizontal. The margins are roughly bifaced. Possibly it fractured during preforming and at 31 mm the remaining portion lacked sufficient height to merit its continued development into a microblade core.

Two fragments (KbTx-2:1479+1581, Fig. 3.9d) form an incomplete blocky blank of grey and black chert that measures 38 mm high to the flat top, up to 26 mm wide and exceeded 40 mm length. The faces are very roughly flaked. The piece may have been abandoned because of the risk of further fracturing which would have made the investment of more effort to make a core risky.

One group of fragments suggests a mode of core preparation different than that implied by the preceding blanks. Several fragments of olive-coloured chert (KbTx-2:893---901, 1519) were refitted into an irregularly-shaped block 49 by 39 by 27 mm. No element of core morphology was recognized in this assembly but two additional flakes, that appear to be from the same specimen but cannot be refitted, seem to form the top of a core that would have had a platform exceeding 24 mm width. This is unlike the wedge-shaped cores. Why a block of chert was so determinedly broken into at least 10 pieces remains to be determined.

Microblade core face rejuvenation. The status of face rejuvenation is uncertain. A sharp angulation of the arc(s) of the fluted face was removed sometimes by a thick microblade. Two such specimens are illustrated (KbTx-2:719, 1214; Fig. 3.9a). There are many additional "microblades" that remove the front-bottom of the keel of the core bearing the ends of several microblade flutes. Almost invariably these specimens are incomplete and lack the proximal end. These removals may have acted as a form of face rejuvenation.

Primary ridged spalls removed during formation of fluted face and platform. In the development of a core from a bifaced blank, a spall may be removed from one end to start development of the fluted face. This spall will be triangular in cross section, ridged, and retouched on the two original outer faces. The fineness of retouch, and overall the formality of the spall will depend on how roughly the blank was prepared at the outset. Few of these ridged spalls are recognized in the collection. We are not confident in distinguishing the finer retouched examples from primary burin spalls. First shaping of the platform area may also have been through detachment of such a spall, though shaping of the platform (prior to rejuvenation) appears to have been mainly by way of flaking from the side. Figure 3.9c illustrates a ridged spall probably from the edge of a microblade core blank. Inasmuch as these proposed steps in the generation of the fluted face are poorly represented among KbTx-2 artifacts, we cannot be certain that other modes of shaping the front of the blank were not also used.

Description of Individual Cores

Core information is provided in Table 3.11, but explication is necessary to adequately describe many specimens.

Core 1 (Fig. 3.2, KbTx-2:169+570)

This Lithology 2 core was recovered in two pieces. Fragmentation is interpreted as being the result of attempted platform tablet removal. The intended tablet hinged downward, removing part of the back of the core which was recovered, though the main, front portion of the tablet broke off and was not recovered. The original core blank appears to have been an ovoid or discoid biface. At some stage during core preparation or later, but prior to fragmentation or rejuvenation described above, a broad flat edge was developed at the top of the core or blank. The top or platform then was shaped further from the left side, but formation of the platform did not extend to the rear of the core which remained as a high flat-topped projection. The fluted end shows attempted microblade production marred by step fractures.

Core 2 (Fig. 3.2, KbTx-2:244+L12)

The top of this core was formed by retouch directed from the left side. The platform had been renewed at the face edge through detaching a flake with a blow directed inward from the fluted face, but it is possible that no further microblades were detached. The core may have been abandoned because of the shortness of the face. L12 is a refitted basal fragment recovered in the screen. The material is a lustrous weakly banded light and medium grey chert, somewhat variant from Lithology 1 and 2.

Core 3 (Fig. 3.2, KbTx-2:255+451)

The smallest microblade core is a wedge-shaped specimen pieced together from fragments recovered among the flake lots. It may have been exhausted and discarded because it had been reduced to a small size. The material is a light olive-brown chert of Lithology 7 filled with numerous strain scale fractures. A single planar flake scar surface forms the platform. The keel and back are formed of part of an unmodified flat cortical surface and through retouch from the edge. Long vertically oriented flake scars originating from both the platform and keel form the sides of the core.

Refitting of platform tablet KbTx-2:451 indicates an earlier stage of the core followed by rejuvenation and uninterrupted detachment of microblades. There had been some microblade detachment from the core prior to rejuvenation, so the assembled height and length of 29.3 and 38 mm, respectively, does not fully show the original size of the core.

Core 4 (Fig. 3.2, KbTx-2:370)

KbTx-2:370 is the only olive or green-grey coloured chert core (does not match any colour of lithology previously described), but there are several core products including a platform tablet that come from cores of similar material. The platform is formed primarily by a single large flake scar originating from the side of the core, but two small flakes were detached by a blow directed to the face of the core to trim the platform and adjust its angle. The base of the core is a large flat area of cortex. Small areas of cortex remain on each side of the core, showing that there had been minimal shaping of the blank. The back or dorsal ridge is roughly bifaced. One flake originating from this ridge has been fitted to the side of the core. This core appears to have been produced at the site. Examination of its form and fitted spalls suggests that few if any microblades were detached before it was lost or discarded.

Core 5 (Fig. 3.3, KbTx-2:426+430)

This wedge-shaped Lithology 3 core was recovered in three fragments. The roughly prepared platform was formed from the right side and from the fluted face. It is highly inclined, from the right side down to the left. The base and back of the core are irregular and coarsely flaked in the bifacial mode. The last attempted microblade removals ended short at step fractures, upon which the core was discarded.

Core 6 (Fig. 3.3, KbTx-2:431)

This large core appears to have been broken during an attempt to detach a platform tablet. At 8-12 mm thickness, the tablet came off much thicker than desired and broke half way across the core which ended up in three pieces, one of them not recovered. The material is a fine-grained, non-glossy medium-grey chert with sparse black lines. Very little debitage precisely matches this variation of Lithology 2 chert. The top of the core is formed by retouch directed from the left side, supplemented by three tiny flake scars directed inward from the fluted face to trim the platform. The faces are roughly formed by large flake scars originating from both the platform and the edges of the core. The base is missing; the dorsal ridge is formed by rough-scale bifacial flaking supplemented by crushing. There are two large bladelet removal scars at the face, 9 mm wide in one case.

Core 7 (Fig. 3.3, KbTx-2:449)

This incomplete core of black and light grey chert (Lithology 3) likely had not reached a final stage of preparation for microblade production before it was broken. The evidence of the missing portion is critical inasmuch as the present piece lacks any fluted face. The object is approximately discoidal and has roughly prepared bifaced margins except for one relatively flat and straight area interpreted as the platform.

Core 8 (KbTx-2:495+497, Not illustrated)

This Lithology 6 core was recovered in fragments. A connecting portion is missing.

Core 9 (Fig. 3.3, KbTx-2:518)

The back of this generalized Lithology 2 wedge-shaped core is rough and irregular. The sides were formed by detaching flakes primarily from a roughly bifaced edge that now forms the base. The platform is formed by the scar from a single flake detached by a blow to the front of the core. Remaining areas of the top of the core were roughly trimmed from the left side. The face was recovered as a separate fragment, found 56 cm from the main piece. It had parted on a natural fracture.

Core 10 (Fig. 3.4, KbTx-2:563)

Its considerable length, 53 mm, notwithstanding, this Lithology 2 core appears to have been exhausted after attempted platform rejuvenation. Two very tapered flutes form a face at one end of the core where the platform here had been rejuvenated through removal of a flake by a blow directed from the fluted front of the core, but the renewed platform is highly inclined towards one side. Very little remains of the opposite end of the core, though there are two bladelet facets that appear to originate from the base of the core. One possible interpretation is that this specimen has been rotated, end to end and top to bottom

Core 11 (Fig. 3.4, KbTx-2:564)

The roughly bifaced back of this classic wedge-shaped Lithology 2 core curves under, forming a keel that meets the base of the fluted face. The lateral faces were shaped from this edge. The top bears at the back the distal-end trace of a smooth, curved scar characteristic of tablet removal, while the platform has been formed through removal of a shorter tablet, 19 mm long. Five attempted microblade removals terminate in step fractures, which may be why the core was discarded. Fragment KbTx-2:245 fits this core to form a larger, earlier generation of core described below.

Core 11a (Fig. 3.4)

After a very roughly bifaced blank had been partially prepared, the flattened top of core 11a was flaked through blows directed to the left side of the blank. This produced an inclined, essentially flat area behind the working face, though it was dished from front to back. At the back, the top of the core was left as an untrimmed projection. Apparently, after production of a number of microblades, the top of the core was detached. The tablet, KbTx-2:245, steadily thickened toward the back of the core, from about 4-6 mm increasing to 20 mm.

Further bladelets were detached from the next generation of this core, which now was 36 mm high (less at back). Evidence for this stage consists of a short tablet with crushed edge, KbTx-2:379 which has been refitted to specimen KbTx-2:245. After a number of microblades had been removed, tablet KbTx-2:379 and other rejuvenation flakes (not retrieved from the flake lots) were detached. Sufficient microblades were detached to move the fluted face back approximately 4 mm, after which the specimen was as described above for Core 11.

Core 12 (Fig. 3.4, KbTx-2:615)

On this poorly formed core a single planar flake scar, the result of platform tablet removal, forms the platform and almost the entire top of the core. One side is cortex, the other side is roughly flaked from the lower front and base of the core. The back is essentially unformed, the pointed keel poorly formed. The fluted face is very short, in part due to the lower portion of the front of the core having been removed. Though it is a poor example, its attributes and platform development place this specimen in the wedge-shaped class. Core height of roughly 23 mm increases to approximately 31 mm with the tablet attached. The top of the core formed by this tablet was flaked from the right and is highly inclined to the left. The lithology is medium grey chert (Lithology 8) with areas of other lithology present.

Core 13 (Not illustrated) KbTx-2:562

This core is broken and lacks the base or lower part, as well as possibly part of the back and one side. The material is a fine, medium-grey, semi-glossy chert characterized by the presence of strain scales. Many flakes of the same lithology were recovered.

Core 14 (Fig. 3.5, KbTx-2:725)

This is a classic wedge-shaped core that shows minimal preparation of the blank. The back is in part an rough plane in the stone; one side is formed by a single flake scar that originates from the base edge; the other side of two flake scars, at least one of which originates from the base, plus a small number of retouch traces by which the wedged keel was formed. The core had split vertically and was recovered in two separated fragments. The lithology is Type 5, black chert. Had it not split, for no apparent reason, the core probably would have been discarded because of exhaustion.

Core 14a

Attachment of platform tablet KbTx-2:727 extends the height of this core from 21 to at least 28 mm and the length of the top of the core to 36 mm but does not appreciably expand its width. A fitting side-blow platform-shaping flake also was recovered.. A considerably number of microblades evidently was detached after the core had been rejuvenated before it was discarded. There had been prior production from core 14a, so the original length, from face to back, exceeded 36 mm. Concordance of the width, material, and edge conformation of platform tablet KbTx-2:727, tablet assembly KbTx-2:707-708, and tablet 1292 suggests that all are from the same core or that two cores were produced from a single smooth-sided slab of black chert.

Core 15, 15a, 15b (Fig. 3.5)

Core 15 evidently was discarded after it had been rejuvenated. Core 15a restores a short platform tablet to this core Replacement of platform tablet KbTx-2:729 takes the core back to yet an earlier stage, Core 15b. The few microblades attempted between the time that the short tablet and the main tablet were detached, were irregular and terminated short in step fractures presaging abandonment of the core after one last attempted rejuvenation. This series of fits ties together pieces from three excavation units. This classic wedge-shaped core has a well trimmed wedge element that forms the base and back of the core. The sides tend to be flat, one side being formed by a single flake scar (away from the edge), the other side by a flake scar and a planar surface. The manner in which the original platform was formed is not clear. The chert is slightly stressed, but comes close to Lithology 6.

Core 16 (Fig. 3.5, KbTx-2:725+726)

One side of this Lithology 6 wedge-shaped core is formed by two flakes that originate from the back and back-base edges. The other side appears to be formed principally by a portion of a large planar flake scar present before final preforming of the core. The platform is formed by flaking retouch from the left side. If this is the original flaked platform the low height of the core is surprising (low height might be expected after rejuvenation or when the core is exhausted).

Core 17 (Fig. 3.5, KbTx-2:858+1074)

Most of the platform and back of this relatively stout, black chert (Lithology 5), wedge-shaped core had broken away. It appears, however, that a desultory effort had been made to utilize the upper fragment (KbTx-2:1074) as a core. The fluted face is compound, and consists of two chords or faces that intersect at approximately a right angle. Most of the large number of flutes on the face are irregular. The sides and keel show rudimentary coarse bifacial shaping.

Core 18 (Fig. 3.5, KbTx-2:1076)

This very light-coloured chert core is crisscrossed by fracture lines and seams that may have caused the last microblade removals to fail and the core to be discarded. In this classic wedge-shaped core the sides are formed principally by fracture planes and large flake scars originally present on the blank. There is roughly executed bifacial flaking at the base of the core – the lowest part of the keel – while the rest of the keel and back of the core is lightly retouched along the edge on the right face only. The retouched portion of platform was flaked from the right side, as also was the fitting tablet noted below.

Unlike the morphology of many other cores, the retouched portion of the platform or top of the core is lower than the area to which a tablet fits. Fitted tablet KbTx-2:1077 projects over the flaked top of the core showing that this flaking is not part of the original platform preparation but was done after rejuvenation. The lithology, somewhat like Lithology 1 and 2, is slightly unique and thus a number of side-blow flakes and some other fragments from platform preparation probably are attributable to earlier preparation and utilization of this core. With the tablet, which projects beyond the front of the core, the length of the core, as stated in Table 3.11, increases to 37 mm, and the height to 36 mm.

Core 19 (Fig.3.6, KbTx-2:1083)

This classic core has a wedge-shaped front profile and tapered tear drop-shaped top profile or plan. Its good form notwithstanding, the core exhibits relatively simple preparation of the wedge-keel-back element and the sides. Each side is formed primarily from single flake scars. The keel-back is trimmed by nibbling retouch limited to one face. The top of the core consists of the original highly inclined surface formed by flaking from the right side, at the front, of a smooth dished surface formed by removal of a platform flake or short tablet. Lithology is variety 6: light tan chert with hints of both olive colouration and a slight rust tone.

Core 19a

Attachment of platform tablet KbTx-2:1082 to core KbTx-2:1083 produces the earlier stage of core 19 with greater height and length as recorded in Table 3.11. Attachment of red-brown flake 1081 and olive brown flake 1080 further build up the top of this core to 31.6 mm height.

Core 20 (Fig. 3.6, KbTx-2:1209)

This graceful, relatively large, classic wedge-shaped core is made from a very light tan stone, seemingly unlike that of any other core (no lithology type designated for this material as the stone is likely altered, possibly through weathering). There is little stone waste of this lithology. Like Core 16 there are two chords or areas of the fluted face which meet at the front of the core approximately in a right angle.

Core 21 (Fig. 3.6, KbTx-2:1388)

A core and its fitting tablet are described as a single unit here. The "core" is no larger than the tablet, and it is apparent that after the tablet had removed not only the top of the core but also most of the back, the core was too small and was discarded. The upper removed portion of the core is a dull red-brown fine-grained silicified stone (Lithology 13), the lower portion a tan of slight olive hue. The difference in colour clearly developed after the two pieces separated. This coloration is the reverse of the colours of the soil matrices in which the two fragments were found. There is no evidence that the red portion has been in a fire. This is a good wedge-shaped core showing rudimentary bifacial preparation of the keel or base and rear edge. The sides show little preparation, and one smooth side probably is the ventral surface of a large flake that served as a blank. The top of the core is roughly prepared through flaking from the left side.

Core 22 (KbTx-2:855 Not illustrated)

There is little to be said about this dark red-olive-brown chert fragment of the upper fluted face and platform. The colour may be secondary due to heating.

Core 23 (KbTx-2:1204 Not illustrated)

This Lithology 6 major fragment lacks a fluted face and possibly the core had not been prepared to the point where it was functional for microblade production.

Core 24 (Fig.3.6, KbTx-2:1205) A fragment with part of the fluted face.

Core 25 (Fig. 3.6, KbTx-2:1994-3)

This core is heat altered to a pastel red-chocolate shade on one side, and to a mottled light grey colour on the other side (the light grey appears to be a secondary result of weathering.). One side of the core has spalled off as a result of heating, and this reduces the width slightly, which measurement has been corrected through estimation. Like the other cores, this is a wedge-shaped specimen with rudimentary bifacial preparation of the keel or base and rear edge. The top of the core was prepared by flaking from the right side. The right edge of the top is crushed. At the front there is a short 5.6-mm-long platform formed through frontal removal of a tablet.

Core 26 (Fig.3.6, KbTx-2:1477)

This core is of a light grey chert, Lithology 2, liberally streaked with fine black veinlets. It was rejuvenated through detachment of the whole top of the core and put back into production. Prior to that, a large side-blow flake had been removed from the platform. The side-blow flake (recovered as platform tablet) overlaps both sides of the platform slightly and thus is seen to be derived from preparation of the core blank. The fluted face, especially with the tablet attached, is positioned to the side of the core front.

Core 27 (Fig. 3.7, KbTx-2:1488+379+607)

Its 19 mm width makes this wedge-shaped chert core stouter than most others of wedge shaped format. It does not fit any of the colour varieties described for the Northwest area. The platform width stated in Table 3.11 is not the full width of the core. When platform tablet KbTx-2:379 is refitted, the top of the core is seen to be formed by two smooth inclined surfaces, like a gabled roof, one surface being formed by a skewed (oblique) frontal blow tablet removal, the other being an original surface of the blank. Finally, refitting an additional tablet, KbTx-2:607, restores the top of the core to a roughly bifaced ridge. This ridge is crushed and smoothed. At this stage the core is 33.3 mm high and its length from front to back is about 50 mm. Although the ridged surface may have been an original edge of the preform, the core already had been used and had been rejuvenated, as is seen from the fact that the top refitted tablet already has microblade flutes at the front and bears the hinged-out scar from a platform tablet removal.

Core 28 (Fig. 3.7, KbTx-2:1549+1536+716-717)

This core was fitted together from two tablets and two basal fragments. It does not fit any of the colour varieties described for the Northwest area. An original core apparently was rejuvenated through removal of a whole-top platform tablet which was not recovered. Then, another very thick tablet was removed (recovered in two pieces). This reduced the height of the core to 18.7 and 25.4 mm on the two sides of the inclined platform respectively. A third thin whole-top platform tablet was detached, now reducing the height of the core to 18-21 mm. This was too low and the residual core was discarded. At some time this portion was further fragmented by breakage of the front-lateral portion.

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There are core products, especially platform tablets, that on the basis of size and lithology appear to be from cores otherwise not represented in the collection. A number of cases have been identified on the basis of distinctions other than colour differences. It is important to recognize these cores and the processual histories they represent for the information this provides on the production and utilization of cores at the site and their presumed curation and removal to other sites. The proposed cores are identified by letters.

Core A (missing SE Locus core)

A small number of microblade fragments, flakes, and possibly part of the keel or base of the face of a core are of a variegated off-white to honey coloured chalcedony. Flakes of this undesignated lithology type are rare at KbTx-2, though they were found scattered over four sections. The core from which they were derived probably was brought in from elsewhere and disposed of outside the excavation area. One piece (KbTx-2:722) in this lithic group is part of the top of the core at some stage, detached through a side-blow, and there also are two tiny fitted platform tablets with fluted edge (KbTx-2:723+724).

Core B, C , & D (missing SE Locus cores)

Core B is identified on the basis of the fact that whole top rejuvenation tablet KbTx-2:939 does not match the size and shape of the top of any core in the collection. The bright green chert colour also is unique among the cores and tablets, and probably is the original, unaltered colour which has changed to drab, olive grey in a tablet that is refitted to this specimen.

Core C is proposed on the basis that assembled black chert (Lithology 5) tablets KbTx-2:1025-1026 are not likely to come from either of the recovered black chert cores.

Core D is identified on the basis of the fact that assembled tablet set KbTx-2:1431, 1468, 720-721 and KbTx-2:293, of low lustre red-brown stone, is not likely to come from any recovered core. The assembled tablet stack comprises about half a microblade core.

Core E (missing NW Locus core)

This core is identified on the basis of a very good light olive platform tablet (KbTx-2:451). In some cases lithic colours may be fugitive, but in this case the chert is slightly pitted, possibly from the weathering of inclusions. The pitting, as well as an appreciable difference in colour and the absence of strain scales distinguishes Core E from any other northwest cluster core while the combined features of size and lithology do not match any southeast locus core.

Core F (missing NW Locus core)

Core F accounts for uncommon Lithology 4, which is a medium-grey chert with light grey bands. The collection includes one platform tablet KbTx-2:603 and ten microblades, many of them distal segments. Two thick distal segments each have four arises, which also is noteworthy inasmuch as there are only four specimens with four or three-four arises in the analyzed 1983 collection of 181 microblades. Evidently, Core F was produced outside the area excavated, possibly at a different site. There was limited microblade production from it. Based on the recovered sample, the distal ends of some microblades produced were discarded and the proximal-medial portions retained. Recovery was from the edge of the road cut to almost the inner edge of the excavation. Final disposition of the core was outside the area excavated, perhaps at another site,

Core G (Missing NW Cluster cores)

More than one additional core is needed to account for all the Lithology 5, black chert tablets, flakes and microblades recovered, including a subvariety with tiny white inclusions.

Production of the Cores

Nearly 30 cores and several core blanks were recovered along with platform tablets and distinctive debitage that reflects the preparation and rejuvenation of microblade cores. The synthetic analysis of core production given here draws on the technological aspects of these specimens. In nearly all cases the KbTx-2 specimens are wedge-shaped cores, and they include many classic examples.

Two production sequences are recognized. The one first described here (Mode 1), based on a blank that is a biface and not simply bifacially trimmed from one edge, may apply to only two specimens, but is the one we will give the most attention inasmuch as it is poorly documented elsewhere. Mobley queries the possibility of this mode occurring among the numerous Campus Site cores, where the blank usually was a flake trimmed bifacially along one edge (Mode 2), but he lacked diagnostic material to conclusively demonstrate its presence (Mobley 1991:25). In either case the end product is a wedge-shaped core. The technique of producing cores is similar in both modes except during the first step.

Step 1. Two or three specimens show that the core started as a rough discoid or ovoid biface blank (Mode 1, Fig. 3.3 Core 7; Fig. 3.9e, f). Such biface blanks do not necessarily bear any similarity in form to the subsequent core. The biface discoids were split and trimmed to provide the core preform.

However, the more common mode of preform formation, up to the point where the platform is prepared, appears not to start with a biface as such but starts with a selected flake or block of raw material that usually approximates the initial form of the wedge-shaped core (Mode 2). This blank requires only minimal bifacial preparation at one or two edges to facilitate development of the fluted face from which microblades are produced. Even this bifacing is not always necessary. The fluted face of Core KbTx-2:370 (Fig. 3.3 Core 4), for instance, appears to have been developed from a tapered cortex surface.). Usually, there also is some bifacial shaping at the base or keel (wedge element), except in the case of flake blanks which already have a tapered keel where, nevertheless, there is some fine nibbling of the edge. Careful crafting may trim the entire back and sides of the core in the bifacial mode, though usually the back is left in an unmodified or natural state, or is roughly trimmed through removal of two or three flakes. There seems, though, to be an ideal seen in a few cores, calling for careful bifacial preparation of the keel and back edge of the core. In better prepared cores, the keel and back tend to merge into a single retouched edge that in pronounced cases gives the core has a triangular profile, the three sides being formed by the platform, fluted face and keel.

Once core formation in either mode has reached the stage of preparing the core striking platform, the two core production modes are similar or identical. No attempt was made to distinguish between them among the well-used cores in the KbTx-2 collection though differences likely could be recognized between newly formed cores of the two modes. Wedge-shaped cores in Alaska and the Yukon most commonly are developed from bifacially trimmed preforms, instead of from actual biface preforms. We will not discuss further the bifacially trimmed flake preform inasmuch as this aspect of technology is widely described elsewhere (cf. Hayashi 1968; Le Blanc and Ives 1986; Mobley 1991).

Additional varieties of wedge-shaped microblade cores, defined on the basis of their modes of preparation and rejuvenation or refurbishment, are known in northwestern North America (See in Chapter 4). They do not show the mode of platform preparation and rejuvenation described below. In some cases the wedge (or conical or cylindrical) form appears to be a secondary attribute resulting from the removal of microblades. As these are not represented at KbTx-2 they will not be described further here (see examples in Clark and Clark 1993:Pl. 8a; Pl. 9 c; Pl. 10 b, e).

Step 2. The next step in treating the blank is platform preparation. A portion of the blank edge was flattened through the lateral removal of small flakes. Possibly, in the case of the discoidal biface blanks, an edge spall, triangular in cross section, or an entire end of the biface blank may have been split off first. But this is not certain because no specimen has been completely reconstructed to form an original complete biface blank. Some biface edge fragments in the collection, could be segments detached from biface blanks to provide for the platform area, or these pieces are fragments of actual cores. Lateral flakes from this and the next step are readily recognized in the debitage and include flakes of distinctive "gull-wing" shape.

Step 3. Then the platform was further prepared through removing flakes transversely (Hayashi 1968 uses the term "latitudinal"), across the platform from one of its edges; i.e. originating from the side of the core (see platform views in Figs. 3.2 Core 2, 3.3 Core 6 & Core 9, 3.4 Core 12, B5 Core 14, 3.8a, c). Where the evidence is clear, this shaping originated from either edge of the platform: left in seven cases, right in six cases, both sides in one. Lateral or side-blow flakes from this step are readily recognized in the debitage and include flakes of distinctive "gull-wing" shape (Fig. 3.9b) as well as other less distinctive side-struck flakes. West, Robinson and Curran (1996:384), though, state that these flakes were detached to notch the platform so that the travel of rejuvenation tablets could be controlled. Mobley (1991:30-36) provides a useful discussion of this aspect of core preparation and notes that in the Campus site collection 25 of 38 cores (66 percent), for which lateral preparation is clearly present, were prepared from the right side and two more from both sides. On the KbTx-2 cores this shaping originates from either side of the platform, but examination of 19 KbTx-2 platform tablets with retouch shows that 15 of them or 79 percent were shaped from the right.

Platform preparation sometimes did not extend along the entire length of the top of the core. The back of the top of the core, in such cases, was left more elevated and more roughly fashioned than the platform. At this stage the platform often is inclined to the plane of the core, from one side to the other. The leading or high edge of the platform usually is crushed (note in Figs. 3.3, Core 6; 3.8a, c; and others), apparently as an intentional feature of platform preparation correlated with the transverse (so-called latitudinal) or crosswise flaking of the platform, although the reason why this is the case is not known.

Step 4. Ridged flakes may have been detached from the front edge of the core to develop a fluted working face. Some triangular (in cross-section) retouched flakes plausibly represent this stage, but no fitting of spalls actually demonstrate this step at KbTx-2.

Step 5. During microblade production platforms were rejuvenated or adjusted by removing small rejuvenation flakes or a short tablet from the platform at the front. Platforms also were renewed or further shaped by removing a longer platform tablet or thin slice from the entire top of the core (Fig.

3.8a-i). The blow to remove the platform tablet was directed to the top of the fluted face at the front of the core. This procedure is typical of wedge-shaped cores and contrasts with the mode of platform tablet removal often seen on wide or subcylindrical cores, in which the blow is directed to the side of the core. Primary tablets usually bear on their superior dorsal surface an original platform but are not always distinct from secondary tablets. The latter bear a smooth dorsal surface left from earlier tablet removal. Renewed platforms sometimes were further retouched at the front edge, presumably to adjust the platform angle.

In some cases, the top of the core then was reshaped from the side in the manner in which it was prepared originally. Side-blow flakes, including both "gull-wing" flakes (Fig. 3.9b) and ones lacking this distinctive morphology (Fig. 3.9k-l), may derive from the rejuvenation stage as well as, in a few cases, from preparation of the initial platform. This procedure is demonstrated by a core and a tablet stack on which long fitted platform tablets overlap an area removed through transverse (latitudinal) retouch.

Step 6. There is some question about rejuvenation of the fluted face. Some bladelets that include major portions of the fluted face may be accidents. But in many cases the fluted fronts of the cores do not describe a smoothly rounded arc, as is implied to be the case when analysts record the chord of the core front. Instead, there is a relatively sharp turn at the face that suggests production from right and left arcs or curved surfaces, either successively or concurrently. Some multiple-ridged spalls or large microblades incorporate this turn or angulation of the fluted face (Fig. 3.9a). These may have been detached to reduce the angulation of the two sides of the fluted face, to restore it to the assumed original condition of a single curved surface.

Comparisons of Microblade Cores

Overview

Microblade cores are widespread in northwestern North America and exhibit considerable time depth, as is discussed in the next two chapters. In this section, however, we focus on the comparing the Kelly Creek cores with the cores from a select series of assemblages. Inasmuch as the KbTx-2 core assemblage almost exclusively contains wedge-shaped cores, comparisons will be limited to that category. This excludes tabular and subcylindrical cores. It is difficult, though, to draw sharp lines for cutting off comparisons inasmuch as poorly formalized cores often assume a wedge format with use.

KbTx-2 wedge-shaped cores correspond closely to the variety commonly called the "Campus" core, named after the Campus site at the University of Alaska located at Fairbanks (Mobley 1991) or "Denali" cores following West's (1967, 1981a-b, 1996) definition of the Denali complex. Campus cores are made on flake and bifaced preforms and are more precisely defined on the basis of platform preparation which includes shaping through lateral retouch and platform rejuvenation as described above. However, the use of biface blanks (Mode 1), as contrasted with bifacially trimmed preforms (Mode 2), is not described for the Campus site collections where biface blanks evidently are absent.

Wedge-shaped cores are found in North America from the vicinity of Point Barrow, Alaska, southward and eastward into the Yukon Territory and to the southwest corner of the District of Mackenzie. The Campus (Denali) cores in this area differ from microblade cores of the greater part of British Columbia, Alberta and the District of Mackenzie, and most Pacific Coastal regions. Though, as discussed in Chapter 4, there are rare cases of Campus cores being found in Alberta and northern British Columbia.

The comparisons made below show that formation of core platforms through detachment of a triangular ridged spall from the top of the core is uncommon in northwestern North America (for a description of this "Yubetsu" technique as it was used in Japan see Morlan [1967]). Although recent detailed descriptions of northwestern cores (Mobley's [1991] for instance) in most cases clearly conform to this conclusion, one may be led to expect otherwise from widespread comparisons with microblade industries of Japan employing the Yubetsu technique (Hadleigh-West 1967) together with the identification of a form of the Yubetsu technique at Bezya and the perhaps erroneous attribution of many North American cores to this production system by others (Smith 1971, 1974). Moreover, North American wedge-shaped cores often are identified with the Dyuktai cores of Siberia. Nevertheless, the Dyuktai platform preparation sequence determined by Flenniken (1987) entails detachment of triangular ridged spalls (ski spalls, though this term mainly refers to secondary spalls flat on both superior and inferior surfaces) and is related to the Yubetsu technique. However, Dyuktai cores described by Flenniken clearly differ from the common Campus or Palaeo-Arctic cores described here although illustrations in *American Beginnings* (West, ed., 1996) show that the Campus type core also is present in the Dyuktai tradition. Thus, similarities between North American and Asian cores of wedge-shaped format may be less pervasive than has been stated by archaeologists.

Nevertheless, more than one wedge-shaped core variety is found in the various Siberian, northern Japanese and Korean assemblages, and among them there actually are some specimens very similar to those of North America. Kimura (1990:84), for instance, compares the Yubetsu-Horokazawa technological complex with the Togeshita-Shinmichi technological complex. He notes that the latter is characterized by "formation of microcore, microblade removing, core rejuvenation and subsequent retouch on platform [being] done over and over during [microblade production]" whereas Yubetsu technique cores are not rejuvenated and change little in format during use (for references to Togeshita see Morlan 1967:197). Kimura notes that the Togeshita technique is more widespread than the Yubetsu technique and is present in the microblade cores of the Campus site and of some other Alaskan and Siberian sites. Some of the same attributes also can be recognized in microblade cores from Korea (Lee and Yun 1990).

The provenience of specimens with which comparisons are made below extends south, east and west of the Kelly Creek site. Sites were selected on the basis of their being well described in the literature or the availability of collections at the Canadian Museum of Civilization. The list includes Otter Falls, located only 125 km to the south, Ice Mountain or Mt. Edziza, British Columbia, 575 km south-southeast, Dry Creek 645 km west in interior Alaska, Healy Lake which is intermediate between KbTx-2 and Dry

Creek, Pointed Mountain which is just east of the Rocky Mountains half way between KbTx-2 and the Bezya site, Great Bear Lake 850 km to the northeast, and the Bezya site 1400 km distant in Alberta at the extreme eastern limit of microblade distribution. The most distant collections are discussed first.

Bezya

Bezya, located in northeastern Alberta, is the most distant comparison made here. This assemblage contains five microblade cores, numerous microblades, core products and pieces of debitage, and a notched transverse burin (Le Blanc and Ives 1986). The site has been dated to 3990±70 years B.P. (uncalibrated). In many ways the Bezya and KbTx-2 assemblages are comparable: specimens at both were clustered in a small area, only a very limited range of implement forms is present, and both were microblade production sites containing also the evidence of making microblade cores.

Le Blanc and Ives (1986:Fig. 14) describe Bezya core production and utilization as follows:

1. Start with a pebble or thick flake blank.
2. The blank is roughly bifaced and shaped to the format of the core (bifaced preform).
3. Finer bifacial retouch is applied to the margins where the platform and fluted face are to be formed.
4. A platform ridge flake is detached, by a burin technique, to form the platform.
5. From that platform primary and secondary ridged flakes are detached to form the fluted face.
6. At times the core platform is rejuvenated through removal of the striking platform, by a blow directed to the top of the fluted face.

With the exception of Step 4, this is the basic or generalized production sequence for nearly all wedgeshaped cores. It adequately describes many cores, but other cores entail slight refinements or variations on these steps. Elsewhere and at KbTx-2, the common mode of platform preparation is to produce a bevel or flat area by means of lateral retouch as discussed in the preceding section.

Le Blanc and Ives note that platform rejuvenation at Bezya was accomplished in a "conservative" manner that removed only part of the platform adjacent to the fluted face, thus preserving the mass of the core. In the KbTx-2 collection, from the evidence of the core platforms, we also find rejuvenation of only the outer part of the platform, next to the fluted face, though there also are many tablets that traversed the entire top of the core. These modes, of partial and complete platform removal, are both attributes of Campus-type cores. Le Blanc and Ives comment on the general failure of the literature to report platform ridgeflakes. In some cases a ridged flake may result from the removal of the edge of a biface blank prior to formation of the platform through retouch, but in the KbTx-2 assemblage, and generally elsewhere, one does not recover notable numbers of platform ridge flakes because platforms usually were not produced in a manner that would result in such flakes.

There are both points of similarity and dissimilarity between Bezya and KbTx-2 cores. Differences entail using biface blanks (in addition to the more common trimmed preforms) at KbTx-2 and initial preparation of platforms there through bevelling, as described above. Otherwise, many of the same procedural steps are present in both collections. In their overall shape, however, three Bezya specimens, seen in casts by Clark, differ considerably from the KbTx-2 cores. None of these three cores can be said to be typical wedge-shaped Campus cores whereas many in the KbTx-2 group do have the classical wedge format. Any relationship between the Bezya and KbTx-2 microblade artisans is likely to be remote or indirect.

Great Bear Lake

Evidence of microblade production comes from a number of sites located around Great Bear Lake (Clark 1987), including Horton and Colville Lake to the north (Clark 1975), but relatively few sites have yielded definitive microblade cores. These cores comprise the following forms:

- Uncommon very narrow, wedge-shaped cores (Clark 1975:Pl. 19 a-c) including one definitely attributable to the Arctic Small Tool tradition (Clark 1987:Fig. 4.3 T).
- Very broad wedge-shaped cores (Clark 1975:Pl. 19 f-i; Clark 1987:Fig. 4.5 H may be one in an advanced state of use). Often the wedge core attributes are rudimentary (Clark 1987:Fig. 4.4 M-N) and none in this group is similar to the classic wedge-shaped core of the Palaeo-Arctic tradition or Denali complex.
- Cores of roughly conical format, though the fluted face comprises only part of the perimeter (Clark 1975: Pl. 3 e-f) and hence there is a poorly formalized dorsal element. This form likely grades into other cores.
- Roughly cuboid to cylindrical cores (Clark 1975:Pl. 19 d-e; 1987:Fig. 4.4 i-j) which grade into blocks of stone used at one face and the corners (Clark 1975:Pl. 3 a-g) for bladelet production. Platform rejuvenation through detachment of a thick tablet is common.
- Rare unformalized quartz crystal core (Clark 1987:Fig. 4.3 L).

The Great Bear cores are poorly dated and evidently are the product of at least two major cultural traditions: the Palaeo-Eskimo, more commonly called the Arctic Small Tool tradition, and an interior microblade tradition. There are so few points of similarity between these collections and the KbTx-2 cores that no relationship is posited.

Pointed Mountain

Collections from Pointed Mountain are derived from the work of R.S. MacNeish (1954) and J.F.V. Millar (1981). Eleven cores or fragments and one platform tablet were examined. Pointed Mountain is located near Fisherman Lake in the southwest corner of the District of Mackenzie. It provided a major part of the basis for MacNeish's initial definition of the Northwest Microblade tradition. The Pointed Mountain cores are seen to be closely comparable to ones from interior Alaska and the western Yukon territory including KbTx-2. They differ, with a few exceptions, from those of Great Bear Lake and Bezya.

Pointed Mountain cores include tabular or flat-fronted cores, but most can be referred to the broad wedge- or tongue-shaped class. JcRx-2:84.17 is a typical wedge-shaped core (Millar 1981:Fig. 13; Morrison 1987:Fig. 4 c). JcRx-2:520.2 also exemplifies that class, while core JcRx-2:176.12 may be a different, subcylindrical variety or more likely represents a wedge core on which, as the core was expended, the fluted face wrapped around almost the entire perimeter. Core 151.6 is made on a flake; the others are on bifaced preforms (specimens illustrated in Millar 1981:Fig. 13 and Morrison 1987:Fig. 4). In the case of the wedge-shaped cores, platform development and retouch consists of flaking directed from either the right or the left side (flank) of the core, almost invariably followed by detachment of a flake or short tablet from the front of the platform through directing a blow to the top of the fluted face. Bifacial development of the core blank or preform is very rudimentary, being directed primarily but not exclusively to the keel or base. These are not bifaces in the full sense. Fracture surfaces often form part of the back and sides of the blank. One core (JcRx-2:288.6) is on a uniface blank (unless the blank was a biface, one side of which had split away).

Dry Creek

The microblade assemblage from the Dry Creek site of the Nenana Valley, interior Alaska, comes from Component 2 of that site, which is dated to approximately 10 700 years ago (Powers, Guthrie and Hoffecker 1983). Excavation of this component has produced a substantial collection of artifacts that ranks among the largest from any interior site of the Western Subarctic. It includes 21 wedge-shaped microblade cores and eight aberrant cores that lack some of the definitive features of wedge-shaped cores.

In the description of the Dry Creek cores we find identity with many of the KbTx-2 cores and production procedures. Two differences exist: production on biface blanks is not recognized at Dry Creek collection and preparation of the dorsum or back of the Kelly Creek cores appears to have been more careful than it was at Dry Creek, though even at KbTx-2 this edge often is rudimentary. In addition, thin flake preforms are more common at Dry Creek., though, thin cores also are present in the Yukon as in the case of one KbTx-2 specimen here classified as a burin. Preform preparation and platform rejuvenation at Dry Creek are similar to that described for Bezya, but the mode of platform preparation is different and in this aspect there is identity between many of the Dry Creek and KbTx-2 cores.

The Dry Creek production sequence, compared further with KbTx-2, is as follows:

1. Chunks or flakes of stone were selected for the core blank.

2. Blanks were shaped through bifacial and unifacial reduction over the greater extent of the lateral faces or, in the case of flakes which required less shaping, primarily through bevelling of the edge. Only half the core backs show any preparation – cortex sometimes remains there – but the bases are better shaped. At KbTx-2 there is more shaping of the back edge.

3. The platform is established "by bevelling the edge and attempting to keep it as even as possible so that when finished, the prepared platform lay at about an 80°-90° angle to the sides of the core" (this is the

mode of platform preparation seen at KbTx-2). "Notwithstanding, blanks and some core tablets show that *the initially prepared platform can be quite concave resulting in a high hook or spur at the rear of the platform*" (Powers, Guthrie and Hoffecker 1983:85, emphasis added). This highly distinctive spur feature is found on some KbTx-2 cores and tablets.

4. Subsequent microblade production and platform modification proceeded in this manner:

System 1. Microblades are detached directly from the initially prepared platform, recognized in only two Dry Creek cores. This system is common at KbTx-2.

System 2a. The entire retouched platform (core tablet) is removed with a burin below, followed by microblade production. At KbTx-2 there is ample evidence of the removal of such platform tablets, but in some cases this was preceded as well as followed by microblade production.

System 2b. The most common Dry Creek procedure is to detach only a portion of the retouched platform. Stepped platforms, terminating in hinge lines or fractures bear evidence of this procedure. At KbTx-2 many cores were treated in this manner. We have classified both kinds of removals as platform tablets. Both procedures may be used during the history of a single core, a trait found also at KbTx-2. We suspect that some System 2b tablets were intended for System 2a.

Healy Lake

Eleven cores in this major eastern interior Alaskan collection, about one-third of the total recovered, were available for examination at the Canadian Museum of Civilization. Healy Lake was occupied intermittently over the span of approximately 11 000 years, into the historic contact period, and this durance may partially account for a range of core forms found there. Among the wedge-shaped component of cores there appears to be general comparability to the Dry Creek cores, though more from Dry Creek appear to be made on narrow flake preforms. Similarly, there is comparability to KbTx-2 wedge-shaped cores, though it is not certain that any Healy Lake core was made on a biface blank.

Several core varieties are represented at Healy Lake, including flat-faced Tuktu cores, broad wedge-shaped cores with bifaced keel, narrow wedge-shaped cores, a wedge-shaped core on a flake, and a narrow subconical core (spent wedge core with complete wrap-around fluted face?). Within the wedge-shaped group, platforms were shaped from one side (flank), especially the left side, or from various directions. Then, a flake was removed from the front of the platform by the so-called burin technique. In one core the back of the highly tilted platform, formed by flaking from the left flank, rises above the level of the rest of the platform. The front of the platform was formed or rejuvenated in the manner indicated, but the front face of the core has undergone reflaking in the bifacial mode or was abandoned before functional production of microblades had completely eradicated the bifacial aspect of the face.

Ice Mountain

Microblade cores from the vicinity of Mt. Edziza (Ice Mountain), northern British Columbia, are reported by Smith (1971) and Fladmark (1985). Obsidian hydration data for one site, presented by Smith

(1971:Fig. 2) suggest an age someplace within the range 4000-6000 years, and Fladmark (1985:195) reports a single well-dated microblade component at 4900 B.P.

Smith describes eight cores recovered from a single site, IaTq-1, but not all are sufficiently complete for descriptive analysis. One of these, No. 137, evidently made on a leaf-shaped biface is very narrow. The platform may have been produced in the manner of a burin through detachment of part of the edge of the blank by means of blows directed from the (now) fluted face. However, Fladmark (1985) suggests that the platform on this core actually is the remnant portion of an earlier fluted face following core rotation. On this basis (rotation) and also because of its narrow width and development from a leaf-shaped biface blank, the core is not typical of the Campus wedged-shaped type but best approximates the form in Japan called an "Oshorokko core-burin." Similar cores are known in Alaska, but are uncommon and the type is absent in the KbTx-2 assemblage.

There also is a rotated core, No. 248, with striking platforms at both the top and "bottom" of the core. The lateral edge or keel is bifaced, but it is not evident whether or not just that part of the core was bifaced or whether it started as a blank on a split biface. According to Smith, one platform was formed through a blow directed to a non-fluted edge (i.e., the dorsal edge). After microblade production from this platform became unsatisfactory, a new platform was formed at the base of the core by the burin blow technique. Although rotation is not an attribute of the KbTx-2 cores, the occurrence of this feature is not necessarily of culture-historical significance. Similarities to KbTx-2 cores notwithstanding, identity is lacking.

Another specimen, No. 189, is approximately cylindrical in the upper or platform portion (distal end being missing). The platform is unretouched. This type differs markedly from the preceding Edziza specimens and from those of KbTx-2.

Further cores are reported by Fladmark and one variety is validated through the recovery of several examples. This common form, named the "Ice Mountain type," bears two fluted surfaces that originated successively from a common acute edge (Fladmark 1985:Fig. 76-77; described in Chapter 4 here). This is a form of platform rotation. The blank commonly was an elongate or leaf-shaped biface, although often the biface blank was roughly prepared or incompletely bifaced. (see also first core described above for Smith's collection.) The type is closely associated with Mt. Edziza though a single specimen has been recovered from the southern Yukon (MacNeish 1964: Fig. 89 No. 36).

It is our impression that between the Edziza and KbTx-2 collections the two are much more different than they are alike. This is to a substantial degree due to the presence of several core varieties, most notably the Ice Mountain type, in the one area that are absent at Kelly Creek

Otter Falls

This assemblage from a small discrete microblade locus in the southwest Yukon has been described by Cook (1968) and Workman (1978:182-186). Due to their proximity, Otter Falls and KbTx-2 are expected to have identical cores, except to the extent of idiosyncratic differences. In many respects the Otter Falls site is comparable to KbTx-2 and Bezya. At each there is a large area with scattered traces of occupation, within which one locus of only a few square metres extent produced a microblade industry together with a small number of burinated and retouched flakes. Otter Falls is radiocarbon dated at 4570±150 years B.P. (uncalibrated) (Workman 1978:182-186). The collection of five microblade cores and at least seven core tablets, more than 100 microblades and up to 200 flakes may be credited to a short stay by a single artisan.

The cores show points of divergence from and similarity to the KbTx-2 assemblage. Although it is unlikely that the same band of people left both sites, related peoples evidently were involved.

A single raw material, a very dark grey non-lustrous chert, was used for the microblade industry, though flakes of other lithologies also were recovered.

At least two core forms are present. Cores JgVf-2:43 and 35 are very narrow and made on flakes that are crushed at the base and have prepared platforms. The platform of Core 43 is an inclined bevel produced from one side of the core. It has only two microblade facets and is in many attributes similar to a Donnelly burin (multiply burinated flake–see West 1967). This variety sometimes is called a burin core or identified as a burin rather than as a core. On Core 35, which has only three microblade facets, the platform was first formed in a similar manner, from one side as a bevel, but then a small portion of the front of the core was removed by a blow directed to the top front of the fluted face. Core 3 (Cook 1968:Fig. 4 right top in left half), which clearly is a microblade core, is broader and formed in a like manner on a largely unretouched wedge-shaped flake.

There are two typical wedge-shaped cores with teardrop-shaped platforms and well developed multiple-facetted fluted faces. Both bear the number 18 (Cook 1968:Fig. 4 left half centre and bottom left). The small size of the apparently residual cores makes it hazardous to speculate on the initial format of the core. The keel, at least, was well prepared in the bifacial mode. On one core the platform is irregular, having been roughly flaked from both sides and the front. The front half of the platform of the other core was formed by detaching a flake from the front top of the fluted face directed to the back of the core. The back half of this platform is a flat plane, perhaps left from earlier rejuvenation or the original blank.

The Otter Falls cores are very small, and like the majority of KbTx-2 cores presumably were exhausted. However, the platform tablets from Otter Falls indicate a stage at which the cores were much larger. One is twice as large as the platform of any of the recovered core. Tablet JgVf-2:22 (Cook 1968:Fig. 4 right half upper, Fig. 5 upper) shows incomplete preparation of the platform by blows directed to the side of the core, leaving a spur at the back of the top of the core, followed by trimming of the front of the platform through removal of a short flake (tablet) from the top front of the fluted face area. Core types and attributes of Otter Falls platform preparation thus are seen to be the same as those at Kelly

Creek and at Dry Creek. Cook (1971, 1975) also found identities in comparing Otter Falls, Healy Lake and Campus microblade cores.

The Geographical Distribution of Campus/Denali Cores

We have outlined a cluster of traits peculiar to wedge-shaped cores, especially for platform development and maintenance, that are distributed from Pointed Mountain, in the southwest corner of the district of Mackenzie westward to Dry Creek near the centre of interior Alaska. Sometimes these attributes also are found in microblade cores from the District of Mackenzie, Alberta and British Columbia or on the Pacific Coast (see Chapter 4). Narrow wedge-shaped cores, most of which are of the Campus type, continue to be common at interior Lake Minchumina, located west of Dry Creek, though here there also is another core type of broader conical to cylindrical proportions (Holmes 1986). Beyond that point, in western and northwestern Alaska, wedge-shaped cores to tend to differ in platform attributes and proportions from those described for Dry Creek and KbTx-2. Nevertheless, the core preparation attributes found at those sites can be found on some cores from the extreme western limit of the continent. For instance, an example with a spur at the back of the platform as described for Dry Creek comes from near Point Barrow (Gerlach 1982:Fig. 7 A). The same attributes also are present in eastern Asia (Hyashi 1968, West 1981, West, ed., 1996).

There is some question whether these attributes have any meaningful temporal limits in North America. They are present in the earliest wedge-shaped cores, at Dry Creek, but appear in components like Otter Falls and the Campus site, tentatively dated to about 4500 years old and less, and possibly are as recent as 1500 to 3000 years old in some assemblages including Lake Minchumina (Holmes 1986). West (1996) proposes a Late Beringian tradition, which dates after about 8500 BP, in which cores are primarily of broad, non-wedge, somewhat geometric format, resembling ones of the east Siberian Sumnagin culture, and of poorly formalized or so-called degenerate Denali format.

Flakes

Inasmuch as the majority of flakes at KbTx-2 is derived from the preparation and use of microblade cores some correlated statistics may be of interest (Table 3.13). In the analysis of section data it was found that where microblades tend to be abundant, detrital flakes also are most common. This apparently means that cores were produced and modified in the same area in which the microblades were produced, or that a common discard area was used combining refuse from various stages of lithic work. There is a certain consistency in the ratio of flakes to microblades. A higher recovery of microblades per square metre from the Southeast locus probably reflects the effect of fine screening.

TABLE 3.13. FREQUENCIES AND RATIOS OF FLAKES AND MICROBLADES

	Flakes/ Microblades	Ratio fl/mb	Area m^2	Flakes/ m^2	Microblades/ m^2
Northwest Locus, excavated 1983 with unit 94-2[1]					
Subtotal	1354/345	3.9/1	7.8	73 ave.[2]	44.2[2]
Screen	547/72[2]	7.6/1			
Total	1901/417				
Southeast Locus, 1990					
Total	1489/564	2.6/1	8.5	175 ave.	66.5
1992 Excavation, 1994 Excavation at Southeast Locus					
At NW & NE sides of Southeast Cluster					
Total	2016/694	2.9/1	13.75	147	50.5
Between Southeast Locus and Old Road (SW Area, 1992 & 1994)					
Total	994/291	3.4/1	7.55	132	38.5

[1] Flakes and microblades recovered through trimming the roadcut prior to controlled excavation are not counted here.
[2] Density of flakes and microblades increases to 243 and 53 and the ratio to 4.6/1, respectively when the results of partial screening are included.

Artifacts not Part of the Microblade Industry

Modest numbers of artifacts not related to microblade production were recovered (Table 3.14 repeats Table 2.5). Some objects are natural stones, probably brought into the site, that bear uncertain traces of retouch or utilization. These artifacts are important for the identification of varied activities.

Flake Cores

A few large flakes have been removed from the perimeter of a split cobble found on the dirt road surface (Fig. 3.11b). The 112 mm-long piece has the appearance of a rudimentary hand-axe. It may have been a flake core, though the specimen is not of chert. The object in Figure 3.9k is a large lchert flake. The three very large, regular flake or blade removal scars suggested that it is from a flake or blade core or a tool being formed by the technique of core reduction. A modest number of large flakes and core portions or shatter recovered primarily from the road exposure indicate that some primary reduction of lithic material was undertaken at KbTx-2.

Biface Points

The end of a biface knife or spear head (Fig. 3.10a) was recovered during the Lifeways of Alberta Survey. This reasonably well prepared specimen is 24 mm wide and 8.2 mm thick at the break. The edges are finely crushed and lightly ground, indicating that the recovered piece is the haft end of the point.

TABLE 3.14. IMPLEMENTS FROM KbTx-2

Class	NW Locus	SE Locus	1992, 1994 SW Area	Else-where
Flake core or large core tool			1?	2
Biface, point fragment			2	1
Retouched (bevelled) flake or blade	3 or 4	2	2[1]	3
End scrapers	1	1		1
Other uniface			1	
Transverse burin or other flake burin	1	4	1	
Burin spall	2	8+	4+	
Cobble spall, split cobble	1	3	1	1
Hammerstone? (may be natural)	1		1?	
Abrader? (may be natural)	1			
Total	10	18+	12+	9

[1] One has some attributes of a burin.

A tip fragment and midsection, apparently from two different spear points, were recovered with the microblades. The midsection comes from a straight-sided point, finely shaped to a lenticular cross-section through parallel-oblique flaking. The grey chert used for this point is comparable to the lithology of several implements.

There also are three outre-passé biface reduction edge flakes (KbTx-2:170, 379, 430). These probably are from shaping microblade cores, not biface blades. Otherwise, bifacial work was of minor importance at KbTx-2, and is documented by three bifaced points that were not necessarily produced there.

Bevelled Flakes (Side Scraper Category)

A retouched blade or blade-like flake 59 mm long (distal end missing), 22 mm wide, of light grey chert, is uniformly retouched along one edge on the dorsal surface (Fig. 3.10g). The platform area of the core from which this blade was detached had been finely abraded.

A large, irregular, retouched flake of non-glossy dark grey chert, was recovered in five pieces (Fig. 3.10h). Morphologically, one of the fragments closely resembles a transverse burin, but the break that creates this characterization appears to be fortuitous. The piece remains an object lesson in potential misidentification of burins. The thick distal end of this 93-mm-long flake seems to provide a natural haft. Definitive (intentional) retouch occurs on the dorsal surface all along one lateral edge.

Two additional retouched specimens from the Northwest cluster are a fragment of chert with retouch bevel, too tiny for definition, and (KbTx-2:569) a dark grey chert flake rounded and nibbled on all edges and worn smooth on the flake ridges. The latter item probably is not an implement but evidently has had a history of exposure unlike other items from the microblade area. It may it may indicate earlier camping at the site followed by a period of ventifaction.

The 24.3-mm-long bevelled edge of retouched flake KbTx-2:1418 is broken at each end and is now a 6.5-mm-wide spall, but it lacks diagnostic features of burin spalls. The steep bevel is crushed and lightly smoothed along the edge.

A large retouched flake (Fig. 3.10f) is dorsally bevelled along one straight edge. The 40-mm-long prepared edge is terminated by a break that runs across the flake. The opposite edge is irregular, but bears traces of a second bevel. The original implement may have been twice the size of the recovered piece.

The thin triangular chert implement in Figure 3.10e is finely retouched on the dorsal surface along one sharp edge, possibly as the result of use. This 33-mm-long cutting tool was excavated from the roadcut at the southeast end of the site. No other cultural material was found in proximity.

The proximal portion of a large coarse grey flake was found on the old road surface (Fig. 3.10d). It is very well bevelled along one, incomplete, edge. The opposite edge is missing.

On evenly retouched bevelled flake KbTx-2:1579 attrition and crushing at one corner and on the opposite edge shows that this piece could have been utilized in the manner of a burin, its small size (17 x 13 mm) and lack of the defining technological facets of a burin notwithstanding.

End Scrapers

A small incomplete end scraper has a crushed, retouched edge (Fig.3.10i). There is a pronounced corner projection at one thin bevelled side; the other side and corner are missing. We hesitate to identify the spur as a graver spur as it is not worn.

Another end scraper (Fig. 3.10j) of very dark grey chert is well smoothed at its bevelled edge. The asymmetrically curved edge is 26.5 mm wide while the body is 32 mm long, including an untrimmed natural projection at the back of the blade.

One unifacially bevelled end scraper was recovered during the Lifeways of Alberta survey (Fig. 3.10k). The maximum width of this scraper, near the base, is 37.8 mm and the length is 35 mm. The material is a yellow-brown chert.

Other Uniface

The fragment of a pale yellow-brown chert uniface (Fig. 3.10c) was found in the dirt road. It is 42 mm wide at the break, 12 mm thick, and may have been of elliptical shape, inconsistently retouched around the steep sides.

Burins and Burin Spalls

Burins. It is a rare microblade site that does not also have burins. The classic notched transverse burin (sometimes called Anangula burin, often included with Donnelly burins) forms the hallmark for this class of implement. These were recovered in both typical format and in a thick format with two facets on the edge that sometimes is difficult to distinguish from a thin microblade core.

1. The single complete classic transverse notched burin (Fig.3.9g) is relatively small compared with specimens from the vicinity of Great Bear Lake (Clark 1975) and the Aleutian Islands (Aigner and Laughlin 1966), measuring 28 mm wide at the maximum and 27 mm long. That size, nevertheless, is in the range of Dry Creek burins (Powers et al 1983:119). The 22-mm-long burin facet originates from a short intentionally formed dorsal notch present at one edge of the flake of dull-grey slicified rock.

2. A fragmentary apparent burin, otherwise a microblade core (Fig. 3.7a), is made on a snapped chert flake. It is irregular in plan, measuring approximately 14 x 25 x 5 mm. The flake is unifacially bevelled along part of one edge from which two facets originate (one facet may be a residual surface from the flake blank). Superficially, this specimen resembles the narrow microblade cores from Otter Falls.

3. Another transverse burin is technically a small microblade core (Fig.3.7c). Two burin facets truncate the end of a 20.5 mm-wide chert flake. The edges of the flake are bevelled on the dorsal surface. The facets appear to begin at one bevel and end at the other bevel, but this is not completely clear because part of the platform area appears to have been lost at a flaw in the chert, and the bevel where the facets terminate may have been formed or retouched after burination.

4. Another transverse burin (Fig. 3.9j) in the dull grey lithology has a retouched bevel along one slightly concave side that dominates the specimen. It appears to be either a combination tool or a scraper trimmed at one end by a burin stroke.

5. Dull grey chert specimen (Fig. 3.9h) is a thin irregular burinated flake. There is a facet along one edge that originates from a poorly defined bevel and which extends to a retouched bevel on the opposite edge. Other edges display nibbling or damage and smoothing. Ridges between flake scars also are worn.

6. An additional burin fragment (Fig. 3.9l) is on a tabular snapped chert flake. It is approximately rectangular in shape, measuring 13 x 23 x 4.6 mm. The flake is unifacially bevelled along the full extent of one edge. One or more short burin facets originate from this bevel and run along the edge (several facets, whatever their origin, are present). The facets are truncated by fractures and the present edge of the specimen. Another burin facet, also originating from the bevel, runs along the opposite, thinner, edge.

Burin Spalls. In some cases it is difficult to distinguish between burin spalls and stout microblades, but there remain nearly 20 specimens that should be uncontested burin spalls. These tend to be thick, rectangular in cross section, and sometimes are retouched along one edge as described below. A selection is illustrated and examples are discussed here.

KbTx-2:521 is an incomplete spall, triangular in cross section, that has on the dorsal surface two facets one of which bears fine retouch leading back from the crushed edge. KbTx-2:945+1035 is a 30-mm-long spall fragment, which lacks both proximal and distal ends but is similar in most respects to the preceding one. There are additional similarly endowed spalls, either triangular or rectangular in section (KbTx-2:517, 1173, 1194, 1291, 1501, 1535). On one complete, multifaceted, 32-mm-long spall, KbTx-2:1516, such retouch or edge damage is restricted to a few localized patches. Such spalls probably characterize renewal of the edge of burins heavily used as scrapers; i.e., the retouch can be attributed to use damage. There are, however, several spalls on which the retouch has the appearance of a flaked bevel, occupying a whole spall facet, and these may be from burinated beveled scrapers (KbTx-2:945+1035, 1042, 1173). Unretouched spalls actually are a minority. However, the most impressive burin spall (Fig. 3.9i) appears unmodified. This is a complete arcuate, twisted 52-mm-long spall, rectangular (4-sided) in section. Probably it is a secondary removal, having been preceded by a primary spall (evidently not recovered) that detached a retouched edge. It is especially interesting inasmuch as no burin that massive and with that long an edge was recovered. KbTx-2:1127 is the fragment of a definitive burin spall, rectangular in cross-section and heavily crushed along one edge. A detached edge of an implement is shown in Figure 3.9m.

Boulder Chips and Split Cobble Tools

Cobble spalls or boulder chips may be used for rough scraping, cutting and sawing tasks. One cobble spall (Fig. 3.12 lower) is atypical inasmuch as the thinner, sharp edge is at one end of the spall (in terms of proportions, technically a side in terms of flake technology) instead of being along the edge opposite the back of the flake (technically distal end) as is customary. The concavo-convex thin edge found at one end bears slight retouch. The retouch may be due to utilization, though possibly it is from of natural damage. In either case, the stone is not a natural occurrence within the site context. The quartzite spall measures 140 by 97 mm and is up to 18 mm thick.

A thin flat boulder chip was recovered from the test pit northwest of the microblade loci. The piece measures 100 x 71 x 13 mm.

The single boulder chip from the NW Locus (Fig. 3.11c) is thinner than usual for this class of implement. The 101-mm-long flake may not have been used, edge erosion or nibbling notwithstanding, but the impact pit at the back shows that it was intentionally struck from a cobble.

Split and broken cobble (Fig. 3.12 upper). A 150 by 115 mm slab of coarse stone has been split from the centre of a cobble. The margins are 20 mm thick margins and are formed by remnants of cortical surfaces excepting one broad thin edge, much of which has been lost due to natural damage and weathering. It is not clear to us whether this piece was intended for use as a heavy chopping or scraping implement, or whether it is a residual piece left after large spalls had been detached from both sides of a cobble.

Split shingle (KbTx-2:1138-1140). This flat coarse stone fragment, measuring 78 x 85+ (broken) x 8 mm is a possible hide scraping stone, suggestive of the Athapaskan *tci-tho,* though it is not of the common semilunar format. It is not clear from examining the weathered edges whether this stone has been used. Nevertheless, the presence of this item in the site is due to human agency.

Two refitted fragments of a *tci-tho* hide scraper (KbTx-2:1471,1503) were found about 25 cm apart. In this case the stone is from the interior of a split cobble. Edge retouch to suite this piece for the hide working use is rudimentary, but in combination with the natural edge contour, appears to be adequate. It is not known, though, if this piece had actually had been used. It measures 106 by about 74 mm (possibly incomplete).

Hammerstone

A small discoidal schist cobble (Fig. 3.11a) does not bear positive indication of utilization but its recovery among microblades and cores is suggestive of intended use as a flaking hammer. The specimen measures 85 x 72 x 19 mm.

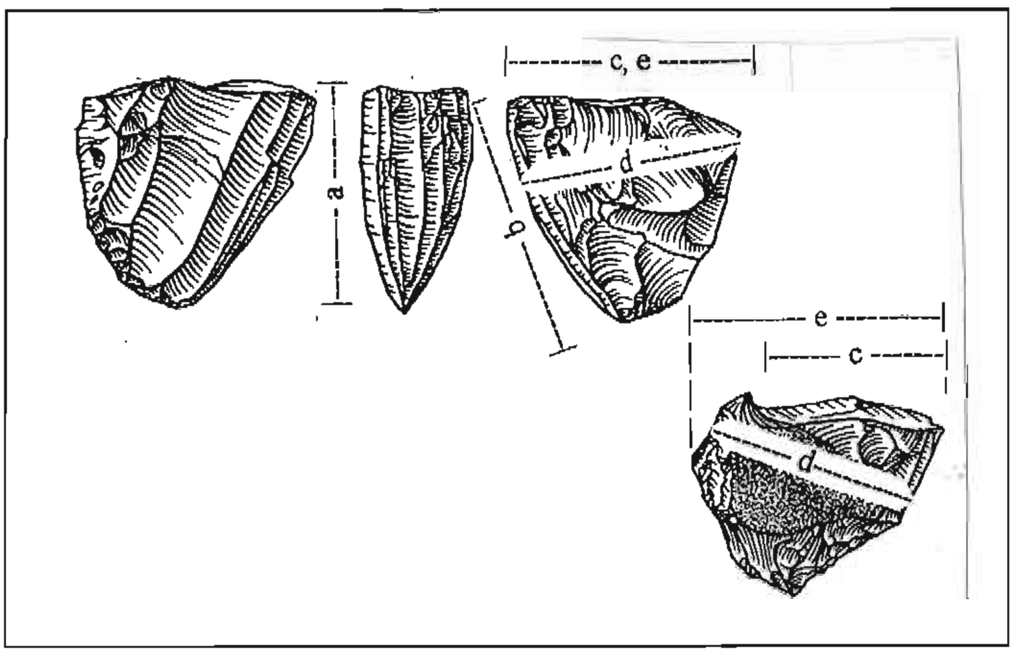
Abrader

One rectangular block of sandstone (KbTx-2:601), now measuring 60 x 35 x 34 mm but incomplete, bears a few scratches on one surface that may be the result of use as an abrader.

Summary

The Kelly Creek microblade industry has many characteristics in common with other Northwest Interior microblade industries. Retouched microblades are almost completely absent. The microblades have a high frequency of dorsal ridges, are narrow and small, and tend to be short. Microblades with these attributes are linked with the narrow, wedge-shaped Campus or Denali type of core which was recovered in substantial numbers at KbTx-2 and occurs widely in the Yukon and interior Alaska and adjacent regions. Artifact recovery from the Kelly Creek site amply illustrates the manufacture and rejuvenation of this type of core. Sometimes the core preform was a whole roughly tabular or discoidal biface, but usually it was a large flake or piece of stone bifacially trimmed at the base or keel only. Rejuvenation was by frontal blow-type detachment of platform tablets preceded and sometimes also followed by lateral retouch of the top of the core, which are defining attributes of the Campus-type core.

Other artifacts form only a minor part of the assemblage. Bifaced projectile points are weakly represented by two fragments, but the lithic debitage fails to demonstrate the presence of any bifacial flaking industry at KbTx-2. Burins, including the notched transverse variety, are present. Cobble spalls and split stone slab tools are present, but their lack of formalization and clear retouch of the edges is bothersome. It is on the basis of their context that they are identified as implements. Bevelled flake side scrapers and end scrapers are almost universally present in Northwest Interior assemblages. KbTx-2 is no exception though these implements are not common and stylistically the end scrapers are most generalized. The small size and limited variety in the implement assemblage presents a poor case for comparison with other assemblages from the Yukon and Alaska. Nothing was recovered, though, that would be out of place in a microblade culture phase, in the Little Arm Phase of the southwest Yukon for instance (see Workman 1978). Other sites usually have stronger representation of biface technology (points, knives, etc.). We are alert to the possibility of "contamination" of the assemblage with artifacts left from antecedent use of the site or subsequent use after the people responsible for the microblade industry left. The lithic scatter at the front of the lower terrace at KbTx-2 actually appears to be the result of another occupation. Too, some artifacts collated in Table 3.14 are noted as coming from "elsewhere" contexts and should not be included with the microblade assemblage. But burins are very much an expected accompaniment exclusive to the microblade culture and, if other occupations had been represented to any notable extent, we would expect to find more evidence of a bifacial industry. The lithology of burins, the Southwest locus point fragment, and many retouched flakes is the same, as if a single people were responsible for these artifacts. Any non-microblade occupations at KbTx-2 thus have had negligible effect on the integrity of the assemblage.



Measurement of core height and depth (refer to table 3.11).

Figure 3.1. Photograph of microblades and burins. Top row: Burins A-C–KbTx-2:1136, 608, 1211 (Fig. 3.9l, 3.9g, 3.7c respectively). Facets are at top edge. Middle row: Microblades, smallest to largest (left to right)–KbTx-2:1168, 1573, 1572, 1571, 1512, 1575, 1568 (medial), 1214 (carries angle from front of fluted face), 947, 1366 (medial), other. Bottom row: Triangular ridged spalls and burin spalls–left to right, three triangular ridged spalls with retouch on one face, from microblade cores or burins KbTx-2:517+521, 945+1035, other, burin spalls or thick microblades KbTx-2:1516 (2.3 mm thick), 879 (3.5 mm thick), burin spalls KbTx-2:1173 (retouched along right edge), 1501a, 1501b, 1525 (retouched right edge lower). Left and right microblades (ends of middle row) are 9.5 and 45.8 mm long respectively and 2.3 and 9.3 mm wide.

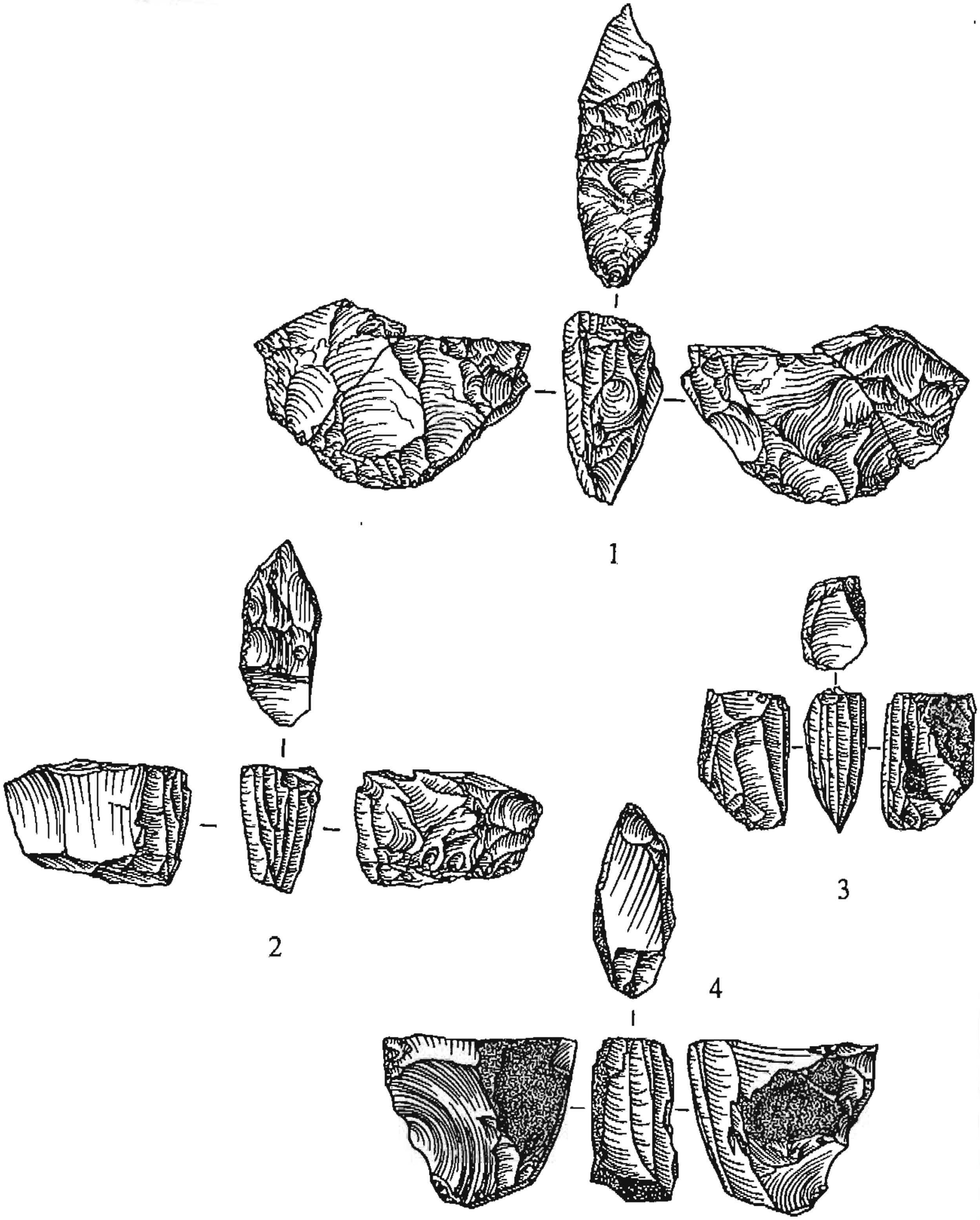


Figure 3.2. Microblade cores, numbered according to their listing in Table 3.12. Natural size.

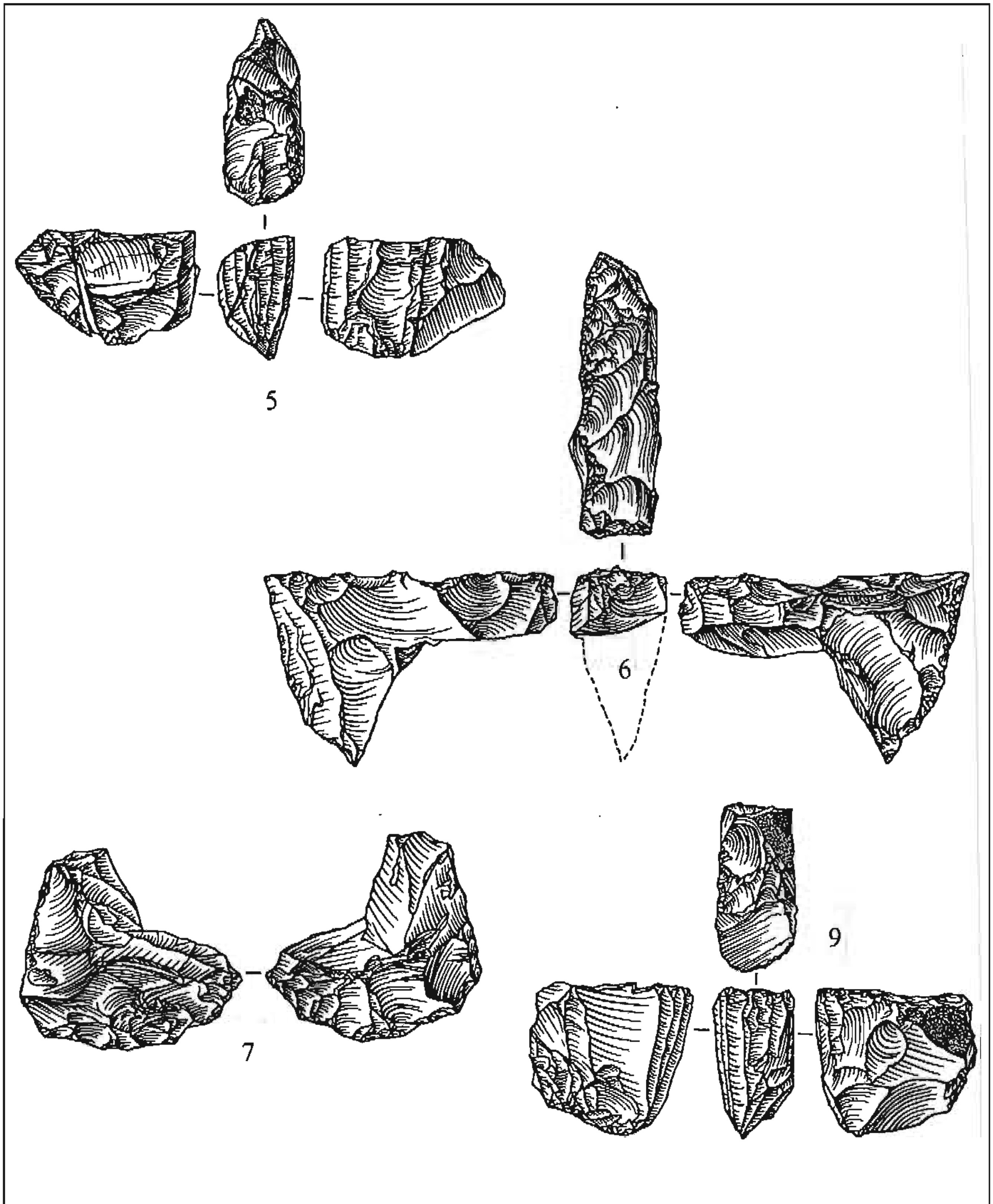


Figure 3.3. Microblade cores, numbered according to their listing in Table 3.12. Natural size.

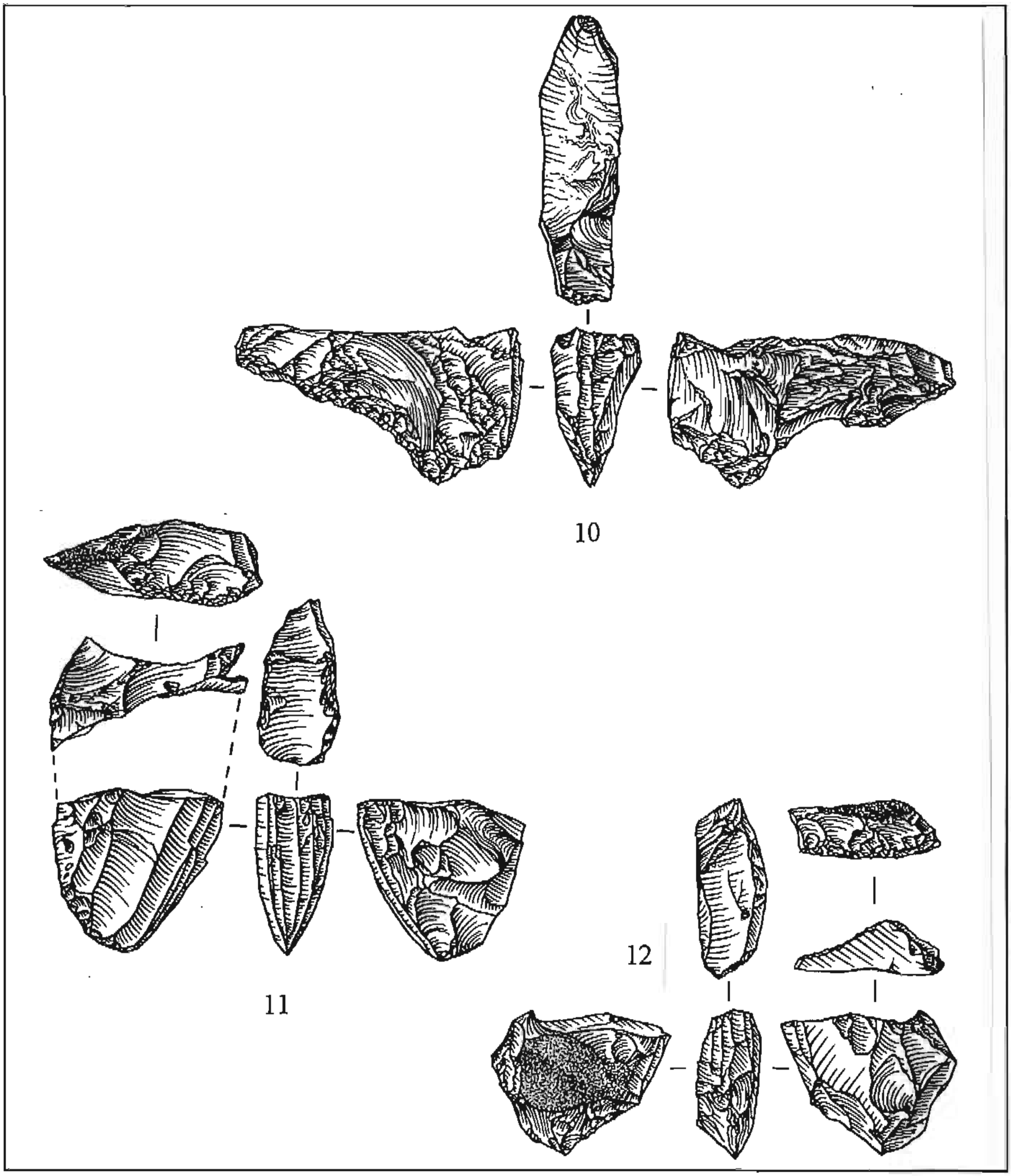


Figure 3.4. Microblade cores, numbered according to their listing in Table 3.12. Edge and top of platform tablets are shown at top left of Core 11 and top right of Core 12. Natural size.

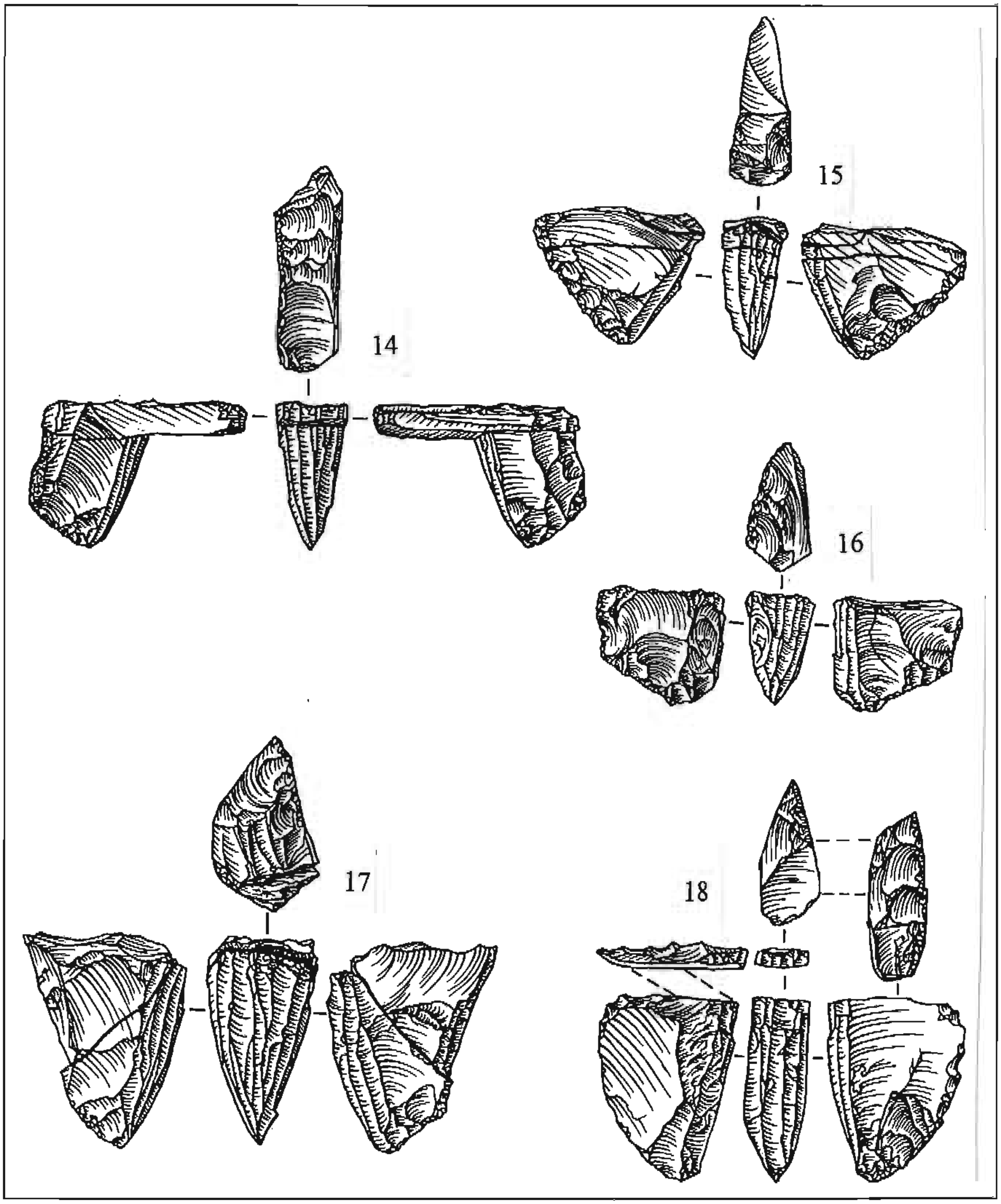


Figure 3.5. Microblade cores, numbered according to their listing in table 3.12. Top right and edge views for Core 18 are of tablet 1077 which attaches to the flake scar on the platform shown in top centre.

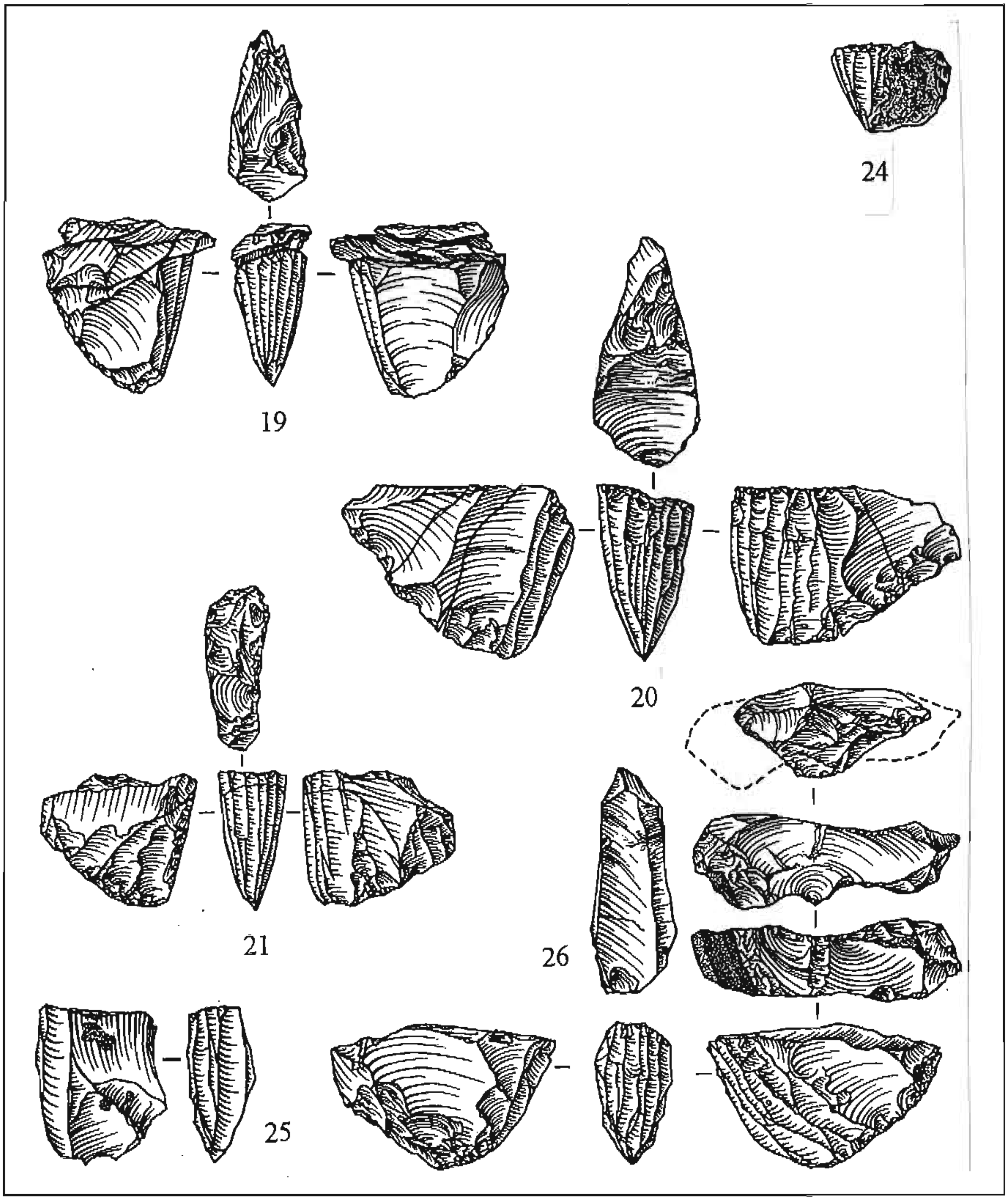


Figure 3.6. Microblade cores, numbered according to their listing in table 3.12. Flake KbTx-2:1379 at top of Core 26 fits top of tablet KbTx-2:1478, shown in top and side views, which then fits the core.

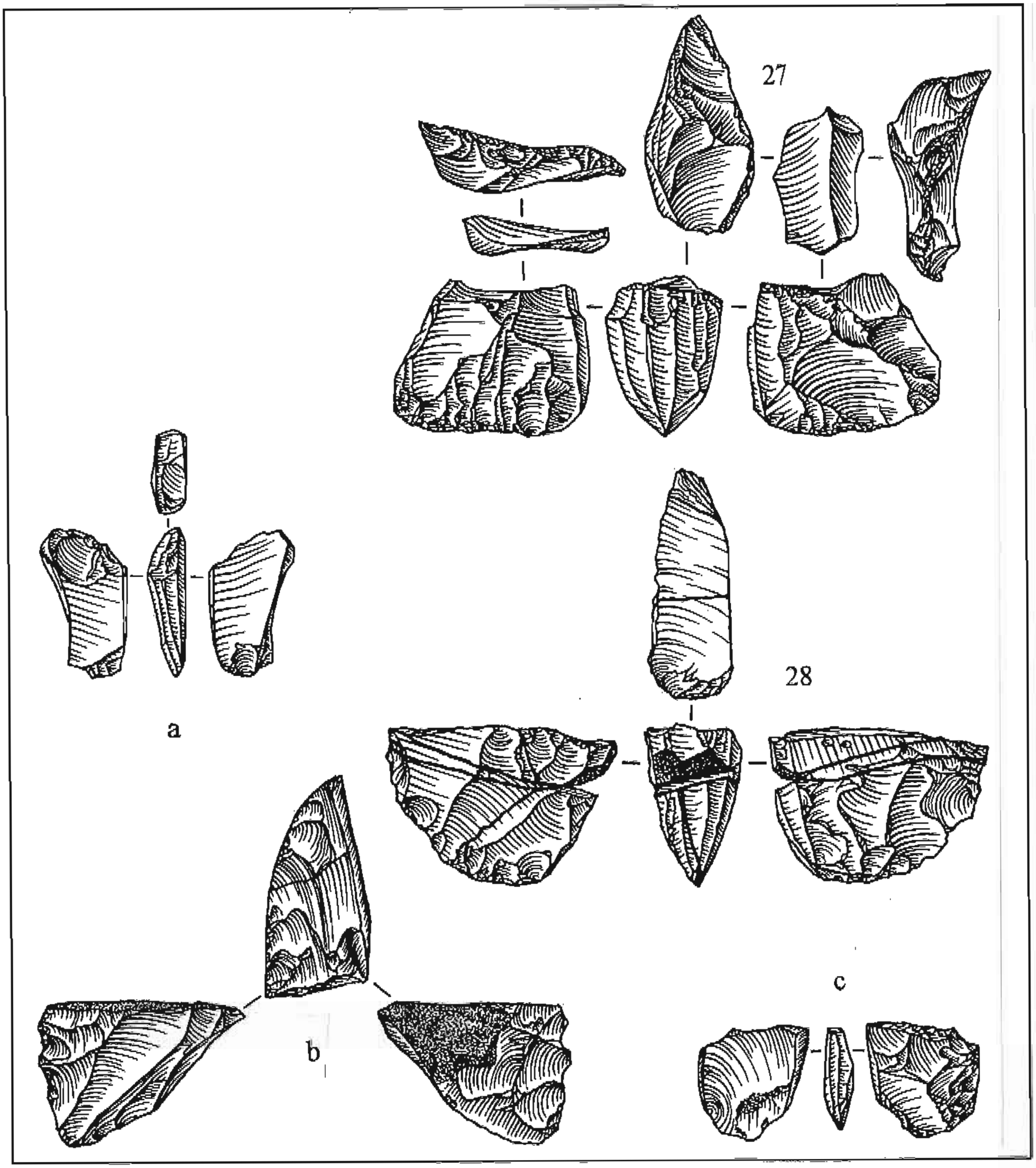


Figure 3.7. Microblade cores. a: burin with core attributes KbTx-2:942; b: core fragment KbTx-2:126; c: burin with core attributes KbTx-2:608. Tablet KbTx-2:607 in Core 27 top right fits flake scar on left side of tablet KbTx-2:379 to its right, which fits flake scar at lower end of platform view. Natural size.

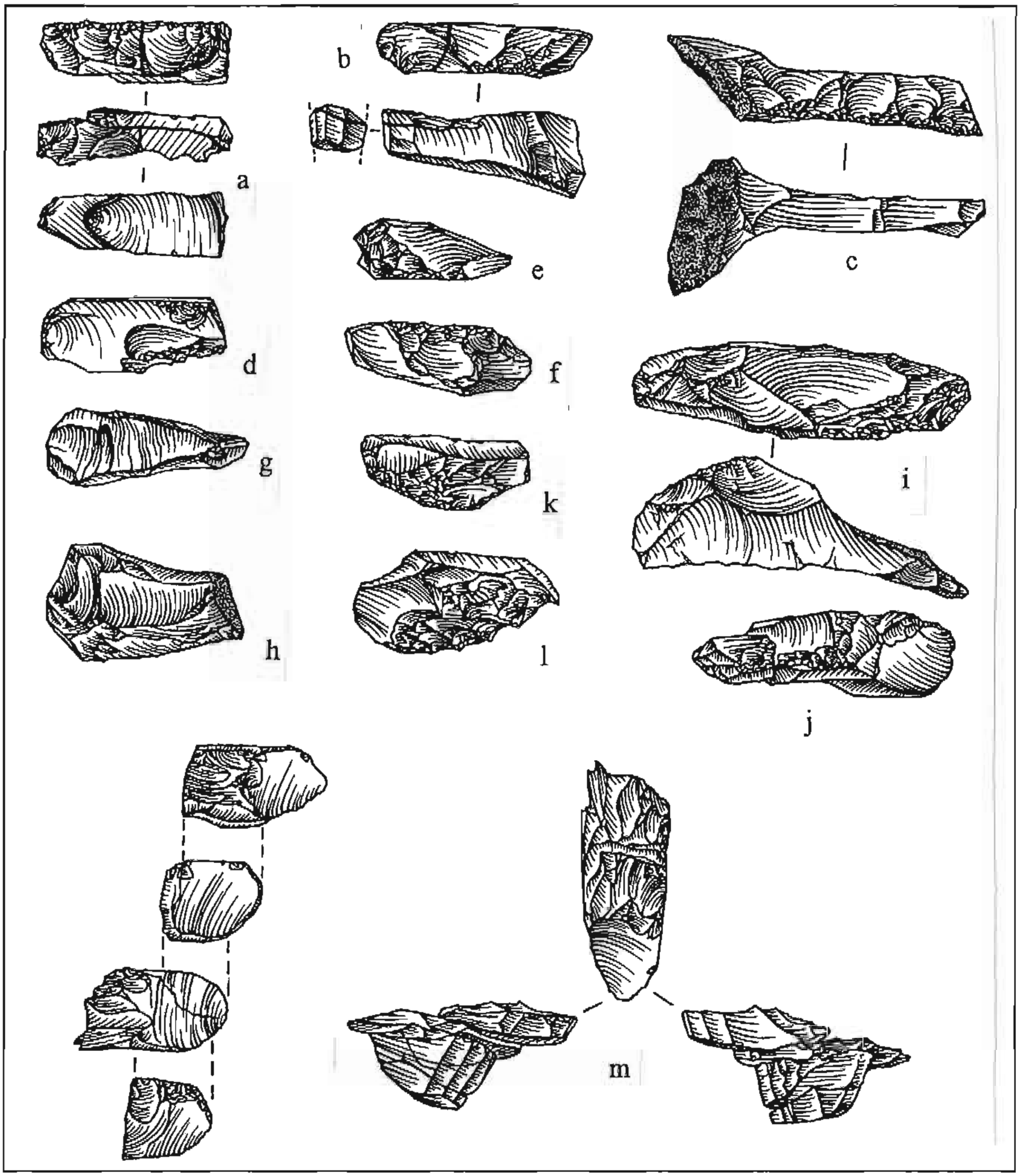


Figure 3.8. Platform tablets. a: KbTx-2:706+707+708; b: 2:039; c: unnumbered; d: 937; e: 1075; f: 451; g: 496; h: 442; i: top and side of 1507; j: 3 assembled tablets 255+610; k: platform shaping flake 1208; l: sideblow platform flake 1566; m: tablets, both assembled and separate 721+293+1431. Natural.

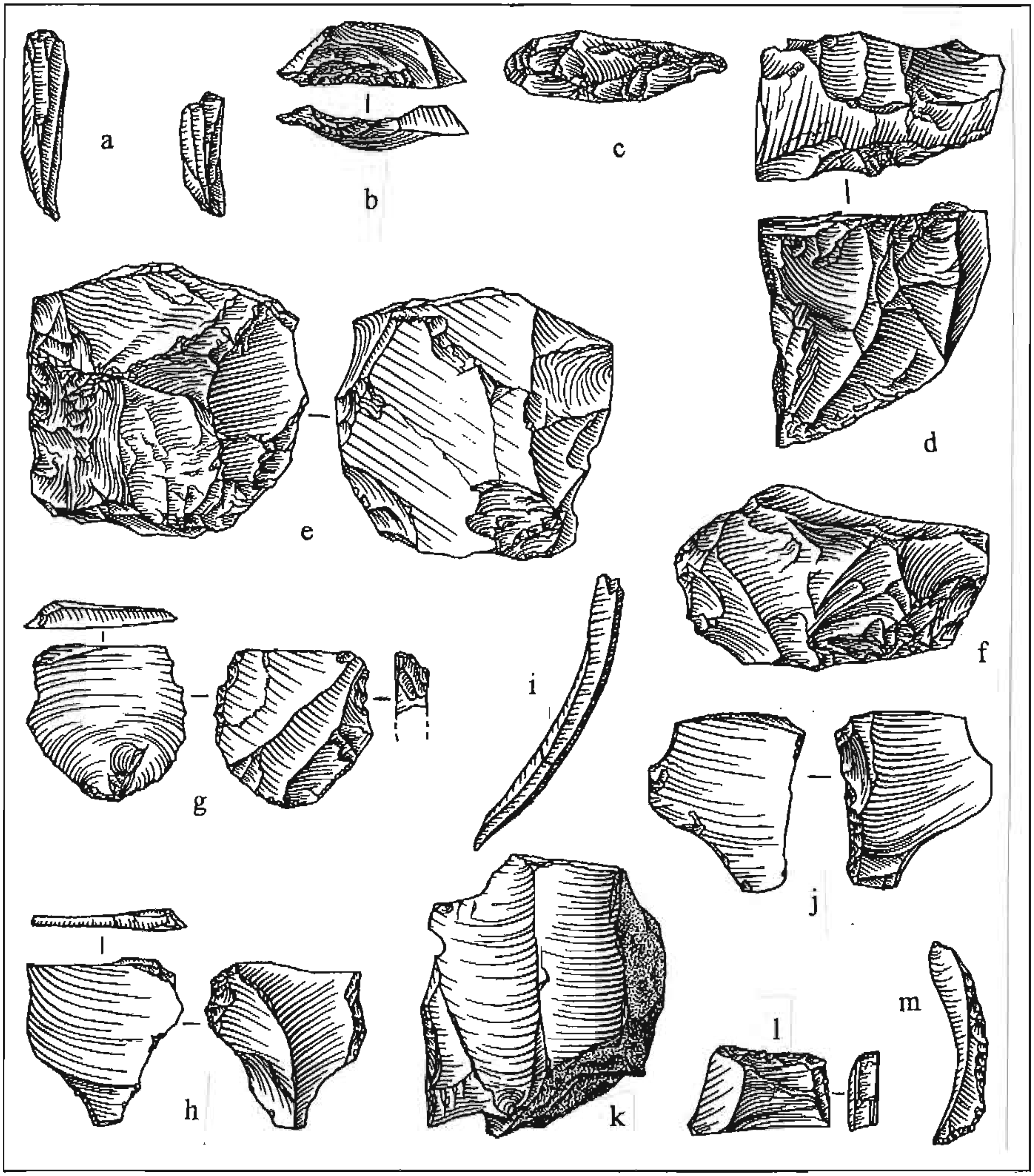


Figure 3.9. Blanks, burins, etc. a: fluted face-angle spalls KbTx-2:124, 719; b: "gull-wing" flake; c: ridged spall; d: blank 1479+181; e: blank 1518; f: blank 1555; g: burin 1211; h: burin 1420; i: burin spall 1462; j: burin 1578; k: blade core fragment 1554; l: burin 136; m: burin spall KbTx-2:1480. Natural size.

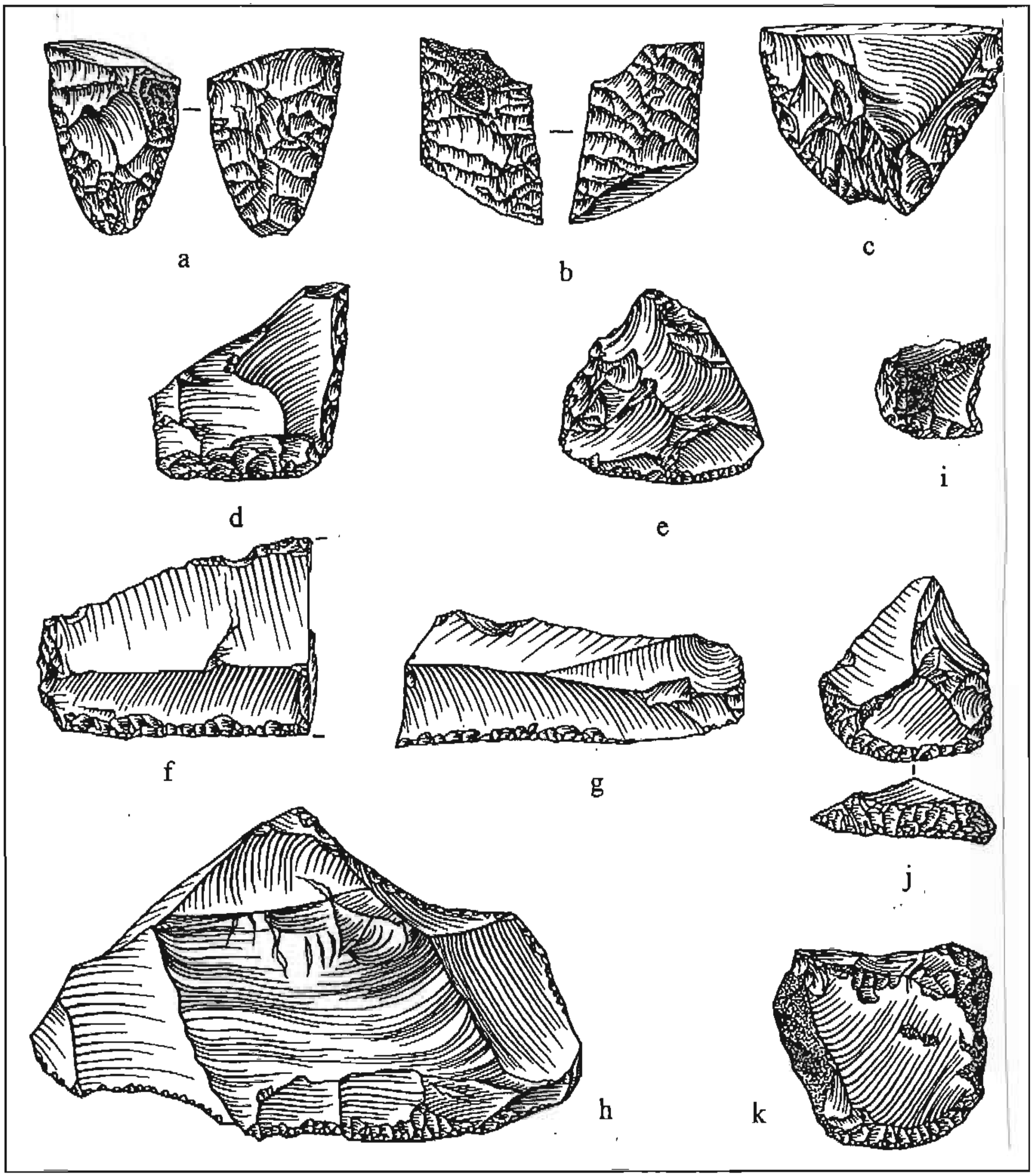


Figure 3.10. Various. a: point/knife base KbTx-2:127; b: point/knife section 1508+1509; c: uniface 1425; d: bevelled flake 1587; e: utilized flake 1427; f: bevelled flake 1028+1212; g: bevelled flake 252+255; h: retouched flake 519; i: incomplete end scraper 251+567; j: end scraper 1419; k: end scraper 125. Natural.

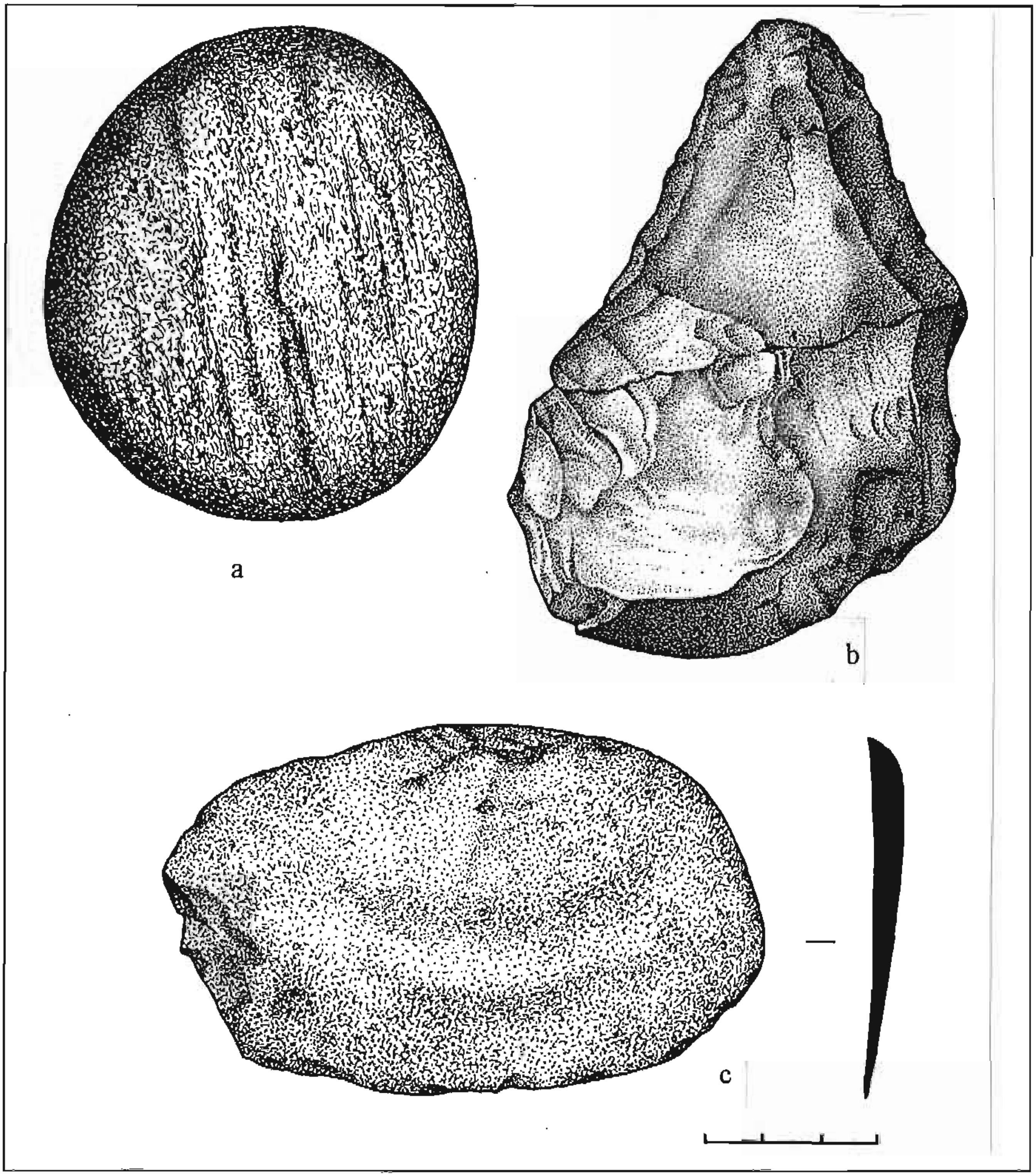


Figure 3.11. Large stone items. a: select cobble KbTx-2:566; b: flake core? KbTx-2:1422; c: cobble spall (*tci-tho*) KbTx-2:566. Natural size.

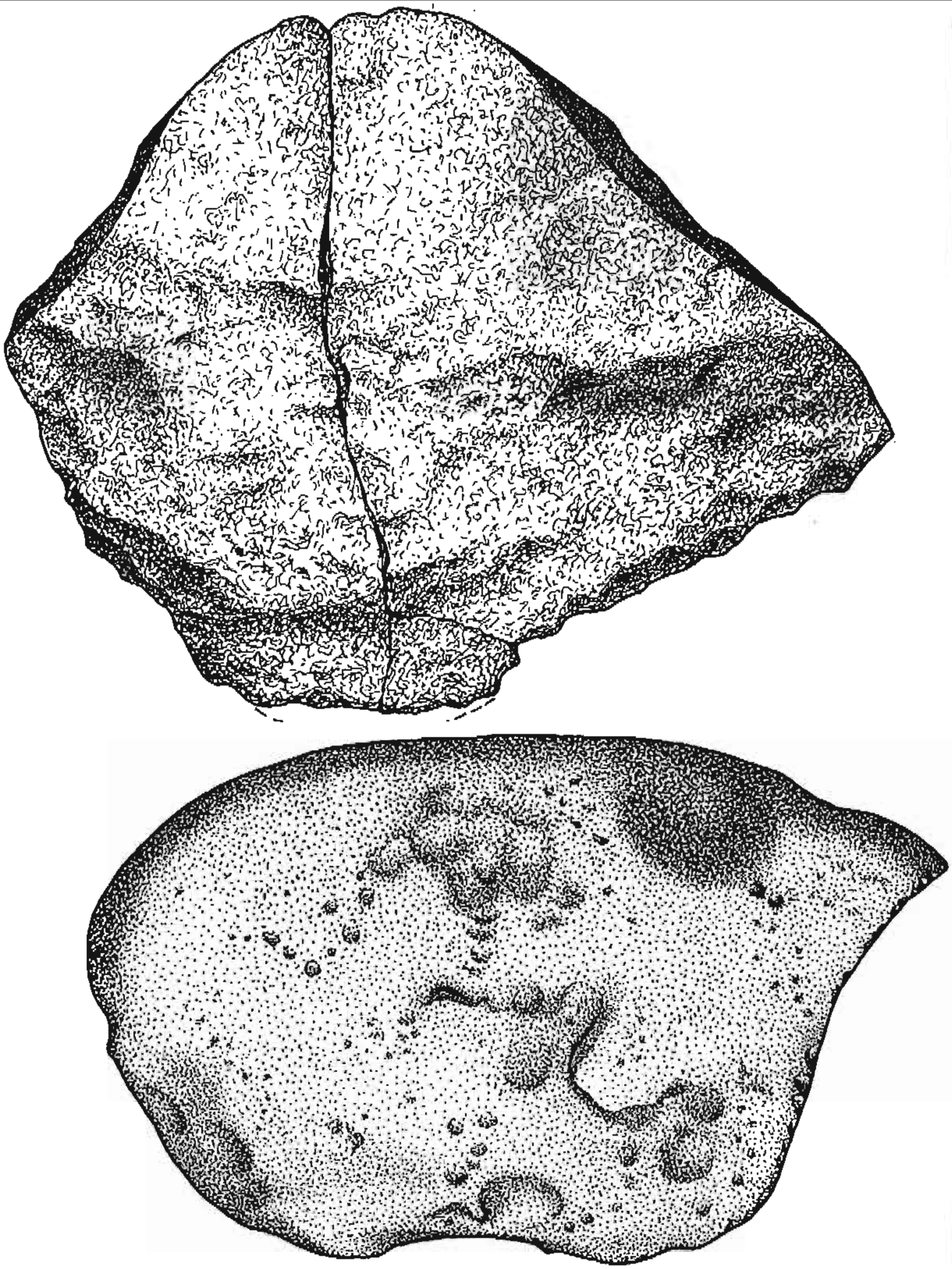


Figure 3.12. Quartzite slab tool KbTx-2:1141+1144; cobble spall KbTx-2:1389 utilized at concave edge.

CHAPTER 4
MICROBLADE INDUSTRIES IN NORTHWESTERN CANADA

Definition and Review of Microblade Core Technology

Descriptions of microblade cores, especially in earlier reports, refer to "polyhedral cores", but as that term is essentially synonymous with blade or microblade core more specific labels are required. Several types and varieties of microblade cores have been described in reports, although there is no comprehensive typology that accounts for all cores at the level of attribute detail employed in the present report (West 1981a Figure 10 notwithstanding). Here we describe a number of core types with the needs of the present analysis in mind.

Campus-Denali Type Wedge-shaped Cores

The term "Campus-type" generally is understood to refer to distinctive microblade cores from the Campus site at Fairbanks, Alaska (Rainey 1939). For instance, in 1968 Cook not only used the term "Campus-type" but showed that examples of this core occurred as far apart as Fairbanks (Campus site) and the southern Yukon at Otter Falls. In 1968 and 1970 Anderson identified cores form Onion Portage as Campus-type cores though in the 1988 comprehensive report on Onion Portage he referred to these cores only as "narrow wedge-shaped cores" and included them as a hallmark of the American Palaeo-Arctic tradition. However, in the analysis that was done several decades after the first excavations at the Campus site, Mobley (1991) used the term "Campus core"only once, and then in an introduction, favoring instead the phrase "cores in the Campus collection." Where preciseness is not required, these and related cores simply are referred to as "wedge-shaped cores." Many major analyses avoid using core-type names, for instance Powers and Hoffecker (1989), and rely on the concomitant information being conveyed through means of descriptions and comparisons. Morlan's (1970) description of wedge-shaped core technology is of broader compass than Mobley's (below) and covers varieties in addition to Campus cores. He briefly notes the "Campus technique" which he states distinguishes a technologically-consistent group of cores from the Alaska-Yukon interior (Morlan 1970:33). Following Hadleigh West's (1967) definition of the Denali complex, Campus-type cores alternatively became known as Denali cores.

Mobley (1991) has provided a detailed description of the cores from the Campus site which are mainly of Campus type, although within this population of cores there are variants that do not fit the exact definition of one single type. In Chapter 3 we described the process by which the cores at KbTx-2 were produced. The Kelly Creek cores are predominantly Campus-type cores and our observations differ little from Mobley's. These cores, from Kelly Creek and Campus and many other sites, are of a wedge shape. They show greater or lesser degrees of bifacial preparation of variable quality along the edges which form the keel and back of the core. Often the blank is a thick flake or thin slab of stone. Platforms were prepared through removal of a triangular ridged spall from the top of the blank or by retouch directed from one side of the blank. For rejuvenation, and possibly for initial platform preparation, tablets encompassing all or part of the top of the core were removed by a blow directed to the fluted face near the top of the core. It is primarily this distinctive mode of platform preparation and rejuvenation, and the resultant byproducts, especially platform tablets and gull-wing flakes, together with their generalized wedge shape (as viewed from the front) that define Campus-type cores.

Campus cores are well documented as the earliest microblade cores found in North America, with an antiquity of up to 10 700 being generally accepted and hesitant reception of dates of up to 11 600 years or greater for Swan Point (C. Holmes personal communications to D. Clark) and Bluefish Caves specimens (Cinq-Mars 1990). However, Campus cores also are reported from relatively late contexts dated as recent as 2500 BP and even 1500 BP. The late dates have provoked considerable discussion of the appropriateness of the dates, on the one hand, and of a persisting Denali tradition or Late Denali culture on the other hand.

Core Burins

These are very narrow Campus cores. The type was defined by Powers, Guthrie and Hoffecker (1983) but is not distinguished from Campus cores in many earlier reports. The distribution of core burins mirrors Campus cores: at Pointed Mountain, NWT (Morrison 1987: Fig. 4g), on the southeast Alaska coast at Ground Hog Bay (Ackerman 1996b: Fig. 9-6e), in the Yukon (this report, also at Otter Falls–Cook 1968), and at Dry Creek (Powers, Guthrie and Hoffecker 1983).

Aberrant (Atypical) Wedge-shaped Cores

Usually we do not try to describe atypical cores as they are not considered to be representative of any particular norm or type but are unsystematic variations and often are difficult to describe. Usually, if platform features distinctive of the Campus type are present aberrations may be forgiven.

Other Wedge-shaped Cores

Some of the best prepared wedge-shaped cores for which the preform is produced in a well executed bifacial mode do not show the Campus mode of platform preparation and rejuvenation. Many others also are of wedge-shape but not only lack Campus platform attributes but also are wider than typical Campus cores. Cores of the Arctic Small Tool tradition, particularly the Denbigh component at Onion Portage, often are of this format (Anderson 1988, figures). And finally, there are cores that have Campus attributes, but are "not quite right." For instance, evidence of the detachment of platform tablets may be lacking even though large flakes were removed frontally in the preparation of platforms. Any substantial Denali complex assemblage will contain some cores that do not fully conform to the Campus norm. To assess the affiliation of these assemblages it is necessary to view their overall complexion or scope and consider the cores as a population with a certain range of variation.

A different form of wedge-shaped core is not prepared at all, except that initially a pebble may be decapitated to provide a striking platform. The core then takes on a wedge shaped profile after several microblades have been removed. This technological mode can also result in cores of other shapes, including pyramidal and tabular cores.

Tuktu Tabular Cores

Well-formed tabular cores often are termed Tuktu cores. Tuktu cores have flat faces whereas wedge-shaped cores are strongly curved at the front. As well, the sides of Tuktu cores taper little, and some times not at all, from top to bottom; that is, they are not wedge shaped. They also taper little from front to back. This results in flat, or sometimes unformed and irregular cortical backs and bases. One aspect of the type then is essentially rectangular or cuboid, though the apparently exhausted specimens through which it is best known present a very short or foreshortened aspect which enhances the tabular appearance of these cores. There also are examples in which the sides (lateral surfaces) are carefully flaked. Platforms are prepared to greater or lesser degrees and often are retouched at the front through removal of several small flakes. Platform tablets are not commonly associated with this type, and we suspect that cases in which platform tablets are reported might be referred to another type. Tabular and cuboidal cores may intergrade. An example of a Tuktu core from the Yukon is the spent core from the Gladstone site, XIB-133 which is 15.5 mm wide and 20-23 mm high (MacNeish 1964: Fig. 89-29). Another one is a tiny exhausted obsidian core from the Engigstciak site.

The cores from the Tuktu site in the Brooks Range illustrated by Campbell (1961, 1962:Pl. 4) actually are not very good examples of the type and one is a pyramidal core. Better examples have been found at Healy Lake by J. Cook (collection at CMC). The least (or most) that one can say about the cores from the Brooks Range site is that they are not wedge-shaped (or tongue-shaped in the terminology common four decades ago). The Tuktu assemblage is the epitomy of Northern Archaic technology and the often-cited 6500 BP date for Tuktu, whether or not it is accurate, may be a maximum age for this core type. A find at Engigstciak may date between 4000 and 3000 years ago and an upper Koyukuk River occurrence at the Girls' Hill site is dated to about 4000 years ago though the site may be mixed (personal communication to Clark by Robert Gal, 1987). There also is a core face or exhausted core probably of this type from the relatively late Pointed Mountain site in the District of Mackenzie (Morrison 1987: Fig. 4d). This last core is of interest because it occurs there with other core types, including Campus cores. Thus, in North America the Tuktu tabular core is more recent than early Denali but probably no later than the Denali finds at the Campus site.

Conical, Cylindrical and Pyramidal and Unformalized Cores

This category may include a number of core shapes, but these forms tend to intergrade. They are described as cuboidal, prismatic, and subprismatic cores and, in Asia, as Sumnagin cores. Examples are common outside the interior Alaska-Yukon region, in northeastern Siberia, western Alaska, along the North Pacific Coast, in British Columbia and in the western District of Mackenzie (cf., Ackerman 1992:21, 1996b: Figures, 1996a: Fig. 10-5d; Dikov 1997; Fedje, Mackie, McSparran and Wilson 1996; Holmes 1986: Fig. 42) but some also occur in the Yukon and interior Alaska where they possibly overlap with tabular cores An example from the Yukon is XIB-134 from the Gladstone site which not only has a roughly conical shape and unformalized technological features but also has irregular microblade removal flutes.

Preparation of the preform varies from careful shaping of all surfaces, including the platform, to virtually no preparation at all. In the latter case a suitable naturally shaped stone is selected and the top may be detached or a natural surface used for the platform. The final, sometimes formalized looking, shape of the core depends on its use history. At many localities throughout coastal and interior Alaska, British Columbia, the Yukon and the western District of Mackenzie these cores were rejuvenated through detachment of platform tablets (Clark and Clark 1993, Aigner and Laughlin 1966; data in present report). Nevertheless, there are also assemblages, especially from coastal regions, in which rejuvenation by platform removal never was practiced (cf. Magne 1996:153). Surprisingly, though, rejuvenation of this kind was done near the city of Vancouver, B.C. (Wright 1966). There may be a positive correlation between the F1 (face first) mode of core preparation as defined by Morlan (1970) and core tablet detachment.

Conical and pyramidal microblade cores are as much as 8200 years old on the Pacific Coast at diverse localities including Analgula in the Aleutian Islands and Chuck Lake in southeastern Alaska, though they also appear to be very much later at some localities, while wedge-shaped cores found on the coast are as much as 9000 years old (Ackerman 1996b). Ackerman (1992) traces Anangula cores, and other more or less similar cores found in western Alaska, as in his Kagati Lake complex, to east Asian Sumnagin cores. Anderson (1980) and West (1996) likewise see a spread of the Sumnagin core into Alaska. An array of such subprismatic cores has been reported from Palaeolithic and Mesolithic sites of the Chukchi Peninsula located closer to Alaska than Sumnagin sites (Dikov 1997). There also is some question in our minds as to what extent the distribution of conical to cylindrical cores can be traced to an introduction of new cores. Many of these cores are relatively unspecialized and their format may be the natural consequence of selection of the blank and core usage. The only specialized trait present, and then not in all assemblages, is rejuvenation through platform tablet removal. This question is of considerable significance if diffusion from a Pacific Coastal source is to account for the microblade core technology of interior British Columbia and possibly also the non-wedge cores of the District of Mackenzie. However, Ackerman (1992:23), while relating Anangula cores to the Sumnagin type, does not tie cores from southeast Alaska and British Columbia to that type, and he states that there is a southeast Alaskan core type (especially at Chuck Lake) that has no direct counterpart in the North. It is our impression, though, that some close similarities do exist, especially between Heceta Island cores (Okada et al. 1989), Kodiak Island cores (Philomena Hausler-Knecht, unpublished data) and Anangula Cores. Interestingly, these cores and wedge-shaped or Campus cores are not always mutually exclusive. The two occur together relatively late at Lake Minchumina (Holmes 1986) and earlier on the coast at Ground Hog Bay (Ackerman 1992 and elsewhere).

Ice Mountain Type

Ice Mountain cores have four distinctive characteristics. First, the cores are made on crude elongate bifaces. The bifaces are not generic bifaces of the kind that might be modified into knives and other implements, but usually are rough productions created for use as microblade core blanks. But in the case of one core reported by Smith (1971) the biface blank was fairly well fashioned and thinly proportioned. These are not the same as the bifacially edged blanks often used for wedge-shaped cores. The second attribute is that the platform was formed by the removal of more than one elongate spall from an edge of the blank. The platform tends to look like a second fluted surface, and in some cases it actually is. The third characteristic is that the fluted platform and the fluted microblade production face meet at an acute angle, sometimes so acute that the core has a chisel-like appearance from the side. Fourth is rotation of the core to alternate the striking platform between the original platform and the original fluted surface. The steps in producing Ice Mountain cores are described by Fladmark and he illustrates numerous examples (Fladmark 1985:169 ff.). Fladmark remarks that this 5000-year-old core type is unique to the Mt. Edziza area. One core from the Canyon site in the southwest Yukon also appears to be of the Ice Mountain type (MacNeish 1962:Fig. 89-36).

Other core varieties are known but do not figure in our analysis.

Data Base: Description of Assemblages with Microblades

This survey lists all the sites with microblade industries found in the Yukon and western District of Mackenzie and some in Alberta and northern British Columbia, to the exclusion of those attributed to the Arctic Small Tool tradition (ASTt). A summary assessment is given later, but first, the following preliminary conclusions are offered.

Northern British Columbia is not to be distinguished from the southern Yukon, though there we are hampered by the lack of information on unpublished collections. Northwestern British Columbia has one type that is almost unique to the local area: the Ice Mountain core found in the vicinity of Mount Edziza. Elsewhere in British Columbia and Alberta there are cores of wedge format but in terms of the Campus-Denali mode of preparation, and especially of platform shaping and rejuvenation, none are "quite right." We see nothing in that region that prompts us to visualize quick communication with Fairbanks, Alaska (Campus site). Some cores there may be based on coastal models, not of wedge-shaped format.

In the Mackenzie River drainage (western District of Mackenzie, northwestern British Columbia, northern Alberta) we find several varieties of microblade cores: blocky rectangular cores, poorly formalized conical to pyramidal and even cylindrical cores, wedge-shaped cores, possibly tabular Tuktu cores, and cores that are aberrant and irregular in terms of the Campus-Denali model. Fully attributed Campus-Denali cores are limited to the Pointed Mountain site. There also are single examples from sites on the arctic coast and at Great Bear Lake. The last may be a case of coincidence as the core comes from an ASTt component, an unlikely venue for a Campus core. Millar's (1981) interpretation of Pointed Mountain as a late eastward penetration of Denali culture appears to be a reasonable assessment, but fails to account for the broader distribution of less distinctive Denali-like microblade and core industries in the western Mackenzie and parts of Alberta and British Columbia which possibly began at an earlier time.

Microblade cores in the Yukon compare closely with those found in interior Alaska, with the wedge-shaped Campus type predominating. Occasional cores, however are of the flat tabular variety and others are irregular and lack features for easy sorting into well-defined categories or are of uncommon varieties, Ice Mountain cores for instance.

The geographical order of listing below is, for the Yukon and Northwest Territories, generally from south to north, and where there is considerable latitudinal breadth in the distribution, from west to east, according to site code blocks. For Alberta and British Columbia sites are listed from north to south in order to group the more northerly sites with those of the two territories with which they may be closely related. North of 60 degrees latitude the rows in the "Borden" grid blocks are, progressing northward, J, K, L, M, N and O, the initial letters for each site designation. Longitudinally, the blocks which determine the second upper case letter in a site code end with "V" at the border with Alaska and decrease (U, T, etc.) eastward. Unless otherwise noted, site and collections data are from the CHIN (Canadian Heritage Information Network) Archaeological Sites Database.

Yukon

J-T BLOCK

Tamarack Knoll JdTq-2

The site is located west north of Watson Lake, in the southeast Yukon near km 64 on the Campbell Highway. G. Hare and T. Heffner found a double arris microblade at the base of the B soil horizon in a test pit. Trace of late occupation also were encountered at a shallow depth (Hare 1998).

J-V BLOCK

JcVe-1

MacNeish reported four microblades, a tabular microblade core, a so-called Refugio point (crude, stubby with rounded base), biface fragments and scrapers at this site located in the Kluhini River drainage just east of Dezadeash Lake (MacNeish 1964:281). The microblades, two of which are good examples and are reported individually in Table 4.2, were located in the collection at the CMC but there is no microblade core in the collection nor is there one in the catalogue records.

Champagne Vicinity
JeVc-20

This site is located on an as yet unconstructed realignment of the Alaska Highway, 6 to 7 km east of Champagne. It was located and tested in 1984. At that time S. Greer (1984) identified a microblade industry there, though the single short microblade segment and possible poorly formalized core were unconvincing to Clark (unpublished report of Yukon Heritage Branch) who visited the site in 1987 and found abundant shallow flaking debris, most of it in two clusters exposed by equipment during the clearing of vegetation from the right-of-way. None of it pertained to microblade production. In 1995 the site was substantively tested by T.J. Hammer (Hammer 1996). At that time two artifact zones were found below the White River volcanic ash. The upper zone (B1) produced microblades and platform tablets assoeiated with a notched-stemmed spear point. This zone has not been dated. The lower zone (B2) also produced microblades. Charcoal from a hearth in the lower zone returned a radiocarbon date of 7030±60 BP.

The following artifacts were recovered (in addition to retouched flakes and biface fragments): biface thinning flakes were present only in low frequency (as often is the case for assemblages devoted primarily to microblade production); probable macroblade fragments and macroblade core fragments were found throughout; there are seven microblade core platform rejuvenation flakes or tablets from the upper (B1) horizon; 24 microblades were found in B1 and 18 in B2 in addition to seven found with the early-dated hearth; a number of macroblades also were found in the B1 horizon; an oblaneeolate chert biface or point was found in B2; the complete sidenotched point and base were found in B1; just below the White River ash. The microblades are short, under 20 mm, whether complete or fragments, and are relatively wide, averaging 7.61±2.46 mm (Hammer 1996:29). Single arris specimens strongly predominate, which is unusual. Two uninterpretable fragments may be from cores. Judging from the shapes of the platform rejuvenation flakes, the microblade cores at JeVc-20 were <u>not</u> wedge-shaped or Campus cores. Hammer suggests initial affiliation of the microblade industry with the Little Arm phase and subsequent affiliation with the Taye Lake phase or with a transitional stage. Taye Lake is indicated by the notched points and an informal macroblade industry. This interpretation is somewhat strained inasmuch as a single microblade industry appears to be represented, yet three millennia or greater temporal spread is proposed to account for the presence of notched points. Little Arm would better be characterized by wedge-shaped cores and a finer variety of microblade than those found at JeVc-20.

JeVd-13 & JeVe-3

Flakes were collected at this multicomponent site by Gotthardt in 1990. The site was tested in 1995 (Hare 1996). The site is located 10 km west of Champagne, on a small creek tributary of the Dezadeash River. It was partially destroyed by construction of the Alaska Highway. Among 2830 lithic pieces recovered from both above and below the White River ash in 1995 there are 81 microblades found clustered with most of the recovered implements in one area of the site. Other collections include numerous flakes and pieces of shatter, often found in clusters, a few utilized flakes and scrapers, and a possible microblade core face fragment (Hare 1996). JeVe-3 may be part of the same site.

Dezadeash (JeVd-4)

Another site in the vicinity of Champagne, west of the settlement of the north bank of the Dezdeash River was collected in 1977 by Van Dyke. It produced one point, eight scrapers and a microblade. The microblade is a single arris chert spall, hence its relative great thickness (given in Table 4.2). The point is an almost-fluted Annie Lake point.

JeVc-4

A small lot of artifacts was picked up by MacNeish in 1957 from a roadside exposure or blowout just south of Champagne. It includes several specimens acceptable as wide microblades, some of which are like small single arris bladelike flakes, bifaces, spokeshaves and other scrapers, and generalized leafshaped projectile points one of which has a concave base.

JeVe-2

In the small collection from this site, exposed in a telephone line right-of-way, there are three single arris microblades and 49 flakes and pieces of shatter collected by Hare in 1995 (Hare 1996) and a biface collected earlier by Van Dyke.

JeVd-9

This site located along the river 3.5 km west of Champagne was collected by J. Hunston and G. Allison in 1985. Among the 53 lithics recovered is a black chert platform tablet that encompasses the whole top of a large (22.6 x 50 mm) Denali-type microblade core. Although the collection is fairly extensive it contains no other evidence of actual microblade production but some large flakes have attributes that suggest they are from the preparation of a large core. A distinctive intense yellow (slightly olive) chert is present in the JdVd-9 lithics.

Mendenhall River Area

JeVb-15

This relatively large thoroughly disturbed multicomponent site is located at Km 1558 of the Alaska Highway, overlooking the Mendenhall River. It was located by S. Greer in 1984 and tested extensively by G. Hare in 1995. It has produced 14 or more microblades most of a crude single arris format, a possible microblade core rejuvenation tablet, two blades, a side/end scraper, an end scraper, four hammerstones, biface fragments, utilized flakes, a copper preform, and approximately 4900 flakes and pieces of shatter (Hare 1996). No microblade cores were recovered, though Hare considers the site to be primarily a work station. Radiocarbon dates from charcoal samples are 2620±40 BP and 3480±70 BP but the association of the dated samples with microblades is inconclusive because of disturbance of the site. Nevertheless, the copper preform should postdate the period of the radiocarbon dates.

JeVb-16

This site, discovered in 1995, produced one single arris microblade from among five additional flakes and pieces of shatter found on an eroded surface (Hare 1996). Testing failed to discover any buried cultural horizon.

JeVn-4

G. Hare and T.J. Hammer recently (1997) reported that a sample collected by B. Ebell, R. Le Blanc and B. Liddle from this site located in the HooDoo Mountain obsidian source area contains microblades.

Mile 1013 [At Mile 1011.9] (JeVi-1)

This site, exposed along the side of the Alaska Highway and largely destroyed by the construction, was collected in 1944 and 1948 by the Johnson and Raup party (1964). Items recovered include an elongate biface with nearly parallel sides and rounded at both ends. There are reported eight microblades and a complete wedge-shaped core, probably of the Campus-Denali type, and an additional fragment of such a core (Johnson and Raup, 1964: Fig. 38 nos. 8 & 9). There also is one apparent notched transverse burin, an ovoid biface, an end scraper and unclassifiable point fragments which have generated the identification of Lerma and Milnesand points. The few items from JeVi-1 at the CMC apparently do not include these specimens but there are two microblades catalogued for JeVi-1, which are the source of the measurements in Table 4.2.

Taye Lake (JfVb-4)

MacNeish (1964) shows a tabular microblade core from here in his tables and states that in the Taye Lake phase microblades were on the wane. Workman (1978:126) adds that in his opinion they have "waned to the point of nonexistence" and he lists only a dubious core for the reasonably large JfVb-4 assemblage obtained in 1959 following earlier site visits.

Canyon Creek (JfVg-1)

The site was discovered by Johnson, surface collected by Leechman, excavated in 1957 and 1959 by MacNeish and further excavated by J. Cook in 1966 and also visited and surface collected by various archaeologists at other times. In each case the artifact yield was scant though the site did provide an early 7200-year-old component (lacking microblades) (Workman 1978). Typical of earlier investigations, the 1966 crew "devoted about 33 man days to further excavation at this deeply stratified but largely unproductive site. We recovered meager traces of the presence of man from several buried humus zones" (Workman 1978:186). An Ice Mountain microblade core was found here, evidently out of context on the surface (MacNeish 1964: Fig. 89 no. 36). That evidently is the only core from this well-known site as Workman (1978:Table 8) reports only a "MCM" (miscellaneous microblade core) and three microblades, which is in accord with MacNeish's data (1964:Table 14). Measurements for each of the three microblades are given in Table 4.2.

JfVg-3

The site located next to or part of the Canyon site was found by Johnson and also collected by Leechman. A report by MacNeish (1964) of microblade cores from the site was not verified from examination of collections at the CMC or by Johnson and Raup's list of artifacts (1964:Table 2).

Otter Falls (JgVf-2)

The site was discovered by William Workman in 1966. Most of the microblade industry was recovered as a cluster found adjacent to a hearth in three 5-foot-square excavation units. The site is located on the front of elevated terrain adjacent to Otter Falls, at the outlet of Canyon Lake. It produced an almost pure assemblage derived from the production of microblades: 17 cores, platform tablets and core fragments (five essentially complete cores), 150 microblades, three burins and eleven unifaces and utilized flakes (Workman 1978:Table 8). It is not uncommon to find a few burins and scrapers (unifaces) at microblade production loci in Yukon sites, as was the case here. The whole front of the rise where JgVf-2 is located contains a very sparse lithic distribution, including end scrapers, thus some non-microblade content at the microblade locus could be from other use of the site. The microblades average a narrow 4.4 mm in width. Workman comments that there appears to be two size populations of microblades in the Yukon, with Otter Falls being similar to assemblages from interior Alaska in this respect. Data available in the mid-1970s suggested to Workman that narrow microblades were associated with early Holocene sites, which was difficult to explain in view of the relatively late Otter Falls radiocarbon date (Workman 1978:256). Material from Otter Falls has been used in an article by Cook (1968) and also is described by Morlan (1970:20) and Workman (1987). The cores are of Campus-Denali format and were singled out for detailed examination in Chapter 3. The site is of interest for its radiocarbon date: 4570±50 BP (uncalibrated), which at the time it was obtained, three decades ago was a landmark date for microblades in the Alaska-Yukon interior region and was later than many archaeologists had proposed for microblade technology.

JgVg-4

The site, found on the west side of Canyon Lake by S. Greer in 1995, yielded a single microblade from below the White River Ash.

Gladstone (JhVq-1 Zone G)

Like Little Arm, the Gladstone site is located on the shores of Kluane Lake. It was discovered by Johnson in 1948, surface collected and tested in 1949 by Leechman, excavated by MacNeish in 1960 and further excavated in 1973 by R.E. Morlan. Stratigraphically clear representation of the Little Arm phase at this site is minor, consisting, after Workman's reanalysis (1978:405), of the Zone G assemblage of two projectile points, four microblades, three unifaces, one utilized flake and other flakes recovered by MacNeish and attributed by him to a Kluane complex (MacNeish 1964). There is, however, a stronger representation of the microblade industry in the surface collection of displaced artifacts and artifacts attributed to Zone F that possibly do not properly belong with that component, due to soil mixing, and from an "Old Cultural Layer" excavated by Leechman that we can not clearly identify with either Layer F or G. These additional artifacts include "peculiar" microblade cores, one of which is a tabular core of Tuktu type (XIB-133, MacNeish 1964:Fig. 89-30), and microblades collected by Leechman (Workman 1978:136 and Table 8). Other cores are of generalized wedge-shape (XIB-135) and amorphous or somewhat conical in form (XIB-134) respectively. Workman (1997:126) found little in Gladstone, exclusive of Zone G, to see it as either a distinct phase of the Northwest Microblade tradition or as a transition between Little Arm and Taye Lake. Nineteen microblades from Zone (layer) F and a surface collection average 7.15 mm wide (Table 4.2), but the four microblades from the lowest layer, G, average only 4.6 mm wide and 0.78 mm thick. There are four radiocarbon dates ranging from 780±60 BP to 1890±50 BP, but none of the dates is in association with the microblade component.

JhVq-2

This is the west end of the Gladstone site. MacNeish excavated here and reportedly recovered microblades along with a broad range of implements, evidently under the designation JhVq-1. Morlan examined the site but did not do further excavation (CHIN Archaeological Sites Database).

JiVq-1

Specimens collected from deep soil in an erosion exposure on the west side of Talbot Arm, Kluane Lake are reported by MacNeish to include a side scraper, blade, microblades and bones but the site is missing from MacNeish's 1964 compendium unless it is entered as JhVq-1

Little Arm (JiVr-1, listed in error usually as JiVs-1)

This site, located on the shores of Kluane Lake, was discovered by Leechman in 1945 and excavated by MacNeish in 1959 and 1960. At that time the Little Arm phase in the southern Yukon was best known from Level 5 (Zone F2) of the Little Arm site. Some 63 microblades also were found in overlying Level 4. Possibly the Level 4 specimens ultimately came from Level 5 (Workman 1978:405), though one or two Level 4 specimens are tabular cores, best described as of Tuktu type (Workman 1978:250). Workman's restudy reports the following collections from Level 5 (1978:404 and Tables 8 & 9):

Projectile points	6	None is side-notched
Biface	1	
Microblade cores & tablets	11	Campus type & broad tabular somewhat Tuktu
Microblades	405	Ave. width 7.2 mm, other levels are about the same, but a displaced surface sample of 45 microblades is 5.1 mm.
Burins (Donnelly burins)	12	
Gravers	3	
End scrapers	7	

Unifaces	15
Utilized flakes	5
Notched cobble	1
Hammerstone	1

This assemblage describes a camp rather than a microblade workshop. The microblades tended to be in two clusters, which suggests that most of them were produced by two persons or during two separate episodes

Little Arm formed the basis of MacNeish's definition to the Little Arm phase. Workman (1978:125) describes MacNeish's conception of Little Arm as follows: "Points are usually still unstemmed and unnotched and microblades occur in profusion. Also noteworthy are burins and gravers. Some continuity is seen with the antecedent Champagne phase [northern Plano, later dropped from the Yukon sequence by Workman] but closer ties are seen with the subsequent Gladstone phase. This phase is the first of several that belong, in MacNeish's view (1964:319 ff) to the Northwest Microblade tradition, a long-lived (and diffuse) entity in boreal northwest North America.... Curiously [among prominent traits], microblades are listed as a common, but not a universal element...."

JiVs-2

The site, found by Johnson in 1944, and identified by him as the Little Arm site, is situated on the same terrace at Kluane Lake as Leechman's and MacNeish's Little Arm site. Artifacts listed by MacNeish (1964:264) include two lanceolate-leafshaped points, nine microblades, a wedge-shaped core, a flake burin and numerous scrapers and bifaces. However, F. Johnson and H. Raup (1964:44) state that only five artifacts were found in situ, and the microblade core and lanceolate points listed by MacNeish are not to be found in their collection.

JiVm-1

This is a large surface collection made by James Bennett (University of Calgary/University of Michigan) in 1969 or 1970 from the northeast end of lowest Gladstone Lake on a route through the Ruby Range between Aishihik and Kluane Lake (Workman 1978:412). The site had been first reported by geologist Dan Krinsley in the early 1960s and was examined by a person, referred to as "Johnson," from Carleton University in 1965 and reportedly also was visited by M. Gates and J.M. Campbell. The assemblage appears to be mixed and contains considerable small faunal material that had been exposed on the surface. Workman also reports three microblade cores, five microblades and Donnelly burins. Workman (1978:Table 8) classified the cores as Tuktu (1), miscellaneous (1) and dubious (1). Although the average microblade width is narrow (Table 1) the average thickness is high because of the influence of an atypical 4.1 mm-thick specimen (Workman 1978:Table 9). Projectile points of styles suggestive of the Northern Archaic Taye Lake phase also are present (CHIN Archaeological Sites Database). Clark's reexamination of the collection found two cores. One is of rough wedge to conical format with a scalene cant. It probably produced large bladelets. The other core is a fine chert specimen with microblade removal faces on each side. These fluted faces meet at a sharp angle at the front of the core. This appears to be an extreme case of the fluted face forming in two zones that meet at an angle, as was described for some Kelly Creek cores. This core has been classified in Table 4.2 as a Campus core but we are not certain that it should not be classified as an "other wedge" core.

JiVm-2

The site is located on a tributary of Gladstone creek just north of Gladstone Lake. It was visited by M. Gates, J. Bennett and J. Campbell. Surface collections made in 1971 include two microblades, a core, two projectile points, a biface and a wedge. Testing by Gates failed to reveal in situ material.

JjVi-2

MacNeish (1964:Table 14) reports one microblade from Mile 67 on the Aishihik Road. Associated artifacts include a large bifaces, a fine willowleaf point and side scrapers. The microblade is a short thick proximal end.

JjVj-3

MacNeish (1964:Table 14) reports two microblades (three seen by Clark in the collection) from this site located on Sekulman Lake. Associated artifacts include a side scraper, and two blades.

J-U BLOCK

Snafu Lake (JaUk-1)

A single microblade was found among a number of flakes by Jeff Hunston at this disturbed and apparently destroyed site.

Annie Lake (JcUr-3)

Annie Lake is one of the better-known sites in the southern Yukon. The site is located almost midway between Whitehorse and Carcross to the south. Excavations were started by S. Greer in 1982 and continued in 1990, 1991 and 1992 by G. Hare, in the last year as a joint Yukon Heritage Branch and Carcross-Tagish First Nation project (Hare and Greer 1994, Hare 1995). Several occupations are represented, principally assigned to the Northern Archaic tradition as demonstrated by notched spear points and by concave-base Annie Lake points (Greer 1993). Two radiocarbon dates of 1490±100 BP and 2795±65 BP (uncalibrated) apply to the Northern Archaic occupation but do not determine its older limit. No microblades are associated with the Northern Archaic, but a small number of microblades was found in deeper deposits in a zone radiocarbon dated to 7160±70 BP and 6230±70 BP. Stop-dates essentially identical to the 6230 BP date also were obtained from the sand layer overlying the microblade horizon. No microblade cores were recovered from that zone and there is no clue as to the type of core utilized. There are no platform rejuvenation tablets, for instance. Two large bladelike "Northern Cordilleran" flakes were recovered from a deeper undated layer, but the artifact sample is too small to reliably indicate an era preceding the local use of microblades. Suffice it to say that the overlying 7160 BP occupation presently has one of the two earliest Little Arm phase dates on microblades for the southern Yukon. From another, culturally mixed and undated area of the Annie Lake site there is an incomplete wedge-shaped core that probably is of the Denali type (G. Hare personal communication to D. Clark, May 1997).

JcUj-1

R.S. MacNeish found two blades and three microblades at this bluff site located next to the Alaska Highway at Squanga Lake. The collection contains one possible blade and two poorly formed microblades.

Bonneville Lake (JdUt-5)

This site is one of the group clustered in an upland setting west of Fish Lake. Blowouts at the Bonneville Lake site yielded a mix of implements characteristic of all local traditions, including macroblades, burins, notched points and scrapers. No microblade cores or core fragments, were recovered in the 1993 survey (Gotthardt 1994), though they might be expected in an collection with this composition. There is a fine, utilized microblade in the CMC collections from an earlier survey by Hunsten in 1980 (Greer 1981). While semidiscrete macroblade and notched point components are recognizable, it is not clear that these technologies are contemporaneous at JdUt-5.

Fish Lake (JdUt-8, JdUt-3, JdUt-4)

Fish Lake occupies an upland basin located in the hills 15 km west of Whitehorse. It has been visited by archaeologists several times. The principal work done there was a Kwanlin Dün First Nation/Yukon Heritage Branch project in 1993 (Gotthardt 1994). Lithic artifacts were found at several sites.

Apparently earliest in the sequence is an undated macroblade and core workshop, the Quarry site (JdUt-8), thought to belong to the Northern Cordilleran tradition. Use of the site also extended to later times judging from the styles of artifacts recovered. One microblade core was found during a revisit in 1996 but no microblades were recovered though elements of macroblade technology are abundant. The chert microblade core is described as being nearly tabular in form, but also as a blocky, broad, wedge-shaped core with a trimmed single facet platform and 80 degree platform angle. The view of the face of this core (Gotthardt 1997: Fig. 20) bears out its description as blocky and tabular.

Next in the proposed Fish Lake sequence is the Little Arm phase which is represented by microblades from the Main Camp (Fish Lake 3) JdUt-3. Notched spear heads also were found at Main Camp but the association of these objects is equivocal due to mixing of the deposits by ground squirrels.

Notched spear points and numerous end scrapers, among other artifact types found at the north end of Fish Lake, at East Side of Fish Creek (JdUt-4) belong to the succeeding Northern Archaic tradition, represented in the southwest Yukon by the Taye Lake phase. There also is a probable face rejuvenation flake that does not appear to be from a wedge-shaped microblade core.

JeUu-1

This site is 3 km from Jackson Creek on the east side of the Ibex River. S. Van Dyke collected, at an eroding bank, one microblade, two scrapers and one biface.

JeUv-1

Another small site in the Ibex River area reported by S. Van Dyke in 1979 yielded two point fragments and a wide microblade segment at a road cut.

JeUv-25

This site also is located in the Ibex River area, on the road northeast of Esker Lake and northwest of Kame Lake. Van Dyke recovered seven blades and one microblade or burin spall fragment.

JeUv-36

Collections at Ibex Pass in 1979 and 1980 from several tests and exposures by Van Dyke are very minor but are reported to include burinated artifacts and evidence of microblade technology. The collection contains, among other items, a concave based point and one 4-arris microblade from the front of a probable wedge-shaped core.

Scout Lake

Scout Lake is located west of Whitehorse near km 1494 of the Alaska Highway. Artifacts exposed over a large disturbed area of knolls and turned over to the Heritage Branch, and additional specimens collected by G. Hare and R. Gotthardt, include five microblades, a large blade core and a small end/side scraper (Hare 1998).

Chasa'n Chu'a (JeUs-28)

The site, tested by a Yukon College field school in 1997 and during the two previous summers by D. Rutherford, is located near McIntyre Creek on the outskirts of Whitehorse. Among the small assemblage of artifacts recovered are seven or eight microblades (1996 specimen 0.8 mm wide, 1997 specimens mean width: 0.7 mm) and many bifaces or biface fragments including crude lanceolate or leafshaped points (Rutherford, paper presented at the annual meeting of the Alaska Anthropological Association, Whitehorse, April 1997 and Web Page "The MacIntyre Creek Archaeology Project" accessed February, 1998, and permit report for 1997 to Yukon Heritage Branch).

Whitehorse near Riverdale Subdivision (JeUs-7)

A microblade core privately collected on the north side of the Riverdale Subdivision, Whitehorse was turned over to the Yukon Heritage Branch. Examination of the site in 1997 by T.J. Hammer for the Yukon Heritage Branch recovered a triangular, contracting stem projectile point and several microblades. Earlier collections from this destroyed site by D. Davidge in 1982 and J. Hunston in 1983 had not produced evidence of a microblade industry.

Louise Lake (northernmost of Jackson Lakes) (JeUt-1)

Surface collection of a disturbed area by Gotthardt in 1993 produced a 5.7 mm-wide microblade mid-section and a few lithic tools including a finely retouched red chert biface knife. It is not certain whether this is the same site recorded earlier by Reeves as JeUt-1.

Five Mile Road Site (JtUt-12)

The site is located on the west bank of the Yukon River below the Takhini River confluence. A collection from the disturbed surface was turned over to the Heritage Branch. Though the collection is reasonably broad in scope, three test holes by Hare and Gotthardt were unproductive. Artifacts recovered earlier include a possible microblade core fragment, retouched microblade, end scraper, lanceolate point fragments, large and small notched point bases, and there also is a possible bison bone (Hare 1998). The precise site location may be problematic.

JkUx-5

The top of this site, located at Airport Lake south of Carmacks was stripped off by airport construction. The broad scope of materials in the small collection, a small side-notched arrow point for instance, appears to indicate that more than one component is present.

K-T BLOCK

Frenchman Hill (KbTx-6)

The multicomponent site occupies most of a small hill located at the northwest end of Frenchman Lake (Clark and Gotthardt 1997). Minor representation of a microblade industry, similar to the one found at the Kelly Creek site, was found towards the base of shallow sub-ash deposits at the top of the hill. A Northern Archaic component with notched points also is found below the White River ash but the Northern Archaic occupation is not clearly associated with the microblades.

Kelly Creek (KbTx-2)

The Kelly Creek site report and analysis of collections in Chapters 2 and 3 comprise the greater portion of the present volume. The site is located close to Kelly Creek on a topographic bench along the northeast side of the valley that extends from Frenchman Lake to Tatchun Lake. It produced concentrated workshop debris from a relatively pure Campus-Denali microblade industry, including more than a score of microblade cores and 1438 microblades. Only 722 microblades were considered suitable for measurement, which is reported in two lots (Table 4.2). No satisfactory date is available for the site.

Tatlmain Lake

Surveys and excavations were done here in 1990 and 1991 as a joint project of the Yukon Heritage Branch and the Selkirk First Nation (Gotthardt 1992). Two multicomponent sites on the shore of the lake, KdTx-4 and KdVa-10, yielded notched transverse burins, a type that one expects to occur either with early microblades or in Northern Cordilleran assemblages. Nothing else was found at KdVa-10 while a single broad (12.2 mm) microblade segment was found at KdTx-4. Considering the amount of survey and testing done at Tatlmain Lake, the recovery of microblades there is enigmatically low.

Hess Lookout (KjTh-2)

This site, located on the Hess River in the hills between the Yukon and District of Mackenzie north of Macmillan Pass, produced a few microblades among generally non-diagnostic lithics thinly scattered over a large site (Greer 1982). No cores were recovered and the site has not been dated but investigation was severely constrained by lack of time and rain.

K-V BLOCK

Beaver Creek Area These are the westernmost sites in the southern Yukon.

KbVo-1 & KbVo-2

This multicomponent site pair was exposed in a roadcut near the end of Enger Lake, about 16 km south of Beaver Creek, and was tested later in 1991 and 1993 (Walde 1994). The assemblage of tools of various ages, some relatively recent, includes one microblade core fragment and three microblades. Walde does not provide a typological assessment of the core which is missing its platform area. One of the microblades is from KbVo-2 and constitutes the only item of microblade technology from that site. Interestingly, it was found in two conjoinable parts: one above the White River Ash, the other 10 cm below the ash.

Red Hill (KcVo-1)

This site situated 4 km north of Beaver Creek was investigated by K. Walde and more recently, in 1995, tested by N. Easton in the context of a Yukon College field school (report in preparation) and, the same year, inspected by G. Hare and R. Gotthardt. The disturbed site is subject to continued destruction from gravel mining. It yielded a broad spectrum of artifacts including one and possibly three microblades.

KdVo-3 was severely disturbed and mixed by quarrying for the construction of the Alaska Highway and the remainder was destroyed by renewed construction. Artifacts recovered in 1993

(Walde 1994) include several projectile points, a microblade core, five microblades, two fragments of native copper, and other items some of which are in accord with a 810+80 BP radiocarbon date. Projectile points include two side-notched ones of typical Northern Archaic or Taye Lake phase format. The microblade core is a fragment and Walde does not specify a particular type (nor is this apparent from the illustration). It came from the same area as one of the notched points, but it is uncertain that the two belong together at this multicomponent site (Walde 1994 and CHIN Archaeological Sites Database).

KaVn-2 No microblade industry was found here but the site is of interest for the information it provides on cultural chronology. The site, located alongside the Alaska Highway, was partially excavated in 1993 and 1994 following a survey in 1991 (Walde 1994). The lower component has produced lanceolate and leafshaped points from a layer radiocarbon dated to 7770±70 BP and 10 130 ±50 BP, but no microblades. There may have been a non-microblade culture there at that time. A 'fish-tail' point was recovered from an upper horizon, only 1 cm below the White River ash. This point is basically a lanceolate point with very slightly concave lateral margins and slight lateral projections at the base. A date of 4740±60 BP is thought to apply to this point. Again, there are no microblades in the upper artifact horizon though they occur at that date elsewhere.

KaVa-1

MacNeish collected three microblades, two of which are dubious and the other not a good example, and a tiny chip but no other items from an exposed surface alongside the highway to Carmacks Mile 95 (MacNeish 1964:Table 14).

KaVa-4

The prominent low hill, Tantalus Bluff or, locally, Coalmine Hill, located next to the town of Carmacks likely was a lookout station. The site has been heavily disturbed by equipment.

Carmacks (KaVa-3)

KaVa-3 is located on elevated terrain on the west bank of the Nordenskiöld River. It has been cut into by the Freegold Road just west of the bridge crossing. Intact portions of the site lie largely within the Carmacks cemetery. Though the site was reported in 1978 it remained untested until 1995 when a modest 1.25 square metres was excavated (Gotthardt 1995:31-34). At that time 26 microblades and a microblade core tablet were recovered together with flakes of fused tuff (from the western District of Mackenzie), red agate (local), various cherts and obsidian (imported). A side-notched spear head of obsidian that had been privately collected from the surface also is attributed to this site. Most of the flakes are thought to represent the preparation of microblade cores though no cores were recovered. The platform tablet appears to be from a wedge-shaped core. Gotthardt considers that the notched point represents a later occupation of the site. The microblade component has been dated at 5890±40 BP (Beta-86359). The average width of the 22 measured microblades is 6.06 mm, the thickness 1.44 mm.

KbVa-11

A single wedge-shaped microblade core was recovered from the roadbed at Tatchun Lake by J. Hunston in 1983. No undisturbed deposits or any substantial quantity of disturbed material was found at the site.

KbVa-15

J. Hunston's 1983-84 survey recovered microblades, bifaces, flake cores, a burin spall and a projectile point from a single large test pit on the east side of Tatchun Lake. Further examination of the locus by Gotthardt in 1990 revealed lithics, fire-cracked rock and calcined bone but did not recover elements of microblade technology.

KbVb-4

A single microblade was recovered from the second "B" soil horizon under the White River ash in limited testing by Gotthardt in 1990.

Fort Selkirk (KeVd-3)

Sites located near Fort Selkirk, at the confluence of the Pelly and Yukon River, were tested during the 1980s. One site located 2.5 km upstream from Fort Selkirk tested during a joint Yukon Heritage Branch-Selkirk First Nation project, yielded microblades, notched burins on flakes, graver spurs and scrapers made from cherts (Gotthardt 1990b, Hare and Gotthardt 1996). The site has not been dated. Earlier, a wedge-shaped microblade core was recovered from the site by MacNeish (1964: Table 15). The core can best be described as an exhausted Campus core formed with minimal shaping of the blank. The assemblage is small but diagnostic artifacts are suggestive of the Palaeo-Arctic tradition.

KkVa-2

The site is located at Minto Lake north of Mayo between the Stewart River and the McQuesten River. MacNeish illustrates a Campus-Denali core that D. Leechman collected from here in 1947 or 1950 (donation of Nora Hare) (MacNeish 1964: Fig. 89 no. 33). MacNeish claims to have found two additional wedge-shaped cores here but these are not present in the collection nor are they listed in the artifact catalogue.

L-V BLOCK

Moosehide (LaVk-2)

MacNeish first excavated here, in 1960, in a 70 foot long 5 foot wide trench. Artifacts were limited to a pink soil band, two to eight inches thick, which contained two flake burins (Fort Liard burins), a burinated end scraper, a wedge-shaped microblade core, microblades, very numerous end scrapers and side scrapers, lanceolate, leafshaped and other points and a side-notched sinker. The wedge-shaped core is atypical in terms of the Campus-Denali format.

Further excavation was done at Moosehide by Jeff Hunston in 1977 and 1979 who obtained a 5625±80 BP radiocarbon date (S-1002) from a zone that yielded artifacts comparable with those of the microblade-bearing Little Arm phase of the southwest Yukon. Hunston also obtained an earlier basal date of 8050±100 BP. No distinctive implements were recovered from the earliest dated context, but the younger date is consistent with the age of microblades at many sites. Higher components extend up to late prehistoric times.

The microblades are narrow, averaging 4.6 mm, and predominantly thin, averaging 1.19 mm dropping to 1.11 mm if four specimens measuring 2 mm thick and greater are excluded from the calculation. This is the size of the KbTx-2 microblades and the Otter Falls microblades. Considering that a reasonable large sample of microblades was recovered at Moosehide, it is surprising that distinctive core shaping and rejuvenation products were not found there.

Deadwood Creek (LaVk-7)

This site, located on the west side of the Yukon River about 1 km below Dawson, was investigated by D. Stothers in 1970 for the University of Toronto Northern Research Programme. The relatively large site, measuring approximately 250 feet by 60 feet according to Stother's fieldnotes, was occupied during a period of microblade use and during the present century. Eight microblades, a chert biface, a possible Donnelly burin and approximately 75 flakes and pieces of shatter, including some obsidian, were recovered form a 3 by 5 foot test. We have not had the opportunity to examine the collection (which is not at the CMC repository). In 1974 J. Hunston revisited the site and enlarged one of Stothers' tests, recovering side-notched points, *tci-tho* scrapers and microblades from within a single context. Four of the seven microblades at the CMC were measured, the others being technologically marginal.

LeVi-7

R. Gotthardt and G. Hare report a core tablet, possibly from a Campus-type core, 2 microblades, and an end scraper from this site which is located on the north side of east Seela Creek, upper Blackstone river drainage (Gotthardt 1993).

Yukon-Charley River National Preserve Area

Although this material is from Alaska, it is included as it provides the only representation of a microblade industry for the region north of Dawson at Moosehide and south of the Bluefish Caves, to cite a better known locality. (The MeVl-1 and Dave Lord Creek microblade sites actually are somewhat south of the Bluefish Caves.) Several surveys have been done in the area, resulting in the discovery of 91 recorded prehistoric sites and many others not formally recorded (as of 1988). Nearly all reports are in manuscript files but the results are recapitulated by Griffin and Chesmore (1988). One wedge-shaped core was found at EAG-167 in 1981. The specimen, illustrated by Griffin and Chesmore (1988:Fig. 7) appears to be of the Campus-Denali type though diagnostic details of the platform are not described. Another wedge-shaped core (detail not clear in photograph) and microblades were found at CHR-077, a discontinuous site complex that extends for more than 3 km. A Northern Archaic-style notched point, a rough biface, a leafshaped knife or point and other artifacts including a tabular Tuktu core (not illustrated) also were recovered there (Griffin and Chesmore 1988:Fig. 7-9, 110). A third site, CHR-074, has yielded both microblades and side-notched point of the fish-tail variety, but it is not known which of these items are coeval. Microblades have been found at additional sites, but without cores; none is dated.

M-V BLOCK

MeVl-1

This northern Yukon site, discovered by Jacques Cinq-Mars in 1987, has produced a substantial collection of 91 good microblades and a tabular microblade core. The core measures 27 mm wide, 13 mm thick and 28.5 mm high. Platform preparation appears to be by large flake removal from the right lateral edge of the platform and subsequent trimming or retouch from the facetted edge onto the platform.

Dave Lord Site

Elements of microblade technology, particularly a wedge-shaped core, were found at this site discovered by Cinq-Mars in 1987.

Bluefish Caves (MgVo-1, -2, -3)

The Bluefish Caves are located in the northwestern Yukon not far south of the Porcupine River within the eastern Beringia palaeo-region (Morlan 1997). They were discovered in 1975 and excavated intermittently between 1977 and 1987. The shelters were sparsely occupied between about 13,000 and 10,000 BP, and possibly also earlier judging from the recovery of earlier dated bones with cut marks and fracturing attributed to human agency (Cinq-Mars 1979, 1990). A numerous and diverse fauna, principally mammalian, with many extinct species was recovered but is only to an unspecified degree is anthropogenic in its origins. Artifacts recovered include two microblade cores, one of which is of Campus or Denali format, and several burins on flakes and on bladelike flakes. The small lithic assemblage also includes microblades, burin spalls and small flakes. Although some latitude must be allowed in the dating of this assemblage, Bluefish possibly offers the earliest dating documentation of a Denali-type (and any type) of microblade industry in North America.

Rock River Area (MfVa-9, MfVa-14, MfVb-7)

Rock River upland sites were extensively investigated by Gotthardt at the beginning of the 1980s (Gotthardt 1990) and reinvestigated in 1996. The earlier investigations recovered abundant artifacts from a blade industry, a large side-notched spear point likened to a reworked Kamut point (from MfVa-9, there is also a Kamut point from MfVa-17), and a wedge-shaped microblade core of imported raw material, but only nine microblades and some of them dubious. The more definitive of the two cores, MfVa-9:5 (the other is an undistinguished pebble core), was reexamined for this study to confirm its identification as a Campus-type core This core was found exposed on the surface. Its association with the notched point and 7160±60 (lower organic horizon) and 7580±420 BP (combined upper/lower organic horizons) radiocarbon dates from MfVa-9 is uncertain. MfVa-14 is an assemblage with Rock River type blade industry, recovered by Gotthardt. It includes at least one microblade which may represent the lower end of the size range of blades.

The 1996 reinvestigation of Rock River sites recovered additional evidence of macroblade production from MfVb-7. That site yielded radiocarbon dates of 5010±110 BP and 4580±60 BP which together with the MfVa-9 least partially bracket the temporal span of blade production in the area. A microblade core in the form of an elongate rectangular stone block with microblade removal from one end was recovered at MfVb-7 (Raymond Le Blanc personal comm. to D. Clark April 1997). The fluted surface thus is suggested of a tabular (Tuktu) core, but the overall shape of the core does not fit that type which is not as elongate as the present core. These finds notwithstanding, in relation to the amount of site exposure and archaeological exploration and collection done in the Rock River area, microblade technology is highly underrepresented, to the extent to suggest that Northwest Microblade (or Denali) people did not inhabit that area. But Le Blanc sees coexisting blade and microblade industries based on cores produced in other, non-Denali technological modes (paper read at Alaska Anthropological Association annual meeting, Whitehorse, April 1997).

MhVb-3

R. Le Blanc reportedly recovered a microblade and other artifacts from this northern Yukon site (Le Blanc 1994b).

MiVb-4

The site is situated 750 m north of MhVb-3. Le Blanc recovered a small shouldered point and a microblade here.

MjVk-1

This site, investigated by W.N. Irving and R.E. Morlan in 1970, is located on a bluff along the Porcupine River north of Klo-kut (near Old Crow). It yielded microblades, scrapers and flakes (Cinq-Mars 1973, App. B). Historic material also is present.

First Caribou Lookout (MjVk-2)

This site, investigated by W.N. Irving and R.E. Morlan in 1970, is located on a bluff along the Porcupine River north of First Island (near Old Crow). It reportedly yielded microblades, bifaces and other artifacts (Cinq-Mars 1973a, App. B).

Old Chief (MjVk-7)

Microblades were found associated with a house pit at the Old Chief site, located on the Porcupine River a few kilometres upriver from Old Crow village. There also is a wedge-shaped core of

Denali type made on a relatively unmodified flake. However, it is believed that the housepit was dug into ground bearing the microblade component, which it postdates (Cinq-Mars 1974).

N-V BLOCK

Around Old Crow flats

At least a score of wedge-shaped microblade cores of Campus format have been recovered from sites located around the periphery of the Old Crow Flats. In their preliminary report on these finds, Irving and Cinq-Mars (1974) also record a lesser number of tabular or Tuktu microblade cores and draw attention to a nearly circular core tablet that probably came from a cylindrical or conical core. Further analysis by Cinq-Mars is in progress.

Potato Hill (NaVo-1)

The 1975 collection locality is located less than 1 km east of the Alaskan boundary. An analysis of the microblades and cores by Cinq-Mars is in progress.

North Bench, Potato Hill (NaVo-2

A microblade core was collected in 1978. Analysis by Cinq-Mars is in progress.

Kikavichik Ridge (NcVl-1, K-Ridge)

This site is located at the north edge of the Old Crow Flats. Many microblades, core tablets, six microblade cores generally of wedge-shaped format, and a transverse burin were recovered (Irving and Cinq-Mars 1974:74, Fig. 6). The cores (judging from dark illustrations) are of the Campus type, which contrasts with the recovery of other core types at Black Fox Ridge, Friggit Lake, and Sam and King Lakes. A fluted point fragment also was found at K Ridge.

NbVj-6 (Black Fox Hills No. 4)

A wedge-shaped microblade core of Campus type was collected here in 1975. Analysis by Cinq-Mars is in progress.

Black Fox Ridge (NaVi-1, -2, -3, NbVi & NbVj blocks)

This terrain is located on the east side of Old Crow Flats. Traces of core and blade technology occur at several localities among more than a dozen collecting localities but are limited to a few small samples of microblades, a wedge-shaped microblade core, and a few core tablets varying in shape from circular to rectangular (Irving and Cinq-Mars 1974:Fig. 3a-e).

Friggit Lake (NbVi block)

The locality is located on the east side of the Old Crow Flats, 6 km east of Back Fox Ridge. Two minimally-prepared tabular cores were recovered together with macroblades and burins on flakes (Irving and Cinq-Mars 1974:67).

Sam and King Lakes (NcVh block)

The locality is in the hills northeast of the Old Crow Flats. Collections include macroblades, an almost circular core tablet, probably from a relatively large conical or a cylindrical core, and two tabular microblade cores (Irving and Cinq-Mars 1974:74, Fig. 5 h-k). The tabular cores are reported to lack platform preparation, but judging from their illustration they are Tuktu cores.

Sam Lake Lookout (NcVi-8)

In 1989 Gotthardt collected a classic Campus wedge-shaped core from Sam Lake Lookout site NcVi-8 together with a transverse notched burin on a blade and two crude side-notched points. The site previously was collected by Irving and Cinq-Mars in 1970 and 1977.

Hanging Lake (NcVh-7)

This site has portions of microblade cores. Analysis by Cinq-Mars is in progress.

Dog Creek (NcVl-3 & in part NcVi-3)

Major excavations were done here from 1975 through 1979 by J. Cinq-Mars. Excavations were resumed in 1997 and 1998 by R. Le Blanc. Analysis by Le Blanc is in progress.

Blade Lake Lookout (NcVn-1)

The site, found at the top of a heavily timbered hill northwest of Thomas Creek (NW corner of Old Crow Flats) by W.N. Irving, has produced blades, microblades and detritus from biface preparation (Cinq-Mars 1973a, App. B).

Lazarus Lookout (NcVo-2)

The site, reported by W.N. Irving, is on a bedrock highpoint overlooking the Thomas Creek valley (NW corner of Old Crow Flats). It yielded microblades and end scrapers (Cinq-Mars 1973a, App. B).

NdVo-1

MacNeish reportedly found two microblades at this site located on the Firth River in the hills close to the Alaska-Yukon boundary (Cinq-Mars 1973a, App. B) but the specimens are missing from the collection at the CMC

Trout Lake (NeVi-9)

The collection, of surface finds and material excavated by B. Gordon, has a large core with curved/tabular face, a broad flat back and a broad flat base. It may be best classified as a variant of a tabular (Tuktu) core or simply as a generalized subconical core. From the same site there is a large core tablet, wider and more massive than Campus core tablets, that may be from a core similar to the one described above. There also is a narrow wedge-shaped core that is not further classified here due to damage. The site has Arctic Small Tool tradition artifacts (noted by Greer 1991 and verified by

Clark), though most artifacts from this probable multicomponent site are not typologically distinctive of to the ASTt (collection at CMC). The core tablet is of especial interest inasmuch as such tablets are not common to ASTt assemblages, Engigstciak possibly excepted.

NgVm-4

The site, first reported by MacNeish, is on the Firth River below Blowhole Canyon. According to L. Burns, microblades are present.

NfVi-6 (Trout or Trail River/Barn Mountains)

A microblade core was collected here in 1987. Analysis by Cinq-Mars is in progress.

Engigstciak (NiVk-1)

Eight microblade cores are accounted for in the collections from the Engigstciak site, located on the Yukon coastal plain adjacent to the Firth River. Six of these are of a very nondescript format, one is a well formed miniature tabular or Tuktu core of obsidian, and one is a wedge-shaped core but lacks the Campus-Denali mode of platform preparation and maintenance. The context of most of these cores appears to be the Arctic Small Tool tradition, though one core is attributed by MacNeish to an earlier, Flint Creek, context. The site has produced a reasonably large number of microblades of which 233 were measured in a study supervised by Clark, giving an average width of 5.6 mm and a thickness of 1.47 mm. This width is narrow for an ASTt assemblage.

NeVc-2

The site is on Rapid Creek, 7 km east of its confluence with the Blow River, Arctic Slope. Blades and blade cores are reported, but no microblades (Gordon 1974:79).

NeVc-12

R. Le Blanc reported a microblade from this Rapid Creek site (Le Blanc 1994b).

NeVd-1

This site is located on the north coastal plain 25 km south of the Shingle Point Radar station. R. Le Blanc collected a classic Campus-type core tablet here in 1985 along with a small number of less diagnostic artifacts (catalogue, collection examined at CMC). CHIN Archaeological Sites Database reports the collection as a Tutu-type core, quartzite cobble core, and cobble spall.

Northern and Central Interior British Columbia

Data given here for British Columbia have been drawn from published literature and are less complete than the comprehensive listing of Yukon sites. We believe that they present an adequate sample to indicate the types of microblade cores present in the region. Coastal cores of British Columbia, which have been found in an increasing number of sites are excluded from consideration (cf. Carlson and Dalla Bona ed. 1996). The rationale for this is the supposition that a different branches of northern microblade core technology are represented, but there likely is some overlap between coastal and interior core lines in southern interior regions of the Northwest.

Muncho Lake

Muncho Lake is located along the Alaska Highway in northern British Columbia. Sites there with microblades date to middle Holocene time (T. Loy oral communication to D. Clark).

Callison site (IfSh-1, published as IeSh-1)

This site also is located along the Alaska Highway in northernmost British Columbia between the Racing and Toad rivers. The site was surface collected by F. Johnson, and later by MacNeish who made minor excavations in 1957 (MacNeish 1960). The collection consists of abundant side scrapers (retouched flakes), various styles of end scrapers, and macroblades (good examples present), concave-based points of both plain and side-notched types (one each plus unclassifiable fragments), ovoid and rectangular-based bifaces including numerous "crude core choppers" or "quarry blanks" and, from the surface collections, a wedge-shaped microblade core. *Tci-thos* and burins are absent and there are no unequivocal microblades though MacNeish claimed otherwise. MacNeish concludes (1960:46) that Callison belongs with the Taye Lake phase of the southern Yukon. That assessment was made before the Northern Archaic tradition had been defined and before the Taye Lake phase, which was placed therein, was redefined to exclude microblades from its inventory. MacNeish (1960:48) also saw a relationship between Callison and the N.T. Docks complex and Natalkuz Lake in central British Columbia (Borden 1952) and proposed that these sites represented the recent end of the Northwest Microblade tradition. We agree with MacNeish that an age in the range of between 2500 and 4000 years ago is possible for these sites. The Callison site is enigmatic for its good representation of macroblades in what appears to be a Northern Archaic component. There is no assurance that the unprovenienced microblade core belongs with this component.

Mt. Edziza Area

The microblade industry in the Stikeen River drainage is best represented at the Grizzly Run site HiTp-63 excavated by K. Fladmark in 1981 (Fladmark 1985). Microblades and cores also were recovered from the Wet Creek site (HiTp-1) and cores from five additional sites in 1981 for a total of 11 microblade cores or fragments, 158 microblades and 13 primary spalls. Additional cores were found elsewhere in the Mt. Edziza region at IaTq-1 during earlier excavations by Jason Smith in 1969 and 1970 (Smith 1971).

The complexly stratified Grizzly Run site has more than one cultural component. The older component radiocarbon dated to 4870±120 BP contained the microblade and core industry. This date is generally supported by the tephra chronology of the area. This lower assemblage is dominated by microblades but there also are many biface fragments – probably preforms, and some flake cores. Burins and, for the most part, macroblades are absent from this and other assemblages from the area.

Fladmark (1985:155) considers the component to be workshop residue from the preparation of bifaces and microblades. Many notched points and lanceolate points, some reminiscent of Palaeoindian spear heads, also were recovered from the Grizzly Run site but they belong to a younger component, lacking microblades, dated to about 4000 years ago.

The largest microblade sample from a single site, 39 specimens, has an average width of 6.1 mm while the total measurable collection is close at 5.99 mm (Fladmark 1985:Table 6). Most of the microblade cores recovered by Fladmark are of a distinctive Ice Mountain type which clearly differs from Campus and other wedge-shaped cores, from tabular Tuktu cores, and from cylindrical and conical cores.

One core collected earlier and described by Smith is of the Ice Mountain type, though it was produced on a finer biface blank than those recovered by Fladmark (Smith 1971:Fig. 7, core 137). Another core (Smith 1971:Fig. 6, core 189), which is a proximal or platform portion fragment, is described as a cylindrical core with an unprepared platform. There also are two variants of wedge-shaped cores (cores 221 and 242). The more distinctive specimen has a striking platform at either end (top and bottom) and microblades were produced in two directions, from one platform and then from the other. Neither of these cores appears to be similar to Campus cores. Obsidian hydration measurements suggest an age of about 5000 years, using a 1.4 microns squared hydration rate (Smith 1971:201, Fig. 2).

Kitselas Canyon, Skeena River (Paul Mason Site)

The microblade industry in the Bornite phase is dated to 5050±40 BP (Coupland 1996). Although microblades are common, cores are represented only by fragments or rejuvenation flakes. The average width of the microblades is 5.9 mm for unmodified specimens and 6.5 mm for ones thought to have been utilized. It is doubtful that this industry is based on Campus-Denali cores. It very likely is an inland expression of a coastal microblade technology according to Coupland.

Pink Mountain Area, Northern British Columbia (HrRr-1)

The site is located at the very head of the Beatton River, northeastern British Columbia. A microblade core from HrRr-1 is best described in Wilson's words as roughly cube-shaped with a battered and irregular striking platform (Wilson 1996:29 and Fig.4d). The presence of 10 microblade scars around two sides of the core move it somewhat out of the tabular core class. There also is a small fragment of a conical or prismatic core.

Charlie Lake Cave

In the early 1980s a single microblade was found in Zone III (Components 3,4,5), dated between 8500 and 4500 BP Driver et al 1996: Table I). During further excavations in 1991 a microblade core was found in Component Subzone IIIa dated to about 9500 BP (Driver et al. 1996:272

and Fig. 8). The core may come within the range of variation of the Campus type though, as the authors state, it "presents some problems of interpretation."

Plateau Microblade Tradition: Natalkuz Lake (FiSi-19), Central BC and Southward

Microblades and cores are reported from many central and southern interior British Columbia sites. In most cases, as with the Ulkatcho and Natalkuz Lake examples, associations and dating are not firm. Although some of these cores, and especially ones from southern British Columbia, actually have a wedge shape (see examples in Sanger 1968b, also Donahue 1975) their mode of platform preparation distinguishes them from Campus cores. Sanger (1968b:114) proposes a Plateau Microblade tradition with the following characteristics:

1. Cores utilize a weathered surface for a striking platform, usually unmodified.
2. Multiple blow striking platform preparation is scarce.
3. Core rejuvenation tablets are not known
4. The technique of preparing the fluted surface (prior to microblade removal) had not been determined, but ridged flakes apparently were absent from microblade core debitage.

x. Other characteristics noted by Sanger are not seen relevant to the present analysis.

Cores of the Plateau Microblade tradition are different from Campus cores and tabular Tuktu cores of the north. They differ also from some of the cylindrical, conical and roughly pyramidal cores found in some coastal and interior sites while showing similarity to other coastal cores.

Findings from the pioneering survey by Charles E. Borden in 1950-1952 include a polyhedral microblade core and microblades from hearth deposits of a Natalkuz Lake house pit (Borden 1952). The hearth was radiocarbon dated at 2415$\pm$160 BP but some researchers consider the date to be anomalously young and they suspect the association of the core with the hearth. The exhausted core may be of a wedge-shaped variety, though we are not certain of that. Sanger (1969:98) describes the platform as being an old weathered surface partially modified by the detachment of small flakes. Associated artifacts included leaf-shaped points and knives, corner notched points, and boulder spalls.

A core from another central BC site, **FlSa-3** (Sanger 1968b:Fig. 5) better fits the technological requirements of a wedge-shaped core with flaked platform though in front profile it is not a wedge.

Ulkatcho Lake

Ulkatcho Lake is located south of Natalkuz Lake. One exhausted microblade core and five microblades were recovered from mixed deposits at the multicomponent site. The core is not classifiable on the basis of the published description and photograph (Donahue 1973).

Northwest Territories

Pointed Mountain (JcRx-3, first published as NWT 42)

This site, initially excavated by R.S. MacNeish in 1952, is located at Fisherman Lake in the southwestern corner of the District of Mackenzie. A significant amount of microblade material, including cores, was recovered. Pointed Mountain was one of the principal sites used to define the Northwest Microblade tradition. MacNeish estimated that a single microblade-producing occupation occurred at the site sometime between 5000 and 8000 years in age (1954:237). He stated that although artifacts came from various (secondary) soil horizons they originated from a single soil layer associated with a hearth. A radiocarbon date of 320 BC$\pm$75 years was obtained on charcoal from the hearth. However, subsequent work at the site has produced earlier dates that may apply to the microblade industry as well as to an antecedent occupation.

Pointed Mountain emerges from the comparisons with other regions as one of the most interesting microblade sites to be found east of the Rocky Mountains. Collections at the CMC, which are incomplete, contain cores of a narrow intergrading microblade core/burin format. Such cores, sometimes identified as burin spall cores, also are found in the Yukon, as at the Kelly Creek site, and Alaska. Specimen 277.3 appears to be a spent tabular (Tuktu) core. A third core type that is neither Tuktu nor Campus is represented by specimen 176.12. It is oval in cross section, lacks the Campus mode of platform preparation, tapers very little, and might best be described as semi-cylindrical in shape. There also are several Campus-type wedge-shaped cores. For these there was little preparation of the blank, but the definitive features of the type, including the Campus style of platform preparation and rejuvenation are present. Some of the Pointed Mountain cores are especially large – giants in terms of the minuscule wedge-shaped cores recovered from many sites. The one recognized core tablet in the collection also comes form a large wedge-shaped core. However, occasional 6-cm-long microblades found across the Western Subarctic indicate that at many sites microblade production started from large cores. Microblade flutes on these cores tend to be wide. The microblades from Pointed Mountain were not available for examination but an analysis of MacNeish's original collection reported by C. Holmes (1971:387) cites a width of 7.3 mm based on the measurement of 80 microblades.

MacNeish reported the following collection from his initial excavation (Clark's annotations in brackets, based on reexamination of the collections at the CMC):

67 flake cores
8 microblade cores [with cores later excavated by Millar there now are 7 cores and a core tablet]
251 microblades and small blades, 2 mm to 20 mm wide [includes 27 triangular flakes and a modest number of flake tools. A later study found 80 measurable microblades]
27 pieces used as gravers, subgrouped as follows—
    9 beaked lamellar flakes [not microblades]

5 microgouges
3 Microburins [not microblades, identification of burin facets questionable]
2 corner burins [good burins, flakes with burin facets along one side. Later, MacNeish refers to burins on flakes as Fort Liard burins]
2 angle burin [one made on a roughly prepared blank, one is a snapped flake]
4 lamellar flake drills and graver

10 projectile points [only 1 complete]
2 contracting stem, shouldered points, rounded base
2 elongate side-notched points [fragments, identification dubious]
x [not described, evidently minor tip fragments]

129 scrapers [most of them not examined, count probably is optimistic]
end scrapers:
8 large planoconvex end scrapers [these are fragments of chert nodules]
2 peaked end scrapers [the peak is a high back, basically same as preceding variety]
4 large snub-nosed end scrapers, may be teardrop shaped
8 small triangular steep sided end scrapers
11 keeled end scrapers [flake blank has dorsal ridge and may be a bladelike flake]

1 flat end scraper [thin, sharp edge with fine retouch]
95 side scrapers:
single and double edged flake side scraper, on thick and thin flakes, large and small formats

32 biface tools
12 ovoid bifaces [10 are fragments, the whole specimens are 98 and 46 mm long]
2 square-based biface blades [fragments, one is basally thinned]
x choppers, thick and rough, some may be quarry blanks or flake cores

c 2300 flakes

The question of the age of the microblade industry at JcRx-2 has not been resolved. Later work on the site by J.F. Millar has resulted in a number of radiocarbon dates for the Pointed Mountain complex ranging from AD 1415 to 2035 BC (uncalibrated) but Millar (1981) gives an earlier age estimate. Dates apparently for the antecedent Nakah phase of the Northern Plano tradition range from 4600 BC to 1790 BC$\pm$110 years. It is probable that the duration of the microblade culture at Pointed Mountain is bracketed by the suite of dates from 2035 BC to 180 BC, although Millar (1981:272) sets the time bracket at 4000 BC to 2200 BC. Elsewhere, Millar and Fedirchuk (1975:11) date the encompassing Northwest Microblade tradition at Fisherman Lake from 3635 BC to 500 BC but state that microblade technology became much less important after about 2000 BC. Millar has summarized portions of the Fisherman Lake sequence (1981:272) and demonstrates similarity between Akmak of the Palaeo-Arctic tradition in northwestern Alaska and Pointed Mountain in the Mackenzie, though Pointed mountain is much later than Akmak. He suggests that Pointed Mountain is an amalgam of Akmak artifact types with the addition of projectile points, gravers and drills. His overall assessment then leads to the conclusion that the late phase of the Northwest Microblade tradition, essentially the tradition as defined by MacNeish, appears in the southern Yukon and District of Mackenzie later than does the early (Denali) phase of this tradition in Alaska, and with the addition of notched and other projectile points and certain other implements.

Millar's 1981 article illustrates a richness of artifacts from JcRx-2 not found in MacNeish's original (1954) report and draws attention to an antecedent Nakah phase, thought to be of Northern Plano affiliation. Present at Pointed Mountain are side-notched points in various formats, lanceolate and leafshaped points and knives in several styles, ovoid and round based symmetrical bifaces, Archaic-style drills, burins including a transverse notched burin, a grooved abrader, and a graver spur. The site and its interpretation is discussed further by Morrison (1987).

Julian Site (JcRw-13)

This site, like Pointed Mountain, is located near Fisherman Lake in the southwest Mackenzie District. Materials excavated by G. Fedirchuk (1975) were assigned to the Northwest Microblade tradition but we suggest the site is technologically subsequent to the Northwest Microblade. Rough or preliminary stone work found in the Julian assemblage and also in Pointed Mountain, utilizing local chert river cobbles, has been given the term Julian technology (Millar 1968, Fedirchuk 1975, Morrison 1984). Projectiles include side-notched points similar to ones from Pointed Mountain. Although microblades and polyhedral blade cores (and microblade cores) are reported from the Julian site, examination of the collections by Morrison (1984) casts doubt on the existence of microblade technology there. Morrison reports that although burins are present in the Julian complex, these are not of the notched or Donnelly burin type. Radiocarbon dates are inconsistent (Morrison 1994: Table 4) and it would be hazardous to assign any particular date to the Julian site. Morrison finds that Julian is broadly similar to the Northern Archaic Taye Lake phase of the southern Yukon. While there may be continuity from Pointed Mountain to Julian, technological differences suggest that the latter no longer should be considered as part of the Northwest Microblade tradition.

JlRq-1

Blades and microblades, along with other artifacts of a camp assemblage, are reported for this Sibbeston Lake site investigated by K. Dice and L. Konotopetz in 1972 (CHIN Archaeological Sites Database). There are two radiocarbon dates: 2225±170 BP (S-691) and 2265±385 BP (S-703). Millar interprets the assemblage as transitional between middle and late period in the western Mackenzie (Wilmeth 1978:42). We were able to locate two microblades (one poor) and an elongate ridged flake in the collection at the CMC, thus the site has a minimal claim to microblades.

Esker Bay Site Fish Lake (KgRi-11)

The site is located on a small tributary of the Mackenzie River at the east side of the Mackenzie valley. It was excavated by Tim Losey assisted by Conaty and Slater (Losey, Conaty and Slater 1978). The modest assemblage includes a microblade industry of 37 microblades and a wedge-shaped core according to Morrison's reanalysis (1987:Table 2). Microblades were found both above and below the White River ash, but above-ash recovery probably is due to soil disturbances. The core (470) is atypical of the wedge-shaped format, but it is only 19 mm high and obviously is exhausted. An additional possible core is identified in the catalogue, but it lacks definitive features (493). There also is a fine blade or front from a high very regular core, with three full and two partial facets (595, broken). It is 13.5 mm wide, and more than 32 mm long. The materials is a glassy fused rock, evidently from the Tertiary Hills (Cinq-Mars 1973b).

KlRs-5

This site is a lithic workshop at "Drum" Lake, tested by C. Hanks in 1985. The only distinctive artifacts were microblade segments.

Grass Pass Microblade (KlRs-20)

The quarry workshop site located at Grass Pass near Drum Lake was tested by C. Hanks in 1986. It produced microblades from beneath the White River ash.

LbPq-9

The site at Snare Lake is characterized by tent ring features which probably are late, but two microblades were collected there from among lithic waste (not collected) in 1993 by T. Andrews.

Franklin Tanks Site, NT Docks Complex (LgRk-2, NWT 54)

The site excavated by R. MacNeish is located at the outlet of Great Bear Lake. A small number of microblades along with a moderate-sized assemblage of other artifacts were recovered from the upper or NT Docks component ("NT" is Northern Transportation Company, but never is spelled out in this context). A radiocarbon date of 3560±210 BP, also reported as 4195±200 (S-5) and as 5000±200 BP (S-5 rerun) on peat in the site deposit *may* apply to this component. There is a date of 3480±240 BP (S-8) or 4100 or 4050±200 BP (S-8 rerun) for the underlying Tanks component (Wilmeth 1978:35) which lacks microblade technology. There are similar dates for the nearby Great Bear River site which also lacks microblades (Nolan 1994). Artifacts include a spatulate biface – loosely termed a point – with notches on the lower sides (a point wwith shallow side notches attributed to the NT Docks complex comes from a different site). Other artifacts are microblades and macroblades, a non-diagnostic microblade core fragment, numerous end scrapers of various formats including ones on bladelike flakes, and a large, rough rectangular-based biface (MacNeish 1955). MacNeish compared the Docks complex with the Pointed Mountain complex and Campus site – little else was available then – and suggested that the NT Docks complex dated late within what later came to be called the Northwest Microblade tradition. He also reported that NT Docks had Fort Liard burins and a tabular core (MacNeish 1964:326) but Clark's (1970) examination of the collection does not recognize these artifacts.

Chick Lake (LlTa-1 & LlTa-2)

The site located north of Fort Norman produced a major collection during two years of excavations. However, the collections were lost before a final report was prepared and the only record we have is a manuscript progress report for the first year's collection (Chambers 1974). Chambers proposes that there was occupation by the Northern Plano tradition, Arctic Small Tool tradition, a "Mackenzie Blade complex" (term proposed by B. Gordon in 1974 but not in use today), and a historical component. In our estimation only the ASTt is clearly identified on a typological basis although other phases seem to be present and a burinated point is suggestive of Agate Basin. There are no supporting radiocarbon dates. Macroblades and end-of-blade scrapers came from an eroded area of the site, and were assigned tentatively to the Mackenzie Blade complex. This may be related to others from the western District of Mackenzie and northern Yukon that have yielded macroblades.

Sites around Great Bear Lake

Microblades and associated artifacts have been found at a number of sites around the shores of Great Bear Lake (see also Franklin Tanks site). Clark (1987) has described finds from the northern shores of the lake made during 1972, 1976 and 1979. None is dated. There are in Clark's collections 10 cores for microblades and linear flakes, two of which are attributed to the Arctic Small Tool tradition, 12 core platform tablets (none of them ASTt), and 137 microblades only two of which clearly belong to the ASTt. Later surveys at Great Bear Lake do not report any microblade industry (see Hanks 1996, Toews and Pickard 1997).

The constellation of wedge-shaped core types familiar to researchers of Alaska and Yukon prehistory is absent at Great Bear Lake with the exception of one exhausted, apparent Denali core that was clearly part of an Arctic Small Tool tradition assemblage, though heretofore this type has not been attributed to the ASTt. A number of cores, of varied format, are described below. Several of them have broad, nearly circular, retouched platforms, and there is evidence of platform rejuvenation through the detachment of flakes and tablets, though otherwise these cores have been shaped only minimally.

Core MfRd-4:4 is a conoidal object. Flakes have been removed from all around the perimeter of the core but many of the flake scars are short, less than 12 mm long. The platform is a convex flake surface, trimmed at one end to remove a high area. While this specimen does not strike us as being a functional microblade core, it was found with microblades and microblade cores of a different format. This form is uncommon for a microblade core.

A number of poorly formalized roughly conical cores will not be described here as it is difficult to visualize them from verbal descriptions. Such cores, which may be for bladelets that are not true microblades, are widely distributed in the Western District of Mackenzie and in northern Alberta, as at the Peace Point site (Stevenson 1986).

From MdPs-26 there is a pair of cuboid to subconical blocks of stone that by themselves fail to display any regular fluted face indicative of microblade removal. However, reassembly with platform tablets, one for each core, brings remnants of fluted surfaces to the cores. A small number of microblades also was found with the cores. A transverse notched burin was found on the surface many metres from the cores.

MdRj-5.7 has a broad curved face, but lacks formalized preparation of any keel, dorsum and lateral surface. It might be considered to be an unformalized variant of a tabular (Tuktu) core. This example is assigned tentatively to the Arctic Small Tool tradition. More or less similar cores from Alaska (that are not ASTt) are simply pebbles with a prepared platform from which microblades have been removed on one face.

Microblade collections from additional Great Bear Lake sites are listed in Table 4.1 (MdPr-6, MdPr-3, MdPs-5, MdPs-25, MeRe-1a). Great Bear Lake microblades tend to be wide. The MfRd-4 sample of 37 averages 6.9 mm wide and 15 microblades from MdPs-5 average 7.1 mm. For the two lots there are 21 specimens with a single arris and 30 with two or more arrises.

Horton Lake (MiRi-2)

Cores of three formats were recovered from a single Horton Lake site, MiRi-2 (Clark 1975). One (MiRi-2:65) is a very narrow (thin) specimen that evidently is a wedge-shaped core with bifacial preparation of the edges, but observations are somewhat clouded due to exfoliation and weathering. One side of the core has split away completely, thus its present width of only 11 mm, compared with a height of 44 mm, could be far short of the original dimension. The diagnostic front area of the platform is missing, probably due to natural fracturing of the weathered stone.

The second core has a shape between a cylinder and a cube, with a 90-degree platform angle, and measures 32 mm square. Shaping of the core appears to have been minimal. Late modification removed most of the broad fluted face although traces of several flute scars remain. The platform angle was near 90 degrees.

The third core, MiRi-2:151 (Clark 1975:Pl. 19 F-I) is formally a wedge-shaped core but it has a plain, unretouched platform formed by a single flake surface. The platform is proportionately very wide at 35 mm compared with the height of 37.5 mm, and the size of the last bladette removals is between that of blades and microblades. The residual core has the appearance of a spent macroblade core, but restoration through the addition of two face flakes, found a few feet from the core, changes the broad facets of the fluted face into microblade facets. The back and lateral faces are roughly flaked in a manner common to wedge-shaped cores, but the flutes now extend around the sides of the core and eradicate most evidence of its original form and preparation. The fluted end is highly raked with a platform angle of 55 to 60 degrees. It is similar to a small blade core from site NcVc-2 in the northern Yukon.

Associated artifacts include 106 microblades, a narrow copper *ulu* blade, two large side-notched spear heads or knives, generalized large coarse leafshaped bifaces, macroblades, several end scrapers some of which are tiny, and one *pièce esquillée* (wedge). Of the 58 measured microblades, 14 have single arrises. The average width of all microblades is 7.23 mm. The native copper knife may date to the second millennium AD, judging from the age of most native copper tools elsewhere in the North. One of the spear heads is made from fused stone that comes from the Tertiary Hills near Fort Norman (Cinq-Mars 1973b). A number tools are made from fine chert characteristic of Arctic Small Tool tradition usage. Tiny end scrapers also may be indicative of the ASTt but no definitive ASTt artifacts were recovered from MiRi-2.

Collections from three additional Horton Lake sites are listed in Table 4.2 (MiRh-1, MiRh-3, MiRi-4). Although 14 and 9 specimens were collected from MikRh-1 and MiRh-3 respectively, many are poorly formed or marginal and the measurements in Table 4.2 are from only a few specimens (Clark 1975).

Colville Lake (MgRr-1)

Six microblade cores were found in a blowout at MgRr-1(Clark 1975). None of the cores is of typical wedge-shaped (Campus or otherwise) or tabular (Tuktu) format.

MgRr-1:50 is a complete sub-conical quartzite microblade core, probably exhausted and now only 20.4 mm high (Clark 1975:Pl. 3e).

There are two rectangular blocky microblade cores assembled from fragments and platform tablets. In both the shape and size of the blank block were determined by the natural thickness of the seam of chert and fractures in the stone. MgRr-1:47, a small incomplete specimen, measures 17.5 mm wide and was somewhat more than 33 mm long from front to back . There was a fluted surface at one end. MgRr-1:45-46 was larger, measuring 28 mm wide (Clark 1975:Pl. 3a-d). A distinctive feature of both of these cores is the detachment of platform tablets through blows directed to the side of the core. Blocky cores are known from ASTt sites in Alaska and arctic Canada but they do not feature this technological element. Additional core fragments were recovered.

There also are 47 microblades from the site. For the better-formed specimens, medial segments average 7.3 mm wide, proximal segments 7.8 mm. One microblade is of fused tuff, found near Fort Norman (Cinq-Mars 1973), though there are no cores of this material; 4 microblades are of quartzite, like one of the cores, and the rest match the non-glossy banded chert of the other cores. Many of the 200 flakes collected relate to the production and use of microblade cores. Other than for the microblade and core industry, the only lithic artifacts are two uniface fragments. Most of this material was found within an 2.2 by 7 m zone, though the quartzite core and some of the flakes were found outside that cluster. Deflation of the blowout could have altered the shape of the distribution, but it is evident that MgRi-1 is purely a workshop for microblade production and not a campsite. Other sites in the vicinity were small camps of ASTt people, as indicated by the recovery of burins of ASTt type. MgRr-1 may also be an Arctic Small Tool tradition site.

Whirl Lake (MjTp-1)

Whirl Lake is located in the western Mackenzie District adjacent to the head of the Mackenzie Delta. An area of 60 square metres was excavated, though not all units contained the lower level component. The undated Lower horizon produced a microblade industry along with a few lithic implements. The artifacts include blades, microblades, a possible microblade core fragment, end scrapers, well-prepared projectile points, and fragments of biface and uniface knives, for a total of just under 40 implements exclusive of microblades. Burins are absent except for a possible burin on a biface fragment (Gordon and Savage 1973). No notched points were recovered. End scrapers (N=12) are the most numerous implement. The assemblage is notable for the presence of both microblades and large blades. The core is a non-diagnostic fragmentary tablet of black chert, lacking the platform area, from which bladelets evidently were peeled off two sides. Twenty-nine microblades, all but the most irregular specimens, were measured by Clark to give an average width of 8.33 mm, ranging from 5.4 mm to 13.6 mm with eight specimens exceeding 10 mm. Gordon (Gordon and Savage 1973) suggests that Whirl Lake is related to N.T. Docks component of the Franklin Tanks site.

Anderson Plain, NbTj-3

Many sites in the area of the Anderson Plain, situated between the Anderson River and the Mackenzie River, belong to the Arctic Small Tool tradition, and some of these have microblades in small numbers (NbTj-9, NbTj-17, MlTk-2, summarized in Pilon 1994 but without microblade statistics). An additional microblade-producing culture evidently also is present in the area, as found at Whirl Lake, a short distance west of the Anderson Plain, and at the Modeste site. In 1987 and 1988 J-L.Pilon recovered microblades and considerable lithic debitage that apparently does not belong to the ASTt from NbTj-3 (Modeste site) (Pilon 1991). The collection includes both linear flakes, or blades if that term is liberally construed, and microblades (Pilon 1991:Fig. 16). The smaller specimens illustrated are about 7.5 mm wide, the blade-like flakes between 10 and 20 mm wide

NkTj-1

The site is located along the McKinley palaeo-channel on the Tuktoyaktuk Peninsula. During work on the site in 1986 and 1987 Le Blanc (1991) found microblades, microblade core tablets, one possibly from a wedge-shaped core, and burins on flakes and a transverse burin (Le Blanc 1991). A side-notched point, part of a lanceolate point, and *piecès esquillées* also were recovered. The site has not been dated. Le Blanc suggests that it pertains either to the Northwest Microblade or the Northern Archaic tradition. The collection was not available for examination at the CMC.

NkTj-8

This site is located 2 km south of NkTj-1. Le Blanc (1994:208) characterizes it as a Northwest Microblade surface scatter. One rectangular blocky core, probably for microblade production, is present in the collection. There also is a very broad, short, side-notched point.

NkTm-8

The site is located south of Hutchison Bay. Visits by Le Blanc, Sutherland and Swayze in the late 1980s, 1991 and 1993 have resulted in a small collection of microblades, microblade cores, a side-notched point and bifaces. As reported by Le Blanc (1994a:208) after Sutherland (1991) and personal communications from K. Swayze, the site may be mixed ASTt and Northern Archaic tradition. Radiocarbon dates on buried caribou bone are 5360±140 BP and 6650±180 BP (uncalibrated, see Nolin 1994), but no distinctive artifacts are associated with the dated samples.

ObRv-21

This site on the Old Horton River Channel of the Arctic Coast is reported by Le Blanc (1991) to have a classic Campus-type wedge-shaped core together with other flake and blade cores and large bifaces. The assemblage also offers evidence of a macroblade industry. It was not available for examination at the CMC.

Qugyuk (ObRw-1)

This multicomponent site, located on the Bathurst Peninsula at Harrowby Bay, was discovered by R. McGhee in 1982, briefly tested by him in 1984, and excavated by Le Blanc in 1992 (Le Blanc 1994a). Because of cryoturbation, Inuit, Arctic Small Tool tradition and Northwest Microblade tradition occupations are separated primarily on the basis of typology. Evidence for early occupation also is supported by radiocarbon dates on caribou bones of 3100 BC-2050 BC (calibrated range limits) (Le Blanc 1994a:Table 2). There also is a date of 5230+200 BP on a bison bone without artifact associations that came from a slumped block during early exploration of the site. Microblade technology is represented by microblade cores, core tablets and microblades. The two microblade cores are fragmentary and lack further characterization but Le Blanc suggests that one fragment represents the keel portion of a wedge-shaped core. We concur that they must be poorly characterized as we failed to recognize them during a quick examination of the collection. Among the six burins are two of the notched transverse type. Le Blanc suggests that the majority of the lithis from the Qygyuk site relate to the Northwest Microblade tradition as their workmanship is not typical of the ASTt.

Other Sites

At JlRu-1 (Little Doctor Lake) J.V. Millar reportedly found a fragment of a microblade core in 1967 but it is not in the CMC or NWT repositories.

At KkRl-1 (across from confluence of Johnson River with the Mackenzie) J.V. Millar reportedly collected a quartzite microblade core in 1973 but it is not in the CMC or NWT repositories.

A microblade is reported from MfTf-4 at Big Creek, collected in 1975 by S. Van Dyke.

Millar and Fedirchuk report two microblade segments collected from the surface at a Hudson's Bay Company (Northern Stores) property at Fort Norman under the designation LfRq-6 and illustrate one of them (1975:194, Plate 134). Testing failed to find a subsurface component. There has been a change in site designation, and CHIN records for LfRq-6 no longer apply to this site. This is the only microblade find reported for the Mackenzie River Archaeological Survey in 1973.

Alberta

This section is limited to a small sample gleaned from published accounts.

Peace Point

There are published references to microblade cores from this site. The cores are semi-formalized cores, evidently for small blade-like flakes (Stevenson 1986). They are not microblade cores, and even if liberally interpreted as such, they are not wedge-shaped cores. But the people at Peace Point may have been producing a flake equivalent to microblades. Reports of Peace Point-type microblade cores from other sites are interpreted accordingly.

Bezya Site (HhOv-73)

Bezya is primarily a microblade and core production workshop, excavated in 1982 and 1983 (Le Blanc and Ives 1986). Located north of Fort McMurray, it is the most easterly site of northern interior microblade technology. The cores, a variant of Denali technology, have been analysed by Le Blanc and have been compared with Kelly Creek further in Chapter 3. Flake burins also link this site to assemblages to the northwest. A radiocarbon date of 3990±170 BP is thought to apply to the microblade industry. Le Blanc and Ives discuss the appropriateness of using the "technocomplex" construct to place Bezya in context with microblade traditions of northwestern North America and conclude: "In spite of the unresolved problem [of culture taxonomy], there is still good reason to believe that the evidence of microblade technology from the Bezya site places it within this technocomplex as an extreme eastward expansion of the Northwest Microblade tradition. As such it is perhaps ultimately related to the Pointed Mountain Complex of Fisherman Lake (Millar 1981) and perhaps the Little Arm phase in the Southwestern Yukon (Workman 1978) ...all three appear to overlap in time approximately 4000-4500 years ago" (Le Blanc and Ives 1986:89).

High River

The High River collection (Sanger 1968) includes 62 microblades and several primary and secondary ridged flakes and spalls from the preparation of microblade cores. Similar ridged flakes come from shaping wedge-shaped cores. Three cores also have been collected from the vicinity of High River (Le Blanc and Ives 1986 citing personal communication from M. Wilson). Other artifacts found in the area circumstantially associate these cores with Palaeoindian occupations. Two of the cores are described in terms that suggest they may be Campus cores: "...two cores are very similar to the Bezya examples. Both are also wedge-shaped and have bifacial ridges and striking platforms which have been prepared by means of longitudinal burin blows to the fluted element, just below the striking platform-fluted element margin" (Le Blanc and Ives 1986:86).

Fort Vermilion (IcQa-11)

This is a very good wedge-shaped core found in a plowed field at a multicomponent site complex at Gull Lake (Pyszczyk 1991). No closely associated artifacts are reported.

Vermilion Lakes (EhPv-8)

Fedje et al. (1995:97 & Fig. 11e) describe and illustrate a small backed biface from an early Holocene Vermilion Lakes component that may have been used secondarily as a microblade core. We are not convinced, from examination of the illustration, that the object with three 1-cm-long bladelet flutes similar to burin strokes actually is a microblade core. The blank, though, is a narrow tabular piece suggestive of the Charlie Lake Cave core.

Summary of Distribution Patterns of Microblade Core Types

Age

The temporal distribution of microblade industries is a major basis for tracing their relationships. We have noted dates in the discussion of individual sites. Unfortunately, many sites lack close age estimates, and the applicability of radiocarbon dates from other sites often is in question. Ages and dates given here are in uncalibrated radiocarbon years.

Yukon Sites

Annie Lake. Between 7160±70 BP and 6320±70 BP.

KaVn-2 (Beaver Creek area). There is a 7810±80 BP horizon at the site lacking microblades.

Little Arm. Level 4, 3220±140 (1270 BC). Said to be Gladstone phase under MacNeish's early seriation. Microblades and cores occur in Level 5, the main Little Arm phase component, but part of Level 4 also had microblades and cores. It is not established whether the sample dated is correlated with microblades.

JeVc-20 (near Champagne). 7030±60 BP. Microblades also occurred with a notched point in an undated later component.

JcVb-15 (near Mendenhall River). 2640±40 BP and 3480±70 BP from disturbed areas, thus association with the microblades is uncertain.

Canyon Creek. A basal component dated to 7200 BP lacks microblades but the assemblage is very small. Three dates on wood (MacNeish 1964:Table 6) are attributed by MacNeish to the Taye Lake phase (Northern Archaic). They are 1520±300 BC, 1770±300 BC and 2780±320 BC (3470, 3720 and 4730 BP). The earlier date appears to be peculiar if no microblades are present.

Otter Falls JgVf-2. 4570±150 BP (4590 BP with C-13 correction). The context and association are secure.

Carmacks KaVa-3. 5890±40 BP.

Kelly Creek KbTx-2. 1340±360 BP; date not accepted (Chapter 2 here).

Moosehide. 5625±80 BP.

Bluefish Caves. Definitely older than 10 000 BP and probably older than 11 000 BP.

Rock River MfVa-9. 7580±420 BP, 7160±60 BP. The association between dates and wedge-shaped microblade core found on the surface is tenuous.

Trout Lake, northern Yukon. No microblades were recovered from this site but the dates are of interest as they are within the time range of microblades elsewhere: 4590±110 BP, 5380 ±125 BP, and 5490±125 (Wilmeth 1978:9). The associated assemblage has been discussed by Gordon (1970) and by Greer (1991) and includes a microblade core.

Mackenzie District Sites

Pointed Mountain JcRx-3. 2270±75 (320 BC) on a hearth excavated by MacNeish should be reliable. Later work has produced a suite of dates of about this age and earlier (Millar 1981). The microblade industry probably dates between 2200 BP and 4200 BP.

Franklin Tanks site LgRk-2. NT Docks component age is estimated by MacNeish (1955) on the basis of a date on buried humic soil of 3560±210 BP (S5) and 5000±200 BP (S5 rerun) but the underlying Tanks component which lacks microblades has a date of 3480±240 (S8) and 4100±200 BP (S8 rerun). The rerun dates are patently dubious. MacNeish suggest that S8 is material displaced from the NT Docks component. The nearby Great Bear River site lacks microblades but has six dates on caribou bone and wood ranging from 3250±300 BP (S10) to 4804±200 BP (S10 rerun), including two AMS dates of approximately 3900 BP and 4200 BP (Nolin 1991). All the Great Bear River site dates are for a pit feature and do not necessarily apply to either the main period of use on the site or to the ASTt component found there. We agree with MacNeish (1955) that the Docks component probably is younger than the Great Bear River site; i.e., younger than 4000 years BP.

Qugyuk ObRw-1 (Arctic Coast). 4280±90 BP and 5230±200 BP dates might apply to a "Northwest Microblade" component.

Others

Grizzly Run, Mt Edziza. 4820±120 BP
Paul Mason, Kitselas Canyon. 5050±40 BP
Charlie Lake Cave. *circa* 9000 BP
Natalkuz Lake, B.C. 2415±60 BP, application to the date to microblades has been questioned.
Bezya, Alberta. 3990±70 BP

These dates provide reasonable indication that microblades were being made in the Yukon from about 7000 years ago to 4500 years ago or about 2500 BC, exclusive of the Arctic Small Tool tradition which likely was plying this technology for some centuries after 2000 BC. They may have been used substantially earlier at some localities, and that is especially the case for the Bluefish Caves and vicinity. There also are microblade industries possibly younger than that. Hare and Hammer (1997) have expressed the view that that numerous relatively young dates from microblade sites in the Yukon cannot all be dismissed. For the western District of Mackenzie, microblade production appears to have been a couple millennia later, though presently there are few solid dates to anchor this technology in time. Dates for Alberta and British Columbia are highly scattered, from very early to very recent times. Probably more than one historical tradition of microblade production is represented there.

Geographical Distribution

The distribution of microblades in the Yukon has been covered in the preceding site data list. Essentially, microblade cores, especially the Campus type of wedge-shaped core, are ubiquitous, although there are subareas where microblade technology is weakly represented. Examination of the distribution of microblade industries beyond the Yukon, eastward and southward, provides a better perspective of what was occurring in the north. Morlan published a major study of wedge-shaped cores in 1970. His definition of wedge-shaped core was sufficiently broad and flexible that it included also cores of the Denbigh Flint complex or Arctic Small Tool tradition, Anangula (though earlier we noted Anangula cores in a different category, many also are wedge shaped), and the Lehman complex of southern interior British Columbia, as well as Campus or Denali cores of the interior region. At that time most of the microblade cores now known from coastal regions and interior British Columbia had yet to be recovered. Nevertheless, Morlan was able to distinguish, statistically, cores of the Arctic Small Tool tradition, a cohesive interior Alaska-Yukon group (Campus type), Lehman cores, and the single coastal representative, Anangula cores.

Magne (1996) has done a statistical analysis of recently recovered coastal cores from British Columbia, in search of historical patterns, thus extending Morlan's work. He found that most coastal cores and Lehman cores as well as Hat Creek (a southern BC interior assemblage not in Morlan's study) were produced in the P1 (platform shaped first) mode, while all interior cores, and also Anangula cores, were produced by the F1 (face first) technique. We believe, though, that Magne would have found a mix of cores of the two techniques if his study had included cores from such Southeast Alaska sites as Ground Hog Bay and Hidden Falls where there are wedge-shaped cores somewhat like Campus cores.

At one time Cook (1975:129) proposed that Denali (Campus) cores were associated with the origins of Athapaskan culture. By far the majority of early Denali cores have come from the area regarded by linguists as the proto-Athapaskan homeland, and to some measure those found outside this area are relatively late. But to trace ethnicity or language family 11 000 years or longer into the past through a single artifact type is daringly perilous.

In North America the Campus core is confined to the Yukon and Alaska with the exception of an extension to the southwestern District of Mackenzie where it is found at Pointed Mountain. This core also occurs to a minor degree near the arctic coast a short distance east of the Mackenzie River. For the rest of the Mackenzie valley, British Columbia and at several localities in Alberta, there are microblade cores of various formats, including some wedge-shaped cores, but none is quite right for a Campus-Denali core, excepting some northern British Columbia cores.

Microblade technology is early in the south and has a Pacific coastal origin, distinct form the slightly antecedent interior microblade traditions of Alaska and the Yukon though, ultimately, the two are related. In that regard we can recall the hypothesis of two microblade traditions, one Denali, the other largely coastal, as adumbrated by Dixon (1975) and others. Other finds, though, are late but that is a secondary issue. The essential point is that the Palaeo-Arctic and Denali equate to having Campus cores and except for one or two tongues of this technology that spilled eastward across the Cordillera, this technology belongs to an Alaska-Yukon cultural galaxy.

Artifact Patterns and Site Types

We propose here to examine clusters of artifacts or site assemblages for information which may contribute to the identification of site types, such as camps, way stations and workshops for instance. This is of some importance if we are to interpret the significance of both larger and smaller assemblages, of ones with varying proportions of implements, and if we are to assess the possibility of there being sites of microblade people that lack any residual traces of microblade technology. Table 4.1 compares a number of assemblages. These are thought to be relatively pure components, though there is the possibility, or even probability that this is not completely the case. We can see a mix of tool types, differing relative abundance of tools compared with microblades, and also evidence for microblade manufacture or core refurbishment. Some positions in the table are blank because we did not feel confident to modify original reporting categories to extract the requisite information.

All the sites listed in Table 4.1 appear to have been loci of microblade manufacture. They have abundant microblades in relation to other artifact types, and evidence of core refurbishment in the form of platform tablets has been recovered. There also are in these collections, in low frequency, initial spalls, trifaced ridged flakes and gull-wing flakes derived from preparing microblade cores. All sites also have several non-microblade tools which indicate the practice of various manufacturing activities. Points show that the inhabitants possessed and repaired projectiles (most points are fragments). Other activities, probably domestic in nature, are represented by biface knives, notched cobbles, and *tci-tho* hide working slabs. However, the frequency of items that do not form part of the microblade industry differs considerably from site to site. Considering the vagaries of recovery, we place little meaning in small differences but can point to the following possibly significant situations.

- Kelly Creek yielded the greatest number of microblades but the fewest implements. Coincidentally, the number of implements and cores is identical, and there are 50 microblades for each implement.

TABLE 4.1. FREQUENCY OF ARTIFACTS IN SELECTED ASSEMBLAGES

Description	Campus (Mobley)	Pointed Mtn. (MacNeish)	Little Arm[1] (Workman)	Kelly Creek (this report[2])	Dry Creek Comp. II
Microblade cores	42	*c* 6	4	27	37
Core blank/preform				5	24
Core burins[3]	present	present	?	2	8
Microblades	not stated	not stated	405	1368	1772
Microblades measured	604	80	not stated	765	not stated
Rejuvenation flake/tablet	28	1	8?	81[4]	45
Macroblades	6	present	0?	1 scraper	not stated
Lanceolate, leafshaped point or small pointed knife	7	0	2	0	10
Shouldered point	0	2	0	0	0
Notched point	2	2	0	0	0
Biface fragment, small pointed knife or projectile	16	6	5	2	14
Biface, not projectile point	71	14	1	0	23
Flake core	17	present	not counted	1	4
Flakes & shatter	7486	c 2300	not counted	6404	not stated
Donnelly burin	22	2?	present?	7 incl. other	13
Other burin	10	?	12	see above	16
Scraper, short axis transverse, (end scraper)	43	34	7	2	3
Side scraper & convergent scraper	13	82[5]	15	8 may incl. next category	18
Irreg. retouched flake, flake tool, blade-like flake tool	79	13[5]	5	see above	39
Graver spur	1	0	3	0	0?
Microgouges, gravers	na	present (category used in Pt. Mtn. report only)			
Tci-tho tabular slab	4	0	0	2	0?
Boulder flake (spall)	3	0	0	3	0?
Heavy flaked implements & miscellaneous cobble tools	(category used here for Dry Creek only)				47
Hammerstone	3	4	1	1?	3
Anvil stone	0	0	0	0	3
Notched cobble	0	0	1	0	0
Grooved abrader	1	0	0	0	0
Total non-microblade tools	**290**	**159**	**52**	**27**	**189**

1 Level 5 plus a Level 4 core.
2 Excludes specimens found along dirt road
3 Core burins are very narrow Campus-type cores. Mobley discusses the problem of distinguishing between Campus cores and burins (1991:63), with the implication that core burins may be present in the Campus collection. Workman (1978) does not use this type in the analysis of southwest Yukon collections, but one Otter Falls core could be so classified. The Kelly Creek specimens are illustrated in Figure 3.6 a, c. Core burins have been excluded from the total of tools because of their uncertain status or mode of accounting. Here Donnelly burins also include those reported as transverse burins.
4 The total of tablets was enhanced by the recovery of tiny and fragmentary tablets during intensive examination of flake lots for the refitting exercise. A more representative figure to compare with the other sites would be about 60 tablets.
5 Sample may be mainly unmodified flakes.

- Little Arm produced twice as many implements as Kelly Creek but relatively few cores. There are only 8 microblades per implement.

- The number of implements relative to microblade cores increases further at Pointed Mountain, though the data are imprecise due to the manner of classification in the original report by MacNeish and a lack of subsequent publication. There is about one microblade per implement. The number of microblades is not accurately known but it could have been twice the 80 measured specimens.
- The Campus site has the greatest number of implements, as well as the greatest number of nearly all other categories, but to some extent this is due to greater sample size. Here there are 2 measured microblades per implements (Mobley does not indicate separate totals for measured specimens and all microblades). There are 6.9 implements per core, considerably higher than Kelly Creek's one per core.
- While in qualitative terms, all these sites were microblade manufacturing stations, some of them, especially Campus and Pointed Mountain, were also camp sites where families lived at least part of the year over many seasons. These two have relative high frequencies of biface tools, many of them unfinished, and large number of scrapers, both end scraper bits and other varieties. At Little Arm the relatively frequency of scrapers drops, and at Kelly Creek it decreases further. Bifaces of a format customarily termed projectile points are present at all sites but the occurrence of only two points at Kelly Creek is very low compared with the other sites.
- The most striking difference is the lack of bifaces of the large broad format, customarily identified as knives, at Kelly Creek (none) and Little Arm (1 only) in contrast to Pointed Mountain which has 14 such objects and Campus which has 71 of them. If Little Arm, which is somewhat intermediate in makeup, is removed from consideration we see two highly contrastive assemblages: Kelly Creek on the one hand and Campus and Pointed Mountain forming the other. Clearly, Kelly Creek was not the kind of camp that the other two sites were. It was primarily a microblade factory where a modest amount of other work was also done

Dry Creek has not been discussed above as it represents an early period, about 10 600 radiocarbon years ago, while the other sites probably date within the range of 2500 to 5000 BP. Dry Creek does have relatively more projectile points or pointed knives than Kelly Creek and a generally higher proportion of implements to microblades and microblade cores, but the two share a peculiarly weak representation of end (transverse) scrapers. Marked differences in the frequency of microblades found between several activity areas at Dry Creek serves as a cautionary warning for the interpretation of small site assemblages (Powers, Guthrie and Hoffecker 1983).

TABLE 4.2. MICROBLADE SITES OF THE YUKON AND ADJACENT REGIONS OF CANADA

Site	Microblade Cores							Microblades			Blades	Other & Notes
	Wedge-shaped Cores			Tabular or Geometric			Other & Undetermined	Number	Width mm	Thickness mm		
	Campus/ Denali	Campus tablets	Other wedge	Tuktu classic	Tuktu poor	Cuboid, etc						
YUKON												
JcVe-1								4?	6.85	1.15		2 mb measured
JeVi-1	1?&frag							8	5.15	1.75		Notched trans. burin; 2 mb meas.
JeVc-20								38	7.6	1.73	X	See text for details, 33 mb meas.
JeVc-4								7	10.1	2.13	2	Leafshaped points; single arris mbs
JeVd-4								1	9.1	3		Annie L. point, little else
JeVd-13								81	7.5	1.7	X	66% have double arris
JeVb-15								14	6.8	1.7	2	83% of mb have single arris
JeVb-16								1	7.7	2.8		
JeVe-2								3; 2 meas	4.55	1.1		mb have single arris
JeVd-9		X									2	Large campus tablet, burin spall
JeVn-4								X				
JfVg-1							1	3	7.73	1.4		Canyon, Ice Mtn. core
JgVf-2	5	4	1					150	4.4	1.3		Otter Falls; Workman/Cook data
JfVg-3								0				In error as mb site
JfVg-4								1				
JiVm-1				1			1	5	4.8	2.6		Measurements from Workman 1977
JiVm-2								2	7.85	1.63		
JiVr-1	1	X	2	2			5	405	7.2	1.6		Little Arm main layer; Workman 1977
JiVs-1								0				In error for Little Arm
JjVi-2								1	7.1	2.4		
JjVj-3								3 or 2	4.35	1.55	2	2 mb measured
JhVq-1			1	1			2	19	7.15	1.65		Gladstone w/o Le G, Workman data
JhVq-2												Part of Gladstone site
JaUk-1								1	5.8	1.2		Snafu L., little else in collection
JcUj-1								2	7.3	0.8, 1.6	1?	Squanga Lake
JcUr-3								7	7.7	1.6		Annie Lake, 50% single arris
JeUt-1								1				Louise Lake

Site	Microblade Cores							Microblades			Blades	Other & Notes
	Wedge-shaped Cores			Tabular or Geometric			Other & Un-	Number	Width	Thickness		
	Campus	Tablets	Other	Tuktu A	Tuktu B	Cuboid	determined		mm	mm		
JdUt-3								18	7.1	1.6		Fish L. 3 (Main camp), 83% 2 arris
JdUt-4								2 possible				Rejuven. flake not of wedge core
JdUt-5								0				Bonneville Lake
JdUt-8					1...	or 1					X	Fish Lake Quarry
JeUu-1								1	not found			Ibex R. area
JeUv-1								1	11.2	3.1		Ibex R. area
JeUv-25								1	8.6	1.48	7	Ibex R. area
JeUv-36								1	7.3	1.3		Ibex Pass
JeUs-7							1	27	4.7	1.5		Riverdale, 30% single, 55.5 double,
JkUx-5								2	9, 7.3	1.6		Airport Lake
JeUs-28								7 or 8	7.1			Chasa' Chu'a
KbVo-1							1	2	5.1	1.35		Single arris
KbVo-2							1 frag.	1	10.7	3.7		
KcVo-1								1 + 2 bad	9.8	2.1		Red Hill
KdVo-3							1 frag.	1	7.5	3		Single arris
KaVa-1								1, 2 or 3				Nothing else present
JfUt-12							1 frag?	1	7.8	2.1		Five Mile Road, retouched on end
KaVa-3		1						26	6.06	1.44		At Carmacks
KaVa-4								2	8.4,9.7	1.8		Coalmine Hill
JdTg-2								1	5.7	1.8		Tamarak Knoll, double arris
KbTx-6								3	5.4	not meas.		Frenchman Hill
KbTx-2	c 20	many	several				several	722	4.1,4.8	1.17,1.29	X rare	Kelly Creek; 2 measured series
KbVa-11	X											
KbVa-15							X					
KeVd-3	1							8	7.8	1.6		Burins, Fort Selkirk area
KkVa-2	1											At Minto Lake
KdTx-4								1	12.2	1.4		At Tatlmain L., single arris, burins
KjTh-2								X				Hess Lookout
LaVk-2	1 atypical							c 70	4.62	1.19		Moosehide , 56 mb measured
LaVk-7								8 plus	5	1.54		Deadwood Creek; 4 mb measured
LeVi-7		1?						2	9.6,6.1	2.5,3.7		Tablet probably not Denali
EAG-167	1											
CHR-074								X				

Site	Microblade Cores							Microblades			Blades	Other & Notes
	Wedge-shaped Cores			Tabular or Geometric			Other & Un-	Number	Width	Thickness		
	Campus	Tablets	Other	Tuktu A	Tuktu B	Cuboid	determined		mm	mm		
CHR-077	1 (or other)			1				X				
MeVl-1				1 tabular				91	7.34	1.63		26% one arris, 60% two, 13% three
Dave Lord												Elements of mb technol. present
MgVo-1, -2	2							X				Bluefish Caves
MfVa-9, -14	1							10 or less			X	Rock River, reworked Kamut Pt.
MhVb-3								1				
MiVb-4								1				
MjVk-1								X				
MjVk-2								X				First Caribou Lookout
MjVk-7	1							X				Old Chief
MfVb-7						1					X	Rock River area
NaVo-1		1						X				Potato Hill
NaVo-2		1					1					Potato Hill North Bench
NaVi-1, -2	1	X?						X				Black Fox Ridge
NbVi...					2						X	Friggit Lake
NbVj...	see NaVi...											part of Flack Fox Ridge
NbVj-6	1							1				Black Fox Hills No. 4
NcVl-1	6	X						X				Kkikavichik Ridge, fluted point
NcVh...				2							X	Sam and King Lakes
NcVi-8	1										burin	Sam L. Lookout, classic Denali core
NcVh-7				1?		1? frag.						Hanging Lake
NcVl-3, Vi-3		X?					X	X				Dog Creek
NcVi-9		1			1							Trout Lake, ASTt
NcVn-1								X			X	Blade Lake Lookout
NcVo-2								X				Lazarus Lookout
Ndvo-1								2				Dubious, specimens missing
NeVi-9					1 or	1						Trout Lake, ASTt?
NeVc-2								0			X	Also blade cores
NgVm-4								X				ASTt
NfVi-6			1									ASTt (& other?)
NiVk-1		1?	1	1			6	233	5.6	1.47		Engigstciak; mb mostly ASTt?
NeVc-12								1				

Site	Microblade Cores							Microblades			Blades	Other & Notes
	Wedge-shaped Cores			Tabular or Geometric			Other & Un-	Number	Width	Thickness		
	Campus/	Campus	Other	Tuktu A	Tuktu B	Cuboid &	determined		mm	mm		
	Denali	tablets	wedge	classic	poor	Geometric						
NORTHWEST TERRITORIES												
MfTf-4								1				Big Creek
MjTp-1							1 frag.	29	8.33	not meas.	X	Whirl Lake
MdPs-25								4	9	2.13		Great Bear Lake
MdPs-26						2		X				Cores with tablets, Great Bear L.
MePr-6								4	8	1.89		Great Bear Lake
MdRh-3								5	9.9	1.59		Great Bear Lake
MdRj-5						1		0				Great Bear Lake, ASTt?
MeRe-1a								5	7.6	1.69		Great Bear Lake
MfRd-2	1?											Great Bear, may be ASTt
MfRd-4							3	37	6.9	1.68	core	Great Bear
MgRr-1						3		47	c 7.6	c1.7		Colville Lake
MgRs-3								X				Colville Lake
MiRh-1								14	10.7-10.9	1.2 to 2.2		Horton Lake
MiRh-3								9	8.4, 8.9	1.8, 2.2		Horton Lake
MiRi-2			2			1		106	7.23	1.83		Horton L., 58 mb measured
MiRi-4								2	6.7, 8.6	1.2, 2.5		Horton Lake
NeVd-1		1		1?								Tuktu core not in collection
NbTj-3								X	see text description			Modeste site
NkTj-1		1?						X				On Tuktoyaktuk Pen.
NkTj-8						1						On Tuktoyaktuk Pen.
NkTm-1							X	X				
ObRv-21	1										cores	At Horton River
ObRw-1			1? frag.			1 frag		X				Qugyuk
JcRx-2	X	X	X	X		X		80 meas.	7.3			8 mb cores; Pointed Mountain
JcRv-13							?	?			?	Julian
JlRq-1								2			X	At Sibbeston Lake
KgRi-11			1				1? frag.	37				Esker Bay, Fish Lake
KlRs-5								X				Workshop at "Drum" Lake
KlRs-20								X				Workshop near "Drum Lake"
LbPq-9								2				At Snare Lake

Site	Microblade Cores							Microblades			Blades	Other & Notes
	Wedge-shaped Cores			Tabular or Geometric			Other or Undeter. mined	Number	Width mm	Thickness mm		
	Campus/ Denali	Campus tablets	Other wedge	Tuktu A classic	Tuktu B poor	Cuboid & Geometric						
LdRx-3												At Carcajou Lake
LgRk-2							X frag.	X			X	NT Docks at Franklin Tanks
LlTa-1, -2											X	Chick L.; ASTt & other
BRITISH COLUMBIA												
Muncho L.												See text
IfSh-1			X								X	Callison site, core out of context
HiTp-1							X	X				Mt. Edziza, Wet Creek site
HiTp-63							X Ice Mtn.	39	6.1			Mt Edziza, Grizzly Run site
IaTq-1			X			X	X	X				Coll. by Jason Smith
Charlie L.			X					X				Charlie Lake Cave
FiSi-19			X					X				Natalkuz Lake
GdTc-16							X	5.9, 6.5				Paul Mason
HrRr-1						X	X					Pink Mountain area
FlSa-3	X?											
ALBERTA												
HoOv-73	X variant							X	4.6			Bezya
High River	2?	X	?				1	62				High River & vicinity
IcQa-11			1									Fort Vermillion
EhPv-8			1?									Vermillion Lakes

NOTES

CHAPTER 5
SYSTEMATICS AND OVERLAPPING TRADITION CONSTRUCTS

In the preceding chapter we described the distribution and types of microblade cores found in the Yukon and adjacent regions. Here we look at the archaeological systematics of the region. By means of archaeological taxonomy, past cultural relationships within and between areas may be depicted. Taxonomy is taken to mean the principles of classification, and systematics the specific schemes of classification employed. The principal elements of taxonomy used by northern archaeologists are traditions (whether called traditions, cultures or complexes). Formally defined phases, the qualifying terms "late" and "early," periods and site or regional names have been used to subdivide traditions. Conceptually, complexes are technological assemblages of limited scope, but in practice "complex" has become a synonym for tradition, if of large scale, and phase if of lesser magnitude. The review undertaken here may help us understand the place in prehistory of Kelly Creek and other Yukon microblade sites. But this understanding is beset by problems of systematics. In the present chapter we propose for the Yukon a framework for a seamless synchronic and diachronic prehistory.

Archaeological Traditions in the Yukon, Western Mackenzie and Alaska

The earlier history of several constructs used to organize prehistory in the far Northwest, and to articulate that region with the prehistory of eastern Asia, has been outlined by West (1981:80-82). Additional traditions account for the span of prehistory in northwestern Canada and Alaska. Here we discuss several of them that still are in vogue in the Yukon and Alaska and in some cases are competing for the same materials of the past. These traditions are not always mutually exclusive as the same archaeological assemblages may be placed in differing traditions. Statements about their technological makeup sometimes seem to be more predictive than empirical, and the traditions may also suffer from use of data from mixed sites containing material from disparate occupations. A further problem is that of achieving holistic or seamless coverage. A particular tradition may work well for one region but articulate poorly with coeval cultures in adjacent regions. Wright (1995:165 ff., 385 ff.) has discussed this situation and copes with it through the use of "catch-all" designations and period categories. The task of solving these problems is left by him to regional specialists. One specialist, Workman (1978), however, had declined to become involved with the systematics of microblade-using cultures by staying at the phase level, Little Arm, though he acknowledged a more widely distributed "unnamed" tradition.

Definition of the Northwest Microblade Tradition

In his discussion of the Pointed Mountain site, located in the southwest corner of the District of Mackenzie, MacNeish (1954:234-235) saw similarities among sites with microblades and certain other artifacts found over a very wide zone of the Western Subarctic. MacNeish especially saw a likely relationship between Pointed Mountain and the Campus site (1954:250). "...It is suggested that in interior northwest North America...there was a series of related sites with a distinctive cultural pattern." It was not long before this pattern was called the Northwest Microblade tradition (NWMt). According to MacNeish, characteristic artifacts include tongue-shaped (wedge-shaped) and other microblade cores, tools on blades, end scrapers and relatively crude burins.

The latest major discussion of the Northwest Microblade tradition by MacNeish appeared several decades ago (MacNeish 1964). Essentially the same description also had been given two years earlier in the 1962 but with more detail on its breakdown into three sequential phases (MacNeish 1962:23-24). One can safely surmise then that the Northwest Microblade tradition suffers from a lack of updating or revision even though Millar later extended the scope of the tradition. Millar (1981:270) proposed an early phase (Denali) and a late phase of the Northwest Microblade tradition. Pointed Mountain belonged to the late phase which was essentially coeval with MacNeish's NWMt. A quotation from his 1962 paper provides an insight into his thinking and the comparative approach of the time (MacNeish 1962).

> I suspect the various elements of each tradition came from a variety of sources and by a variety of processes. I believe they somehow coalesced in certain areas at certain times, perhaps due in part to ecological conditions. They then spread through a similar environment....
>
> It [Northwest Microblade tradition] seems to have formed somewhere in the interior of Alaska or the western Yukon about 7,000 years ago. It would have taken from the Kluane and Flint Creek horizons [now these would be northern Cordilleran tradition], already in that region such elements as Fort Liard...burins, end-of-the blade scrapers and conical cores and blades [microblades?], as well as a few bifacial types and unifacial scrapers. From the northwest-moving Yumoid tradition [northern Plano], it might have acquired the Agate Basin-like and Milnesand-like points.... It might have acquired from Asia tongue-shaped cores, microblades.... Such a combination of tools...made a tradition which seems to have been adapted to the environment of that time period in interior British Columbia and the interior of the Canadian Northwest Territories. Thus this tradition moved into this similar environment slowly, by diffusion and migration, perhaps changing slightly through time as it met new situations and as it met new cultures.
>
> Such a process would account for the fact that we see no total complexes, like those of America, in Asia; and little evidence of rapid replacements of peoples and cultures in the New World, but instead, a great many local inventions, specializations, and developments plus a few odd Asiatic traits.

MacNeish found that sites of the NWMt in the southwest Yukon contained the following artifact types (1964:345-346):

chi-thos (tci-thos) (hide working stones)
net sinkers
end-of-blade scrapers and other end scrapers
split pebble and biface choppers
lanceolate points
wedge-shaped (tongue-shaped), tabular and conical microblade cores
microblades and macroblades
numerous large bifacial knives
flake burins (Fort Liard burins, some are West's Donnelly burins)
burins on artifacts
drills
notched and stemmed projectile points in various styles

He reiterated, though, that *chi-thos,* end scrapers, large notched points, and bifacial knives and choppers were basic to the tradition. Judging from its name, he also considered microblades to be basic. This formulation predated the definition of the Northern Archaic tradition (Anderson 1968) which is now seen to include most diagnostics of the Northwest Microblade tradition. MacNeish later wavered on the inclusion of any sites other than those of the southwest Yukon. Thus, the initial locus, Pointed Mountain, had become marginal (see also MacNeish 1959a, 1959b, 1963).

Definition of the Denali Culture and American Palaeo-Arctic Tradition

American Palaeo-Arctic and its relationship to Denali Anderson defined the "American Paleo-Arctic" tradition in 1968 and 1970 to account for an early blade and microblade tradition with Asian links found in northwestern Alaska. Here we use the widely accepted alternative spelling "Palaeo-Arctic" (cf. West, ed., 1996) and sometimes drop the word "American." Northern archaeologists, notably Dumond (1977, 1982), expanded the tradition to include essentially all early cultures of Alaska (and implicitly the Yukon) though Anderson did not subscribe to this broadening of his tradition (1980:Footnote 1). As the Palaeo-Arctic thus included early remains from central Alaska it was placed in competition with the Denali complex (below) which encompassed the same archaeological manifestations with wedge-shaped microblade cores (West 1967). The scope of Denali also has been expanded to apply wherever wedge-shaped microblade cores have been found, especially in early contexts (earlier than 7000 BP) in Alaska and the Yukon (West 1981b, 1996). Some archaeologists also have included Pacific Coast assemblages in the Palaeo-Arctic as a possible Beringian tradition maritime facies (West 1981:82). The Beringian tradition includes Denali, the American Palaeo-Arctic and maritime subsets and has an expanded focus that includes eastern Siberia. At this point we have elected to use the term Denali where the option between using it and Palaeo-Arctic is present because as these traditions were initially defined, Denali seemed more proper for an interior Yukon drainage culture. But earlier in this work we used the term "Palaeo-Arctic" because we felt that explication, now given in this chapter, was needed to support use of the term "Denali."

This choice is partially supported by a review of contemporary writing that shows a preference for Denali, though Palaeo-Arctic also is use (cf. Cook 1975; Dixon 1985; Erlandson et al. 1991; Hoffecker and Powers 1989; Hoffecker, Powers and Gobel 1993; Powers 1990:59; West 1981a, b:82;1975). Powers (1990) saw the Denali Complex as a localized southern variant of the American Palaeo-Arctic tradition, the northern form remaining essentially that defined at Onion Portage by Anderson. In 1985 Dixon used the term American Palaeo-Arctic tradition in a manner that closely approximated Denali as defined by West, but Dixon also recognized a "Late Denali" that included some of West's Denali sites for which there are late radiocarbon dates. Cultural schema are clouded by attempts to distinguish between a Late Denali and a Denali proper as something more than late and early facies in a single tradition, or to equate Late Denali to the Northern Archaic. Pearson and Powers, in a 1995 conference paper presented to the Alaska Anthropological Association, identify the Campus site as Late Denali, an assignment with which many others are in accord, though West used Campus to define Denali proper.

Denali Culture The most succinct definition of the Denali is in the abstract to West's 1967 article in which the Denali complex debuts (see also West 1981a:91).

> Excavations carried out at the site of Donnelly Ridge in central Alaska have led to the delineation of an early core and blade culture which includes the Campus site and two sites previously excavated on the Teklanika River to the west. Sites of the Denali complex are linked by distinctive microblade cores, core tablets and microblades derived from the latter, large blades, biconvex bifacial knives, certain end-scraper forms, a distinctive burin type [Donnelly burin], and other traits. The clearest affiliations of the Denali complex are with a series of late Upper Palaeolithic sites west of Lake Baikal.... The bearers of this culture probably entered Alaska prior to the final submergence of the Bering land bridge (Hadleigh-West 1967:360).

Subsequent research has confirmed assignment of an early date to Denali. But there remain many Denali sites with late radiocarbon dates, though some late dates are equivocal. The distinctive microblade cores to which West refers are termed Campus cores, Denali cores or Gobi cores (West 1981a). They are the primary index to this culture and to the Palaeo-Arctic tradition. "Wherever...there is shown the presence of 'Gobi' cores, it may be assumed that some variety of relationship with Denali complex does exist" (West 1981a:139). However, these cores also may be present later in the Northern Archaic tradition.

West carefully outlined the perceived differences between MacNeish's Northwest Microblade tradition and Denali. Nevertheless, he appears to have been misled by MacNeish's inadequate site sampling and poor artifact descriptions. Both archaeologists include the Campus site in their traditions, though MacNeish used Campus more peripherally than does West. West states that the Pointed Mountain site cores are quite different than Denali cores and that identity is lacking in other artifacts other than blades. But the Fort Liard burin, from Pointed Mountain, appears to be a Donnelly Burin. Only one good example was published by MacNeish, but further work in the Yukon and at Pointed Mountain (including inspection of MacNeish's flake lots by R.E. Morlan) has recovered additional specimens. Thus the case for differences in respect to burins (West 1967:374) is weakened. And while most Pointed Mountain cores are only marginally Campus cores, good cores of that type actually are present and also were recovered by MacNeish from some southern Yukon sites that he included in the Northwest Microblade tradition. Recognized as common to both traditions, by both MacNeish and West, are numerous end scrapers, some of them on blades, and numerous large, often roughly prepared, leafshaped, ovoid and square-based biface knives. A noteworthy difference, though, is that MacNeish cites notched points as a diagnostic feature of late phases of the Northwest Microblade tradition while such points do not appear in West's definition of Denali. But subsequently, so-called Late Denali assemblages with both microblades and notched points and sometimes Campus cores have been reported.

West (1967) concludes that "viewed from Alaska it would seem that the concept of the Northwest Microblade tradition should be applied cautiously, if at all. The major virtue would be that of grouping all sites and complexes which contain microblades (excepting Anangula Island) and which are not members of the clearly-delineated Arctic Small Tool tradition. Perhaps eventually such a grouping will be found meaningful...." We feel though that the differences between Denali and the Northwest Microblade tradition are small if more recent finds are taken into account, including sometimes called Late Denali, and latitude is allowed for regional variation. But at this point there looms the unwelcome question of whether, with their emphasis on notched points, Late Denali and the Northwest Microblade tradition are not best portrayed as facies of the Northern Archaic tradition.

Late Denali Culture. West does not particularly provide for any Late Denali culture, either as an entity separate from Denali or as an occupation late in the Denali time range, though he acknowledges late microblade industries that in some cases may be derivatives from Denali (West 1996). However the term is used by many archaeologists, for instance, by Bacon (1977, 1987) as a phase within Denali or by Dixon (1985) as a separate culture having Campus-type microblade cores and also burins. Late Denali is dated to a time considerably more recent than that usually accorded to Denali proper, to 3000 BP or later at some sites. We cannot avoid this tangled discussion because some archaeologists place late assemblages with Denali microblade industries in the Northern Archaic tradition while sometimes materials otherwise classified as NWMt also are placed in the Northern Archaic, especially by persons who do not use the term Northwest Microblade tradition (see Morrison 1987).

Dixon's sequence for interior Alaska (1985:Table 1 and text synopses) includes (1) the American Palaeo-Arctic tradition with Denali as a regional variant, (2) Northern Archaic tradition, (3) a separate Late Denali *c* 1500-3500 BP, and (4) an Athapaskan tradition. The Northern Archaic is defined as having side-notched projectile points; end scrapers, elongate and semi-lunar biface knives, boulder spall scrapers, large unifaces, notched cobbles, and choppers but lacking microblades and burins. Anderson's (1968) Northern Archaic at Onion Portage is cited as an example. These Northern Archaic diagnostics fit reasonably well the Yukon phase of that tradition called Taye Lake.

Dixon's Late Denali complex has wedge-shaped (Campus) and tabular (Tuktu) microblade cores, burins on bifaces and flakes, end scrapers, notched projectile points, constricting base (oblanceolate and leafshaped) and lanceolate projectile points. Dixon gives the Campus site assemblage as an example, though Campus does not have very many points. Except for its lack of side-notched points, the Little Arm phase of the southern Yukon fits the definition of Late Denali. As for the rationale for separating Late Denali from the Denali proper, Dixon (1985:57) states that "it is difficult to explain how the Denali complex persisted virtually unchanged...[except for the late addition of certain point forms] for approximately 9000 years, particularly in light of the intervening Northern Archaic tradition." We concur. Late Denali clearly is derived from Denali proper. The intervening gap may be an artifact of interpretation and insufficient exploration. We also may be seeing a melding of Denali and Northern Archaic traits in the formation of Late Denali, after a period of contact. The question thus arises: is Late Denali actually part of Denali or does it belong within the Northern Archaic tradition? Acceptance of a simple answer would be a scholarly shortcut that risks rationalizing what happened in prehistory. There are at least two configurations of technology during the late millennia BC: a pure Northern Archaic without microblades, and a blended or Late Denali culture. This is the situation in Alaska. In the Yukon substantial examples of a blended format Late Denali culture have yet to be reported, i.e., ones with notched points and biface knives as well as wedge-shaped microblade cores derived from controlled excavation contexts, but minor occurrences may have been rationalized through attempts to clean up apparent errors and inconsistencies in MacNeish's (1964) excavation results. There are, nevertheless, many uncontrolled collections, usually from disturbed sites, in which both microblades (or cores) and notched points both occur. Eventually there may be found more conclusive evidence for a blend of Denali and Northern Archaic technology in the Yukon. Moreover, in the western District of Mackenzie there are variations of a such a blended culture, in this case identified as the Northwest Microblade tradition.

One factor with ramifications for this debate was the quandry of the longevity, for more than 10 000 years, of the specialized Campus core technology, and its persistence across a 3000 year occupational hiatus after about 7500 years ago. To some degree the temporal gap in radiocarbon dates now has been bridged, but representation of those millennia (7500 to 3000 BP) remains weak. Erlandson et al. (1991:Fig. 2) find only two dates from Healy Lake and Chugwater applicable to the time between 8000 BP and 4000 BP. Dates from the Yukon in the order of 5000 to 7000 years (uncalibrated) are available from at least six sites but have very limited artifact associations.

Northern Archaic Tradition, in Brief, and Recapitulation

The Northern Archaic tradition has been discussed in passing. Northern Archaic assemblages are quite variable, but this taxon provides a convenient grouping of assemblages. Initially a link to the Archaic cultures of the mid-continent region was implied, and that view is still held today to some degree by archaeologists. In some respects the Northern Archaic may better be considered to be a horizon, albeit a very broad one, the horizon marker being the appearance of notched points which are free to associate (or not) with microblades available for adoption from coeval Denali peoples.

Thus far we have discussed the following traditions and permutations:

- An American Palaeo-Arctic tradition found in Northwest Alaska.
- An extended version of the American Palaeo-Arctic tradition found over Alaska and the Yukon and on the coast.
- An early Denali complex (tradition) found mainly in interior Alaska.
- An extended version of Denali that spans about 10 000 years. This Denali also has Campus-type cores, notched burins, and, later in time, other types of microblade cores and notched points. Late Denali is a facies or phase of it.
- The (pure) Northern Archaic tradition, found in Alaska and the Yukon, characterized by notched and other point styles, but lacking microblades and notched burins of the Donnelly type.
- A more broadly constituted Northern Archaic tradition that is similar to Late Denali. It has tabular and pyramidal microblade cores and Campus-type cores.
- A Northwest Microblade tradition with Campus-type and other microblade cores, burins on flakes and notched points, showing similarities to both Late Denali and a broadly defined version of the Northern Archaic.

One other construct used for the Yukon region is the early Northern Cordilleran tradition, which may be a source for the Northern Archaic tradition. Inasmuch as this early tradition lacks a focus on microblades we will not bring it into the present discussion. Probably, only two basic technological traditions are involved in the entities listed above.

Further Explication of the Northern Archaic. It may be instructive to see how others have viewed the Denali-Northern Archaic relationships. Dumond (1987:51) notes that the definition of Denali has been broadened to include side-notched and stemmed points occurring at a relatively late time (a revision not employed by West). "Such assemblages as these may be taken to relate to the Northern Archaic tradition despite the fact that apparently very similar assemblages *without* the projectile points seem to be assignable to the much earlier Palaeo-arctic tradition" (p. 52). Dumond continues: "...inasmuch as some of these microcores [from several locales] would be assigned to the wedge-shaped or Campus type, one must then accept that the so-called 'Denali complex' probably represents not one but two valid cultural entities: the first the Palaeo-arctic tradition, dating from as early as 8000 bc; the second, an aspect of the Northern Archaic tradition...."

Dumond concludes: "Although the remains...[Northern Archaic] seem to represent people with a definite heritage carried from the American interior in the south, they also give evidence of descent from earlier peoples of Palaeo-arctic tradition. One must, therefore, conclude that the ancestry of the Northern Archaic peoples was not confined to one or the other of these two predecessors, but included both" (Dumond 1987:54). To put the heritage from the south in perspective, we can note that notched points and some other tools similar to those of the Northern Archaic appeared in the central Subarctic, in the Shield Archaic about the same time as they appear in the Northern Archaic (see Wright 1976), probably as part of a continent-wide trend.

Coming Together--A Resolution

To draw this discussion towards a conclusion, we present a trial scenario of prehistory and framework of systematics. Dates are in uncalibrated radiocarbon years.

1. 11 000–12 000 years ago. Hunter-gatherer populations were living in the north, except in the mountains and east of Great Bear Lake which were still glacial. The best documented occupation for this period is the Nenana Complex in Alaska (Hoffecker, Powers and Goebel 1993).

2. Microblade technology was becoming common in central Alaska by 10 700 years ago. Although microblades likely were a technology adopted by the resident population, some bands with microblades apparently moved eastward in advance of the "wave" of microblade technology. They reached the Tanana Valley 11 600 years ago (C. Holmes personal communication to Clark 1997) and the Bluefish Caves, northern Yukon, at least 11 000 years ago (Cinq-Mars 1979, 1990). This Beringian tradition is known locally as the Denali culture or as the American Palaeo-Arctic tradition. Its hallmark is the Campus-type microblade core.

3. Soon after 11 000 BP Palaeoindian styles of artifacts, including both fluted and nonfluted points, began to appear north of the Plains. They reached the Arctic Ocean and moved westward across the northern Yukon to reach northern Alaska by 10 200 BP at the Mesa Site (Kunz and Reanier 1996) or even by 10 500 BP (Putu site Bedwell component). Fluted point Palaeoindians may have been the first inhabitants of the recently deglaciated Mackenzie Valley, but whether this peopling process continued into already occupied Yukon and Alaska, or whether the status there is the result of diffusion to coeval peoples is a question that we will not entertain as it is peripheral to our topic.

4. Local cultures that did not partake of microblade technology persisted and continued to develop in the northwestern Subarctic region. Perhaps their ancestry lies in the early Nenana complex or Northern Cordilleran culture or with Palaeoindians. Late evidence of these people is offered by the small assemblage with 10 200 BP and 7800 BP radiocarbon dates found near Beaver Creek in the southwest Yukon (Walde 1994). Another case is the Flint Creek collection from the northern Yukon Engigstciak

site, for which there are 9600 BP to 9800 BP dates on butchered bison bones (Cinq-Mars, Harington, Nelson and MacNeish 1991).

5. Another local culture, Acasta, is somewhat later at 6900 or 7000 BP (Noble 1971). It is surprising to find this culture east of Great Bear Lake, given its obvious western ties as documented by the occurrence of Donnelly burins (including transverse notched burins). Donnelly burins occur in two formats: (a) a transversally burinated flake that often has prepared platforms or notches at the point of origin and end of the burin facet, and (b) a flake that has multiple burin facets around the perimeter, again beginning and sometimes ending at prepared platforms or notches (for examples, see Clark 1987:Figure 4.6).

Acasta also is found on the north shore of Great Bear Lake and at Colville Lake, N.W.T. (Clark 1975, 1987). On the basis of occurrences of lobate-based side-notched Kamut points, it appears that Acasta may be related to 7200 year-old material found in the Rock River vicinity, northern Yukon (Gotthardt 1990). If the territory from Rock River to Acasta Lake is its range, Acasta culture was more than local: it was a regional that, moreover, did not adopt microblade technology from its western contemporaries. Such an entity may have given rise to the Northern Archaic tradition.

6. About 7000 years ago microblade technology resumed its spread eastward, as documented by dated finds from the Yukon. It is possible that at this time the Donnelly burin was introduced into the northern Yukon from Alaska and thence eastward to become part of the Acasta complex, but enigmatically without accompanying microblades.

7. There may have been a pause in the spread of microblade technology. Then, about 4000 or 5000 years ago, elements of Denali culture appeared at Pointed Mountain in the southwest Mackenzie district. Pointed Mountain is so specifically Denali (American Palaeo-Arctic as Millar pointed out in 1981) that one might be tempted to interpret from it an incident of migration. Microblade technology also reached other points along the foothills of the Rocky Mountains from southern Alberta to the Arctic Ocean. More than one source is likely for microblades west of the Rockies, judging from the wide range of dates and core varieties present. For the northern reaches, however, dates tend to be late.

We do not propose to account for all the microblade and core occurrences in British Columbia and Alberta. They vary greatly in age and to a substantial degree are derived ultimately from the Pacific Coast cores. However, Bezya in northeastern Alberta is different (Le Blanc and Ives 1986). The elements of Denali technology are there, including Donnelly burins, but the cores are not "quite right" in comparison with ones from the Campus type site. Bezya may be at the general limit of Denali diffusion, and its 3990 BP radiocarbon date bears this out, but Bezya is so far east of other reported occurrences that it would appear that that one band of microblade users had moved out beyond the range of its affiliates.

8. Early western Mackenzie prehistory is only sketchily known. Some of the Palaeoindian people who evidently entered the Mackenzie about 10 500 or 11 000 years ago probably stayed. But as yet there is little evidence of this. Millar (1981) proposes that Plano people occupied the southwest Mackenzie prior to the appearance of the Northwest Microblade tradition at Pointed Mountain. This interpretation is supported by the recovery of well-made leafshaped projectile points apparently associated with radiocarbon dates in the 5000 to 6000 year range. There also is a single 8000 BP radiocarbon date. By 8000 BP Plano still was to be found on the northern Plains, and inasmuch as we can expect some northward temporal lag or time slope it would not be unreasonable to find 7000-year-old Plano expressions in the Mackenzie. As microblade technology seems to have been adopted at a relatively late date in the Mackenzie valley, probably no earlier than 5000 years and perhaps only 4000 years ago, there remain several millennia to be filled in by persisting remnants of Plano (and the Northern Cordilleran).

The western Mackenzie is a forested northward extension of the Plains physiographically and, to some degree, also in its culture history. Wright (1995:318) finds that actual penetration of the Boreal forest, north of the parklands and east of the foothills, by Plains cultures was limited. Nevertheless, he sees Plains influences diffusing into the Mackenzie valley around 5000 BP (Historical Atlas of Canada, Plate 7, also Wright 1995:Map III). This evaluation complements Dumond's reference (quoted earlier) to "heritage from the American interior in the south" in the makeup of the Northern Archaic tradition. This influence included notching of knife and point hafts and possibly the production of bone grease (from boiling cracked bones) and hide tanning techniques, though the last may go back to very ancient times (and is not necessarily a southern development), given the unrelenting need for well made winter clothing in both areas.

Beyond these particular elements, the evidence from the Mackenzie Valley and Yukon only generally fit into a model of southern influence. Denali traits arrived from the west and Archaic influences from the south or east, and these technologies were mixed by peoples in the Yukon and western Mackenzie district who were not the original bearers of either tradition. Sites in the Mackenzie Valley have the combined presence of notched points and microblades (Morrison 1987). Though few are dated, most appear to be late. These assemblages are quite variable, a situation interpreted by us as the result of diffusion into antecedent cultures from two fronts: southern (Plains) and western (Yukon).

The Mackenzie valley apparently was the home of a local culture tradition that is in a sense an amalgam, but we are uneasy with the term "amalgam" as ultimately most cultures are amalgams drawn extensively from antecedents and neighbors. It is this culture taken "from a variety of sources" (MacNeish 1962) that MacNeish called the Northwest Microblade tradition, though Pointed Mountain, which loomed large in MacNeish's perception of that tradition is strongly Late Denali. Most other Mackenzie valley sites with microblades comprise a heterogeneous non-Denali Mackenzie blade and microblade tradition, as once proposed by Gordon (Gordon 1974:71; Gordon and Savage 1973:C15). However we are averse to proliferating terms and propose to retain the designations Northwest Microblade tradition and Mackenzie Middle Period (the latter after Morrison 1987) for these Mackenzie sites. In discussing the middle prehistoric period of the Mackenzie valley, Morrison (1987) expresses the opinion that the Northern Archaic tradition concept has almost completely replaced the Northwest Microblade tradition. Nevertheless, he feels that the term "Northern Archaic" is inappropriate to describe sites in the Mackenzie valley, that the Northwest Microblade tradition provides a better fit.

Earlier, we pointed out that the Northwest Microblade tradition was looked upon unfavorably by many subarctic area prehistorians, but several Canadian archaeologists continue to use it. Le Blanc comments thus on finds from the northern coast of the District of Mackenzie: "I concur with the views of Clark...and Morrison..., that the Northwest Microblade tradition concept is still a viable one, particularly in the Mackenzie Valley region. Indeed, I believe this to be the case even when notched points are found with microblades, because I think it preferable to give priority to the presence of the microblade technology at any given site over the co-occurrence of the points, particularly when the latter are often represented by very few specimens" (Le Blanc 1994:207).

The genesis of the Northwest Microblade tradition, at least its microblade industry and possibly also its burins, lies in the spread of Denali culture to the Yukon about 7000 or 8000 years ago and its further, later spread into the District of Mackenzie and adjacent areas of British Columbia and Alberta. In the District of Mackenzie this technology amalgamated with that of local cultures and with influences that moved northward from the Plains or the eastern foothills. These processes resulted in considerable heterogeneity. We thus propose that for the western Mackenzie region the Northwest Microblade tradition should be viewed as a frontier culture vis-à-vis the Denali focal region west of the Rocky Mountains (but this is not the only presence of the Northwest Microblade tradition).

The considerable discussion in which we have engaged permits us to return now to Yukon prehistory. For the region west of the Rocky Mountains, and here particularly the Yukon, we find that in most instances the microblade and core assemblages found there are similar, and in some cases identical to what is referred to in Alaska as the Denali complex (i.e. tradition or culture). However, as we noted earlier, MacNeish's designation "Northwest Microblade tradition" has priority. Understandably, with further fieldwork and the passage of time constructs like "Denali" and "Northwest Microblade tradition" require updating, but need not be discarded because original formulations are out-of-date. The Yukon is, figuratively stated, is a tension zone located between east and west. Most Alaskan archaeologists would be comfortable in extending Denali culture to the Yukon but dread applying the NWMt label there. On the other hand, Canadian archaeologists find any recognition of Denali in the Yukon region to be foreign and forced and are more comfortable with the Northwest Microblade taxon, its faults notwithstanding. Such issues of systematics cannot be 'legislated,' and that, perhaps, is just as well inasmuch as these constructs are to an undetermined degree creations in the minds of archaeologists that only imperfectly fit reality. Moreover would-be parties to agreement on such matters likely would soon revert to following their own dictates. We have shown here the place of the microblade cultures of the Yukon within a greater northwestern geographic context. At that level (and we make a few exceptions such as the Rock River blade industry), the assemblages subsumed under Denali and Northwest Microblade are basically a single somewhat variable entity. The choice of which name to apply is up to the reader and archaeological scribe.

Many microblade sites in the Yukon have late radiocarbon dates. In fact, almost all are late in terms of West's (1996) time frame for the Beringian tradition. Such dates are incorporated into the definition of the Northwest Microblade tradition, but we see a need for temporally qualifying Denali where appropriate.

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