

Whirl Lake: A Stratified Indian Site near the Mackenzie Delta¹

BRYAN C. GORDON² and HOWARD SAVAGE³

ABSTRACT. MjTp-1, the Whirl Lake Site, near the southeast Mackenzie Delta in Canada, consists of upper and lower artefact components. The former represents occupation by Mackenzie Flats Kutchin Indians, and comprises a single family fishing site where nets or traps were employed and caches in permafrost were used for the storage of fish as autumn feed for dogs and for possible human consumption. From the lower level, which represents an earlier Indian occupation, have come tools such as lance points or arrowheads which are much more refined than tools from the Kutchin level. Dating by radiocarbon has placed the Kutchin level as an early 18th century occupation, and the lower microlithic level about 2000 years B.C. judging from its affinities with the Northern Transportation Company Docks/Franklin Tanks complex at Great Bear Lake.

RÉSUMÉ. *Whirl Lake: site indien stratifié près du delta du Mackenzie.* MjTp-1, le site de Whirl Lake, près du sud-est du delta du Mackenzie au Canada, consiste en deux composantes d'outils, une supérieure et une inférieure. La première correspond à une occupation par des Indiens Kutchin des marais du Mackenzie et comprend un seul site familial de pêche où l'on employait des filets et des pièges et où des caches dans le permagel servaient à entreposer le poisson pour la nourriture des chiens en automne et peut-être pour la consommation humaine. Au niveau le plus bas, qui représente une occupation indienne plus ancienne, on a trouvé des outils du genre pointe de javelot ou de flèche, qui sont beaucoup plus raffinés que les outils du niveau Kutchin. Les radiodatations placent l'occupation du niveau Kutchin vers le début du 18^e siècle et le niveau microlithique inférieur à environ 2000 ans av. J.-C., si l'on en juge par ses affinités avec le complexe Northern Transportation Company Dock/Franklin Tanks du Grand lac des Esclaves.

РЕЗЮМЕ. *Древняя стоянка индейцев в районе дельты реки Макензи.* Остатки древней стоянки индейцев на озере Уирл в юго-восточной части дельты р. Макензи в Канаде (MjTp-1) состоят из двух горизонтов, верхнего и нижнего, содержащих орудия и прочие материальные свидетельства существования человека. Верхний горизонт указывает на стоянку отдельной семьи индейцев, где употреблялись сети и кашканы, и были устроены камеры в мерзлом грунте для хранения рыбы, как осеннего корма собак, а также для потребления человеком. В нижнем горизонте, который относится к более древней стоянке, были найдены наконечники стрел и копий, гораздо более совершенные, чем орудия из верхнего горизонта. Датировка по радиоуглеродному методу указывает, что верхний горизонт соответствует началу 18го столетия, а нижний микролитовый горизонт — периоду приблизительно 2000 лет до нашей эры.

¹An earlier version of this paper was presented at the 4th Annual Meeting of the Canadian Archaeological Association, Calgary, Alberta, Canada, on 27 February, 1971. For report of discovery of site and 1970 excavation, see Gordon 1972. For full details of artefacts, see Gordon 1974.

²Archaeological Survey of Canada, National Museum of Man, Ottawa, Ontario, Canada.

³Royal Ontario Museum, Toronto, Ontario, Canada.

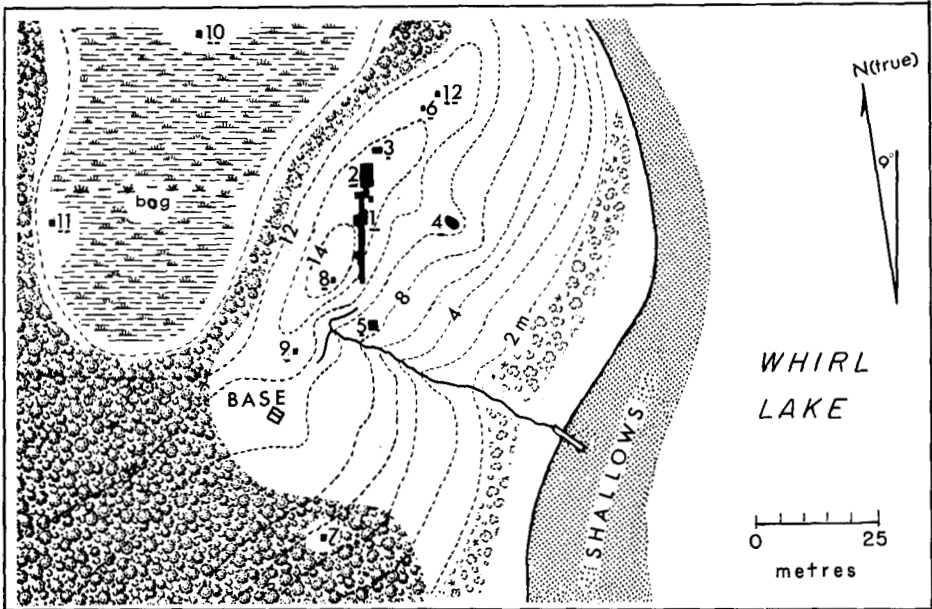


FIG. 1. Area surrounding the Whirl Lake site — contours and distances are approximate only. Twelve test pits are shown.

MjTp-1, the Whirl Lake Site, lies adjacent to a Dempster Highway cutline between Arctic Red River settlement and Inuvik, eastern Mackenzie Delta, N.W.T., occupying an area 50 m. by 100 m. at an elevation of 15 m. above Whirl Lake on its northwesternmost ridge, 24 km. (15 mi.) eastnortheast of Arctic Red River and 14.4 km. (9 mi.) from the Mackenzie River ($67^{\circ} 30' 30''\text{N.}$, $133^{\circ} 14' 30''\text{W.}$). The site area (Fig. 1) is low and marshy, seldom exceeding 122 m. (400 ft.) in elevation, and comprises hundreds of unnamed boggy lakes and swamps within a central gathering basin below 91.5 m. (300 ft.). Hills approaching 305 m. (1000 ft.) above mean sea level are seen 24 km. (15 mi.) to the east of MjTp-1.

The vegetation surrounding the site includes mixed black and white spruce (*Picea mariana* and *P. glauca*) and scrub willow (*Salix* spp.), much of it growing in twelve irregular depressions along the hillside. Some trees also grew in one large depression (housepit), while another large depression (intact fish cache) had only normal surface mat cover.

At first the largest of the depressions on the ridge was test excavated and found to be a semi-subterranean house (Fig. 2, upper). Subsequently, twelve small and a second large depression on the ridge crest were excavated and found to be fish caches where the Kutchin stored pike for dogfeed, as they presently do in the Delta, and possibly for human consumption (Fig. 2, lower). On the surface of the ridge, and extending into the black humus zone, recent artefacts of the Mackenzie Flats Kutchin Athapascan Indians were found. Immediately below, where downslope leaching has stained the soil zone orange-red, core-and-blade artefacts of a much older genre were discovered. Porous bottom levels are remnants of ancient sand and gravel beaches which existed when the surrounding basin comprised a single large periglacial lake.

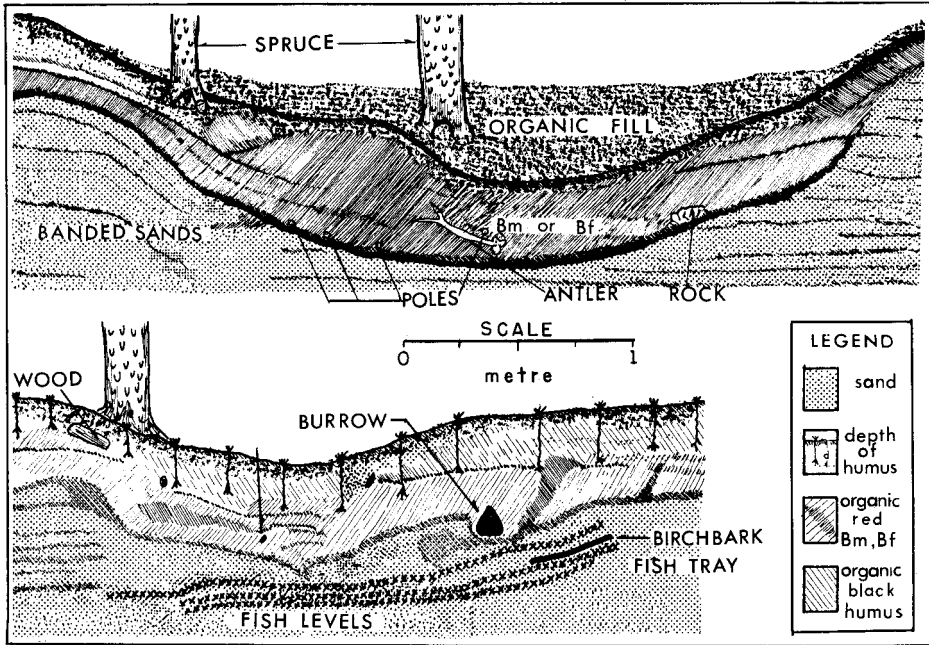


FIG. 2. Wall profiles of the Whirl Lake site. Top drawing represents the east wall of the central trench of the housepit. Bottom drawing shows the north wall of the fish cache.

The housepit was dish-shaped, curving gently along its north-south axis and more abruptly laterally. It averaged one metre in depth, and its overall configuration was oval. A central fireplace and collapsed roof materials of birch poles and bark were evident. Two small stitched bark fragments, larger flattened portions of bark and a concentration of bone — chiefly avian — were taken from the housepit.

The large fish cache southwest of the housepit retained its contents of three distinct pike (*Esox lucius*) levels below the present permafrost table. Reconstruction suggests that pike were chilled on the old primary frozen level, covered with an insulating shallow level of earth and bark, and stored for later retrieval. The added insulation allowed the frost table to rise with the later additions of pike. A birch bark tray, consisting of several large pieces of bark and folded and fastened with blanket and running stitches of spruce or willow root, was found 60 cm. below the surface, i.e., immediately above the second pike level in the intact fish cache. Tray contents comprised a thick layer of fish bone and scales intermixed with common fly larval casts. The small depressions which appeared to be fish caches had been emptied by the Whirl Lake inhabitants, and only a few scattered fish bones were left. Not surprisingly, the few stone tools, flakes and bone remains taken from these caches predated their construction as caches. These items intruded when they were contained in older cultural materials sloughing from the walls or added as an insulant to the caches.

In an earlier report on the Whirl Lake Site, Gordon (1972) suggested on the basis of preliminary analysis that the Whirl Lake Site, MjTp-1, represented

a single component dating from approximately 1000 B.C. to 2000 B.C. The finding of blades, microblades and microcores above the house structure poles lying at the base of the housepit and above the fish tray supported this suggestion. Gordon was nevertheless dubious as to whether the well-preserved non-lithic materials ought to be included in the same inventory as the lithic micro-tools. Also, historical data of the 19th century contained records of Kutchin bark and pole lodges, platform sleds, tool types (especially the beamer) and birch tray similar to those found at MjTp-1. Drs. Owen Hughes (Pleistocene geologist) and Wayne Pettapiece (pedologist) subsequently visited the site and their interpretation helped to make it clear that there had been more than one occupation.

The profiles of excavated units between the housepit and the large fish cache revealed continuity of humus and leached orange-red (Bm and Bf in Fig. 2) soil horizons, indicating approximate contemporaneity of these structures. This was corroborated by dates of 1740 ± 90 A.D. (Gak-3266) and 1730 ± 90 A.D. (I-5840) obtained from samples of the wooden house-structure poles found in this level, and Hughes' and Pettapiece's estimate (personal communication) of 500 years or less for the accumulation of the thin humic layer. The confusing double humus and orange-red bands within the housepit clearly represent the addition of a duplicate soil profile by Kutchin fishers when they excavated their house and fish cache.

Excavation in 1972 made clear the existence of two cultural components, with an admixture of upper and lower components in the housepit and the fish cache. The radiocarbon-dated upper level contained most of the contents of the housepit and of the fish cache, the surface-ridge materials including the beamer and the toboggan, and the upper humus materials above the orange-red horizon producing almost all the bone material together with bark and leather. The lower level, comprising the orange-red horizon, yielded a significant core-and-microblade industry, but no material for radiocarbon dating. Altogether, 60 one-metre pits were excavated by trowel in 5-cm. arbitrary levels. Materials recovered will now be described in the following order: (1) upper level faunal remains; (2) upper level leather and bone artefacts; (3) upper level bark, wood and stone artefacts; and (4) lower level stone artefacts. Briefly, stone artefacts were sparse in the upper level, whereas in the lower level core-and-blade artefacts predominated while wood, bone and leather materials, even if existing previously, were absent.

(1) *Upper level faunal remains*

While remains of pike (*Esox lucius*) were numerous in the intact fish cache, their extreme sparseness in the housepit supports ethnohistoric reports of their having been used predominantly as dogfeed — but also, possibly, for human sustenance. Two trout bones were identified from the housepit. Their identification as brook trout (*Salvelinus fontinalis*) or Dolly Varden trout (*S. malma*) was however prevented by lack of reference material for the latter species. While representatives of the Dolly Varden-arctic char complex are uncommonly present in the Mackenzie River (Hatfield *et. al.* 1972), the brook trout has been present in the upper Mackenzie system (Athabasca and McLeod Rivers) only since its introduction into these rivers (McPhail and Lindsey 1970) in recent decades.

The migratory avifauna of archaeological significance at MjTp-1 use the Pacific, central and/or Mississippi flyways during their travels (Kortright 1942). Concentrated within the housepit were representatives of at least three loon species — the common loon (*Gavia immer*), arctic loon (*G. arctica*), and red-throated loon (*G. stellata*). Other avian species present included the red-necked grebe (*Podiceps grisegina*); trumpeter swan (*Olor buccinator*), not now in the Whirl Lake area; oldsquaw (*Clangula hyemalis*); and white-winged scoter (*Melanitta deglandi*). Skinning and butchering marks were found on unburnt distal bones of loon wings and legs. Only an oldsquaw tibia showed evidence of calcination through exposure to heat. The recovery of most of the bird bones in an uncharred and uncalcinated condition suggests that birds used as food were cooked by methods other than roasting or broiling. The virtual absence of any fragment of femoral, vertebral, sternal and axial elements suggests that the body proper and proximal portions of the legs may have been cooked and eaten away from the habitation.

Mammalian species comprise those of the Arctic Boreal Life-zone (Hall and Kelson 1959). They include moose (*Alces alces*), caribou (*Rangifer tarandus*), a dog or wolf (*Canis* sp.), muskrat (*Ondatra zibethicus*) and beaver (*Castor canadensis*).

TABLE 1. Summary of the faunal findings of the Whirl Lake Site by taxa, artefact source material and extremity distribution

Zoological taxa	No. of elements	No. of individuals represented	Artefacts or possible artefacts	Extremity* distribution	
				Front	Hind
Class Aves					
Common loon	1	1		1	
Arctic loon	10	3 or more	1	4	6
Red-throated loon	1	1		1	
Loon sp. large	19	3 or more	2	8	10
Loon sp. small	9	3 or more	4	8	1
Loon sp.	2				2
Red-necked grebe	12	3 or more		8	4
Trumpeter swan	1	1			
Eagle or trum. swan	2			2	
White-winged scoter	3	2		1	1
Oldsquaw	2	1 or more	1	1	1
	62		8	34	25
Class Mammalia					
Muskrat	2	1 or more			2
Dog or wolf sp.	1	1	1		1
Moose	5	1 or more	3	1	2
Caribou	9	2 or more	7	1	7
Cervidae sp.	1		1		
Artiodactyla (hoofed mam. sp.)	15		5		
Mammal sp. large	17		1		
Mammal sp. med.-large	16		2		
	66		20		
Class uncertain	6			1	

*Caribou scapula included with upper extremity. Caribou innominate included with lower extremity.

The lack of positive identification of 13 artiodactyl specimens (as moose or caribou) from the 1972 excavations was the result of an inability to exclude bison from this group. The former distribution of the woodland bison (*Bison bison athabascaae*) through central Alaska, the Yukon Territory and the southwestern portion of the Mackenzie District (Miller and Kellogg 1955) would place these animals in the Mackenzie River Valley a few hundred miles from the Whirl Lake Site. This valley in the vicinity of Whirl Lake has been noted as part of the broad, rolling drift-and-tree-covered Mackenzie Plain (Douglas 1970); it would appear to be readily accessible to bison. While no evidence of bison was found at Whirl Lake, the possibility of its presence needs to be kept in mind.

A summary of faunal findings at Whirl Lake appears in Tables 1 and 2.

TABLE 2. Summary of faunal findings of the Whirl Lake Site by site subdivisions.

Pit no.	Bony fish	Birds	Mammals	Class uncertain
1 (fish cache)	many	1	16	2
2 (housepit)	2	60	41	4
3		1		
4			3	
5			3	
6			2	
7			1	
		62	66	6

(2) Upper level leather and bone artefacts

Three large hide fragments from moose and caribou were found in the housepit. One measured 9 cm. by 30 cm. and was stitched (Fig. 3A). The three may have been remnants of clothing, tenting or bags.

Eight loon ulnae from the housepit (1970 collection — Savage 1971) were irregularly pointed, showing rounded edges with slight polish under twofold magnification. The polish suggests use rather than erosion by natural forces. The oldsquaw humerus was also polished. Contact with each other or against a hide or bark container could have produced these changes.

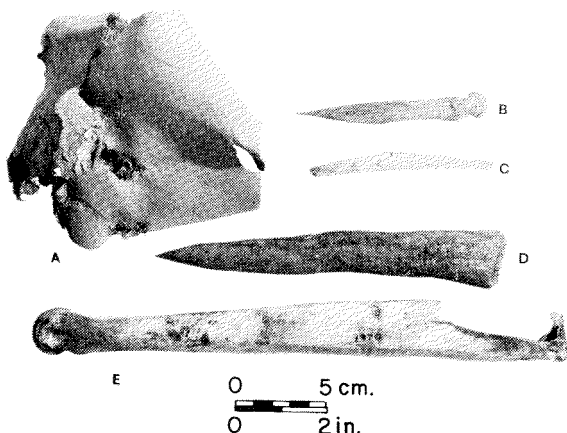


FIG. 3. Bone artefacts and leather clothing — upper level.

Four artefacts from the 1970 collection and 14 from the 1972 collection (Savage 1973) were constructed from mammalian bones. Twelve artefacts had been constructed from large, heavy, and weight-bearing bones of large mammalian species, while three were made from non-weight-bearing elements (rib and antler). Of these, seven artefacts had a form suitable for use as an awl, while four would have served well as scrapers. Included in these groupings are a moose metatarsal as a stout awl, the distal third of a caribou tibia as awl and scraper, a moose splint-bone awl, and a caribou metapodial beamer. The moose splint-bone awl was 10.5 cm. long, 1.3 cm. wide and 9 mm. thick (Fig. 3B). The caribou beamer, or dehairing tool for skins, measured 29.5 cm. long, 5.1 cm. wide and 2.2 cm. thick (Fig. 3E). A fragment of a long bone of a large mammal had been altered to form either a bifacially decorated needle for snowshoe netting, or a fish lure, 10.2 cm. long, 1 cm. wide and 4 mm. thick. It depicts two muskrat (George Swinton 1972, personal communication), beaver or caribou alongside a lodge or hill (Figs. 3C and 4). Finally, a dog or wolf tibia had been modified to form a scraper.

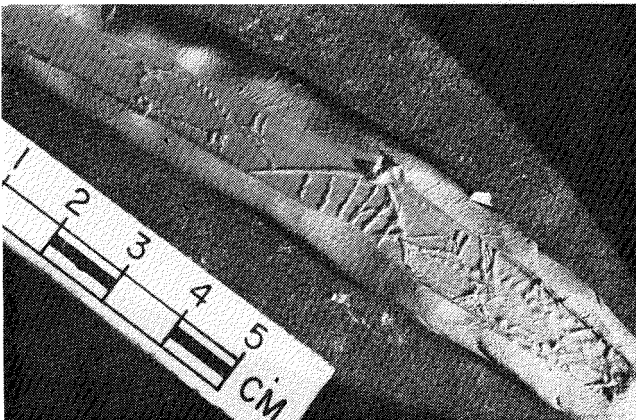


FIG. 4. Impression of snowshoe netting needle or fish lure — upper level.

Five possible artefacts include three caribou tibia portions having smooth borders with rounded edges. A rib from an unidentified hooved animal, possibly moose, had similar characteristics. A distally flattened antler tine, possibly used for removal of bark from birch trees, measured 18.4 cm. long, 5 cm. wide and 2.4 cm. thick (Fig. 3D).

Additional worked bone included a cut antler base with striations, a cut antler base with attached tine, and an almost complete antler of a mature caribou possessing a deeply incised and broken mainshaft about 5 cm. above the first tine. Irregular and non-parallel sides on the incision favour cutting by stone knife.

(3) *Upper level bark, wood and stone artefacts*

A large birchbark fish tray 11 cm. deep, 33 cm. wide and greater than 40 cm. long was taken from the intact fish cache (Fig. 5). It was sewn with a 7-cm.-wide overlap centred along its length and joining two segments. A number of large bark rolls probably once formed the protective covering of both housepit and fish levels. Two fragments of sewn bark containers were also found.



FIG. 5. Pike remains in fish tray — upper level.

The Whirl Lake lodge was probably constructed out of a species of birch which, though presently uncommon in the existing area of the site, was the same as that used for what was identified as the housepit floor. It was probably selected for lodge construction because of its flexibility and the ease with which its dendritic branches could be interwoven. Small birch was used for the framework, while skin was probably the main cover. It is possible that rolled birchbark on the housepit floor was used in conjunction with a skin cover.

Many poles were found during the excavation. The only other wooden object was the Indian sled found in the humus level of testpit 5 (Fig. 1) on the path leading down to the lake. Its fragmentary nature suggests a length of approximately 2-2½ m. (6-8 ft.).

Stone artefacts from the upper level are crudely finished, and include end scrapers (Fig. 6F left), sidescraper (Fig. 6E), pebble end scrapers (Fig. 6F right), pecked pebbles (Fig. 6B right), choppers (Figs. 6A and 7A), knife fragments

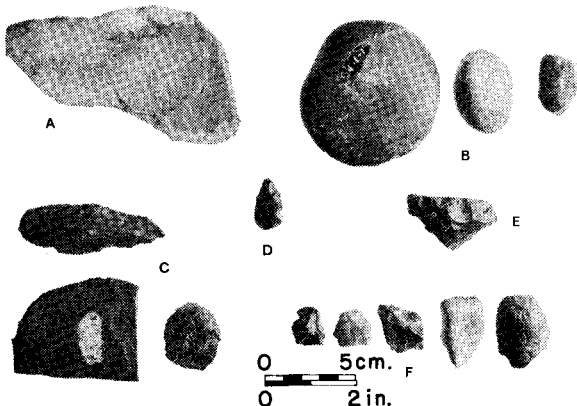


FIG. 6. Crude stone tools — upper level.

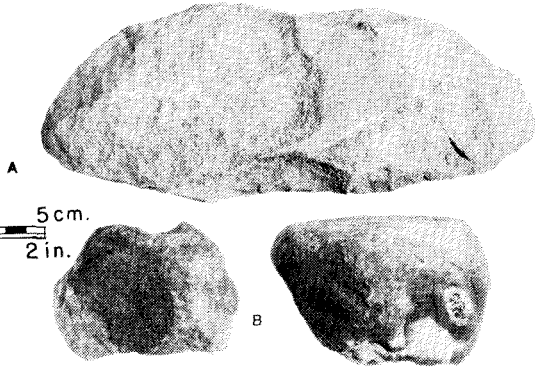


FIG. 7. Crude choppers — upper level.

(Fig. 6C lower), hammerstone (Fig. 6B left), two possible net sinkers (Fig. 7B), two blanks or preforms of knives or projectile points (Fig. 6C upper and D), chipping detritus and fire-cracked rock.

(4) Lower level stone artefacts

Artefacts from the lower level in the red-orange horizon below the lower humus level included only stone tools and blades (Figs. 8 and 9). Although including a number of crude specimens, lower level artefacts tend to be refined

FIG. 8. Finely made stone tools — lower level.

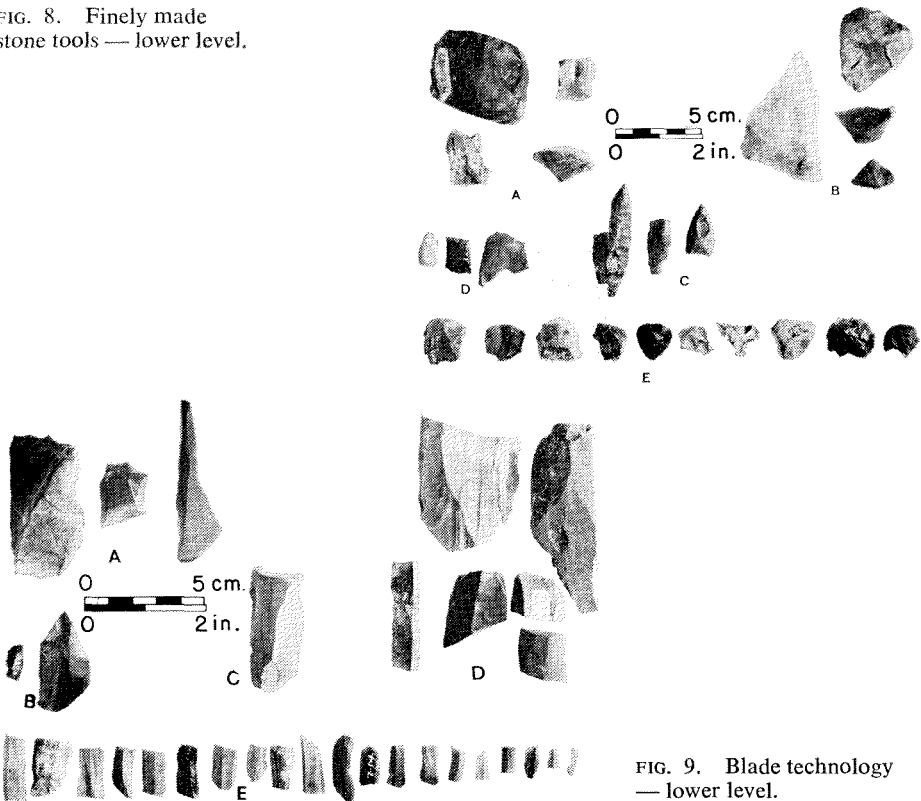


FIG. 9. Blade technology — lower level.

products of a core-and-blade industry such as: large blades, some of which are retouched (Fig. 9D); microblades (Fig. 9E); microcores (Fig. 9B); graters on blades (Fig. 9A) and blade endscraper (Fig. 9C). Three projectile points of differing types were represented (Fig. 8C). End and side scrapers (Fig. 8E, and Fig. 8A bottom), unifacial knife fragments (Fig. 8D), a burinated biface fragment and flake core (Fig. 8A top), and flake core fragments and flake tools were also present. Careful examination of lower level stone artefacts failed to reveal burins. The burinated biface fragment does not represent proof of a burin industry, and it is possible that the three graters may have functioned as grooving or cutting tools, as suggested by the polish resulting from wear on their distal tips. Interestingly, one grater (Fig. 9A left) consists of a wide blade with a 2-mm.-long central spur having polish on three sides. The depth of penetration of the spur in construction of non-stone tools would be very slight, and it is possible that the spur has been shortened through use. Another grater (Fig. 9A right) resembles a drill, but its lateral flaking consists of crude, hinge-fractured edge blunting. Moreover, all wear is concentrated at its distal tip, the latter being dorsally and ventrally polished. The third grater possesses a polished distal spur on an otherwise crude small biface (Fig. 9A centre). Its application as a grater may have necessitated hafting due to its small size.

The blade-end scraper (Fig. 9C) has a rather rough distal edge — almost serrated, and its function as a scraper has not been fully confirmed. It is evident from the presence of this scraper, the retouched blades, the fragments of much larger blades, graters, medium-sized blade sections, microblades and microcores, that a well-developed blade industry employing large, medium and microblades was present at Whirl Lake long before the time of the Kutchin Upper level.

Lower level projectile points are exceedingly well made. Their production involved the removal of fine ribbonlike spalls during thinning. The presence at Whirl Lake of lanceolate and triangular points as well as unifacial and bifacial knives supports the suggestion that hunting was a major activity there. Absence of bone material from the lower level prevents the identification of prey, but it is probable that boreal forest fauna were hunted.

Scrapers were evidently the most popular tool in the lower level at Whirl Lake. Their presence indicates the importance there of the manufacture of clothing, and possibly tents and bedding, out of skins in addition to the wood and bone materials possibly used.

Upper and lower levels — sources of lithic raw materials

The source of the varied stone materials used at both levels of occupation remains a matter of conjecture, except in the case of the very small amounts of Barn Mountain chert (Gordon 1970) and local river and lake cobbles. Interestingly, the presence of several lower level artefacts of Barn Mountain blue-grey chert implies trade with, or sorties for tool materials to, northern Old Crow Flats some 240 km. (150 mi.) to the northwest. Investigations carried out in 1972 along the Lower Ramparts (cliffs above the Mackenzie River near Arctic Red River) failed to reveal the sources of the raw materials used in the manufacture of the majority of Whirl Lake stone artefacts.

DISCUSSION

Ethnographic analogy

The prehistory of the northwestern District of Mackenzie, exclusive of Eskimo territory, is almost unknown. Knowledge of the southern Mackenzie Delta is even more fragmentary. Opening up of the Whirl Lake Site, MjTp-1, presents the first opportunity for the establishment of an archaeological chronology for the region. Additionally it serves to demonstrate a considerable ethnographic continuity, extending into the late prehistoric period, in the artefacts from the upper level — namely the fish tray, sled and pithouse.

Jones (1867) illustrated a Kutchin sled and pithouse, the latter in longitudinal and plan views. Elliptical in plan, it measured 3.7-4 m. (13 ft.) lengthwise, and 1.8 m. (6 ft.) in height. Dwellings were constructed of sewn, rolled caribou skin with the hair intact, stretched over a frame of bent poles. A caribou-skin door hung over the single opening. A 1.2 m. (4 ft.) diameter smoke hole allowed smoke from a single central hearth to escape. With evergreen boughs as flooring, snow was heaped against the outside walls as insulant. Initial house placement in winter involved only the clearing of snow with snowshoes as shovels, but summer and spring conditions permitted of some excavation. Jones (1867) wrote that women hauled the portable lodges and household goods upon a sled having an elevated platform with two lateral runners. Turned-up at both ends, it allowed movement backwards or forwards. The men erected the lodges without regular arrangement, except that doors were all placed leeward to the wind.

The early 18th century occupation at Whirl Lake may be envisioned best by studying an excellent lithograph by Murray and Hanhart in Richardson's "journal of a boat voyage through Rupert's Land and the Arctic Sea in search of the discovery ships under the command of Sir John Franklin" (1851). It depicts a Kutchin winter lodge and trappings including sled, snowshoes and dogs. Identification by Savage of a possible dog tibia, together with the retrieval in 1972 of a possible snowshoe-netting needle, support this analogy. A similar Kutchin hut depicted by Petitot (1889) is somewhat more hemispherical, but essentially the same as the lodge of Murray and Hanhart and, in turn, the Whirl Lake housepit.

Among the Athapascan birchbark vessels illustrated by Morice (1894) is a duplicate of the birchbark fish tray found inverted between two pike levels within the intact cache. Morice's fish tray is constructed without seams, while the Whirl Lake specimen has a 7-cm.-wide overlapping seam along the length of the tray. In both trays the corners were simply folded and stitched. Spruce-root stitching is employed to secure the double rim around the top, for strength and for tying the folded corners. Morice reported this tray to be a component of the daily net-fishing routine. The net, sinkers and floats were placed in the tray for transport to the lake in the evening after they had been dried and repaired. Two similar trays were placed in the canoe for collection, respectively, of net paraphernalia and fish following fishing.

While no nets were found at Whirl Lake, their presence is implied. Savage suggests that the grebe from MjTp-1 may have been taken accidentally in fishnets. Alternatively, he suggested, it may have been taken in the defence of its nest,

as it cannot take off from land. Common loons may also have become entangled in nets. Jones (1867) mentions the use of a fishing stage with a basket rather than a net. Both stage and basket are constructed in the shallows. The basket has dimensions of approximately 1.2 m. by 2.7 m. (4 ft. by 9 ft.). When the fish enter the basket they are forced towards its closed end by a netted scoop.

No canoe parts were recovered from the Whirl Lake Site. Had the Whirl Lake people used either the fishing basket or a net, some sort of floating vessel would have been necessary to bring the fish to shore. The opinion that canoes were in use is supported by the large size of the fish (almost all exceeding 60 cm. — 2 ft. — in length). Generally these are too large to be found in the shallows near shore and would have had to be caught in the deeper water towards the centre of the lake — to judge from the present authors' fishing experiences in 1970 and 1972.

That there was a developed processing of moose and caribou hide in the Mackenzie Flats Kutchin area may be inferred from ethnohistoric accounts. This is suggested prehistorically by the presence at MjTp-1 of sewn hide, scrapers, knives, projectile points, beamers, a netting needle and a bone awl.

Wooden dishes, spoons and tamarack root kettles described by Jones (1867) were not found at Whirl Lake. Still, a good inventory of artefacts, the presence of stitched basketry, and artwork in the form of ornamental bone-and-antler carving, makes this a significant contribution to our knowledge of the prehistory of the Kutchin.

Size of population.

It is impossible to estimate the size of population of the earlier inhabitants from the MjTp-1 excavations. While dwellings larger than the pithouse in the upper level at Whirl Lake had several families sharing a lodge (living on each side of a central hearth, according to Jones (1867)), the housepit size, and the rather sparse quantity of artefacts and faunal material from the upper level, suggest a single-family occupation. Ethnohistoric reconstruction suggests a woman employed in fishing while her husband was out hunting. The presence of children is possible.

Seasonality

The season of avian migration includes spring, summer and the early fall. That for common loons and red-necked grebes extends from late May until early October (Bent 1919). Oldsquaws arrive likewise in late May but leave earlier (Bent 1923), while arctic loons are known to be present at Old Crow, northern Yukon, in late May (Irving 1960) and around Great Bear Lake, N.W.T. in early September (Bent 1919). Savage suggests that the swan, loon, grebe and duck bones found at Whirl Lake indicate human occupation between May and August. His identification of the probably immature loon tibia would be in keeping with its owner having been hatched in the neighbourhood of the site, i.e., in summer. The existence of larval casts of the common fly in the fishbones also supports the probability of summer occupation.

While the presence of a housepit usually implies a winter dwelling constructed prior to ground frost, the utilization of a shallowly dug lodge of bark and poles,

with perhaps the addition of a floor of skin and spruce boughs, supports the authors' premise that the Kutchin occupation was of summer duration, with winter snow existing prior to, or after, occupation, as indicated by the sled.

Archaeological cultural affinities

The Whirl Lake Site stands isolated by at least 280 km. (175 mi.) from all other controlled excavations of Indian sites. Bone, bark, wood and antler artefacts from the upper, or Kutchin, level compare most closely with materials from a few small recent sites in the vicinity. Very similar beamers and awls have been found in the neighbouring Athapascan villages of Arctic Red River, Fort McPherson, Fort Good Hope and Old Crow, where they have been used until recently.

The blade-and-core material most closely comparable to that from the lower microlithic level at MjTp-1 is that from the Franklin Tanks site some 496 km. (310 mi.) to the southeast, near the outlet of Great Bear Lake. MkVb-1 (MacNeish 1953) at Rat (McDougal) Pass is the site closest to Whirl Lake containing similar microblades.

The most outstanding similarity between MjTp-1 and the Northern Transportation Company Docks/Franklin Tanks site (which, in Gordon's view, probably represent a single complex) is that both contain the large, medium and microblades, some of which are made of the same banded grey and black chert. Similar blade artefacts include concave blade-end scrapers and blade graters. Blade-retouch and edge-blunting techniques were alike at both sites. Similarities between the artefacts found at the two sites may be perceived through a comparison of the illustrations provided by MacNeish (1955) of the Franklin Tanks artefacts with illustrations of Whirl Lake artefacts (esp. Figs. 8C right and left).

The N. T. Docks/Franklin Tanks complex has been radiocarbon dated at 3560 ± 210 and 3480 ± 240 years ago, or approximately 1500 years B.C. Since stratigraphic separation was only hypothetical at best, Franklin Tanks and N. T. Docks components may not be distinguishable, with the result that the dates for the microlithic industry can only be regarded as tentative — and so dates for the blade component at MjTp-1 must also remain tentative.

Blade artefacts of a lithic material and tool type similar to those of the lower level at Whirl Lake have recently been found along the upper drainage of the Anderson River, specifically around Colville Lake, N.W.T. (Clark 1972). These materials closely resemble MacNeish's inventory from Great Bear Lake in possessing blade-end and side scrapers, blade knives and possibly graters.

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