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Vihtr'iitshik: A Stone Quarry Reported by Alexander Mackenzie on the Lower Mackenzie River in 1789

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ABSTRACT. The analysis of archaeological specimens gathered in 1988 at the mouth of the Thunder River (MiTi-1), lower Mackenzie Valley, indicates that the locality's primary function was as a quarry/workshop. Historical and toponymic data show that this was likely the quarry identified by Alexander Mackenzie on 24 July 1789. Collections from the southwest Anderson Plain contain high proportions of Thunder River siliceous argillite, some obtained from beach gravels or till deposits, while some was obtained from primary geological deposits. In collections from peripheral areas, Thunder River siliceous argillite is occasionally found and often consists of the end-products of lithic reduction. It is especially interesting to confirm the presence of Thunder River siliceous argillite in Mackenzie Delta Inuit sites. A critical evaluation of all available data shows that Alexander Mackenzie's journal was relatively accurate with respect to this lithic source.

Key words: Alexander Mackenzie, Mackenzie River, Thunder River, archaeology, lithic quarry, toponomy

RÉSUMÉ. L'analyse de la collection archéologique obtenue en 1988 au site MiTi-1, situé à l'embouchure de la rivière Thunder, dans le bas Mackenzie, témoigne de l'exploitation de l'argillite silicifiée qui s'y trouve. En effet, les récits de voyages ainsi que les toponymes autochtones suggèrent que cette localité fut celle indiquée à Alexander Mackenzie comme l'endroit où les Indiens et les Inuits venaient trouver de la pierre pour fabriquer leurs outils. Les collections archéologiques de la plaine d'Anderson recellent de cette argillite silicifiée prélevée de dépots géologiques primaires ou retrouvée sur les plages sous forme de galets. Dans les régions avoisinantes cette argillite silicifiée ne se rencontre que rarement et très souvent prends la forme d'outil ou de microlames. Il est surtout intéressant de noter la présence de ce type lithique dans plusieurs gisements néo-esquimaux du delta de la rivière Mackenzie. Une lecture critique des écrits de Mackenzie démontre que ce dernier était un observateur fiable, du moins en ce qui concerne cette source de pierre.

Mots clés: Alexander Mackenzie, rivière Mackenzie, rivière Thunder, archéologie, carrière lithique, toponomie

INTRODUCTION

The Northern Oil and Gas Action Programme (NOGAP) is a federal government initiative aimed at acquiring baseline data in a number of environmentally sensitive fields. This information, it is hoped, will permit a sounder approach to the management of oil and gas resource development within the NOGAP regions: the Mackenzie Valley, the Beaufort Sea and the Northwest Passage.

One of those areas of concern is heritage resources. The Archaeological Survey of Canada, Canadian Museum of Civilization, working in conjunction with territorial government agencies (Prince of Wales Northern Heritage Centre and Yukon Heritage Branch) and heritage contractors, undertook the task of identifying and assessing the significance of the archaeological resources within the NOGAP areas.

Much of the field work in the lower Mackenzie Valley (Pilon, 1985, 1987, 1988, 1989) was carried out in the southwestern portion of the physiographic region known as the Anderson Plain (Bostock, 1964) (Fig. 1). Previous archaeological surveys within the general area had identified 107 archaeological sites (MacNeish, 1954; Millar and Fedirchuk, 1975; Cinq-Mars, 1975; Morrison, 1984), but only one, the multi-component Whirl Lake site (MjTp-1), had ever been systematically studied (Gordon and Savage, 1973).

One other site stands out from among the relatively meagre sites located prior to NOGAP: MiTi-1, discovered and tested in 1973 at the mouth of the Thunder River (Millar and Fedirchuk, 1975:239) within the context of the Mackenzie Valley Archaeological Survey. In all, the combined collection included more than 600 pieces of debitage along with 3 blades, 3 unifaces, 7 bifaces, 4 scrapers and an unspecified number of cores and utilized flakes. Unfortunately, the only available information pertaining to this collection is contained in a brief description of the site and two artefact plates (Millar and Fedirchuk, 1975:239-241). Although revisited by Hanks and Winter in 1982 (Hanks and Winter, 1984), no additional materials were collected from the site.

Since very little was known about prehistoric uses of the resources of the lower Mackenzie River, the apparently rich site at the mouth of the Thunder River was targeted for additional study. In 1988 the MiTi-1 site was visited in order to determine whether much remained of the site, to assess the damage that may have resulted from a major forest fire in the area in 1986 and to collect an artefact sample.

The primary objective of this article is to bring together a relatively broad range of archaeological, historical, geological and toponymic data that relate to MiTi-1 and permit a better understanding of the potential significance of this archaeological site.

DESCRIPTION OF THE THUNDER RIVER LOCALITY

The valley of the Thunder River consists of a deeply cut former glacial spillway. Today the river itself is nothing more than a small, meandering stream draining a lake some 25-30 km to the north. A portage of about 1 km in length links this source of the Thunder River with a series of four long interconnected lakes leading to the north-flowing Iroquois-Carnwath-Anderson drainage system, which eventually empties into Wood Bay (at the head of the Eskimo Lakes).

At the mouth of the Thunder River, the stream is deflected against the steep eastern bluff by strong eddy currents, which have resulted in the formation of a spit on the west side (Fig. 2). The spit, capped in thick, unctuous Mackenzie River silt, rises steeply to a first bench, at the back of which a cabin foundation was reported (Millar and Fedirchuk, 1975). The relatively level portion of this narrow terrace is perhaps some 50 m deep, at which point it again assumes a very steep grade,

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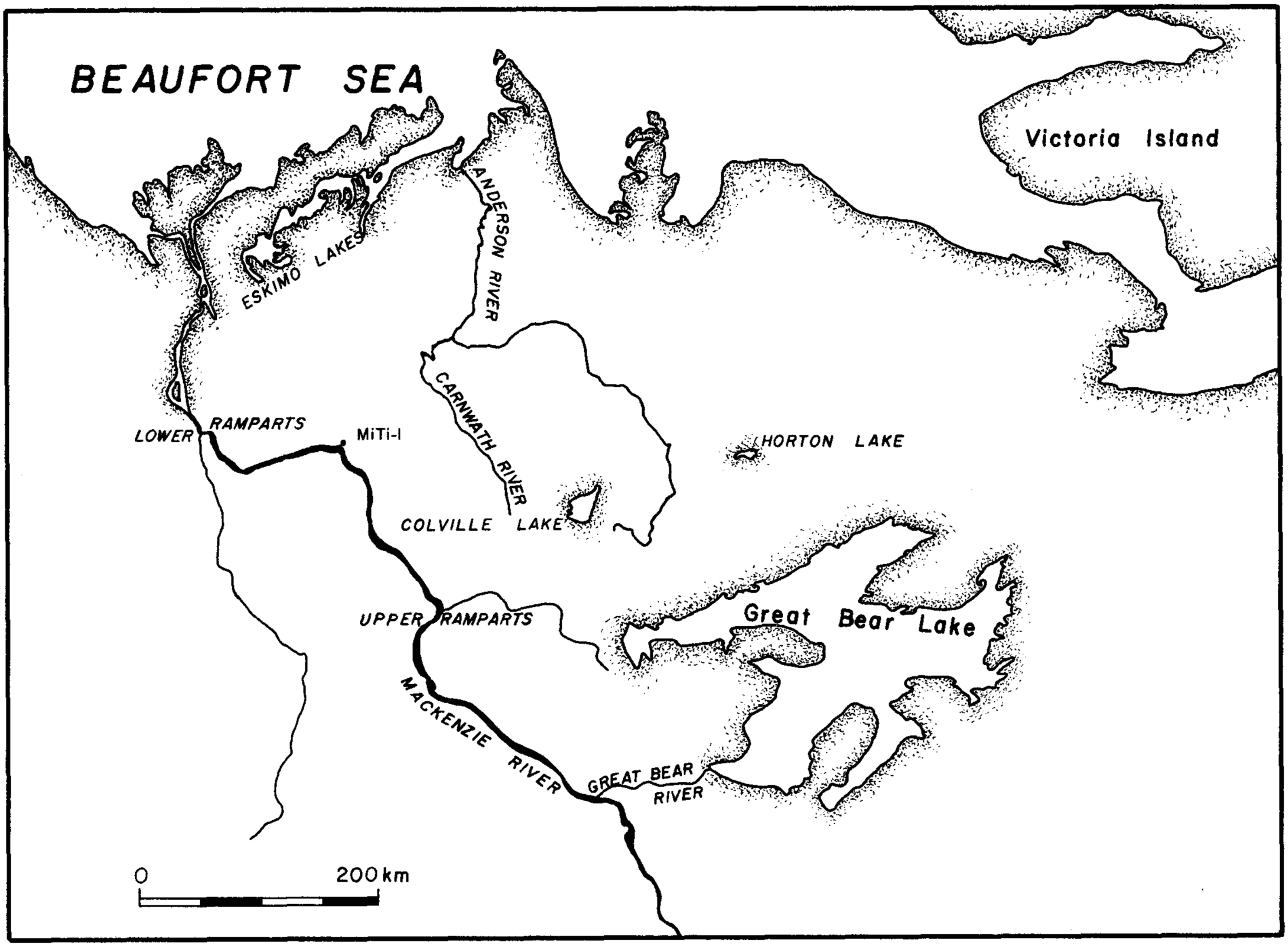

FIG. 1. Map of the lower Mackenzie Valley.

rising to the uppermost bench. The lower terrace is some 16 m above the Mackenzie River (Hanks and Winter, 1984). The upper bench is 10 or more metres higher.

Looking across to the opposite side of the valley from the top of these terraces, the uppermost portions of the slopes are covered in certain areas with what appeared to be a powdery crust, like a salt that had leached out of the gravels. One area was reddish and another yellowish. It was of interest to later read Mackenzie's description of the environs of a lithic source described to him in 1789 in this general vicinity and to note many remarkable similarities with what we observed at the mouth of the Thunder River:

> The bank is an high, steep, and soft rock, variegated with red, green, and yellow hues. From the continual dripping of water, parts of it frequently fall and break into small stony flakes like slate, but not so hard. Among them are found pieces of *Petrolium*, which bears a resemblance to yellow wax, but is more friable. [Mackenzie, 1927:203.]

Richardson explained Mackenzie's observations in the following manner:

> The flint he speaks of is most probably flinty-slate; but I do not know what the yellow petroleum is, unless it be the variety of alum, named rock-butter, which we observed in other situations, forming thin layers in bituminous shale. [Richardson, 1971:xxxvii.]

Finally, although Millar and Fedirchuk (1975) only collected archaeological specimens from the terraces and beach

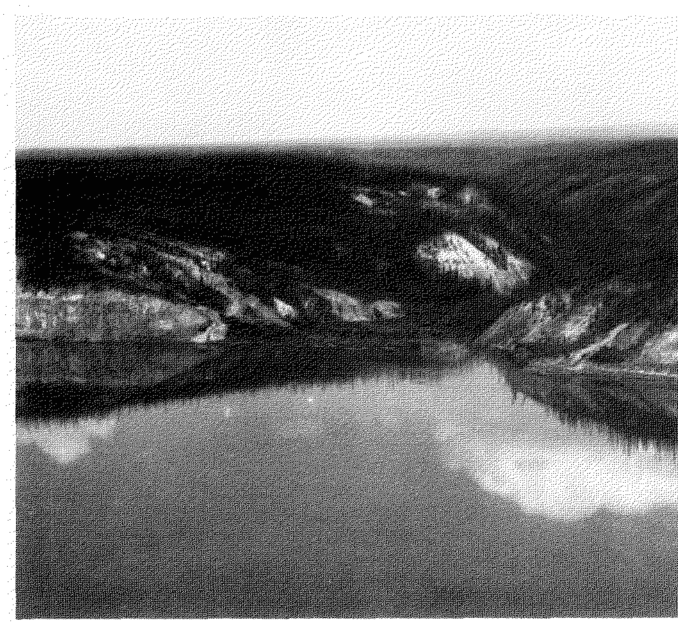

FIG. 2. The mouth of the Thunder River, *Vihtr'iitshik*.

on the west side of the valley, they did note a possible source of shale on the east side of the valley, some distance from the Mackenzie River. In this respect we are reminded of Mackenzie's assertion that "We passed a small river, on *each side of which* the natives and Esquimaux collect flint" (1927:203; emphasis added).

GEOLOGICAL OBSERVATIONS PERTAINING TO THE THUNDER RIVER LOCALITY

The sedimentary rock deposits that occur at the mouth of the Thunder River were originally used by Kindle and Bosworth (1921) to define the Upper Devonian Fort Creek Formation. Bassett (1961:494) suggested that the bituminous portion of the Fort Creek Formation correlated with the Canol Formation defined near Norman Wells. Although he assigned a Middle Devonian age to the Canol Formation, subsequent fossil identifications have shown it to be of Upper Devonian age (Cook and Aitken, 1975:8). Cook and Aitken (1975:8) characterize the Canol Formation as "black, siliceous, bituminous shale with some silty beds, clay-ironstone beds and concretions, and pyrite nodules... closely spaced joints result in characteristic blocky fracture and vertical cliff faces."

The Canol Formation is the predominant outcropping rock along a very limited stretch of the Mackenzie River, essentially restricted to the bend in which the Thunder River empties (Cook and Aitken, 1975:map 1409A). Downstream from Thunder River, the Canol beds lie under more recent Upper Devonian sandstone and shale: the Imperial Formation. Upstream they are encountered only some distance inland from the Mackenzie River. Along the Mackenzie itself, up to Fort Good Hope, the older Middle Devonian Hare Indian Formation of limestone and shale constitutes the main bedrock type.

The high bitumen content of the Canol Formation combined with forest fires causes a slow burning process that results in "a bright brick-red colour" (Kindle and Bosworth, 1921:48; Hume and Link, 1945:70). This specific formation is also known for the sulphur deposits on top of the upper layers and "sulphur springs in areas underlain by them" (Hume and Link, 1945:72; Kindle and Bosworth, 1921:47). Clearly, these two characteristics of the Canol Formation more than likely account for the variegated colours of the cliff sides noted above.

ARCHAEOLOGICAL CONTEXT

Millar and Fedirchuk (1975) recovered archaeological specimens from terraces on a number of spurs or lobes forming the west wall of the valley, near its juncture with the Mackenzie River. During our brief visit to the site, we examined portions of these same terraces. Specimens were gathered from the steep slope and the edge of the first terrace directly overlooking the Mackenzie River. Toward the back of the first bench there was a marked reduction in the amount of lithic detritus visible on the surface, but on the second slope leading to the higher terrace, artefacts were once again noted in relative profusion.

As mentioned earlier, one of the reasons for visiting this locality was to assess the amount of damage that might have occurred because of the 1986 forest fire. Tall, coarse grasses and fireweed were growing in relative abundance between the blackened trunks of the spruce trees that once formed a fairly thick forest cover over the two terraces. It appears that the pre-1986 sod was quite thick and had to have been composed of moisture-retaining vegetation, which subsequently retarded or even inhibited the burning of the sod (Hanks, pers. comm. 1988). As a result, small clumps of sod remain, although these have been blackened and reduced somewhat in thickness. Between these clumps the mineral soil is exposed, forming a dendritic pattern. Artefacts were found on the surface of the bare crevasses and protruding from the sod clumps (Fig. 3).

FIG. 3. Artefact concentration at MiTi-1.

Severe slumping and active layer glides are evident on the west side of the Thunder River Valley. Undoubtedly this is a result of the destabilizing effect of the forest fire and the resulting reduction or elimination of the vegetation cover (Mackay and Mathews, 1973:37-40). It would be premature to suggest how this has or will influence the integrity of the archaeological site, especially if one considers the relative frequency of forest fires in this region and our lack of a benchmark from which to estimate erosion. Notwithstanding these facts, it is likely that portions of the site are threatened and others have already succumbed to erosional forces, as witnessed by the discovery of debitage along the slope of the first terrace.

ARTEFACT ANALYSIS

A total of 361 artefacts was surface collected during the brief two-hour visit at MiTi-1. This relative abundance compares well with preliminary figures of more than 600 lithic specimens found in 1973 (Millar and Fedirchuk, 1975:239).

Lithic debitage accounts for the overwhelming majority of the artefact total (297 specimens). Most of the debitage consists of quite large flakes, many of which are primary flakes removed during the reduction of blocky, angular cores. Flakes produced during the manufacture and thinning of large bifaces were also recovered.

Twenty-seven pieces of debitage have been identified as linear flakes (Fig. 4). One particularly long, narrow and

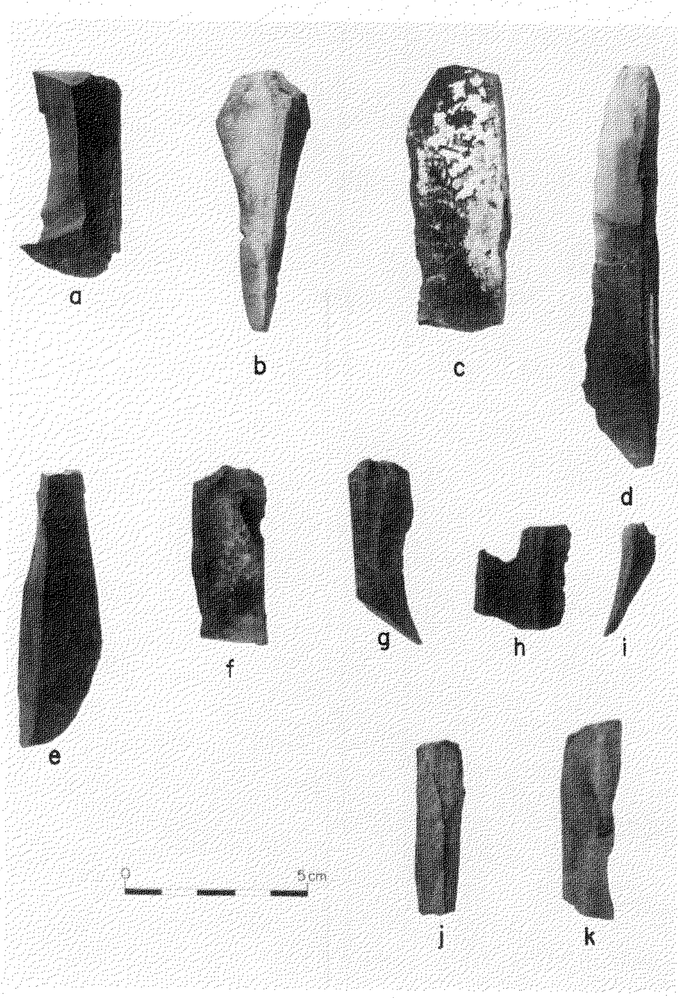

FIG. 4. Linear flakes (j is distally retouched).

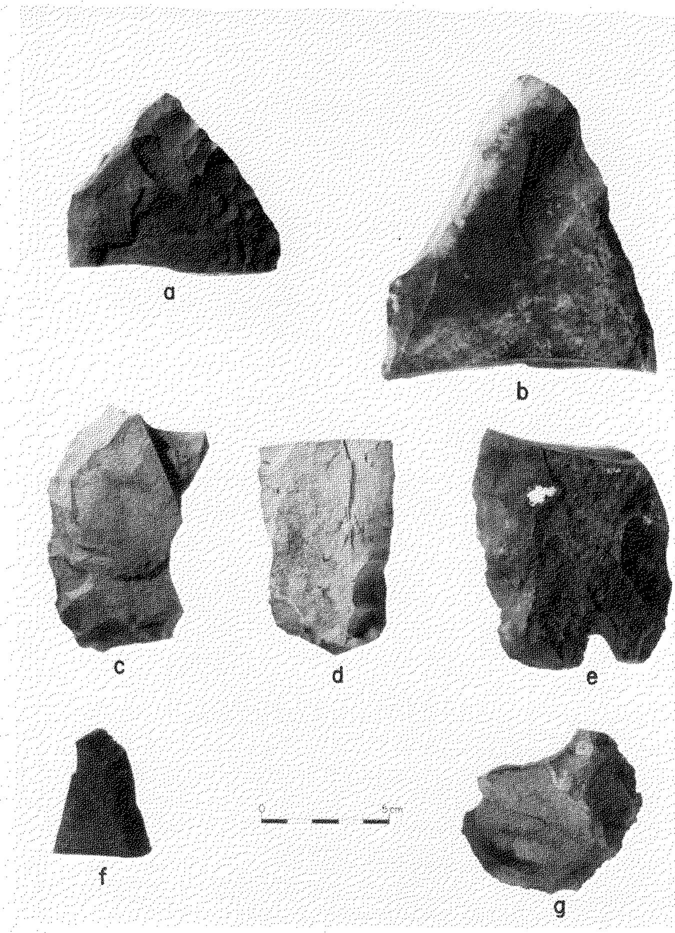

FIG. 5. Marginally retouched tablets.

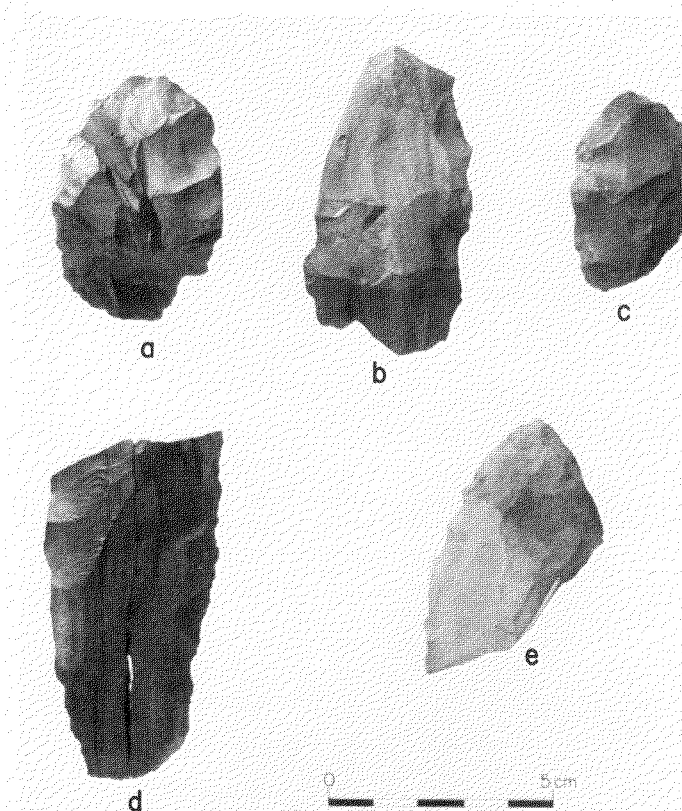

FIG. 6. Bifaces.

parallel-sided example was steeply retouched along its distal margin (Fig. 4j) and six others bear some kind of retouch or use wear. The majority of the remaining linear specimens consists of long flakes detached from the corners of blocky or angular cores.

Two artefact categories stand out from the remaining 64 specimens: cores and bifaces. The latter consist of large tabular bifaces and biface fragments (N=14) exhibiting only marginal flaking (Fig. 5) and smaller, more refined bifaces (N=6) whose entire surfaces have been flaked (Fig. 6). Both types likely represent different stages of a technological continuum. In all instances but one, the quality of the flaking suggests only preliminary shaping or thinning, in view of producing blanks destined for further reduction and refinement.

Most of the cores and core fragments (N=30) can be grouped into two types. The first group of cores (N=12) consists of wide, relatively thin tabular pieces whose flat surfaces were the main flaking faces (Fig. 7). The flaking planes are thus parallel to the natural layering within the raw material. The second group of cores (N=16) consists of thick, but narrow and long tabular pieces whose principal flaking face is perpendicular to the bedding planes of the rock (Fig. 8). Essentially these cores could only produce long, parallel-sided flakes.

Two cores stand out from the rest in that they are large pieces of raw material that have had flakes removed from

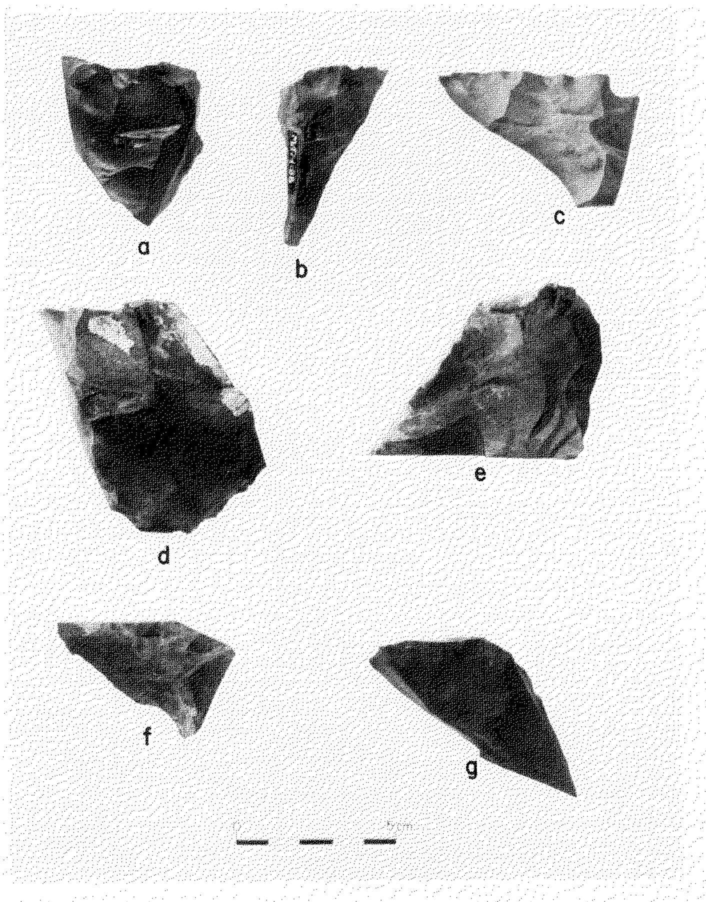

FIG. 7. Rotated (a,d) and tabular cores.

a number of faces. Flakes removed from the principal flaking faces tended to be directed down the length of the cores and suggest the intentional production of linear flakes, if not blades/microblades (Fig. 7a,d).

SITE INTERPRETATION

Analysis of the lithic collection demonstrates one important point: that the MiTi-1 locality was used as a quarry/workshop. Reviewing the data, three technological elements stand out. The first is the size range of the debitage. Unlike any other site in the southwest Anderson Plain, the debitage consists of an extensive collection of relatively large pieces. In addition, a very high proportion of the debitage comprises primary flakes produced during the initial reduction of blocky or angular cores.

A second feature of the collection is the relatively high incidence of large cores. It is conceivable that many of these could easily have been further reduced if availability of raw material was a constraint. Rather, extravagance is suggested. In fact, few cores exhibit attempts to re-orient flaking once failure (hinge fracture in many cases) occurred.

Lastly, the bifaces and biface fragments all point to initial reduction aimed at blank production. There is no apparent refinement in the flaking patterns or the shapes produced.

These three features of the collection indicate that, although perhaps not the only activity that took place at the site, the preliminary processing of readily available lithic blocks was the most important reason for using the high benches at the mouth of the Thunder River. Furthermore,

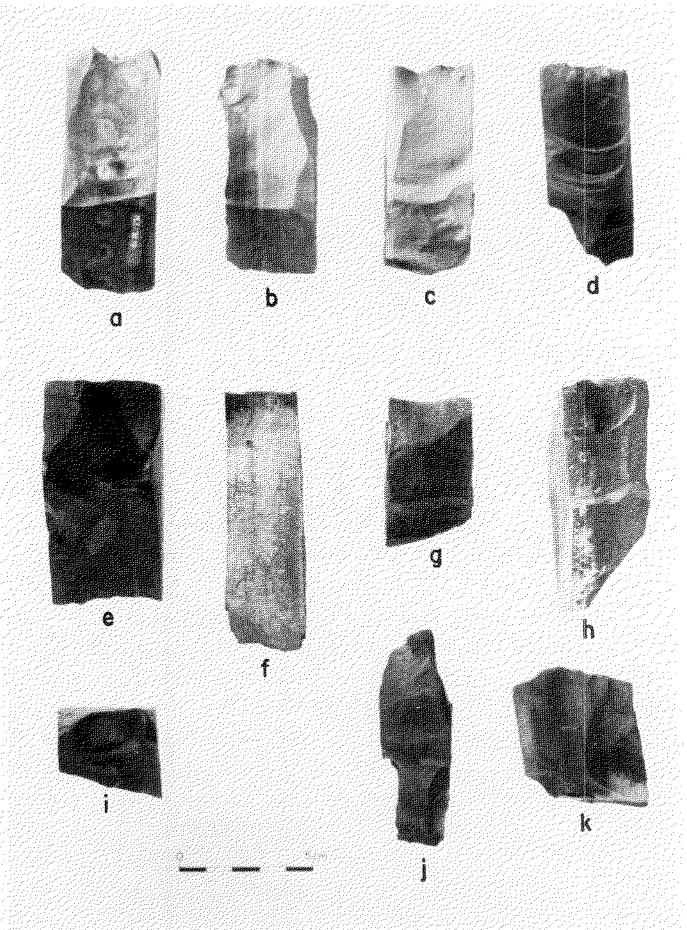

FIG. 8. Thick tabular cores.

the angularity of the blocks indicates that this raw material was obtained from an outcrop rather than collected from beach gravels or till deposits.

The source of this rock is assumed to be the cliff face in front of the site; its verticality is maintained by the strong currents of the Mackenzie River (Fig. 9). We did not sample the various layers of rock during our brief visit. However, blocks of similar raw material were observed on the beach near the base of the cliff, and there is little doubt that these beds contain the raw material sought after in prehistoric times. Controlled sampling of the site and the geological formation will be undertaken in future field seasons.

PETROGRAPHIC EXAMINATIONS

Thunder River (MiTi-1) Samples

In order to identify the raw material type, characterize it and document its variability, 11 specimens found on the lower and upper benches of the Thunder River site (MiTi-1) were selected for thin sectioning and petrographic analysis. The specimens selected represent a visual cross-section of textures and colours; some were banded with shaley grey layers grading to lustrous black cherty bands, while others were more homogeneous.

All 11 raw material samples were identified as shales with high silicate contents or what may be termed siliceous argillite (J. Grice, pers. comm. 1988).

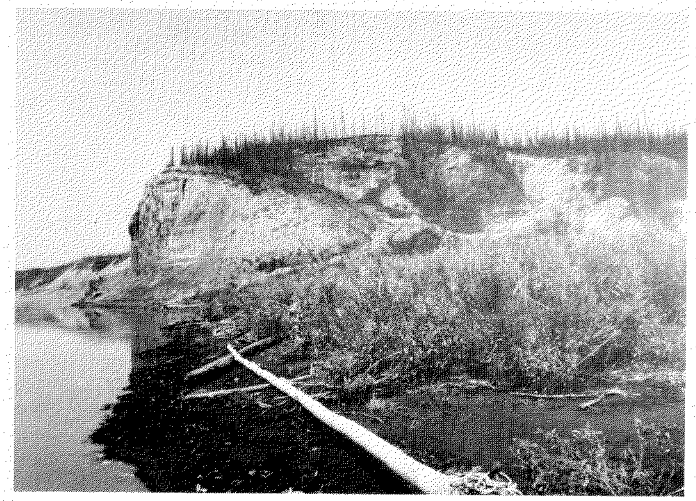

FIG. 9. Canol formation outcrop at the mouth of the Thunder River, the source of Thunder River siliceous argillite.

Three features characterize the sample (S. Presley, pers. comm. 1988). All consist of a dark matrix within which iron oxide or hematite formations are always found. In addition, round to oval quartz/chalcedony/calcite formations are common. Examination of Table 1 shows that microlites and pyrites are also common inclusions. During thin sectioning, some chipping of the new surface revealed a markedly different colour from what was obvious prior to cutting. In a number of cases, the very light grey surface was found to be a thin patina over a darker core, while in one notable example this layer was quite thick. Yet in spite of this colour shift, the banding remains visible. Evidently, the appearance of this raw material can be altered by specific site conditions. In this particular instance, the forest fire or some other feature of the soil chemistry might have modified the colouration of some specimens.

TABLE 1. Petrographic analysis of Thunder River (MiTi-1) samples

	Sample no.										
	1	2	3	4	5	6	7	8	9	10	11
Banding	X	-	-	-	X	X	X	-	-	-	-
Micromarine organisms	-	-	X	-	-	-	-	-	-	-	-
Dark matrix	X	X	X	X	X	X	X	X	X	X	X
Iron oxide or hematite formations	X	X	X	X	X	X	X	X	X	X	X
Scattered microlites	-	-	-	X	X	-	X	X	-	X	X
Scattered quartz grains	X	X	-	-	X	X	-	X	-	X	-
Random calcite	-	-	X	-	X	X	X	X	X	X	X
Round to oval calcite/chalcedony formations	-	X	-	-	X	-	-	-	X	X	-
Round to oval calcite formations	-	-	-	(light areas)			X	X	-	-	-
Round to oval quartz/chalcedony formations	X	-	X	X	-	X	X	(dark areas)			X
Scattered amorphous pyrites	-	X	-	X	-	-	-	X	X	X	-
Pyrites in bands	X	-	X	-	X	X	X	-	-	-	-

X = characteristic is present.
- = characteristic is absent.

As a result, it should be emphasized that it is the *combination* of a dark matrix, banding and quartz/chalcedony/calcite inclusions that permits the visual identification of this raw material. This is substantiated by microscopic examination. Thunder River siliceous argillite is quite distinctive. When present in a relatively unaltered state, there is little doubt as to its identity. On the other hand, it is entirely possible for Thunder River siliceous argillite to be present in a collection but not identified because of a change in surface colouration. In these instances, microscopic examination of thin sections can resolve the question.

Southwest Anderson Plain Samples

The next step of the petrographic study involved the analysis of archaeological specimens from southwest Anderson Plain sites. Collections from most sites are relatively small and few could afford the destruction of any single specimen. Instead, a single site with a suitably large collection (minimum of 10 lithic specimens) was chosen from each of the following sub-areas within the southwest Anderson Plain: 1) lac à la Truite, 2) Hyndman Lake, 3) Whirl Lake and 4) Sunny-Sandy Lakes.

The results of the analysis of the southwest Anderson Plain archaeological samples, presented in Table 2, suggest that although these specimens exhibit a broader range of variation than is found at the quarry workshop of MiTi-1, the basic attributes identified earlier for the Thunder River siliceous argillite also characterize these archaeological samples: i.e., iron or hematite, pyrites and chalcedony/quartz/calcite formations in a dark, often banded matrix.

R.J. Dale (1988) has recently completed a study of all available pre-NOGAP site collections from the lower

TABLE 2. Petrographic analysis of SW Anderson Plain siliceous argillite samples by sample number

	Area 1			Area 2				Area 3				Area 4				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Banding	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-
Micromarine organisms	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dark matrix	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Iron oxide or hematite formations	X	X	X	X	X	X	X	-	X	X	X	X	-	-	X	X
Scattered microlites	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-
Scattered quartz grains	-	-	-	-	-	X	-	-	X	-	-	X	-	-	-	-
Random calcite	X	-	-	X	X	-	-	-	X	X	X	X	X	X	-	-
Round to oval calcite/ chalcedony formations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Round to oval calcite formations	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-
Round to oval quartz/ chalcedony formations	X	X	X	X	X	X	X	-	X	X	X	X	X	-	X	X
Scattered amorphous pyrites	-	-	-	X	X	X	X	-	X	X	-	X	X	-	X	X
Pyrites in bands	X	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-

X = characteristic is present.
- = characteristic is absent.

Mackenzie Valley. She found that by far the most predominant raw material on sites within the southwest Anderson Plain was what we can visually identify as Thunder River siliceous argillite. This observation parallels my own concerning lithic raw material types from sites discovered within the context of NOGAP investigations.

DISTRIBUTION OF THUNDER RIVER SILICEOUS ARGILLITE

Southwest Anderson Plain

The distribution of Thunder River siliceous argillite in the southwest Anderson Plain clearly shows the importance of this raw material to the inhabitants of the region. Of nine suitable pre-NOGAP sites (sites with a minimum of 10 lithic specimens), two appeared to lack siliceous argillite, while the remaining seven included significant proportions of this distinctive lithic type. The percentage ranged from a low of 38% to as high as 100%. It is not surprising that the siliceous argillite collection from these sites includes debitage representative of all stages of core reduction and tool manufacture, as well as tools.

Cursory inspection of the Whirl Lake collection as well as the collections from NOGAP sites reveals very high proportions (usually well over 50%) of Thunder River siliceous argillite. In addition, most of the smaller collections (less than 10 lithic specimens) recovered during the activities of NOGAP in the southwest Anderson Plain consist of Thunder River siliceous argillite debitage.

Thunder River siliceous argillite is visually sufficiently distinctive that it can be assumed that all archaeological specimens made of this lithic type ultimately derive from the same geological formation. Some cores and blanks were obtained directly or indirectly from the quarry at the mouth of the Thunder River. These exhibit sharp, unworn corners or arrises similar to those found at MiTi-1. Others were likely gathered from secondary depositional contexts such as beaches. In these instances worn cortical surfaces and rounded corners or edges are indicative of transportation by natural agents.

Areas Peripheral to the Southwest Anderson Plain

Sites (with a minimum of 10 lithic items) visited by D.W. Clark (1975, 1987) in the following areas were visually inspected: the north and west shores of Great Bear Lake (combined in Table 3), Horton Lake, Colville Lake and the Anderson River below the forks with the Carnwath.

The absolute number of Thunder River siliceous argillite artefacts in all four sub-areas is still quite small (100), especially when one considers that 86 sites were examined. Nonetheless, 9 of these items are tools (scrapers or projectile points) and 15 are microblades or blades (1). Additionally, the vast majority of the debitage consists of small trimming or resharpening flakes. Taken as a whole, or considered on a site-by-site basis, Thunder River siliceous argillite most likely found its way into these regions in the form of finished implements, specialized microblade/blade cores or perhaps rarely as blanks.

Two collections from the Moraine Lakes area (four collections included more than 10 specimens), west of Yeltea Lake (near Little Chicago), contained siliceous argillite (1/15;14/25), while five site collections gathered in the Fort Norman region did not appear to contain any raw material similar to the Thunder River siliceous argillite (C. Hanks, pers. comm. 1988).

The late prehistoric/historic Mackenzie Inuit sites of Kittigazuit and Cache Point were examined for the presence of Thunder River siliceous argillite. Not only was a lithic type virtually identical to the Thunder River siliceous argillite noted in these collections, but good evidence to suggest that some of this stone was originally obtained at the primary source was also found, i.e., corner flakes, exhibiting sharp arrises, removed from tabular cores. Although debitage of siliceous argillite was not common, many of the chipped stone tools at Kittigazuit are made of what appears to be this type of stone. Two refined bifaces at Radio Creek were very definitely made of Thunder River siliceous argillite.

C. Arnold (pers. comm. 1988) examined the Gupuk, Cache Point (both East Channel–Mackenzie Delta late prehistoric Inuit sites) and Saunatuk collections and found that they contain specimens that appear to be made of Thunder River siliceous argillite.

In spite of any inherent sampling problems or difficulties with the visual lithic identifications discussed earlier, it is quite clear that the predominant raw materials found in areas adjacent to the southwest Anderson Plain differ markedly from those found on sites of the southwest Anderson Plain. Moreover, the occurrence of Thunder River siliceous argillite — some of which was definitely obtained from primary geological deposits — in areas outside of the southwest Anderson Plain is generally limited to implements, specialized flakes (microblades) and debitage associated with the resharpening of stone tools (curation).

TABLE 3. Siliceous argillite in collections from the Anderson River–Great Bear Lake region

	Anderson River	Great Bear Lake	Horton Lake	Colville Lake
No. of suitable sites	9	33	20	18
Collection size range	20-611	14-4130	1-1700	15-473
No. of sites with S.A.*	4	7	4	7
S.A.* summary (#S.A./collection size)	4 fl/122 1 scr/77 1 fl/20 1 scr/87	3 mb/4130 6 fl/978 1 pp/121 1 mb/46 2 fl,1 scr/92 1 fl/73 8 fl;1 pp;1 scr/5-600	4 mb,6 fl/272 3 fl/43 5 mb,2 fl/1700 1 mb, 1 fl/783 also 1 scr/5	1 fl,1 scr/175 30 fl/473 1 bl, 1 fl/321 3 fl/86 1 scr/20 4 fl/53 3 fl/28

* Thunder River siliceous argillite.
fl = flake; pp = projectile point; scr = scraper; mb = microblade; bl = blade.

Taken as a whole, it appears that access to Thunder River siliceous argillite in areas surrounding the southwest Anderson Plain was indeed limited. In addition, the uses to which this raw material was put indicate that it was a valued and useful lithic type.

HISTORICAL REFERENCES TO A STONE QUARRY ON THE LOWER MACKENZIE RIVER

On 24 July 1789, while returning up the present-day Mackenzie River from his voyage to the shores of the Arctic Ocean, Alexander Mackenzie passed the mouth of a small stream where, he informs us, both local Indians and Esquimaux collected a flint-like stone (1927:203). Two days earlier some people (likely Gwich'in) camped just above the Lower Ramparts indicated to him that "a strong party of Esquimaux occasionally ascends this river, in large canoes, in search of flint stones, which they employ to point their spears and arrows" (1927:200).

Mackenzie mentioned only one such place in his journal. Since most of the landscape of the lower Mackenzie River consists of glacial deposits, bedrock outcroppings of stone suitable for modification into tools are quite rare. Although cobbles obtained from glacial deposits could provide raw materials for implement manufacture, the quality, quantity and size of pieces obtained from primary geological deposits may afford the craftsman a greater range of control and flexibility. Consequently, those few suitable bedrock outcroppings that did exist must have played a significant role in local economies. The identification of the precise location of the source shown to Mackenzie could contribute to our understanding of the movements of lithic resources throughout the region at the end of the 18th century, if not earlier.

W.K. Lamb (1970) and J.K. Stager (1965) have reconstructed Mackenzie's voyage down the Mackenzie River. For the most part I am in agreement with their determinations concerning the route travelled between the Upper and Lower Ramparts, as well as the return trip between these same points. However, there is one crucial passage in Mackenzie's journal that they interpret differently, namely, the location of his campsite of the evening of 8 July 1789. Lamb (1970:192) places it "near mile 800, a few miles upstream from Thunder River," while Stager (1965:Fig. 4) locates this campsite between the mouths of the Thunder and Travaillant rivers, "on the east bank of the Mackenzie about 5 miles upstream [*sic*] from the Thunder River" (1965:234).

The approximate location of this 8 July campsite is critical since Mackenzie reoccupied that same spot on the evening of 23 July on his way back up the river (Mackenzie, 1927:201). The next day, on 24 July, the following observation was recorded:

> At five we continued our course, but, in a very short time, were under the necessity of applying to the aid of the line, the stream being so strong as to render all our attempts unavailing to stem it with the paddles. We passed a small river, on each side of which the natives and Esquimaux collect flint. [1927:203.]

If one plots the distances and directions travelled during the day of 8 July (Fig. 10), while keeping in mind potential errors of distance reckoning and the coarseness of Mackenzie's directions, the result is an outline of the Mackenzie River that fits remarkably well that section between approx-

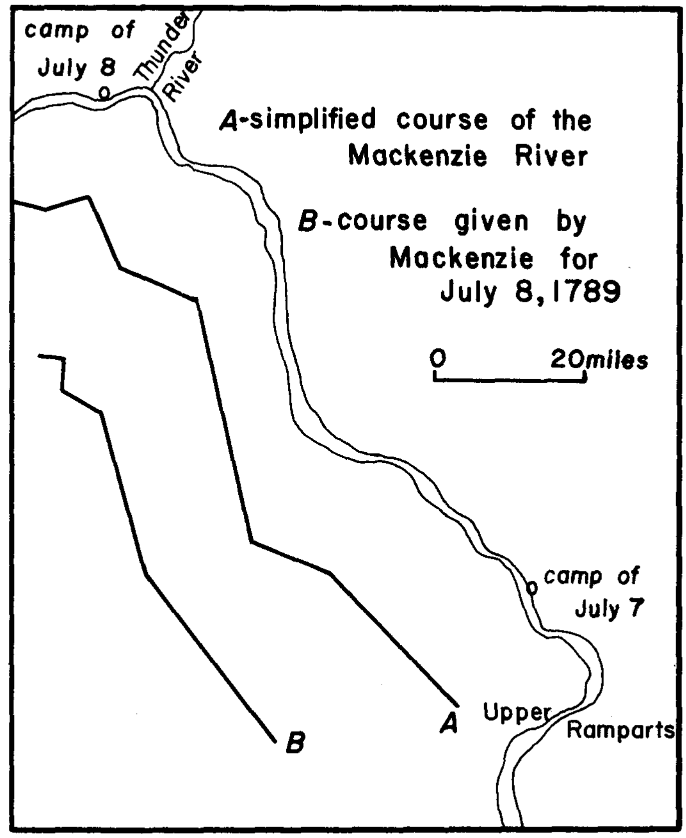

FIG. 10. Comparison of Mackenzie's directions with the actual course of the lower Mackenzie River.

imately the mouth of the Loon River, just below the Hare Indian River, and somewhere just downstream from the mouth of the Thunder River. There can be no mistaking the latter portion of the river since the last three sets of directional instructions — bearing in mind that the magnetic deviation from geographic north today is on the order of 40° east — clearly outline the major bend in the Mackenzie River that occurs in this region: "Our course and distance this day was west twenty-eight miles, west-north-west twenty-three miles, *west-south-west six miles, west by north five miles, south-west four miles,* and encamped at eight o'clock" (emphasis added) (Mackenzie, 1927:174). Stager's determination of this particular campsite is more acceptable than Lamb's.

Further corroboration of Stager's location of the 8 July campsite is provided by the journal of Sir John Franklin, who travelled on the Mackenzie River in 1825 (Franklin, 1971). He covered the distance between the Upper and Lower Ramparts, both on the descent and on the return trip, in the same number of days as Mackenzie: three days down and seven days up. In both cases, several stops were made in order to collect information and supplies or simply to rest. The lengths of the working days varied, as did the type of watercraft used and, undoubtedly, the work habits of the crews.

At the time of Franklin's voyage, Fort Good Hope was located on the south side of the marked bend in the Mackenzie River, just about opposite the mouth of the Thunder River (Franklin, 1971:23; Petitot, 1889:37). Franklin stopped at Fort Good Hope on both occasions. Again, the number of days for him to reach the trading post from either of the ramparts (one day on the way down and three on the way up) coincides with the time it took Mackenzie to travel between either of the ramparts and the campsite of 8 July, which I estimate to have been slightly downstream from the mouth of the Thunder River. Thus, there appears to be a basis for assuming that Mackenzie's 8 July campsite and the 1825 Fort Good Hope are located in the same general vicinity.

The Fort Good Hope visited by Franklin was moved to near its present location at mouth of the Hare Indian River in 1825 or 1826 (Stager, 1962:7). The 1825 site has yet to be identified, in spite of the geographic coordinates provided by Franklin. His latitudes are remarkably accurate, judging from that provided for the mouth of the Arctic Red River (Franklin, 1971:26). However, his ability to calculate longitude may have been hampered by the quality of his chronometer.

If we accept Franklin's Fort Good Hope latitude and extend this line to the west, the left bank of the Mackenzie River is intercepted in the vicinity of a small lake on the flats located slightly downstream from the mouth of the Thunder River (Fig. 11). Simpson's observations in 1837 suggest that this is indeed the likely location of the former trading post:

> On the 24th (of August) we encamped a mile above old Fort Good Hope, on the opposite side of the river, under a high cliff of crumbling slaty rock, strongly impregnated with iron, and containing a great deal of sulphur. [Simpson, 1970:186.]

TOPONYMS RELATING TO THE THUNDER RIVER LOCALITY

According to the Canadian Permanent Committee on Geographical Names (J. Révie, pers. comm. 1988), the designation "Thunder River" is fairly well entrenched in local English usage.

The earliest reference that the committee has to the name Thunder River is from Petitot's 1889 map. On it he provides a number of toponyms for the Thunder River: *"R. Tseindjig ou Leotaladelin ou _____-tchillé-daten ou Tonnerre"* (French for thunder). The native names do not appear related to the Hare Indian or Loucheux words for thunder as far as could be determined from Petitot's dictionary (1876). Curiously though, Petitot indicates that the place opposite the Thunder River is called *Yé-kfwéè*, or red fox. The Hare

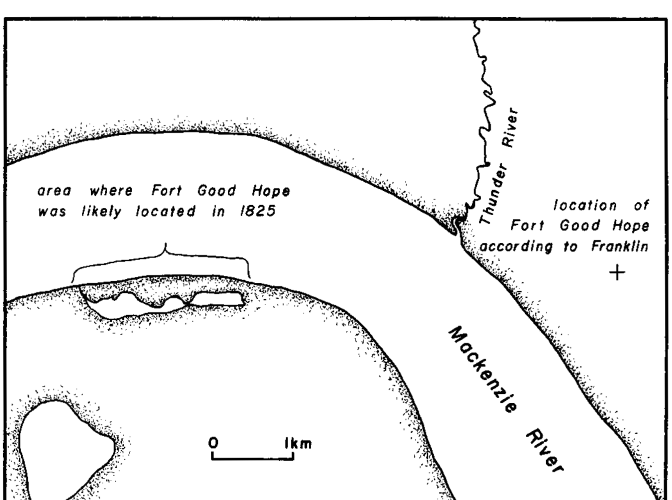

FIG. 11. Location of Fort Good Hope (1825) using Franklin's latitude.

Indian word for stone, according to Petitot, is *kfwè* and flint stone is *'klé-ékfwè*. Could there have been some poor communication or transliteration? In a similar vein, Petitot lists the Loucheux word for stone as being *tchi* or *tcho*. The suffix *tchig* means creek or small river. It could be that the name *Tseindjig* is indeed indicative of the Loucheux knowledge of the lithic source found at the mouth of the Thunder River, if the first half of the word was not correctly understood. The last name, *Tonnerre*, which is the "official" toponym, bears no apparent relation to existing traditional names.

Petitot's *Tonnerre* may relate to a very interesting coincidence. On the night of 8 July 1789, the night spent by Mackenzie and his crew in the vicinity of the mouth of the Thunder River, "thunder and rain prevailed" (Mackenzie, 1927:175). When Simpson camped below the cliffs at the mouth of the Thunder River on 24 August 1837, "there was some thunder with lightning and rain during the night" (Simpson, 1970:186).

Could Petitot, in his effort to provide detail to the map of a largely uncharted country, have found in these earlier writings a coincidence that he wished to commemorate? He may have wanted to draw attention to this locality, which had a particular significance to the local inhabitants and which had been marked by the elements in a rather mystical way.

An additional Euro-Canadian toponym was found in the geological literature. As mentioned earlier, Kindle and Bosworth (1921) used the bedrock outcropping at the mouth of the Thunder River as the type site for the Fort Creek Formation (now the Canol Formation). Knowing that a former site of Fort Good Hope was located across from this confluence, they named the rivulet Fort Creek (Kindle and Bosworth, 1921:43). From an historical perspective, this term is of some interest, but its use appears restricted to geologists and did not enter into common usage.

Hanks and Winter (1983:49) relate that the mouth of the Thunder River was known to the Fort Good Hope people as *Feetee Lu She*, which translates as "stone hide scraper or flat stone, skipping on water."

The name *Vihtr'iitshik*, whose approximate translation is Flint Creek or River, was obtained for the mouth of the Thunder River from a number of Arctic Red River elders (W. Simon, pers. comm. 1988). This locality is more or less at the border between the traditional territories of the Fort Good Hope Hare-Slavey speakers known as the *Tehogowtene* and the Arctic Red River Loucheux speakers known as the *Kwitchia Gwich'in*.

It is thus highly significant that both people who likely exploited the lithic resource at the mouth of the Thunder River recognized this raw material resource in the place names they used to refer to it (see Ritter, 1976, for information relating to *Gwich'in* place names). This fact corroborates the identification of this locality as the lithic source mentioned by Mackenzie. It also suggests that the quarry had been used for centuries, well before Europeans arrived in the lower Mackenzie Valley.

DISCUSSION

There is some suggestion that the lithic source at the mouth of the Thunder River may have been used for several thousand years. The siliceous argillite microblades found by Clark (1987) in the Great Bear Lake region are related to either the

Arctic Small Tool tradition (3000-2000 years ago) or the Northwest Microblade tradition (5000-3000 years ago). The microblade component at Whirl Lake has been assigned by Gordon and Savage (1973) to the Northwest Microblade tradition, and the Arctic Small Tool tradition assemblage at Hyndman Lake (NbTj-8), dated to 3400 years ago, consists predominantly of Thunder River siliceous argillite. However, since the possibility exists that secondary lithic sources were used, controlled excavations at the mouth of the Thunder River may be the only way to properly address this question.

CONCLUSION

The mouth of the Thunder River has been identified as a significant primary source of a distinctive siliceous argillite. The recovery of finished implements at MiTi-1 suggests that some activities took place that were not directly linked with the procurement of lithic raw materials. Extensive testing should provide details about these tasks, as well as insights into the ways in which blocks of siliceous argillite were reduced to useable or transportable forms.

A more extensive and controlled sample should also permit a better assessment of the cultural traditions that made use of this particular lithic source, as well as the length of time during which it has been exploited.

Toponymic information illustrates the potential information still contained in local place names that could help in the understanding of historic and prehistoric land use, which may no longer be evident to local people. It is an avenue of research that urgently deserves attention before more useful data are lost.

Since the bicentennial year of Alexander Mackenzie's voyage has just passed, it is appropriate that the relative veracity of his observations should be brought to light, at least with respect to an important lithic resource for the inhabitants of the lower Mackenzie Valley. In many respects, this locality at the mouth of the Thunder River is a direct link with the long history of the Dene people, a geological age that endowed the Mackenzie Valley with bituminous riches, and an historical figure who precipitated an era that forever changed the lives of the Native people of the lower Mackenzie Valley.

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REFERENCES

BASSETT, H.G. 1961. Devonian Stratigraphy, Central Mackenzie River Region, Northwest Territories, Canada. In: Geology of the Arctic. Proceedings of the First International Symposium on Arctic Geology. Vol. 1. Toronto: University of Toronto Press. 481-498.

BOSTOCK, H.S. 1964. A Provisional Physiographic Map of Canada. Paper 64-35. Ottawa: Geological Survey of Canada, Department of Mines and Technical Surveys.

CINQ-MARS, J. 1975. Preliminary Archaeological Study, Mackenzie Corridor (Final Report 1975). Report 73-10. Ottawa: Environmental-Social Committee, Northern Pipelines Task Force on Northern Oil Development.

CLARK, D.W. 1975. Archaeological Reconnaissance in Northern Interior District of Mackenzie: 1969, 1970 and 1972. Ottawa: National Museum of Man. Archaeological Survey of Canada, Mercury Series Paper No. 27.

______. 1987. Archaeological Reconnaissance at Great Bear Lake. Hull: Canadian Museum of Civilization. Archaeological Survey of Canada, Mercury Series Paper No. 136.

COOK, D.G., and AITKEN, J.D. 1975. Ontaratue River (106J), Travaillant Lake (106-O), and Canot Lake (106P) Map-Areas, District of Mackenzie, Northwest Territories. Paper 74-17. Ottawa: Geological Survey of Canada, Department of Energy, Mines and Resources.

DALE, R.J. 1988. Lower Mackenzie Valley Site Re-evaluation. Ms. no. 3019. Archives of the Archaeological Survey of Canada, Canadian Museum of Civilization, Hull, Quebec.

FRANKLIN, J. 1971. Narrative of a Second Expedition to the Shores of the Polar Sea in the Years 1825, 1826, and 1827. Edmonton: Hurtig. (Originally published in 1828 by Murray, London.)

GORDON, B.C., and SAVAGE, H. 1973. MiTp-1, The Whirl Lake Site, Northwestern District of Mackenzie, Northwest Territories, Canada. In: Cinq-Mars, J., ed. Preliminary Archaeological Study, Mackenzie Corridor. Report 73-10. Ottawa: Environmental-Social Committee, Northern Pipelines, Task Force on Northern Oil Development.

HANKS, C.C., and WINTER, B. 1983. Dene Names as an Organising Principle in Ethnoarchaeological Research. Musk-Ox 33:49-55.

______. 1984. The 1982 Mackenzie River Cabin Survey. Ms. no. 2361. Archives of the Archaeological Survey of Canada, Canadian Museum of Civilization, Hull, Quebec.

HUME, G.S., and LINK, T.A. 1945. Canol Geological Investigations in the Mackenzie River Area, Northwest Territories and Yukon. Paper 45-16. Ottawa: Geological Survey of Canada.

KINDLE, E.M., and BOSWORTH, T.O. 1921. Oil Bearing Rocks of Lower Mackenzie River Valley. Summary Report, 1920, Part B. Ottawa: Geological Survey of Canada, Department of Mines.

LAMB, W.K. 1970. The Journals and Letters of Sir Alexander Mackenzie. Toronto: Macmillan.

MACKAY, J.R., and MATHEWS, W.H. 1973. Geomorphology and Quaternary History of the Mackenzie River Valley near Fort Good Hope, N.W.T., Canada. Canadian Journal of Earth Sciences 10(26):26-41.

MACKENZIE, A. 1927. Voyages from Montreal on the River St. Laurence through the Continent of North America to the Frozen and Pacific Oceans in the Years 1789 and 1793 with a Preliminary Account of the Rise, Progress, and Present State of the Fur Trade of that Country. Toronto: The Radisson Society of Canada.

MacNEISH, R.S. 1954. Archaeological Reconnaissance in the Mackenzie River Drainage. National Museum of Canada Bulletin No. 128, Annual Report of the National Museum of Canada for the Fiscal Year 1951-52. 23-39.

MILLAR, J.F.V., and FEDIRCHUK, G. 1975. Mackenzie River Archaeological Survey. Report 74-47. Ottawa: Environmental-Social Committee, Northern Pipelines, Task Force on Northern Oil Development.

MORRISON, D.A. 1984. Archaeological Survey in the Mackenzie District, 1984. Ms. no. 2420. Archives of the Archaeological Survey of Canada, Canadian Museum of Civilization, Hull, Quebec.

PETITOT, E. 1876. Dictionnnaire de la Langue Dènè-Dindjié. Paris: Leroux.

______. 1889. Quinze Ans sous le Cercle Polaire. Paris: Dentu.

PILON, J.-L. 1985. Mackenzie Valley Archaeological Survey. Field Report. Ms. no. 2521. Archives of the Archaeological Survey of Canada, Canadian Museum of Civilization, Hull, Quebec.

______. 1987. Reconnaissance archéologique dans le sud-ouest de la plaine d'Anderson et dans la vallée du fleuve Mackenzie. Rapport de terrain (PIPGN) 1986. Ms. no. 2700. Archives of the Archaeological Survey of Canada, Canadian Museum of Civilization, Hull, Quebec.

______. 1988. Report of the 1987 NOGAP Archaeological Field Activities in the Southwest Anderson Plain, District of Mackenzie, Northwest Territories. Ms. no. 2912. Archives of the Archaeological Survey of Canada, Canadian Museum of Civilization, Hull, Quebec.

______. 1989. Report of the 1988 NOGAP Archaeological Field Activities in the Southwest Anderson Plain and in the Mackenzie Valley, District of Mackenzie, Northwest Territories. Ms. no. 3039. Archives of the Archaeological Survey of Canada, Canadian Museum of Civilization, Hull, Quebec.
RICHARDSON, J. 1971. Appendix No.1, Topographical and Geological Notices. In: Narrative of a Second Expedition to the Shores of the Polar Sea in the Years 1825, 1826, and 1827. Edmonton: Hurtig. i-clvii. (Originally published in 1828 by Murray, London.)
RITTER, J.R. 1976. Kutchin Place-Names: Evidence of Aboriginal Land-Use. In: Mackenzie Valley Pipeline Inquiry, Dene Rights-Supporting Research and Documents. Vol. III. Yellowknife: Indian Brotherhood of the N.W.T.
SIMPSON, T. 1970. Narrative of the Discoveries on the North Coast of America Effected by the Officers of the Hudson's Bay Company during the Years 1836-39. Toronto: Canadiana House.
STAGER, J.K. 1962. Fur Trading Posts in the Mackenzie Region up to 1850. Occasional Papers in Geography No. 3. Canadian Association of Geographers, British Columbia Division.
______. 1965. Alexander Mackenzie's Exploration of the Grand River. Geographical Bulletin 7(3-4):213-241.