Chapter 19

Early Bifaces from the Little John Site (KdVo–6), Yukon Territory, Canada

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Introduction

Borden site KdVo–6 was first tested in 2002 during a field survey associated with Easton's long-term Scottie Creek Culture History Project (begun in 1992), which involves archaeological and ethnographic documentation of the region about the Yukon-Alaska borderlands, in collaboration with the White River First Nation of Yukon and the Village Councils of Northway, Tetlin, and Tanacross, Alaska. Controlled area excavations were undertaken in 2003, 2004, and 2006 (Easton 2007). In the local Scottie Creek dialect of the Upper Tanana *Dineh* language this geographic location is known as *Haah Tu Taiy* (roughly "trail at the end of the hill"). After recognition of its significance and consultation with the White River First Nation, it was named the Little John site in 2006 after *Klaa Dii Cheeg*/his hand drops, called in English, "White River Johnny", and known affectionately as "Little John", a respected ancestor of many of the contemporary members of the White River First Nation. Like his ancestors before him, Little John often used the location as a hunting camp and lookout until his death in 1984, a practice continued by his descendents today.

This multi-component site contains evidence of use from the most recent past back to the Pleistocene Transition. The earliest identified component represents the first unequivocal identification of a Nenana complex assemblage within a stratified context to be found in Canada. A subsequent dated Late Glacial component, which we currently relate to the Denali complex, is also present at the site.[1] In this paper we present a description and discussion of the pointed bifaces recovered from these earliest levels of the Little John site.[2]

Site Context

The Little John site is located just off the Alaska Highway, twelve kilometers north of the village of Beaver Creek, Yukon, about two kilometers from the international border with Alaska (Figure 1). It occupies most of the higher surface of a knoll overlooking the upper reach of Mirror Creek, known as *Cheejil Niik*/Grayling Creek in the local Upper Tanana Athapaskan language. It overlooks the basin of the creek below from the north and lies within the most western extension of the Tanana River drainage.

Pleistocene glacial advances in the region were thin piedmont glaciers extending from the Nutzotin-Wrangel-St. Elias Mountain chain, which begin forty kilometers to the southwest of the site

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[1] In this paper we present most dates as radiocarbon years before present (indicated by DATE BP); calibrated dates are indicated by cal BP.

[2] The use of the term "point" is advisable in this context. Both major biface forms described here (Chindadn and Foliate) have been described functionally by some as "knife" rather than "projectile" points.

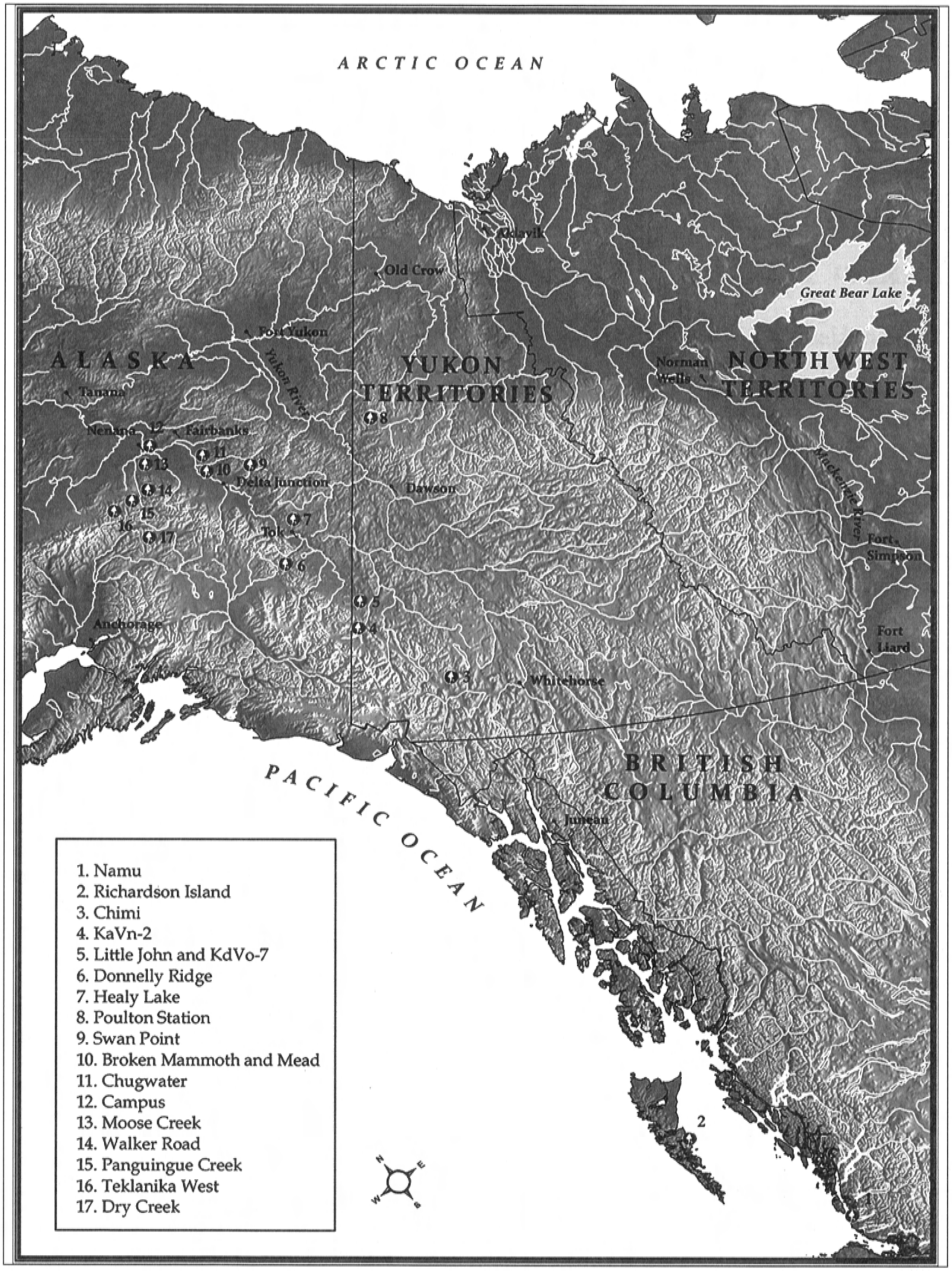

Figure 1. Map locating archaeological sites mentioned in the text.

(Figure 2). However the Wisconsin advance of ice ended at McCauley Ridge, some fifty kilometers to the southeast, and began a rapid recession at about 13,500 BP; by 11,000 BP the region was ice-free to at least the White River, some 150 kilometers to the southeast (Rampton 1971).

Thus, the Little John Site lay within Beringia, a proposition further supported by the recovery of Pleistocene fauna *(Bison, Equus, Mammuthus, Rangifer,* and possibly *Saiga)* less than a kilometer from the site and elsewhere in the Mirror Creek and neighbouring Scottie Creek valleys. A local *Equus lambei* specimen has been radiocarbon dated to 20,660 ± 100 BP (MacIntosh 1997) and an ivory fragment recovered across the road from the Little John site dated to 38,160 ± 310 BP (Beta 231794).

In general terms the geological stratigraphy of the site consists of a basal regolith overlaid with sparse glacial till representing a glacial maximum known locally as the Mirror Creek glacial advance, variously dated to the Late Illinoian-MIS 6, c. 140,000 BP (Bostock, 1965; Krinsley, 1965) or the Early Wisconsin-MIS 4, c. 70,000 BP (Denton 1974; Hughes et al. 1989). Above this are found loess sediments varying in thickness from a few to over sixty centimeters, and then ten to twenty centimeters of Brunisols typical of the boreal forest in the region. In most areas this B horizon is intersected by a volcanic ash layer of several centimeters deposited by what we believe to be the second White River volcanic eruption, c. 1250 BP (West and Donaldson 2002; Lerbekmo and Westgate, 1975). A thin (1–2 cm) A/O horizon caps the sequence (Figures 3 and 4).

The discontinuous depth of these strata is accounted for by the undulating topography of the site, which ranges from over meter deep basins to eroding hillsides. The stratigraphy is also complicated by the action of both ancient and contemporary permafrost, solifluction, colluvial depositions,

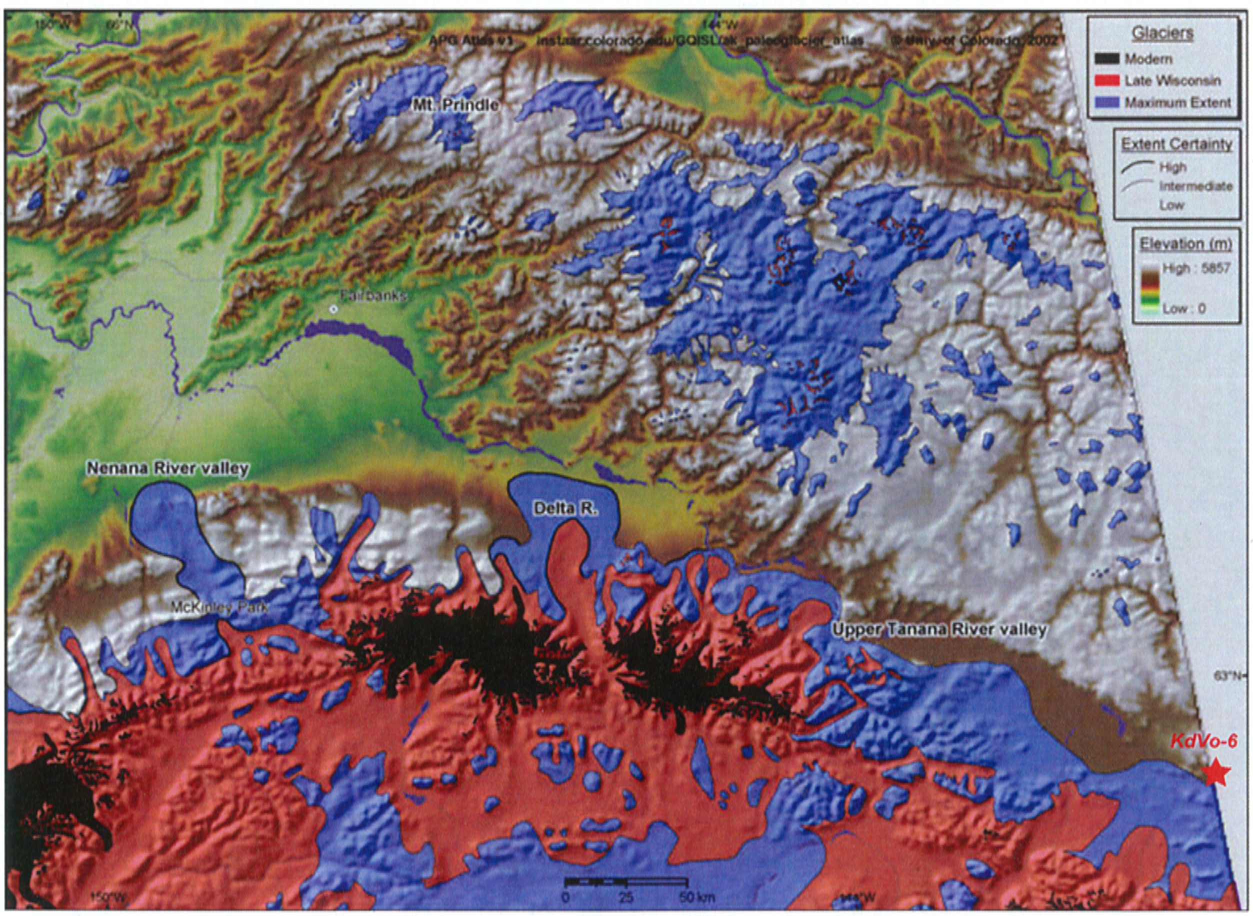

Figure 2. Extent of glaciation in the upper Tanana River basin. Blue represents maximum (Reid) extent; Red represents maximum late Wisconsin advance.

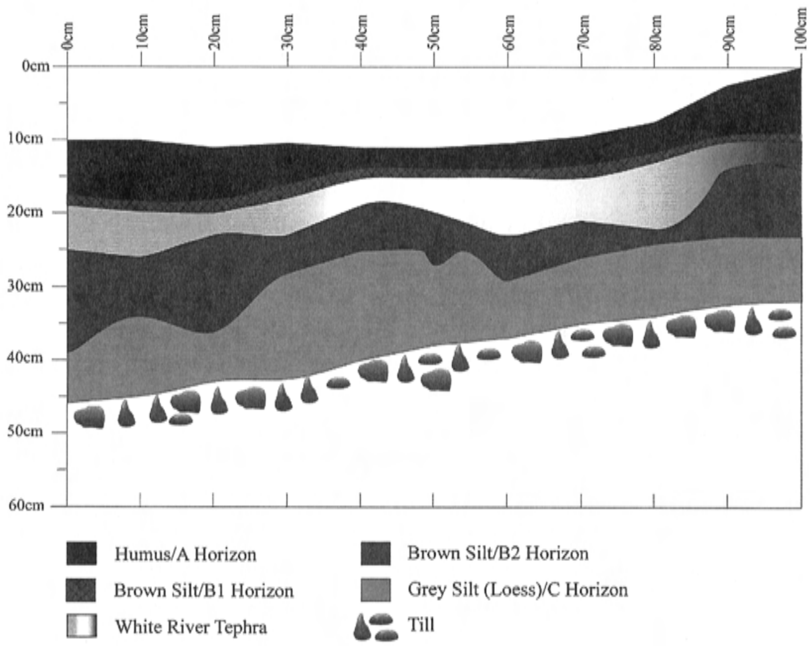

Figure 3. Stratigraphic differences between west and east lobes.

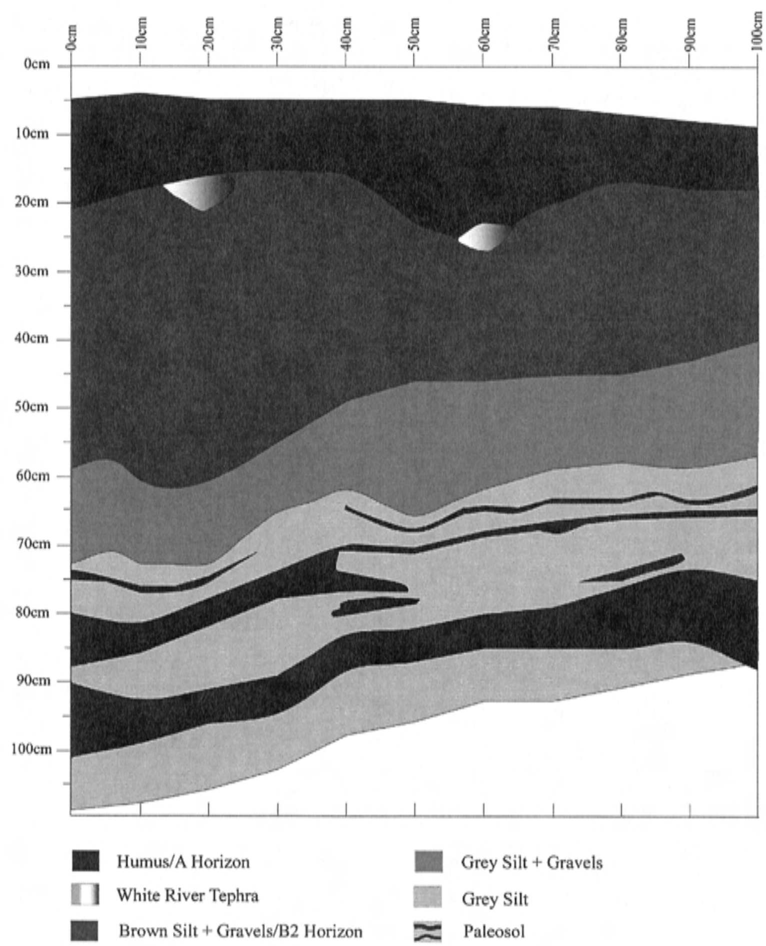

Figure 4. Stratigraphic differences between west and east lobes.

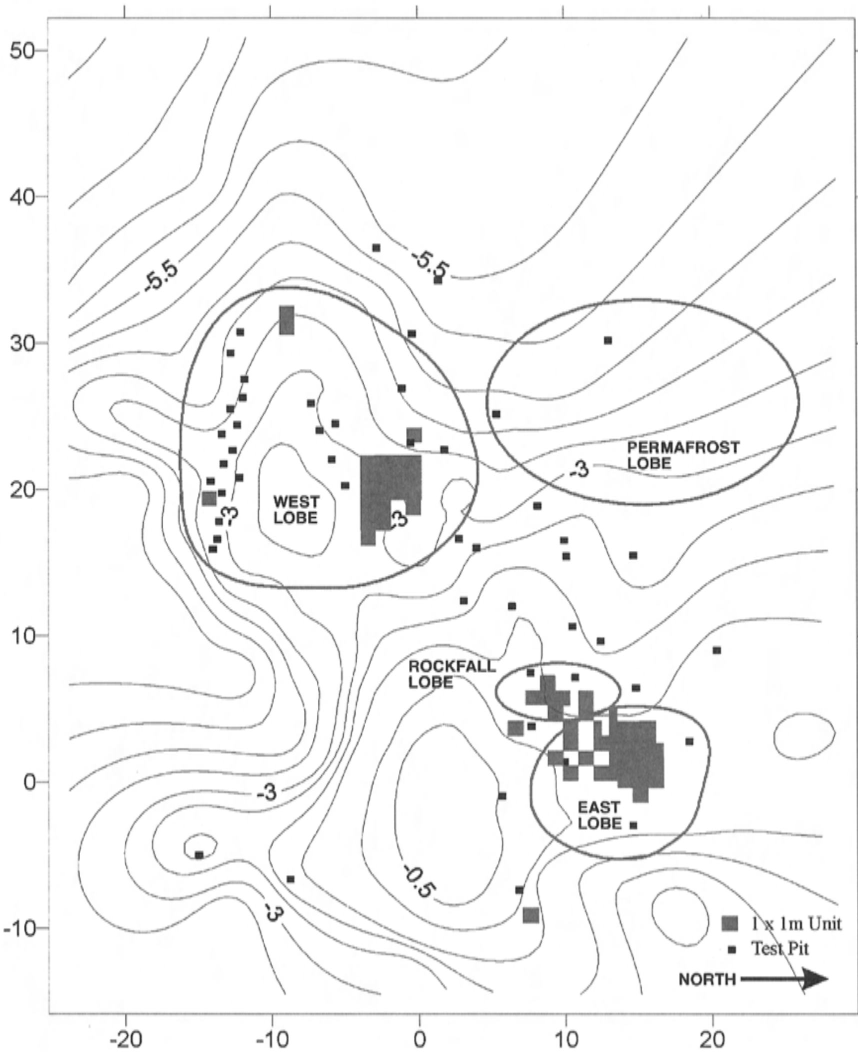

Figure 5. Zonal division of KdVo–6.

and what seems to be a mass wasting event over a portion of the site. Because of this differentiation in depth and nature of strata we have divided the site into four initial zones (Figure 5).

The West Lobe, where the strata are most shallow, occupies the southwestern hillside on which deposits range from five to thirty centimeters. The Permafrost Lobe, where frozen ground is encountered mere centimeters from the surface, occupies the north-facing slope of the knoll. The Rockfall lobe, where large boulders lie through the brunsol and loess deposits, runs roughly through the centre of the site on a north-south axis. The final area is the East Lobe, a large basin that troughs east from the site, and which contains the deep sedimentary deposits of one hundred centimeters and more and at least one, and perhaps two, paleosol strata near the bottom of the sequence. Capped by forty to sixty centimeters of loess below the B horizon, this paleosol complex contains a well preserved, culturally deposited faunal assemblage, in direct association with lithic artifacts.

Fauna and Radiocarbon Dates

Identified fauna from these paleosols include *Rangifer, Cervus, Bison,* possibly *Alces* (based on stable isotope data, Paul Matheus, pers. comm.), *Lepus, Cygnini* and other unidentified *Aves*, *Canis*, and *Rodentia*. Three AMS radiocarbon dates on bone from the paleosol complex have been processed. The first, on an unidentified large mammal fragment, was dated at 8890±50 BP (Beta 182798; 2σ calibrated results range from 10,190 to 9865 cal BP). The second, on *Rangifer*, was dated at 9530±40 BP (Beta 217279; 2σ calibrated results range from 11,090–10,930 and 10,880–10,690 cal BP). The third, on *Cygnini*, was dated at 9550±50 BP (Beta 218235; 2σ calibrated results had two intercepts at 11,080–10,940 and 10,870–10,720 cal BP). All the bones from which these samples were drawn displayed cultural modification in the form of cut marks or fracture; the swan bone was directly associated with a microblade fragment. A fourth sample from a *Canis* spp. humerus, recovered from below the paleosol strata, was found to be lacking any collagen suitable for dating, suggesting greater antiquity than the upper paleosol fauna.

Overall, the faunal assemblage seems to represent a broad-spectrum subsistence strategy, similar to the few other late glacial sites in the Tanana Valley which have preserved fauna (see Holmes 2001; Yesner and Pearson 2002).

Archaeological Components

For the purposes of our analysis of the material remains recovered at the Little John site, we have divided the assemblage into seven archaeological components. Their identification is tentative to the extent that a full suite of radiocarbon dates and detailed artifact analysis is not yet complete. However, they do allow an initial chrono-stratigraphic organization of the assemblage.[3]

From earliest to youngest these components are the Nenana and Denali complexes of late glacial Beringia; the Little Arm Phase of post-glacial Yukon; the Northern Archaic Tradition (or Taye Lake phase) of mid-holocene age until the White River volcanic eruption, c. 1,900–1,200 years ago, the Late Prehistoric Period (or Aishihik phase) which post-dates this eruption, the Transitional Contact Period (Bennett Lake phase), and the Historic (20th century) Period, which includes occupation of the site by non-native builders of the Alaska Highway. An eighth component might be identified as the Contemporary, as the site is still used today by the local aboriginal *Dineh* as a hunting lookout and campsite.

In this paper we report on the lithic pointed bifaces from the earliest two components, provisionally assigned to the Nenana and Denali complexes. We use the term pointed bifaces in order to indicate that the forms we describe below include some artifacts which are clearly projectile points, some which are clearly knives, and some which are equivocal in their function.

Artifact Descriptions[4]

Chindadn Points of the Nenana Complex

The Nenana complex component present at the Little John site is currently undated, due to a lack of suitable organics. Formed tools include large bifaces, a variety of scraper forms, large blades and large blade core tablets, and tear-drop shaped Chindadn points, by which the complex is characteristically identified. Its distribution to date is within the loess deposits immediately above the regolith in the shallower Western lobe and extending east to the middle Rockfall lobe. Four clear Chindadn points have been recovered and are described below (see Figure 6). A pointed biface fragment (KdVo–6:716) may represent the distal end of a thin Chindadn or triangular point, but there is no certainty in this; it is described later along with the other biface fragments. Table 1 provides metric data for all of the artifacts described below; Table 2, provides comparative metric data for a selection

[3] For the late glacial components we use terminology developed and applied within southeastern Beringia, while for post-glacial components we use the southwest Yukon cultural chronology developed by Workman (1978) and refined by Hare (1995).

[4] With the exception of KdVo–6:95, all of the artifacts described here share the same hand-lens lithology of aphanitic volcanic origin; further classification would require thin-sectioning. For general descriptive purposes we identify the dark to black material as "basalt" (i.e., less quartz or maphic) and the light to tan material as "rhyolite" (i.e., more quartz or felsic). KdVo–6:121 is classified as rhyolite but differs from the others by having a very poorly developed lamination and the quartz and feldspar phenocrysts are much larger. Artifact KdVo–6:95 is a chert very similar to the Stanley Creek chert formation of the Shakwak Trench, a discontinuously exposed band found from the south end of Kluane Lake to the international border along its southwestern edge at the foot of the Kluane-Wrangell-St. Elias Mountain range (Grant Lowey pers. comm.).

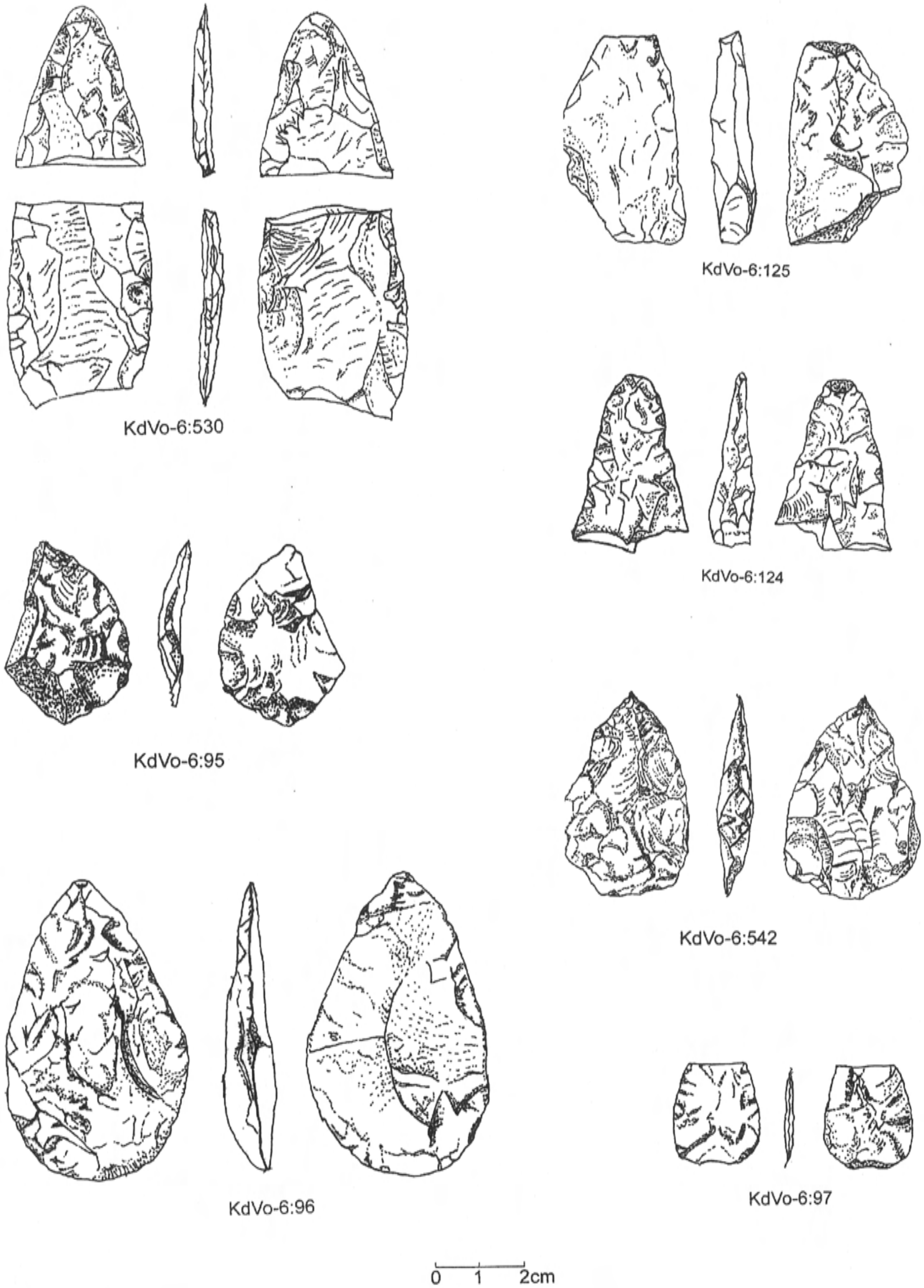

Figure 6. Bifaces of the Chindadn and Bipoint forms from KdVo–6 and KdVo–7.

Table 1. Metric attributes of KdVo–6 artifacts discussed in the text.

Artifact #	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Material (cf Fn 3)	Stratum	Comment
KdVo–6:96	67	40	13	31.86	Basalt	Loess	Chindadn form, complete.
KdVo–6:542	45	30	09	10.90	Rhyolite	Loess	Chindadn form, complete.
KdVo–6:95	38	27	05	5.19	Chert	Loess	Chindadn form, incomplete.
KdVo–6:97	23 (30)	20	04	2.03	Basalt	Loess	Chindadn form, incomplete.
KdVo–6:530	80	33	05	20.15	Basalt	Paleosol	Bipoint form, two pieces.
KdVo–6:140/531	90	28	10	24.26	Basalt	Paleosol	Bipoint form, two pieces.
KdVo–7:1	70	32	09	22.61	Basalt	Loess	Projectile point, convex margins, straight ground base.
KdVo–6:123	38	31	07	10.84	Rhyolite	Loess	Projectile point base, convex margins, straight thinned base.
KdVo–6:122	49	25	12	19.30	Basalt	B2-L	Projectile point, medial fragment, thick, lenticular, straight margins.
KdVo–6:125	44	30	18	9.90	Basalt	B2-L	Projectile point, medial fragment, thick, lenticular, straight margins.
KdVo–6:124	40	27	19	8.60	Basalt	B2-L	Bipoint form fragment?
KdVo–6:716	25	24	04	4.42	Basalt	B2-L	Thinness suggests possible Chindadn or triangular point form; outline inconclusive.
KdVo–6:121	100	41	15	68.3	Rhyolite	Loess	Bipoint form but crudely flaked, – geofact?

Table 2. Comparative dimensions of Chindadn points.

Site	L	W	Source
Chugwater 1	1.4	2.0	Lively 1996, Fig. 6–4a
Healy Lake	3.1	2.2	Cook 1996, Fig. 6–11a
Healy Lake	4.8	1.9	Cook 1996, Fig. 6–11b
Walker Road	3.7	2.0	Goebel et al. 1996, Fig. 7–14a
Walker Road	4.0	2.7	Goebel et al. 1996, Fig.7–14b
Walker Road	4.4	2.5	Goebel et al. 1996, Fig. 7–14c
Moose Creek	3.3	2.5	Pearson 1999

of Chindadn points available in West (1996a) and Pearson (1999).

KdVo–6:96 is a complete Chindadn biface on a black basalt flake. It is from the West lobe of the site from the bottom of the loess deposit immediately above or on the till surface, 20 cm below surface. While its dimensions and mass make it the largest complete specimen of this form recovered that we are aware of (see Tables 1 and 2), KdVo–6:96 is similar to the general shape and dimensions of two of the Type 1 Chindadn fragments from Healy Lake (Holmes 2001:164 presents scaled photographs of these artifacts). Viewed proximal to distal it is highly symmetrical, but asymmetrical in plan view, with a relatively flat ventral surface and a high and rounded dorsal surface (i.e., plano-convex). While flake removal is visible on both surfaces, the ventral surface is much more heavily and consistently worked. As well, the proximal lateral edges are more heavily and finely retouched than the distal lateral edges, suggesting that the rounded proximal end may in fact be the working edge.

KdVo–6:542 is a complete Chindadn biface on a green-tan rhyolite flake. It was found in the West lobe from within loess sediment at 30 cm below surface. It has been worked into a roughly symmetrical form from both perspectives. The striking platform of the original flake is pronounced and present on the left lateral edge. It has finer retouch along the lateral edge opposite the striking platform, suggesting this is the working edge, consistent with its use as a knife.

KdVo–6:95 is a Chindadn biface on a grey-blue chert flake. Found in the middle Rockfall lobe of the site, it is from a cryoturbated loess strata, 30 cm below surface. Thin in plan view, relative to the two previous specimens, it seems to have much finer retouch along the right lateral edge, although certainty is precluded by the fact that much of the left distal lateral edge is missing; below this, on the ventral surface, is a strip of heavily patinated cortex.

KdVo–6:97 is a small Chindadn biface on a dark black basalt flake. It was recovered from the West lobe from the top of the loess at 30 cm below surface. It is broken perpendicular to its long axis, missing the distal end. Measuring 2.6 cm in length it is estimated that complete it would be about 3.0 cm. Both lateral edges hold fine bifacial retouch, while the proximal base has been thinned by flake removal on both sides, suggesting its use as a projectile point.

Foliate Bifaces of the Denali Complex

The Denali complex component is found over the entire extent of the site explored thus far. Formed tools are dominated by microblades. Several core tablets and irregular core fragments with microblade removal scars have been recovered but thus far no wedge-shaped core ubiquitous to this complex. Scrapers and burins are present, as well as two bifaces of a form alternatively categorized as "bifacial biconvex knives" (West 1967), "bipoints" (Hare 1995), "leaf-shaped" (Hefner 2002), and "foliate biface" (Carlson 1996a). Based on the radiocarbon dates and the presence of foliate bifaces, as well as a single proximal fragment of a microblade, we have provisionally assigned the buried fauna-rich paleosols present in the Eastern lobe to the Denali complex. The two foliate bifaces, described below, were recovered from this paleosol complex in direct association with culturally modified fauna dated to c. 9500–9000 BP (see Figure 6).

KdVo–6:140/531 are two pieces which refit to form a biface made on black basalt. It was found at the same level (approx. 64 cm below surface) in separate but contiguous units (FU 25 and 32). While this piece appears semi-lunate in outline, significant damage along one of the lateral margins indicates that its original shape tended more towards foliate. Like its counterpart (KdVo–6:530), this biface displays crude flaking, evidenced by random flaking on both faces, which likely relates to the low quality of the raw material. This artifact was broken by a transverse fracture.

KdVo–6:530 is an incomplete biface consisting of two re-fitting pieces made on black basalt separated on a transverse fracture. The pieces were found next to each other in the same unit at a depth of 64 cm below surface. While one end of this biface is missing, the convex curvature of the lateral margins towards the missing end suggests a foliate outline and thus indicates that this artifact was probably foliate in outline. Exhibiting randomly oriented flake scars on both faces and several step terminations, this artifact—though remarkably thin—appears crudely worked, likely owing to the low quality of the raw material.

Biface Point Fragments

In addition to the above, seven pointed biface fragments have been recovered at KdVo–6 and the nearby KdVo–7 site[5] which bear description and some discussion based on their recovery from early strata (see Figure 7).

Artifact KdVo–7:1 is a straight-based biface made on grey basalt. This artifact was recovered from a basal loess stratum similar to that of the sediment matrix of the Nenana assemblage at KdVo–6. It has slightly convex lateral margins and the distal end is snapped, though whether this is due to use or the result of an attempt to thin this end is unclear. The straight base has been heavily ground. Generally the larger flake pattern is random, but the artifact is finely retouched along both lateral margins.

KdVo–6:123 is a round-based thin bifacial fragment made from tan ryholite, recovered from the loess sediments in the Rockfall lobe, 45 cm below surface. It exhibits slightly convex lateral margins, and a random flake scar pattern. It is also basally thinned by the removal of several flakes on both sides of the proximal margin. The transverse break evident on this piece likely occurred during manufacture, which is suggested by the bifurcated pressure flake scar parallel to the break on the right lateral margin.

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[5] KdVo–7, *Cheejil Niik Naakeeg*/Graying Creek hunting lookout in the Upper Tanana language, is located on a drumlin formation which overlooks the Mirror Creek plain, about two kilometers south of the Little John site. A well-established trail runs to this hunting lookout across the muskeg and atop the drumlin to the south-east prominence at which the site is located. Like many such sites in the region it remains in use to this day by local *Dineh*.

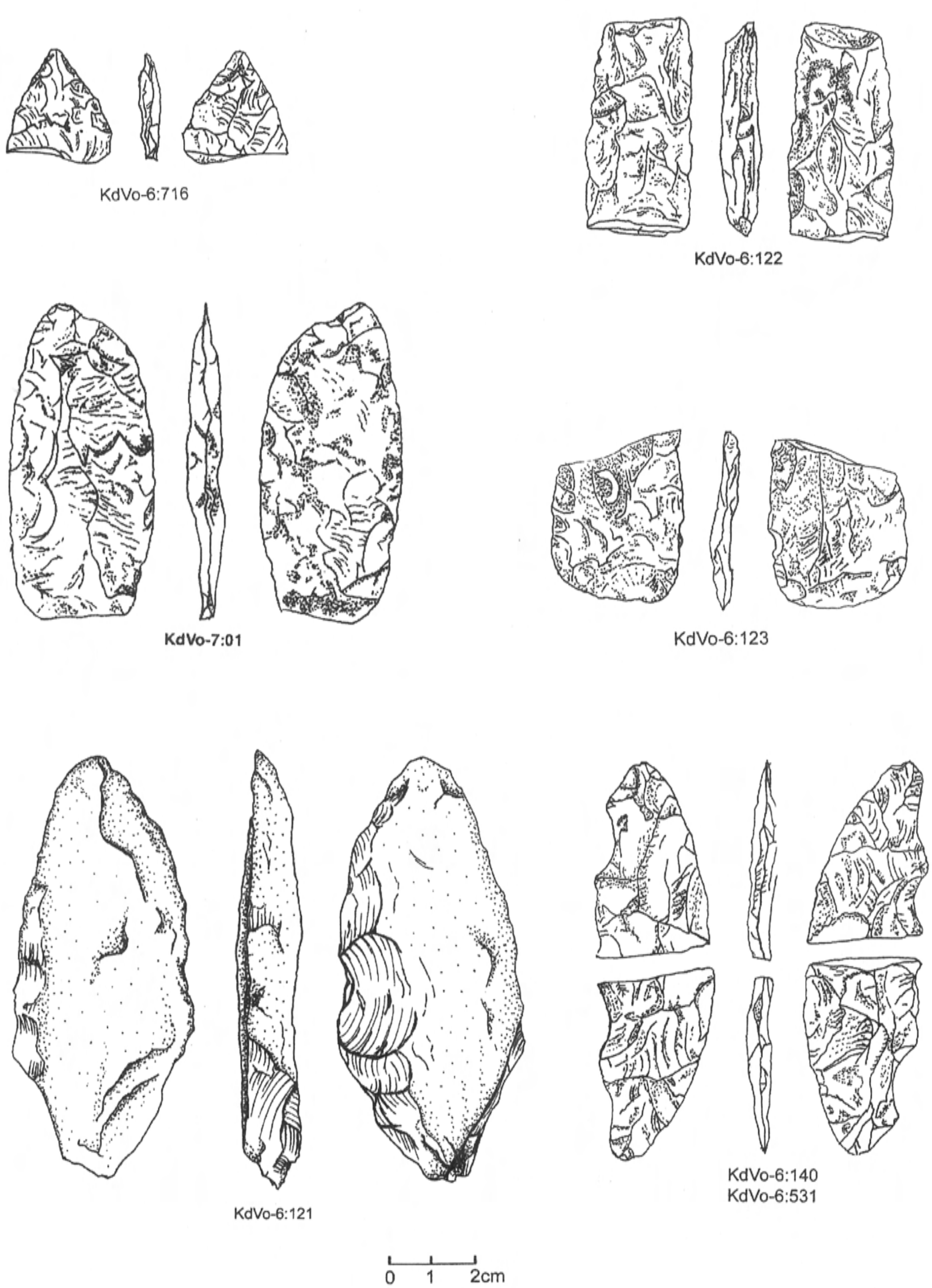

Figure 7. Biface point fragments from KdVo–6.

KdVo–6:122 is the medial fragment of a projectile point made from grey basalt, recovered from the interface between the Brunisol below vocanic ash (B2) and Loess stata (hereafter designated B2-Loess). This artifact is relatively narrow, with a thick lenticular cross-section and straight edges. The flake scar orientation is random and while the lateral margins have bifacial retouch, it is coarse and irregular. Numerous flake scars with step terminations reflect the low quality of the raw material. Transverse breaks are evident at both the distal and proximal ends on this point, and thus the base morphology is unknown.

KdVo–6:125 is the medial fragment of a biface made from grey basalt, recovered from the B2-Loess interface in the central Rockfall lobe. The flake scar orientation is random but there is fine bifacial retouch along both lateral edges. There are several step terminations evident on both surfaces, one of which snapped on a thinning flake removal, separating the proximal portion. The distal point is also missing, but the general form of the existing fragment is asymmetrical, and suggestive of an original foliate form.

KdVo–6:124 is the distal end of a bifacially worked projectile point, made from grey basalt, recovered from the B2-Loess interface in the Western lobe. Besides its expanding margins below the distal point, little can be said of its overall morphology. Although the general formal pattern of flaking is irregular, there does seem to be an attempt to achieve a parallel flaking pattern on the left lateral edge.

KdVo–6:716 is the tip of a distal fragment of a projectile point made from grey basalt, recovered from the B2-Loess interface in the Western lobe. There is a transverse break on a step fracture along its base. However, there is also slight damage to the tip suggesting some use. The flake scar orientation is random, and edge retouch is present but inconsistent. Its thinness alone suggests the possibility of its missing distal end to be tear-dropped or triangular, however besides this there is no other compelling reason not to imagine it as a foliate biface fragment or the business end of a projectile point.

Finally, we report on KdVo–6:121, which is a large edge modified piece, roughly foliate in outline, made from brown-grey rhyolite. While attempts at flaking are evident on both lateral margins, the manufacturer did not achieve flake removals that cover the faces of the artifact, and this was probably not even possible given the quality of the material. Given its state we imagine the piece to have been abandoned.

Frankly, we are not convinced that this is a human artifact. The raw material and crude workmanship suggests that it may be a geofact. However, it does hold numerous flake fractures along its circumference and it was recovered in close association with other indisputable human artifacts within the loess statum in the West lobe. Finally, we must consider the fact that some proportion of every assemblage likely contains material made by children or others of limited technological capacity. In this context we note that during a public tea, at which we displayed this and other finds of the season to our Upper Tanana *Dineh* hosts, this particular piece was picked up by an Elder who opined without encouragement, "You know what this is? It's a kid's piece. Practice." The ambiguity of this piece is increased when we note that, to our knowledge, this is the first apparent foliate biface found in direct association with Chindadn points, though we note it is exceedingly thick in comparison to other extant examples of this form.

Regional Comparisons

We can make the following unequivocal statements about the two principal lithic forms we have described from the early strata of the Little John site. Most of the bifacial fragments are equivocal, but based on their apparent morphology we can compare several of them to other regional expressions.

Chindadn Biface Form[6]

Over fifteen years ago, Goebel and Pontti (1992:2) asserted that, "Chindadn points occur exclusively in Late Glacial premicroblade contexts. Nowhere have

6 Our literature review clearly revealed that some analysts categorize small, thin, triangular shaped bifaces of the Terminal Pleistocene as variants of the Chindadn form, sometimes to the extent of referring to them as such (e.g., Yesner, et al. 1992)—and they undoubtedly are right—but in the following discussion we restrict our comparisons to biface forms of the classic tear-drop shaped Chindadn point.

they been found in direct primary association with microblades. Repeated discoveries in both Alaska and Northeast Asia demonstrate their importance as the first 'type fossil' of the premicroblade Paleolithic of Beringia." Based on our literature review, their assertion holds true today. Chindadn biface forms are found in early levels associated with the Nenana complex west of the Little John site in the Tanana and Nenana valleys. There are also several reported from the Yukon and the Pacific coast. We note, but do not further discuss here, the occurrence of tear-drop biface forms in western Beringian components in Asia (c.f. West 1996a; Hoffecker and Elias 2007:109–110, 138–140).

The Chindadn form was first described by Cook (1969) based on their occurrence at the Healy Lake Village site, where they are found in the early levels (6 to 10). Cook (1996:325) notes that "some are definitely projectile points, while others are larger, and not so pointed, knives." Associated artifacts in these levels include small triangular points, a basally thinned concave-based point, a variety of endscraper forms, and gravers. And while "nearly 100 microblades and two cores" are found in levels 6–8 as well, Cook believes that these are separate from the Chindadn component. Others have suggested that "some post depositional mixing of artifacts may have occurred at the village site", in order to account for the microblades (Hamilton and Goebel 1999:169), which is supported by the steady decline in their occurrence at the lower levels, with none in levels 9 and 10 (see Table 6–7, Cook 1996:326). Dates obtained ranged from 11,410 to 8210 BP and averaged 9700 BP (Cook 1996:327).

At the Walker Road site four complete Chindadn bifaces and three performs, which "may represent Chindadn points in a preliminary stage of manufacture", were recovered from loess levels 1 and 2, dated to 11,300–11,010 BP. The 218 associated artifacts comprise the largest Nenana assemblage yet recovered, nearly fifty percent of which are retouched flakes and blades. Endscrapers (of seven distinct forms) and sidescrapers (of eight distinct forms) make up the next largest category (18.3% and 9.2% respectively). Cobble tools, the majority of which are plano-convex "planes", wedges/*pièces esquillées*, gravers, perforators, notches/spokeshaves, denticulates, and knives, complete the tool assemblage (Goebel, et al. 1996; see also Goebel, et al. 1991).

The Chugwater site contains at least one complete Chindadn biface in its Component I (Nenana) assemblage; a second basal biface fragment may also belong to this class (see Lively 1996:310, Fig. 6–4b). The remaining formed tools include a bifacial "knife" fragment and seven small endscrapers. There is no associated date for this component, but it predates Chugwater Component II (identified as Denali), dated to 9500–9000 BP.

Initial excavations at the Moose Creek site revealed two components dated to the terminal Pleistocene—earliest Holocene, circa 11,700–8000 BP, but lacked clear diagnostic artifacts; based on the dating alone, the lower component was provisionally assigned to the Nenana complex (Powers and Hoffecker 1989). Pearson's later excavations at this site clarified this ambiguity by confirming two components, a microblade-bearing stratum, dated to 10,500 BP, overlying a non-microblade stratum. This lower level, dated to 11,190 BP, also contained a single diminutive Chindadn point and a subtriangular point (Pearson 1999).

In the Yukon, MacNeish (1964:407, see Fig. 88-3, 4) identifies five tear-drop points from a site near Carcross, recovered from above the 1200 year old White River ashfall, and in association with diminutive side-notched points; he designated this form "Catan", a term no longer used in Yukon. Beyond this, we can say little more.[7]

Workman (1974:209–210) assigned "tear-dropped points" to his P5 category of projectile points of Yukon and identified six such points from the Chimi site (JjVi–7) near Aishihik village at the north end of Aishihik Lake and one from JhVf–5, a site at the south end of the lake. The Chimi specimens were recovered from below the 1200 year old White River ashfall. Examination of

[7] Our enquiry for more information on these materials revealed that "Both provenience and frequency data was partially lost during the original cataloguing of this collection. Frequencies in MacNeish's publication are inconsistent with one another, with the catalogue and with the existing collection.... Two projectile points (MacNeish 1964: Fig. 88, Nos. 3, 4) are missing. This is the history for a lot of the MacNeish sites." (G. Hare, pers. comm. Jan 2007). However, our query did identify a tear-dropped form from the JhVf–1 site near Otter Falls in the Aishihik valley (the falls once illustrated the Canadian 5 dollar bill), but there is no recorded provenience.

a photograph of one of the Chimi specimens shows it to be decidedly straight-based and thus more triangular in outline than the classic Chindadn form, which almost invariably have a much more rounded base. Greg Hare of the Yukon Archaeology Branch (pers. comm. 2007) notes that "regarding teardrop or P5 points, there are any number of short round based things that might be called tear drop shaped. Not sure how temporally sensitive they are and probably some of them are short because of reworking." Based on their form and late Holocene dating, we believe that these latter central-southwest Yukon points are neither technologically nor temporally related to the much earlier Chindadn form found in the Tanana River drainage, including those from the Little John site.

Finally, Cinq-Mars and Gotthardt (1998) have reported the recovery of a Chindadn point at the Poulton Station site (MbVn–1) in 1997 from the northwest Olgilvie Mountains of Yukon, near the Yukon-Alaskan border. The point was found on the surface "in a zone that was full of mixed workshop debris .... [and] other artifacts (large end scrapers made on blade-like supports) that also have a definite "Nenanoid" flavour" (J. Cinq-Mars pers. comm. Dec. 2005). No further information is readily available on this specimen.

Outside of the Beringia region, tear-drop shaped points are found in the early (c. 9000 BP) levels at Namu (Carlson 1996b), and perhaps in other early components from the northern Northwest Coast. We are not aware of their occurrence within a relevant time period outside of the distribution we have discussed above.

Based on these data it seems clear that there is a definite association between Chindadn points and occupations of eastern Beringia during the Terminal Pleistocene assigned to the Nenana complex. The discovery of this technological form at the Little John site, lying geographically at the southeastern extent of Beringia extends the geographic distribution of the Nenana complex eastward into Canada and supports a Late Glacial age for the lower component in the Western lobe.

Foliate Biface Form

The bipoint biface form has a much wider geographical distribution than the Chindadn form, being found in late Pleistocene and early Holocene components of sites in eastern Beringia (the Denali complex), as well as the early post-glacial northwest interior (the Northern Cordilleran Traditions), the coastal northwest (the Pebble Tool Tradition) and the Fraser Valley (Old Cordilleran). We also note, but do not further discuss here, the occurrence of the foliate biface form in western Beringian components in Asia (c.f. West 1996a; Hoffecker and Elias 2007).

West (1967:372) included "bifacial biconvex knives, randomly flaked and of variable size" in his original construction of the Denali complex. This is based on their association with microblade/wedge-shaped core technology at the Donnelly Ridge, Teklanika River (East and West), and Campus Sites (the latter was later determined to be late Holocene in age and should thus be removed from considerations of the Denali complex; see Moberly 1991).

At Donnelly Ridge "four specimens, of which only one is complete, were recovered. The proximal ends of two of the illustrated specimens are missing, and the assignment to this category is therefore a matter of probability only. None is perfectly symmetrical, and the term biconvex, like knife, is a matter of convenience" (West 1967:365).

Two biconvex bifaces are illustrated in West's (1967) paper for Teklanika West and two for Teklanika East. Later, West (1996b:335 and Fig. 7-2) notes that at Teklanika West "the dominant form [of biface] is the lenticular or biconvex (two segment) biface found in virtually all Denali assemblages." The accompanying illustrations make clear that what he is assigning to this category include both symmetrical and asymmetrical foliate forms.

Foliate bifaces of more symmetrical form are present in Component II of the Dry Creek site in the Nenana River valley (see Hoffecker et al. 1996:351, Fig. 7–10k). Found in association with wedge-shaped microblade cores, microblades, and polyfacetted (Donnelly) burins, Component II is assigned to the Denali complex; the component has associated dates ranging from 10,690 to 8915 BP (Powers and Hoffecker 1989; Bigelow and Powers 1994).

Component I of Panguingue Creek contains two "lenticular bifaces", which are in fact foliate bifaces of the form we discuss here, based on the illustrations accompanying the site description (see Goebel and Bigelow 1996:370, Fig. 7–18b, c). The site analysts note that the "small size of the assemblage precludes firm assignment to a defined complex, although it appears to fall within the time range (roughly 10,000 BP) generally prescribed for the Denali complex" (Goebel and Bigelow 1996:369). On the other hand, Yesner and Pearson (2002:139) suggest that Component I of Panguingue Creek "represents a late manifestation of the Nenana Complex, with dates and technologies similar to those from Component III at the Broken Mammoth site."

Finally, the lower component at KaVn–2, south of the Little John site just off the Alaska Highway and about 10 kilometers west of the White River, contains two complete foliate bifaces, and three biface fragments which may have also shared this form (see Hefner 2002:111, Fig. 4.19A, B, C, and E, F). They are stratigraphically between constraining dates of 10,670–10,130 BP, although neither date is on cultural material. Hefner draws a similarity between these bifaces and those of Dry Creek, Component II, linking them to the Denali complex. Hefner also draws a link between a lanceolate biface in the lower component at KaVn–2 with a similar biface base fragment in the lower (Nenana complex) component at the Moose Creek site, leading him to classify the lower component at KaVn–2 within West's (1996a) Eastern Beringian Tradition, which combines Nenana and Denali complex sites as seasonal or functional variants of a single population. On the other hand, Hare (1995:110) links the early KaVn–2 component to Clark's (1983) construct of a Northern Cordilleran Tradition based on the early date for the site and his view that the lanceolate biface has an affinity with "Agate-Basin like" points.

Outside of the Beringia region, foliate bifaces, seem ubiquitous to the earliest components of British Columbia, including the early period at Namu on the central coast, c. 9700 BP (Carlson 1996b), the pre-microblade levels at Richardson Island, Haida Gwaii, dating approximately 9300 to 8900 BP (Fedje et al. 2005), the Bear Cove site on northern Vancouver Island, c. 8000 BP (C. Carlson 1979), the Milliken component at the Milliken site in the Fraser River valley, c. 9000–8150 BP (Mitchell and Pokotylo 1996), and the Old Cordilleran component at the Glenrose Cannery site on the Fraser River delta, c. 8000 BP (Matson 1996); they are found widespread in the southern British Columbia interior, though few have early dated contexts (Stryd and Rousseau 1996).

Based on this review, it seems that the foliate biface form has, as Hefner (2002:87) notes, "been included in every major early cultural historical classification in northwestern North America.... [and] it would appear that this artifact originated in the north and diffused southward."

Biface Fragments

Of the biface fragments described below, two pieces (KdVo–6:123 and KdVo–7:1) were indisputably recovered from within basal loess sediments; 123 is from the West lobe of the Little John site, while KdVo–7:1 was recovered from similar sediments at a nearby hunting overlook. Based on this we include them within the Nenana complex assemblage. Morphologically they are similar: thin, nearly identical in width, randomly flaked, with a flat base gently curving upwards towards the lateral margins. The principal difference between them is that the base of KdVo–6:123 is bifacially thinned, while the base of KdVo–7:1 is ground.

These biface fragments appear to be unique to the Little John Nenana component. While they may bear some resemblance to several bifaces in the Dry Creek Component I assemblage (see Hoffecker et al. 1996:Fig. 7–8a–c), which are relatively broad and exhibit straight to round bases and convex margins, this identification is tenuous at best. Alternatively, KdVo–6:123 may be a preform or broken remains of the typically thin Chindadn points (though we note that the KdVo–6:96 Chindadn point is not thin by any imagination).

The points recovered from the B2-Loess interface are assigned to the Denali complex assemblage of the site based on their co-occurrence with numerous microblades in this stratum. Two (KdVo–6:125 and 716) may be tip fragments of foliate bifaces, but there is no certainty in this assumption. We note again that KdVo–6:716 is extremely thin and thus reminiscent of the small Chindadn form and that its outline does not preclude this possibility.

The medial fragment (KdVo–6:122) and remaining point tip (124) share a similar morphology in terms of thickness, lenticular cross-section, and maximum width, and on this basis seem to be the same technological form. We also note that the medial fragment (KdVo–6:122) seems to represent a lanceolate form, which is not foreign to Denali assemblages, such as Dry Creek Component II (Hoffecker et al. 1996).

Discussion

There are two opposing positions regarding the relationship between assemblages of the Nenana type and assemblages of the Denali type. The first, held by the original proponents of the Nenana Complex (Powers and Hoffecker 1989) and others (e.g., Goebel and Ponnti 1992; Pearson 1999), is that the Nenana complex represents the first inhabitants of the Nenana and Tanana Valley basin by a non-microblade producing people and that assemblages containing microblades and other assigned Denali assemblage material (including foliate bifaces) represent a subsequent migrant population or diffusion of this technology into the basin about one to two thousand years later. This position is based on the documented stratigraphic and temporal separation of most assemblages representing the two complexes, with Nenana material being consistently older and underlying the younger and stratigraphically higher Denali material at most sites in the region.

In opposition to this view, West (1996a) and others (e.g., Holmes 2001; Hefner 2002), maintain that the two complexes represent separate tool kits of the same over-arching techno-complex, known variously as Denali, the Eastern Beringian Tradition, or the Beringian Tradition. This position is based on some temporal overlap between the later occurrences of Nenana sites and the earlier occurrences of Denali sites, as well as the evidence from one site, Swan Point (Holmes et al. 1996), at which it is reported that a well-defined microblade assemblage *underlies* a non-microblade bearing "Nenana" stratum.

This view creates a distinction between short-term hunting camps with a limited range of hunting activities—thus lacking microblade technology for functional reasons—and longer-term village sites, where microblade technology was mobilized to perform a wider diversity of activities. Yet, as Yesner and Pearson (2002) aptly point out, the Broken Mammoth site (Holmes 1996), lacks microblade technology in its early components, but does contain evidence of a longer-term encampment, including "[T]ool manufacture and resharpening, caching behavior for both artifacts and meat sections, both primary and secondary butchering, and both hide preparation and skin sewing are reflected by the tools and fauna..."(Yesner and Pearson 2002:152, *sic*), which does not support explaining the difference between Nenana and Denali complex assemblages on the basis of functional distinctions created by short-term occupation.

Consistent with this argument, in his recent analysis of the radiocarbon chronology of late Pleistocene Alaska, Bever (2006) reaffirms the point that microblade technology and artifacts diagnostic of the Nenana complex, and in particular Chindadn points, have never been found in association. While he acknowledges that the Healy Lake site may be a possible exception, he notes that inextricable mixing of the lower levels of this site due to cryoturbation renders the apparent association between microblades and Chindadn points suspect. This prompts Bever (2006) to develop a third scenario for the relationship between the Nenana and Denali complexes. Contrary to Yesner and Pearson (2002), Bever argues that the basal components of the Broken Mammoth and Mead sites, which lack diagnostic lithic artifacts but are often placed in the Nenana complex based on dates comparable to the well-defined Nenana components in the Nenana Valley, are not necessarily Nenana components. Holmes (2001:165) had previously made the same point: "Despite the lack of any microblades from this time period at the Mead and Broken Mammoth sites, I would not assign these components to the Nenana complex on negative evidence alone." What Bever proposes is that these two components could be related to the microblade component at Swan Point:

> Like Swan Point, Broken Mammoth also contains an earlier occupation (Component IV, dated between 11,300 and 11,400 cal B.C.) underlying the Nenana component. The older basal component at Broken Mammoth produced a small assemblage that, while containing a large assemblage of organic tools, lacks known diagnostic types and cannot be assigned to a particular complex. However, it dates to the latter portion of the earliest Swan Point microblade component, and since it is located only about 20 km away, probably represents a related occupation. The nearby site of Mead also contains two occupations

> layers in sync with those at Swan Point and Broken Mammoth, but none contain diagnostic materials (Bever 2006:606).

Based on this interpretation, Bever goes on to describe a possible reversal in the archaeological record of late Pleistocene Alaska. While stratigraphic separation between the Nenana and Denali complexes is apparent in both the Nenana and Tanana Valleys, in the Tanana Valley the Denali complex underlies the Nenana complex; in the Nenana Valley the opposite is the case. Indeed, the Nenana complex of the Nenana Valley overlaps in time with the Denali complex of the Tanana Valley. This leads him to the general conclusion that:

> Clearly, there is no straightforward relationship between Nenana and Denali complexes when the evidence from both the Nenana and Tanana Valleys are considered together. The only clear pattern is that both coexisted side by side for at least two thousand years (Bever 2006:606–607).

All told, the culture-historical patterns evident in the Nenana and Tanana Valleys of interior Alaska, which provide the context for the interpretation of the Nenana and Denali components at the Little John Site, likely represent a complex suite of causes—perhaps relating to shifting economic adaptations, population movements and/or technological diffusion and expressions of cultural identity—yet to be fully unraveled. The influence of the accompanying Younger Dryas climatic event during the latter portion of this period in late glacial Beringia also needs to be taken more fully into consideration but we do no more than note this here (but see Hoffecker and Elias 2006, Carlson 2008).

Evidence from the Little John Site does not unequivocally resolve this debate, but the presence of a non-microblade assemblage bearing Chindadn points and other tools characteristic of the defined Nenana complex stratigraphically, and therefore temporally, separate from an overlying microblade bearing assemblage lends support to the notion that Nenana and Denali assemblages are separate techno-complexes, at least at this time in this place.

It remains unclear how the small assemblage recovered from the KaVn–2 site east of the Little John site near the White River, which possibly dates to between 10,670–10,130 BP, and which includes two foliate bifaces—diagnostic of the Denali complex in our analysis—but lacking in any evidence of microblades, relates to the Little John Site in the culture-historical framework of the region. A reasonable conclusion—in the absence of direct dating of the Nenana component at the Little John Site—is to state that microblades, foliate bifaces, and Chindadn points are present in the far southwest Yukon between 10,500 and 9000 BP. Viewed from the complex associations of techno-complexes in interior Alaska articulated by several generations of archaeologists, different manifestations of purported Nenana and Denali elements at different sites and times in the Yukon would not be surprising. Indeed, in the absence of clear stratigraphic or chronometric evidence otherwise, we have to at least entertain the possibility that the loess-level Chindadn-bearing assemblage from the West lobe of the Little John site *might* be the product of the same culture-bearers responsible for the deposition of the faunal remains and foliate bifaces found in the East lobe paleosols; in such an event the Little John case takes on an additional importance.

In this context, we must finally note the possible relationship of the Little John biface assemblage to areas outside of Beringia. Carlson (1996a, 2004, 2008) has suggested that the Nenana complex may be antecedent to the early pre-microblade occupations of the Northwest Coast of North America. This possibility is based on the presence of foliate and Chindadn-like teardrop bifaces in the earliest documented archaeological components on the coast, dated to c. 9500 at Namu. Carlson (2008:2) argues that bearers of the Nenana complex, adapted to caribou hunting, may have "spread to the northern Northwest Coast ... from interior Alaska through the Yukon between 11,000 and 10,000 BP during the Younger Dryas", at a time at which the tundra environment may have extended from interior Alaska through the Yukon and onto the coast, a proposition supported by the presence of caribou on the coast during this period.

The presence of foliate or bipointed bifaces and Chindadn points in the Yukon at the Little John Site and KaVn–2 in the far southwest Yukon between 10,500 and 9000 BP provides support for Carlson's hypothesis. Interestingly, Bever (2006) notes that the Younger Dryas event might also be implicated in the disappearance of the Nenana complex from the Nenana Valley and its reappearance in the Tanana Valley. This may be supported by the presence of unequivocal Nenana components at Broken Mammoth-Component III and Swan Point-Component III, which taken together date to between 10,800 and 9700 BP, coincident with the Younger Dryas. If this movement from the Nenana valley into the Tanana valley continued eastward and onto the coast via the Yukon, the Little John Site and KaVn–2 are perfectly positioned geographically, and in the right range chronologically, to have been locations across which this migrant population would have passed. A detailed technological comparison between early coastal bifaces and those found in the far southwest Yukon, further excavation and dating of the Little John site, and excavation of new sites to more clearly delineate the early culture-historical framework of the southwest Yukon-Alaska borderlands will help to address these questions.

Conclusions

The Little John site presents us with the first recovery of an unequivocal Nenana complex assemblage from within a stratified context in Canada, overlaid by a microblade bearing assemblage we assign to the Denali complex. The site also contains a buried paleosol complex rich in culturally modified fauna, indicative of a broad spectrum subsistence strategy, and dated to c. 9500–9000 BP, in itself a rare occurrence in Yukon-Alaska and thus important in its own terms (Hutchinson et al. 2007). We have also assigned this paleosol complex to the Denali complex, based on its association with foliate bifaces and some evidence of microblade technology. Unfortunately, no material suitable for dating the Nenana complex component has been recovered but, if our separation of the site assemblage is correct, it would predate the fauna and date to c. 10,000+ BP, which would be in general accordance with similar Nenana complex assemblages in the nearby Tanana and Nenana river valleys.

On the other hand, as our regional comparisons and discussion shows, the apparent is no longer as straight forward as cultural-historians would like, and there are several possible ways to interpret the early assemblage of the Little John site at this time. Only further excavation may lead us to more definitive answers to the complexities of the culture history of the Late Glacial period in this region and its relationship to subsequent developments elsewhere. Fortunately, the Little John site is large, and we are also confident that additional related sites in the borderlands region will soon be revealed, which together will undoubtedly provide additional data on the Terminal Pleistocene occupation of Canada's far northwest in years to come, contribute to the resolution of some of the conflicting interpretations we raise here, and undoubtedly present us with important new questions to ponder.

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