

**THE GREAT BEAR LAKE:  
ITS PLACE IN HISTORY**

**Lionel Johnson**

*Reprinted from*

**ARCTIC**

Journal of the Arctic Institute of North America

Volume 28, Number 4

December 1975

00447



One of the chimneys of the old Fort Confidence as it was in 1964. The chimneys are all that remain of the fort which was constructed in 1836 and last occupied in 1852.

# The Great Bear Lake: Its Place in History

LIONEL JOHNSON<sup>1</sup>

## INTRODUCTION

Great Bear Lake (Fig. 1) is one of the most prominent geographic features of northern Canada. Shaped like the missing piece of a jigsaw puzzle, with five arms radiating from a central body, it has a total area of 31,150 square kilometres — approximately the same as that of the Netherlands. It is the eighth largest, and by far the most northerly, of the world's major lakes, and probably the least productive. (Johnson 1975a).

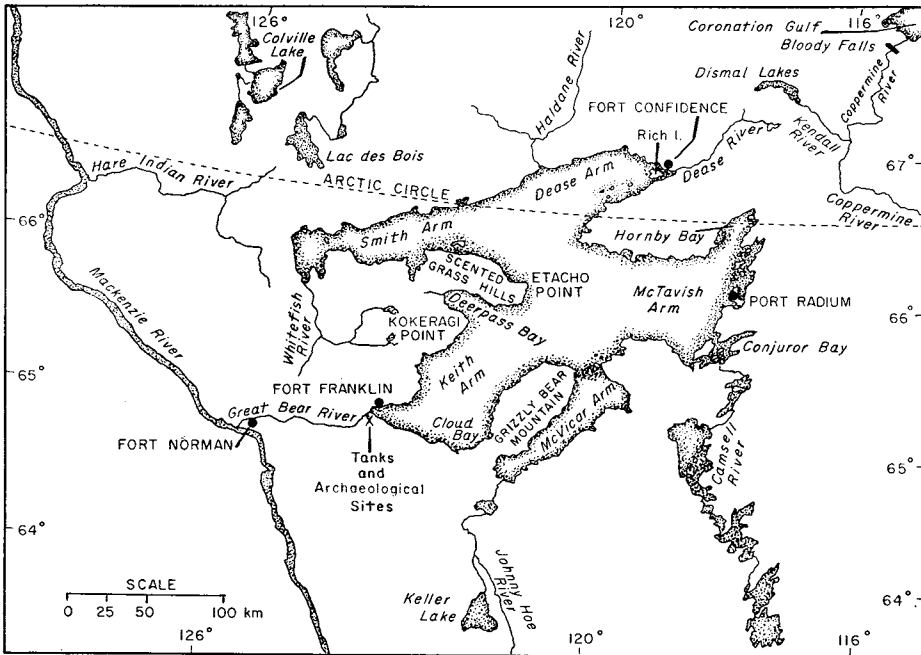


FIG. 1 Great Bear Lake and surrounding area.

The Arctic Circle transects the northernmost arm of the lake, and so the sun is visible from it for 24 hours a day in June, while in mid-winter daylight lasts for only two to three hours. In July, the mean daily maximum temperature is 19°C, in sharp contrast to the equivalent January figure of -27°C. Warm summers and cold winters, together with a total annual precipitation of about 230 millimetres, give rise to conditions which may best be described as northern continental.

Up to two metres of ice form on the lake by April, when the snow on the

<sup>1</sup>Freshwater Institute, Environment Canada, Winnipeg, Manitoba, Canada.

surrounding land begins to melt; and it is not until middle of July, or even later in some years, that the waters become ice-free. As a result, the temperature of the water in the main part of the lake seldom rises above 4°C (Johnson 1975b).

Like most large Canadian lakes, Great Bear Lake is situated on the edge of the Canadian Shield, the very ancient and resistant rocks of which form its eastern shores. The scenery among the islands and in the fiord-like bays is magnificent. Along the western shores of the lake the terrain is flatter, being broken only by the rounded masses of Grizzly Bear Mountain, Etacho Point, Kokeragi Point and the Scented Grass Hills.

As regards vegetation, the lake is situated on the boundary between boreal forest and tundra. Good stands of spruce (*Picea glauca* and *P. mariana*) can be found in favoured areas on Grizzly Bear Mountain and in the vicinity of Fort Franklin, but otherwise forest cover is thin and poor. Trees give way to muskeg along the southern shore of the lake, to tundra in the north, and to outcrops of rock in the area of the Shield.

To the north and east the tundra stretches a thousand miles across the Barren Grounds to Hudson Bay, and the Pacific Ocean lies an equal distance to the west. The only relatively close coastline is that of the Arctic Ocean to the north. In summer, the tundra landscape is broken by innumerable small lakes and interminable rock-and-gravel outcrops; in winter, an apparently featureless white ocean is all that can be seen.

#### PREHISTORY

The ice sheets of the Pleistocene began to retreat in the area of the present-day District of Mackenzie about 12,000 years ago, and about 1,500 years later the margin of the ice was close to that of the Canadian Shield (Bird 1967), and Glacial Lake McConnell had formed (Craig 1965). The latter was a proglacial expanse of water which covered the areas of the present Great Slave Lake, Great Bear Lake, and intervening land. Raised beaches, 167 metres above the present level of Great Bear Lake (Craig and Fyles 1960), in the vicinity of Hornby Bay, are indicative of the considerable changes which have occurred. The fact that the beaches are not level is the result of a differential uplift of the land surface which occurred as the weight of ice lessened. The outlet of Glacial Lake McConnell was originally to the south but, as the ice retreated and the land levels changed, an outlet from Great Bear Lake established itself at the western extremity of Smith Arm, and the waters from it flowed north and west to join the Mackenzie River at a point close to its confluence with the present-day Hare Indian River. As the land levels changed still further, this channel was cut off and the water from a new outlet — that of to-day — developed into the modern Great Bear River.

At the time of the initial ice retreat, the Cordilleran and Laurentide ice sheets stood separated along what is now the Mackenzie Valley (Prest 1970). A route of communication thus existed at an early date connecting the unglaciated regions of Alaska and the Yukon with those of the unglaciated southern part of the continent (McPhail and Lindsey 1970). With deglaciation, additional large areas of land became available for human habitation.

One of the main problems confronting archaeologists in the Mackenzie Basin is the establishment of the exact pattern of former human settlement, and the origin of the people involved. The various early inhabitants of the Great Bear Lake region appear collectively to have had their cultural origins in: the unglaciated south; Asia, migrating via the Bering Land Bridge (before its submersion) and the unglaciated regions of Alaska and the Yukon; and — during certain periods — the true Arctic, as forerunners of the Eskimo.

Site clearance for the erection of oil-storage tanks by the Northern Transportation Company had revealed evidence of early human occupation at Great Bear Lake, but unfortunately much of it had been destroyed before archaeological investigation commenced in 1952. MacNeish (1955) identified three occupations: the Franklin Tanks complex on the southern side of the Great Bear River, close to where it leaves the lake; the Northern Transportation Docks complex, superimposed on it; and the Great Bear River complex at another site a few hundred metres downstream. The actual dates of occupation of these sites are extremely difficult to determine, since the results of radiocarbon dating of artefacts recovered from them have been equivocal.

The Franklin Tanks complex existed some time previous to either  $1,604 \pm 200$  B.C. or  $2,245 \pm 200$  B.C. (MacNeish 1964 p. 326) when, according to radiocarbon dating, a humus layer, correlating with the overlying Northern Transportation Docks complex, was deposited. MacNeish estimates the period of actual occupation (of the Franklin Tanks complex) to have been 6,500-7,500 B.P. when, on his estimation, the Great Bear Lake stood 12-13 metres above its present level. He assigns the occupation to the northern Plano tradition (a late Palaeo-Indian culture), largely on account of the thin lanceolate blades which are the main diagnostic feature of the collected artefacts. The latter are not, according to Clark (1970 p. 116), of established provenance, and therefore cannot be ascribed any relationship — and certainly not closely crossdated — with ones of the American plains. The obtaining of small fragments of mammoth (*Mammuthus* sp.) or mastodon (*Mammot* sp.) tusk from the Franklin Tanks complex led MacNeish to adduce the contemporaneous existence of man and mammoth. Clark (1970 p. 16) does not, however, consider that the available evidence supports the possibility of such coexistence, and expresses the view that the presence of the fragments was most likely the result of some fortuitous circumstance. This view is borne out by the firm establishment of 10,000 B.P. as the most recent date of association of man and mammoth (Martin and Guilday 1967).

The Great Bear River site has yielded radiocarbon dates of  $2,694 \pm 200$  B.C. and  $2,854 \pm 200$  B.C. (MacNeish 1964 p. 325). Clark, however, suggests that its position, in terms of time of occupation, between the Franklin Tanks and Northern Transportation Docks complexes is far from securely established. The site has provided some evidence of association with the Arctic Small Tool (AST) tradition, or pre-Dorset culture, of the northern regions. The main tools displaying these affinities have been a burin, a stemmed adze (or *ulu*), and a bifacially-flaked scraper. However, such tools are of more recent origin than is indicated by radiocarbon dating and are, according to Clark (1975), certainly no older than 3,200 years; he considers that these tools represent a separate culture or are at least

indicative of contact with AST people, remains of whose small camp sites are to be found on the north shore of Great Bear Lake.

Animal bones associated with the Great Bear River complex, and found in storage pits, were identified as belonging to the Greenland sub-species of caribou (*Rangifer tarandus pearyi*), which is no longer to be found in these regions. A climatic amelioration since the time of occupation may be inferred from the existence of the remains, but additional evidence is required to substantiate the suggestion.

The Northern Transportation Docks complex appears to be of approximately the same age as the Great Bear River complex (see dates mentioned in the discussion above regarding the Franklin Tanks complex). The Northern Transportation Docks complex is close to, but stratigraphically separated from, the Franklin Tanks complex, and Clark (1975 p. 50) doubts whether it is a separate entity.

MacNeish (1964) considers that the most likely status of this site is one of marginality to the Northwest Microblade tradition, and in this Clark concurs, with some reservations. The Northern Transportation Docks complex probably represents the northeastern limit of the range of this tradition originally described by MacNeish (1954) from Pointed Mountain, just north of the Alberta — Northwest Territories boundary; however, he subsequently recognized this tradition to be represented by more typical sites in the southwest Yukon Territory (MacNeish 1964).

In conclusion, it is as yet extremely difficult to ascribe a detailed sequence of events and cultures to the Great Bear Lake sites. It would seem that only through a thorough examination of the region will it be possible to gain more precise information concerning the origins and movements of the peoples who inhabited them. There is some slight evidence for the Great Bear River sites having been occupied by a people with a southerly aspect to their subarctic culture, and also by a people whose more immediate origins were in the western Subarctic, and ultimate origins in Asia, as well as briefly by a people of the AST tradition.

#### ETHNOGRAPHY

Only few conclusions can be drawn from the archaeological evidence as to the mode of life of the early inhabitants; but in view of the exiguity of the available resources it probably differed little from that of the native peoples at the time of the penetration of the area by Europeans at the end of the eighteenth century. The nature of the economy was determined essentially by the location of Great Bear Lake on the boundary between boreal forest and tundra, and in the path of migrating caribou (Banfield 1954; Kelsall 1968; Morris 1972). The meat this animal provided was augmented by that of moose (*Alces americanus*), snowshoe rabbit (*Lepus americanus*) from the woodlands, muskox (*Ovibos moschatus*) and arctic hare (*Lepus arcticus*) from the Barren Grounds. Fish, though usually available, was not a preferred diet (Clark 1975 p. 40). General dependence on the caribou obliged its hunters to lead a migratory life.

Early travellers recognized that the area surrounding Great Bear Lake was inhabited by a number of distinct groups from various tribes (Morris 1972), but it was Emile Petitot, the pioneer missionary, who first recognized that the people

surrounding the lake had a distinct identity (Petitot 1893 pp. 65-66). The local inhabitants, having become to some extent dissociated from their parent tribes, naturally tended to form a new grouping of lake-centred people to which Osgood (1931) applied the term *Satudene*, derived from words in Chipewyan meaning "bear water people".

The tribes of the *Satudene* — the Hare, Mountain, Dogrib and Copper Indians — spoke dialects of the Athapascan family of languages which probably differed little one from another, and could therefore be understood over wide areas (Petitot 1876). The various bands of the Hare Indians occupied, and hunted in, areas to the north of Great Bear Lake; the Mountain, or Slave, the area around Great Bear River; the Dogrib the area between Great Bear Lake and Great Slave Lake; and the Copper in the vicinity of the Deese and McTavish Arms (Morris 1972). Eskimo hunters regularly made trips to the north shore of the lake, but they and the Indians deemed it prudent to avoid mutual contacts (Stefansson 1913 p. 217).

Little formal organization existed within the respective groups of the *Satudene*; individuals would establish leading positions on the basis of personality, or prowess in hunting (Richardson 1852 pp. 26-28). Families would join together for hunting and fishing, separate, and then form again, as occasion demanded.

The generally nomadic habit of the *Satudene* precluded the establishment of permanent dwellings. Conical skin tents were used for lodges, while open-sided shelters of spruce boughs often sufficed on the trail. In winter, the tents were banked up with snow, both inside and outside, to make them warmer, while within each a fire burned permanently, the smoke from which was allowed to escape through a hole in the top.

The obtaining of food was an ever-present concern of the adult population, for supplies varied greatly both from season to season and from year to year. This variation was of particularly severe consequence for those tribes which depended to a large extent on the hare with its natural cycles of abundance. In times of scarcity, the elderly people, unable to keep up with their bands, might be abandoned to fend for themselves (Savoie 1971 p. 74). Samuel Hearne (1795) mentions the case of one old woman who, left in this manner, had managed to survive alone for several years. In the most extreme circumstances, cannibalism was not unknown (Savoie 1971 p. 64).

The most favoured locations for the establishment of camps were those from which both good fishing and caribou hunting were possible. Known examples are: the head of Great Bear River, called Telini ("from where the river starts"); the fishing grounds of Hornby Bay, Cloud Bay, Deerpass Bay and, particularly, the southern part of McVicar Arm; and Tritatui ("among the small lakes"), the region drained by the Whitefish River between Keith and Smith Arms (Morris 1972).

Fish were available at most times of the year although, according to Franklin (1828), catches declined in the fall after the formation of ice, and reached their lowest level in January. The preferred species, according to Morris (1972) was whitefish (*Coregonus clupeaformis*), which is to be found in the sandy bays (Johnson 1975a) and is particularly abundant in the fall at the southern end of McVicar Arm (Miller 1947). Walleye or pickerel (*Stizostedion vitreum*) is confined to the region at the mouth of the Johnny Hoe River (Johnson 1975a).

Lake herring (*Coregonus artedii*) is particularly abundant in the spring and constitutes a dietary mainstay. Individual Franklin Indians have told the present author that one can eat it regularly without tiring of the flavour.

Fishing methods used by the Satudene were quite varied, ranging from the use of hook and line to the building of stone weirs (Osgood 1931). Hook and line were used principally in the spring for the catching of lake trout (*Salvelinus namaycush*) (Osgood 1931 p. 39) and, according to McKenzie (1805 p. 21), the hooks were sometimes made of beaver rib fastened to wood. Fish weirs, which can be used only on streams with a relatively small flow, were made of brush or stones (Osgood 1931). However, in the region of Great Bear Lake it is only the grayling or bluefish (*Thymallus arcticus*) which moves regularly along rivers.

Fishing in winter was done through holes cut in the ice of lakes and rivers soon after its formation in the fall and kept open through the winter as its depth increased. An ice chisel, consisting of a ram's or muskox horn mounted at the end of a long wooden shaft, was the instrument in everyday use for chopping the holes. The name used for the chisel (*été*) means horn, although the chisel proper is now made of iron. The companion instrument, the *escoubane* or ice-skimmer, consists of a net stretched on a wooden hoop whose tips are fastened together to form a handle (Savoie 1971 p. 52). After the making of the hole, fish were attracted to it by the working up and down of a jig — a small bone or stone fish. As an alternative, hooks were used but even among tribes who had been taught the use of metal, stone objects continued to be employed as fish hooks (Savoie 1971 p. 62).

Fishing nets were made of the knotted bast fibres of spruce or willow, or even *babiche* (plaited rawhide from caribou or moose) with the aid of netting needles. The nets were of the gillnet type, fitted with wooden floats and with stones attached for sinkers; they were set by cutting a series of holes in the ice and threading a line from hole to hole under it by means of a wooden pole. When the net had been set, only the end holes were kept open.

#### ORIGIN OF NAME

When, on 5 July 1789, Alexander Mackenzie was journeying down the river named after him, he noted in his journal: "We soon found the river of the great Bear Lake" (Mackenzie 1801). He did not visit the lake himself, so presumably accepted the name given to him by his native interpreters.

The fact of the "g" in "great" not being capitalized would seem to indicate a belief on Mackenzie's part that the word had reference to the size of the lake, and was not intended to qualify "bear". He himself, however, did not apparently encounter any bears, though in his entry for 6 July he referred to a *report* by a local Indian that there were "a great Number of Bears and White Buffaloes (small) . . ." in the mountains to the *west* of the river.

An official view of the origin of the lake has been supplied by the Geographical Board of Canada (1910):

"Great Bear: first applied to river discharging the lake — on account of bears seen in the vicinity. 'Great' refers to the size of the lake."

Conclusive evidence for the view that “great” refers to the size of the lake is, however, lacking, and an alternative explanation can be considered.

Between the Keith Arm and McVicar Arm of the lake is a large rounded hill marked on present-day maps — e.g. chart no. 6390 of the Canadian Hydrographic Service — as Grizzly Bear Mountain. On a map drawn by Petitot (Savoie 1971, map 2) it is shown as *Sas-tshô Ewa*, and the Geographical Board of Canada (1910) indicates derivation from a spelling variant of the same Chipewyan words, meaning literally “bear large hill”. According to Höhn (1973), the Chipewyan words refer specifically to the grizzly bear, and there is no reason to believe that they would not do so in the local dialect in the area of Grizzly Bear Mountain. That the lake is named after this hill is confirmed by the fact that the part of the Hare tribe living along its northern shores refer to themselves by Chipewyan words meaning “grizzly bear water people”.

It would thus appear that Alexander Mackenzie’s interpreters supplied a misleading literal translation of the lake’s name. The misrepresentation is understandable in that probably no word for grizzly bear existed in the time of Mackenzie, who was the first European to penetrate its range from the direction of the central regions of North America.

If the explanation just given of the origin of the name Great Bear Lake is indeed correct, it may be noted that the French form “Grand Lac des Ours” is quite misleading.

#### MODERN HISTORY

##### *Nineteenth century*

The first known European establishment on Great Bear Lake was that constructed by Alexander McKenzie in 1799 for the North-West Fur Company (McKenzie 1805). A further post was established by the breakaway XY company of Alexander Mackenzie (whose expedition of 1789 is referred to above), and for at least a year the two posts operated side by side, if not in harmony. In 1804, the two companies recombined and a single post was operated until 1812 — perhaps even until 1821, when the North-West Fur Company amalgamated with its greatest rival, the Hudson’s Bay Company. All that is known for certain is that when the members of Sir John Franklin’s second expedition to the Arctic (Franklin 1828) reached the same locality in 1825, the only remains of the previous habitations were the stone chimneys.

Franklin had decided to establish his headquarters at Great Bear Lake on the basis of an assurance that it was the one site in the area where food supplies could be depended on throughout the winter. The advance party reached the head of Great Bear River in the spring of 1825 and began construction of quarters; “Fort Franklin” was near completion, and had already been named, when the leader arrived.

In the summer of 1825, Franklin explored the Great Bear River and the Mackenzie River in company with the surgeon and naturalist of the party, John Richardson. George Back, who was left in charge at the fort, supervised its com-

pletion and had it stocked with provisions for the coming winter. The exploring party returned before the onset of cold weather, and the whole expedition passed the winter in relative comfort.

In the early spring of 1826, Richardson in company with Lieutenant Kendall, one of the junior officers of the expedition, carried out a survey of much of Great Bear Lake. The two travelled by dog team around Keith Arm and then on to McTavish Arm, leaving only about 20 miles of the north shore of McTavish Arm unsurveyed (Franklin 1828). In McTavish Arm "a piece of white rag let down there did not disappear until it descended 15 fathoms" (1 fathom = 1.83 metres). This result was confirmed 140 years later when, with the aid of a standard Secchi disc, a maximum transparency of 30 metres was observed (Johnson 1975b).

The five arms of the lake were named at this time — after members of the Hudson's Bay Company who had helped Franklin's expedition on their inward journey. Peter Warren Dease, a Chief Trader, was responsible for the erection of the buildings at Fort Franklin. Robert McVicar, another Chief Trader, was in charge of the post at Fort Resolution on Great Slave Lake. John McTavish, originally of the North-West Fur Company, had been met by Franklin at York Factory on his first journey north. At the time a virtual state of war existed between the North-West Fur Company, trading out of Montreal, and the Hudson's Bay Company, which used the northerly routes along the Saskatchewan and Churchill rivers; McTavish was in fact a prisoner of the northern company (Franklin 1823). Keith Arm was named after Chief Factors James and George Keith, and Smith Arm after Chief Factor Edward Smith.

Kendall, taking advantage of the flat expanse of the frozen lake and springtime increases in temperature, made observations from which he concluded that at temperatures below zero on the Fahrenheit scale, the speed of sound decreases by 1.167 feet per second (0.355 metres per second) for every degree Fahrenheit reduction in temperature (Franklin 1828). Considering the circumstances of Kendall's observations, the figure was very accurate in being as close as 0.012 metres per second to that accepted today.

At the earliest opportunity in the spring of 1826, the exploring party left the base camp and proceeded down the Great Bear and Mackenzie rivers to the Mackenzie Delta. From there, Richardson and Kendall, after parting from Franklin and Back, moved east to the Coppermine River, which they reached on 8 August in the two small clinker-built vessels *Dolphin* and *Union*, after which the Dolphin and Union Strait (between Victoria Island and the mainland) is named. Proceeding up the Coppermine River they abandoned their main boats at Bloody Falls, retaining only a collapsible dinghy, covered with "Mr. MacIntosh's patent waterproof cloth".

After travelling up the Kendall River to the Dismal Lakes, they proceeded overland to the Dease River which they descended, reaching Great Bear Lake on 18 August. After a wait of six days, they were met by a party from Fort Franklin which escorted them back to it. Richardson withdrew south in October, to be followed by Franklin in March 1827.

Great Bear Lake was next visited by Peter Warren Dease and Thomas Simpson, who arrived in 1836. The latter was the cousin of Sir George Simpson, Governor

of the Hudson's Bay Company for many years. The purpose of Dease and Simpson was to complete the work, started by Franklin, of mapping the coastline of the Central Arctic. While they were engaged on this activity, the remainder of their party, led by the boat builder John Rich, proceeded to the mouth of the Dease River and, at a point opposite a large island (now Rich Island), commenced the erection of permanent winter quarters which they named Fort Confidence. Dease and Simpson eventually arrived there via Great Bear River and the lake.

Simpson (1843) has left a description of the buildings. These were ready for occupation a month after the arrival of himself and Dease, but inadequacies in the available timber and insufficient roofing caused their interiors to be very cold. Fishing was apparently good until March when the supply failed, and venison became the principal food. From all the early accounts it is apparent that game was abundant in the area. The Indians, who were numerous, were often suffering hardships by the middle of winter — generally from starvation, though influenza was also beginning to take its toll (Simpson 1843).

On 6 June 1837, Dease and Simpson set out, taking with them *Castor* and *Pollux*, two clinker-built boats, each 24 feet (7 m) long, which were tracked up the Dease River for about 70 miles (112 km). Because of rapids and rocks, there were few opportunities for the use of oars. The party eventually reached the point at which the portage across to the Dismal Lakes began. It was accomplished in good order. The lakes were still frozen, and so the boats were mounted on specially-brought iron skids and hauled across the surface by means of drag ropes. Having negotiated the Kendall and Coppermine rivers, the party traversed Coronation Gulf to the extremity of the Kent Peninsula. They then returned to the Coppermine River, cached their boats at the mouth of the Kendall River and proceeded back to Fort Confidence.

In March 1838, Simpson travelled to the southeast corner of McTavish Arm where he enquired of the local Indians about the bays which stretched inland. In one of them there was a cave where, apparently, the "Indian Shamans practised their most solemn necromancy"; it is now known as Conjuror Bay. In the June of the same year, Dease and Simpson set off again from Fort Confidence and, after following the now-familiar trail to the Coppermine River, reached the coast at Coronation Gulf only seven days later. After extensive explorations eastward therefrom, the party returned to the Coppermine River and thence to Fort Confidence, which they reached on 24 September.

In 1849, Richardson participated with John Rae in the search for possible survivors from Franklin's third expedition to the Arctic, which had set out in 1845 (Richardson 1852). They journeyed from, and returned to, Great Bear Lake via the Dismal Lakes portage and the Coppermine River. Richardson, who appears to have lost some of his former vigour by this time, returned to England while Rae (1852) remained at Fort Confidence for the winter. The following year Rae again travelled to the Coppermine River via the Dismal Lakes for further searches. After returning to Great Bear Lake by the same route, he proceeded to Fort Simpson on the Mackenzie River. There he met a naval party which had spent the previous winter at Fort Franklin, where little remained of Franklin's fort except the chimneys.

When the searches for Franklin's lost expedition finally ended, interest in Arctic exploration as such lapsed, to be replaced by increasing activity in the missionary field. In 1863, the Hudson's Bay Company established a trading post at the site of the old Fort Franklin where, in 1866, Emile Petitot established a mission. It was at about this time that the Indians began to forsake their nomadic way of life. In the words of Morris (1973):

“The Satudene were faced with the choice of staying out on the edge of the barrens in summer where they were reasonably certain of procuring sufficient and adequate supplies of caribou for food and clothing as they had done in the past, or of remaining close to the forts, where they would be assured of some continued support, even if meagre.”

The choice they generally made — to remain in permanent settlements in the vicinity of the trading posts — had far-reaching consequences for the economy of the North.

#### *Twentieth century*

In 1899, the geologist, J. Mackintosh Bell, visited Great Bear Lake and its environs in the company of Charles Camsell (1937) who had already done winter fishing there. The observation, recorded by Bell (1902), that “in the greenstones of east McTavish Bay occur numerous interrupted stringers of calc-spar containing chalcopyrite, and the steep rocky shores which here present themselves to the lake are often stained with cobalt-bloom or copper-green”, was instrumental in the eventual establishment of a mine at Port Radium thirty years later (see below). Bell and Camsell also pioneered a route south from McTavish Arm along what is now the Camsell River. In 1903, Edward A. Preble (Preble 1908) traversed much of the route of Bell and Camsell. He collected birds and fishes along the south coast of McTavish Arm and the eastern side of Keith Arm.

In 1910, Vilhalmur Stefansson entered the area of the Great Bear Lake from the north with a party of Copper Eskimos who at that time occasionally hunted around the north end of the lake in the locality of the Dease River (Stefansson 1913). The only evidence he could find of the old buildings of Fort Confidence, which had been standing until a few years previously, were the piles of firewood left by Richardson's men, and two stone chimneys. The latter were still standing in 1964 (see Frontispiece).

In 1928, E. A. Porsild made a study of the vegetation of the northern shore of Great Bear Lake in the vicinity of Fort Confidence with the possibility of reindeer herding in view. While waiting for snow to clear from the land, he carried out observations on seiches and their effects (Porsild 1932). By measuring the rise and fall of the water in a hole cut in the ice in the channel formed by Rich Island and the mainland, he obtained information concerning the periodicity of the seiches and demonstrated that they were responsible for the thinness of the ice.

In 1930, Gilbert LaBine staked claims for silver and cobalt at Echo Bay at the west extremity of the Precambrian Shield (McDonald 1932). The name Echo Bay was originally applied by Bell and Camsell to the innermost bay at what is now Port Radium — not to the neighbouring fiord-like bay, as it applies today.

A mine was established at Port Radium by Eldorado Mining and Refining Limited of Port Hope, Ontario, in 1932. It soon became apparent that pitchblende would be the mine's most important product, for radium was found to be present in it at the unusually high concentration of one gram to 6½ tons. The radioactive metal had previously only been obtainable from the Belgian Congo. The associated metal uranium, although in use to some extent in the steel industry and in the production of glass and ceramics, was in effect a waste product at the time. By 1938, production of radium had risen to the level of 2.8 grams per month, but the breaking of the Belgian Congo's monopoly had caused prices to fall drastically (Eldorado 1967). Developments in nuclear physics soon eliminated most of the need for naturally-produced radium, prices of which in consequence fell still further, and the mine was closed in 1940.

In 1942, the Port Radium mine was reopened and enlarged to meet the emergency wartime demand for the production of uranium. At the same time, the recovery was commenced of much of the uranium ore previously disposed of in the lake; and for the purpose the component parts of a massive dredge were transported to Port Radium for assembly there. Both the newly-mined and the recovered supplies of ore were processed together. Production ceased in 1962 and the mine was closed. As a result, however, of the strikes of silver made in the same area by Echo Bay Mines Limited (Thorpe 1966), it was possible to maintain the above-ground equipment in operation, albeit on a much reduced scale.

During the nineteen thirties, a small township grew up at Cameron Bay, close to Port Radium, which included a store, a hotel, and a Royal Canadian Mounted Police post. It was abandoned with the cessation of mining operations at the beginning of the Second World War, though a fishing lodge was established on the site in 1963.

Also during the nineteen thirties, and abandoned with the advent of war, there was an attempt to establish mink ranching at a site close to the mouth of the Dease River, on the basis of the abundant fish stocks which apparently existed in the sheltered waters behind Rich Island.

The development of mining at Great Bear Lake led to a great improvement in transportation facilities there. The barge service which had been operating along the Mackenzie River since just after the First World War was extended up the Great Bear River (with only a single portage at the St. Charles rapids) and across the lake. By the time the mine first closed, in 1940, air transportation was available and developing rapidly, and the region had become far more accessible. With the reopening of the mine, much greater quantities of material had to be transported to and from the lake. In 1945, therefore, the hull of the 35-metre motor vessel *Radium Gilbert* was hauled up the Great Bear River to the lake — without portage at the rapids, in view of its size — and towed across the lake to be fitted out in Port Radium and become the largest ship ever to sail its waters. Its availability — due to the closure of the mine in 1962 — enabled a limnological survey of the lake to be carried out during 1963-65.

An earlier investigation had been made of limnology and fisheries of Great Bear Lake (Miller 1947) as a result of which it was concluded that the fish stocks were not sufficiently abundant to support a commercial fishery in addition to the annual

catch of 900 metric tons ( $9 \times 10^5$  kg). Miller (1962) relates how a possible disaster at the mine was averted by the unexpected discovery, made in the course of soundings of the lake, that it was as deep as 454 metres in the vicinity of Port Radium, where preparations were being made to drive a shaft towards the lake itself.

During the late nineteen fifties, interest in tourism and angling in the Northwest Territories increased greatly. Two sports fishing lodges were established on the south shore of McTavish Arm, one at Sawmill Bay and one in Conjuror Bay, which became very popular due to the abundance and accessibility of large lake trout (up to 30 kg) in the deep sheltered waters. Three further lodges were built — two in McTavish Arm and one in Smith Arm.

At the present time, the region of the Great Bear Lake is still isolated, but the development of air services has made transportation to it much more rapid. The summer barge route has been supplemented by a winter road from Fort Rae at the northern extremity of Great Slave Lake to Port Radium via the chain of lakes forming the Camsell River and the frozen surface of Great Bear Lake. Trucks make their hazardous journeys along the road in convoys, each of which is preceded by a massive snowplough.

The area of the Great Bear Lake has about the same number of inhabitants today as in earlier times. Morris (1972) estimates the Satudene population, past and present, at 500. Most of them are concentrated at Fort Franklin with its school, trading post, and mission.

Great Bear Lake has, to date, escaped the fate of many of the world's large lakes; its waters are unpolluted and the fish stocks, except in certain localities, are in much the same condition as when Franklin arrived 150 years ago. There are, however, changes in the offing; oil exploration in progress in the basin, and oil and gas pipelines are projected for the Mackenzie Valley less than 50 miles (80 km) away. To meet the demand for electric power, the possibility is being examined of turning Great Bear Lake into a tremendous reservoir to provide the power for a generating station on the Great Bear River. It is fervently to be hoped that the lake, its river and the surrounding land, holding as they do a great place in the history of the Canadian North, will not be adversely affected if such a development occurs. Maintenance, in particular, of the high degree of clearness and purity of the waters of the lake depends upon the most careful treatment of the surrounding land surfaces.

#### REFERENCES

- BANFIELD, A. W. F. 1954. Preliminary investigation of the Barren Grounds caribou. *Canada, Canadian Wildlife Service, Management Bulletin Series* 10A, 10B.
- BELL, J. M. 1902. Report on the topography and geology of Great Bear Lake and a chain of lakes and streams thence to Great Slave Lake. *Canada, Geological Survey, Annual Report, 1899*. Ottawa: S. E. Dawson.
- BIRD, J. B. 1967. *The Physiography of Arctic Canada*. Baltimore: Johns Hopkins Press.
- CAMSELL, C. 1937. Great Bear Lake exploration. *Canadian Geographical Journal*, 14:126-51.
- CLARK, D. W. 1970. A reanalysis of three archaeological complexes from the Great Bear River, District of Mackenzie. (Unpublished report of the Archaeological Survey of Canada, National Museum of Man, Ottawa).

- . 1975. Archaeological reconnaissance in northern District of Mackenzie: 1969, 1970 and 1972. *Canada, Archaeological Survey, Mercury Series, Paper 27*.
- CRAIG, B. G. 1965. Glacial Lake McConnell and the surficial geology of parts of the Slave and Redstone rivers map area, District of Mackenzie. *Canada, Geological Survey, Bulletin 182*.
- and FYLES, J. G. 1960. Pleistocene geology of arctic Canada. *Canada, Geological Survey, Paper 60-10*.
- ELDORADO. 1967. *History of Eldorado*. Port Hope, Ontario: Eldorado Mining and Refining Limited (Annual Report).
- FRANKLIN, SIR JOHN. 1823. *Narrative of a Journey to the Shores of the Polar Sea in the Years 1819, 20, 21 and 22*. London: John Murray.
- . 1828. *Narrative of a Second Journey to the Polar Sea in the Years 1825, 26 and 27*. London: John Murray.
- GEOGRAPHICAL BOARD. 1910. Ninth report. *Canada, Department of Marine and Fisheries, Annual Report, Supplement*.
- HEARNE, S. 1795. *A Journey to the Northern Ocean*; edited by R. Glover, 1958. Toronto: Macmillan.
- HÖHN, E. O. 1973. Mammal and bird names in the Indian language of the Lake Athabasca area. *Arctic*, 26(2): 163-71.
- JOHNSON, L. 1975a. The distribution of fish species in Great Bear Lake, N.W.T., with reference to zooplankton, benthic invertebrates and environmental conditions. *Fisheries Research Board of Canada Journal*, 32(11): 1989-2004.
- . 1975b. The physical and chemical characteristics of Great Bear Lake, N.W.T., Canada. *Fisheries Research Board of Canada Journal*, 32(11): 1971-1987.
- KELSALL, J. P. 1968. *The Migratory Barren-Ground Caribou of Canada*. Ottawa: Canadian Wildlife Service.
- MACKENZIE, A. 1801. *Voyages from Montreal on the River St. Lawrence through the Continent of North America to the Frozen and Pacific Oceans in the Years 1789 and 1793*. London: R. Noble. (Reprinted in adaptation by M. G. Hurtig, Edmonton, 1971).
- MACNEISH, S. S. 1954. The Pointed Mountain site near Fort Liard, Northwest Territories, Canada. *American Antiquity*, 19 (3): 234-53.
- . 1955. Two archaeological sites on Great Bear Lake, Northwestern Territories. *Canada, National Museum of Man, Bulletin no. 136*, pp. 54-84.
- MACNEISH, R. S. 1964. *Investigations in Southwest Yukon, Archaeological Excavation, Comparisons and Speculation*. Cambridge, Mass.: Harvard University Press (Robert S. Peabody Foundation for Archaeology, vol. 6, no. 2).
- MARTIN, P. S. and GUILDAY, J. E. 1967. A bestiary for Pleistocene Biologists. In: Martin, P. S. and Wright, H. E. (eds.), *Pleistocene Extinctions, VIIth Congress of the International Association for Quaternary Research, Volume 6*. New Haven: Yale University Press.
- MCDONALD, R. C. 1932. *Surveys at Great Bear Lake, 1931*. Montreal: Canadian Institute of Mining and Metallurgy (Transactions, vol. 35, pp. 209-23).
- MCKENZIE, A. 1805. *Journal of Great Bear Lake*. (Unpublished manuscript, Victoria Archives, British Columbia, Canada).
- MCPHAIL, J. D. and LINDSEY, C. C. 1970. Freshwater fishes of northwestern Canada and Alaska. *Canada, Fisheries Research Board, Bulletin no. 173*.
- MILLER, R. B. 1947. Great Bear Lake. In: Northwest Canadian Fisheries Surveys 1944-1945. *Canada, Fisheries Research Board, Bulletin no. 72*, pp. 31-44.

- 1962. *A Cool Curving World*. Toronto: Longmans.
- MORRIS, M. W. 1972. Great Bear Lake Indians, a historical demography and human ecology: Part I, The situation prior to European contact. *Musk-ox*, 11: 3-17.
- 1973. Great Bear Lake Indians, a historical demography and human ecology: Part II, European influences. *Musk-ox*, 15: 58-80.
- OSGOOD, C. 1931. The ethnography of the Great Bear Lake Indians. *Canada, National Museum, Bulletin* no. 70, pp. 31-98.
- PETITOT, E. 1876. *Dictionnaire de la Langue Dènè-Dindjé*. Paris: Leroux; San Francisco: A. L. Bancroft.
- 1893. *Explorations de la Région du Grand Lac des Ours*. Paris: Tequi.
- PORSILD, E. A. 1932. Notes on the seiches and currents of Great Bear Lake. *Geographical Review* 22(3): 474-7.
- PREBLE, E. A. 1908. *A Biological Investigation of the Mackenzie-Athabasca Region*. Washington, D.C.: U.S. Department of Agriculture (North American Fauna, no. 27).
- PREST, V. K. 1970. Quaternary geology of Canada. In: Douglas, R. J. W. (ed.), *Geology and Economic Minerals of Canada*, Ottawa: Geological Survey of Canada (Economic Geology, Report no. 1), pp. 675-764.
- RAE, J. 1852. Journey from Great Bear Lake to Wollaston Land. *Journal of the Royal Geographical Society*, 12: 73-96.
- RICHARDSON, J. 1852. *Arctic Searching Expedition: A 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*. New York: Harper.
- SAVOIE, D. 1971. The Amerindians of the Canadian North-West in the 19th century, as seen by Emile Petitot, vol. 2: the Loucheux Indians. *Canada, Department of Indian Affairs and Northern Development, Northern Science Research Group, Mackenzie District Research Paper* 10.
- SIMPSON, T. 1843. *Narrative of the Discoveries on the North Coast of America, Effected by the Officers of the Hudson's Bay Company during the Years 1836-1839*. London: Richard Bentley.
- STEFANSSON, V. 1913. *My Life with the Eskimos*. New York: Macmillan.
- THORPE, F. I. 1966. Echo Bay Mines Limited. In: *Mineral Industry of the Northwest Territories, 1965; Canada, Geological Survey, Paper* 66-52, pp. 47-49.