

ARCTIC CIRCULAR

Vol. 11

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Vol. XI, 1958

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THE ARCTIC CIRCLE

THE COMMITTEE 1958

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THE ARCTIC CIRCULAR

VOL. XI No. 1

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1958

The following meetings have been held:

Eightieth Meeting. 14 January 1958. The Annual General Meeting. A coloured film, "The Newfoundland Scene", produced by Crawley Films, was shown.

Eighty-first Meeting, 11 February 1958. "Ungava archaeological survey" by Mr. W.E. Taylor.

Eighty-second Meeting, 11 March 1958. "Geological investigations in the Arctic" by Dr. R.G. Blackadar and Dr. E.T. Tozer.

Eighty-third Meeting, 8 April 1958. "Across Lapland by bus" by Mr. R.F. Legget.

Eighty-fourth Meeting, 13 May 1958. Three Russian Films were shown and introduced by Mr. A. Tovstogan of the Embassy of the U.S.S.R.

Officers and Committee members for 1958

<u>President:</u>	Dr. D.C. Rose
<u>Vice-President:</u>	Mr. L.A.C.O. Hunt
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Mr. T.H. Manning	Mr. J. Wyatt

Operation Hazen 1957¹. By R.L. Christie²

In 1957 the Defence Research Board organized an expedition to northern Ellesmere Island, known as Operation Hazen. This continuing programme formed part of Canada's contribution to the International Geophysical Year 1957-8. Detailed glaciological, geophysical, and climatological studies were made on the ice cap of the United States Range, north of Lake Hazen, and geological and limnological studies were carried out from the base camp at Lake Hazen. Participating and assisting organizations included the R.C.A.F., Canadian Army, U.S. Coast Guard, Geological Survey of Canada, McGill University, and the University of Toronto.

There were eight scientists on the expedition: Dr. Geoffrey Hattersley-Smith of the Defence Research Board, leader and glaciologist; Dr. Fraser Grant of the University of Toronto, geophysicist; Mr. James Lotz of McGill University, meteorologist; Mr. Keith Arnold of Ottawa, surveyor; Dr. Roger Deane of the University of Toronto, Pleistocene geology and sedimentation studies; Messrs. John Filo and Helmuth Sandstrom of the University of Toronto, geophysical assistants; and Mr. Robert Christie of the Geological Survey of Canada, geologist.

Two Greenland dog teams of ten dogs each, and komatiks, were obtained through the courtesy of the Greenland Department and of

1. Published with the permission of the Director, Geological Survey of Canada, Department of Mines and Technical Surveys, Ottawa, and of the Chairman, Defence Research Board, Department of National Defence, Ottawa
2. Geologist, Geological Survey of Canada, Ottawa.

Commander O. Jensen, Danish liaison officer at Thule Air Base, Greenland. Diesel fuel, gasoline, and motor oil were made available by the U.S.A.F. and R.C.A.F.

With the exception of Filo and Sandstrom, the party was flown from Ottawa to Resolute via Winnipeg and Fort Churchill by the R.C.A.F. Air Transport Command, and arrived at Resolute on April 27. At Fort Churchill the party was joined by Sergeant David Engel of the Royal Canadian Engineers, who was to be in charge of the mechanical equipment and the clearing of the airstrip on Lake Hazen. Sergeant Engel completed his duties early in May and returned to Fort Churchill on one of the last supply flights.

Personnel and supplies were flown in C-119 "Flying Boxcar" aircraft by 436 Squadron of the R.C.A.F. from Resolute to Lake Hazen, with landings at Thule Air Base. The aircraft made excellent wheel landings in about 9 inches of loose snow on the 5-foot thick lake ice near Johns Island. A TD-9 tractor-bulldozer was carried in by the first aircraft, and work was begun immediately on a 3,500-foot airstrip on the ice. At the time of arrival at Lake Hazen air temperatures were about -15°F to $+6^{\circ}\text{F}$. After several days work the airstrip was completed to a width of about 70 feet and the airlift, which lasted about 5 days, was carried out without mishap, the aircraft generally landing in the snow and taking off from the airstrip.

On May 3 members of the ice cap party and their supplies, equipment, and 15 dogs were landed on the ice cap about 20 miles north of the airstrip, leaving Christie and Deane at the airstrip to move the supplies and equipment to land and to build a base camp. A DC-3 "Dakota" aircraft of 408 Squadron R.C.A.F. was used in the landings on the ice cap and supplies were paradropped from C-119 aircraft. The base camp at Lake Hazen was built on a small point north of Johns Island and the supplies and fuel were moved with great efficiency by a Canadian Army Northland sled towed by a Bombardier snowmobile. The camp consisted of two Attwell huts and was completed and the supplies sorted and stored by May 14. One Attwell was heated and was used for living quarters, radio, and meteorological equipment, whereas the other was unheated and was used for storage. Between April 30 and May 18 a Shoran Station was operated by R.C.A.F. personnel on the highest point of Johns Island.

The Bombardier snowmobile proved to be extremely convenient and speedy in the light snow on the lake and late in May a few short reconnaissance trips were made. On May 23 the ice

cap party except Lotz, the meteorologist, arrived at the base camp as planned, to meet the last of the spring flights which also brought in Filo and Sandstrom. Shortly after, most of the party returned to the ice cap camp.

At the ice capcamp a bore-hole was drilled 50 feet into the ice; a core was taken and thermistors were placed at various depths in the hole. An extensive seismic survey was made of Gilman Glacier and this work was eventually extended up into the snowfield above the glacier to a height of about 4,500 feet. Stakes were set out on the glacier and on the ice cap to measure ablation and regular meteorological recording was begun on May 18.

At the end of May trickles of water were running at the snout of Gilman Glacier. The bawling of muskoxen could be heard along the valleys and thousands of mating knots and turnstones made a continuous crescendo of sound along "Gilman River". The melt season seemed imminent and indeed by June 10 hillsides were bare and the air temperature was above freezing.

In the vicinity of the base camp at Lake Hazen, holes were drilled through the lake ice for various studies. The temperatures, acidity, turbidity, and depth of water were measured, and the lake bottom was sampled. Sediment-collecting pans were set out, and were taken up at various intervals.

On June 10 Christie and Deane with five dogs and a Nansen sledge began a two-week trip down Ruggles River, Chandler Fiord, Ida Bay, Conybeare Bay, and across Archer Fiord to Judge Daly Promontory. Data were obtained on the bedrock geology, the surficial deposits, and on glacial geology. By June 23 the shore leads along the fiords had opened considerably and the heavy ice-banks of Ruggles River were collapsing rapidly into the tunnelling water. The ice on Lake Hazen was free of snow and was firm and dry. Christie and Deane reached the base camp on June 23 and found it to be in good shape except for some minor damage by a wolf or wolves. The maximum temperature at the base camp during the time Christie and Deane had been away was 57°F. On the night they arrived back at camp the first rainfall of the season was recorded (a mere .07inches) heralding the end of the prolonged springtime period of nearly continuous sun and near calm. The second half of the season proved to be more variable, relatively cloudy and windy, and cooler. In July rather heavy rainfalls of .26 and .22 inches were measured and in late July winds of up to 45 m.p.h. were recorded.

In late June Hattersley-Smith and Arnold made a trip by dog sledge into the snowfields of the United States Range. A pit 20 feet deep was dug in the firn of the ice cap at 6,000 feet and the stratification was studied. It is estimated that strata back to the early 1930's were uncovered. The second ascent of Mount Oxford was made and the elevation, 7,250 feet, and position of the peak were determined. The first ascent of this peak had been made in 1935 by A.W. Moore of the Oxford University Ellesmere Land Expedition.

During late June and July short geological reconnaissance trips were made by base camp personnel, and the lake water and bottom studies were continued. Until the middle of July, when the lake level rose rapidly and the shore lead widened, travel was particularly rapid as the snowmobile could cruise easily on the dry lake ice. When the shore lead opened sufficiently (about July 14), an aluminum boat with 5 H.P. motor was used. The boat, with its three metal keels, proved to be admirably suited for skidding over the candled ice at places where wind had closed the lead.

For a week in late July drifting ice made the lake unnavigable, and Deane made a short trip to Henrietta Nesmith Glacier using dogs with packs. Travel by boat was fairly dependable however and trips were made to both ends of Lake Hazen to carry out geological work, studies of the meltwater streams, and to sound the lake.

On August 10 Arnold, Filo, and Sandstrom arrived at base camp from the ice cap camp having carried a level survey to within a few miles of the camp. The remainder of the ice cap party tied down the camp for the winter, and with the dogs sledged down Gilman Glacier on August 13. All the records, some instruments, and eight pups, which were born during the summer, were brought by back-pack and dog-pack down "Gilman River" to Lake Hazen.

On August 17 and 18 a helicopter from the U.S. Coast Guard icebreaker Eastwind ferried the four scientists who were to form the winter party, their gear, and 15 tons of supplies in to the Lake Hazen base camp and ferried the summer party, the dogs, and the scientific records and collections out to the ship. The Eastwind arrived back at Thule Air Base from Chandler Fiord on August 23. The party was flown from Thule Air Base to Goose Bay, Labrador, by the Military Air Transportation Service (M.A.T.S.), U.S.A.F., and to Montreal and Ottawa on August 26 by aircraft of Air Transport Command, R.C.A.F.,

The scientific collections and records made during the expedition are now being studied in the offices and laboratories of the various participating organizations. In addition to the scientific collections, relics of previous expeditions and of early Eskimo habitation were found. A note left by Greely in 1882 was recovered from a cairn near Henrietta Nesmith Glacier and signs of early travellers were found at the head of Ruggles River. Eskimo tent rings of unknown age were observed at many widely separated localities. A tent ring near Gilman Glacier, at latitude $82^{\circ}1'7''$ N. is the most northern sign of Eskimo habitation yet recorded in Canada.

Rocks ranging in age from possible Early Palaeozoic to Cenozoic are found near Lake Hazen. The most widespread rocks are tightly folded slate, sandstone, quartzite, and greywacke of the Cape Rawson group of Early Palaeozoic or older age. The regional trend of structure is northeast, parallel to the lake.

Moderately inclined strata of sandstone, arkose, chert-pebble conglomerate, and limestone, probably of later Palaeozoic age, appear to underlie much of the United States Range. Weakly consolidated sandstone and shale, with some fossiliferous limestone and coal, outcrop along the north shore of Lake Hazen. The strata are mainly gently inclined but are extremely contorted in places, perhaps due to faulting. Coal strata outcrop continuously for about 10 miles along the northwest shore of Lake Hazen. As many as 5 seams were observed, commonly 2 to 4 feet thick. In one place an 8-foot seam was noted.

Preliminary calculations from geophysical data on the thickness of ice in the Gilman Glacier indicate a variation from 1,200 feet thick two miles from the terminus to more than 2,400 feet thick about fourteen miles from the terminus.

Some of the glaciological data obtained may be summarized: the highland ice in the interior maintains a general level of 6,000 to 6,500 feet above sea level over a wide area; the firn line lies at 4,000 to 4,500 feet. Temperatures in the ice at the camp indicate a mean annual temperature of -18°C ; at 6,000 feet the firn temperature was steady at -23°C at depths of 13 to 20 feet and is thought to be very close to the mean annual temperature. The rate of movement of the ice at the camp, measured by careful surveying, was 3 metres in two months; change in position of the front of the glacier was less than a few centimetres according to an accurate chain survey at the snout where vegetation was noted growing close to the front. Mean ice ablation half a mile up-

glacier from the camp was 71.7 centimetres; at the camp 79.9 centimetres, and down-glacier 77.6 centimetres up to August 11, when the ablation season was very near its close.

By Piper Cub to the extreme north of Canada. By Welland W. Phipps.

In 1953 I flew Mr. George Jacobsen and his scientific party to Axel Heiberg Island with a Canso aircraft. The party landed on the only large lake on the island at the southwest end of Mokka Fiord on the east coast. Exploration work was carried out in the vicinity, including a long trek to the ice cap which took many hours of strenuous walking. Travel on foot was extremely difficult with steep rugged slopes, glacial streams, and almost impossible mud flats. At the time, I was struck with the advantages of using a light, modern, high-performance, wheel-equipped aircraft in support of such parties throughout the Subarctic and Queen Elizabeth Islands. A light aircraft, I thought, would be invaluable to exploration and survey parties for reconnaissance, establishing auxiliary camps, and leap-frogging personnel. Even on Axel Heiberg, which is one of the most rugged of the Queen Elizabeth Islands, there were countless areas 400-500 feet long where a light aircraft could be landed safely, particularly if it were equipped with an undercarriage which could absorb an abnormal amount of shock and provide a large bearing surface for soft ground operations. I discussed my ideas with Mr. Jacobsen and on my advice he purchased a Piper Super Cub (PA18) which he planned to use the following year for work on Axel Heiberg Island. It seemed at first that a caterpillar-type undercarriage would have some advantage, but after a number of experiments, I decided that for all-round operations, the standard tandem wheel undercarriage was the most suitable.

Unfortunately, Mr. Jacobsen was unable to go through with his plans, and the aircraft was subsequently purchased by Spartan Air Services. Spartan used it as a light support aircraft on their Shoran Operations at Pelly Lake from 1954 to 1956. For this operation it was tandem-wheel-equipped and proved to be extremely useful during the break-up and freeze-up periods, when ski- or float-equipped aircraft could not service their eight shoran stations. This gave me further opportunity to evaluate the potentialities of using light aircraft in the far north as a fast, economical method of transport.

During the winter of 1955-6 Mr. Dalton Muir, who was a member of Mr. Jacobsen's expedition to Axel Heiberg, told me of his plans to make films for the National Film Board in the northern Queen Elizabeth Islands. It became obvious that the scope of his work could be greatly enhanced by the use of a light aircraft and I suggested supporting this with the Super Cub as an experiment.

The following summer the aircraft was again at Pelly Lake and Spartan Air Services generously allowed me to take my annual leave at that time and to use the aircraft. On 4 August 1956 I took off from Pelly Lake for Resolute, carrying additional fuel in drums in the cabin. From Pelly Lake my route lay first to the north end of King William Island where there was a Shoran station for which I had mail. I then flew east over Matty Island to Boothia Peninsula to avoid the open water in James Ross Strait, and as low stratus lay along the coast I continued to the middle of the peninsula before turning north, stopping once in Boothia Peninsula to refuel and again on the north coast of Somerset Island. Barrow Strait was free of ice, except for a few large pans, so I climbed to 10,000 feet and set a course for Griffith Island. When within gliding distance of the island I headed for Resolute, arriving there in the evening after ten flying hours.

After refuelling at Resolute I took off the next day for Eureka weather station. Since Wellington Channel was clear of ice I crossed at its narrowest point to Devon Island and then by Hell Gate to Norwegian Bay; the ice in the bay and to the north was fortunately still solid. I refuelled on Bjorne Peninsula, flew up the Ellesmere coast to Eureka Sound, making a short detour inland at Bay Fiord to examine potential airstrip sites, and arrived at Eureka on the afternoon of August 5.

Mr. Muir, who had been at Eureka since May 26 taking films in the vicinity, joined me here and during the next three days we made short trips out from the weather station. A number of landings were made on a wide variety of surfaces including Black Top Ridge, Iceberg Point, the south coast of Greely Fiord, and several places on Axel Heiberg Island along the edge of the ice cap. An attempt to cross the ice cap to Strand Fiord on the west coast of Axel Heiberg Island proved unsuccessful because of the low ceiling.

It was then decided to extend Mr. Muir's work to the north coast of Ellesmere Island. Accordingly we left Eureka on the morning of August 8 and flew east-northeast up Greely Fiord,

then skirted the north side of the Mer de Glace Agassiz and along Archer Fiord to Fort Conger, where we landed. After spending several hours at Greely's campsite we continued north reaching Alert in the evening. Here we carried out a thorough check of the aircraft before continuing along the north coast as far as Cape Columbia, landing on the ice cap near Peary's cairn atop Cooper Key Mountain. Our return to Eureka lay along the same route as far as Archer Fiord. Here the head of the fiord was closed by bad weather so we first turned south but there was no improvement and we turned back and landed west of Archer Fiord on a tributary of the Dodge River. Better weather the next afternoon allowed us to return to Eureka on August 12.

After one day spent in local flights to complete the film work, I left Mr. Muir at Eureka and returned alone to Resolute, following much the same route as before. Eureka Sound was open but the ice had still not moved out of Norwegian Bay. From Resolute I again went south to Boothia Peninsula and then to the Shoran site on King William Island. After a short stop here I continued on to Pelly Lake arriving on August 15. Altogether the trip had taken 11 days with a total of 50 flying hours and a distance of 4,500 miles.

Throughout the flights I passed position reports every thirty minutes to the nearest radio station, and I was never out of contact. I used a Lear RCBB-T30 combination with a 300-foot trailing antenna enabling me to tune in on the $3/4$ -wave length of the H.F. frequencies I was using. For operation on the ground I carried balloons and a hydrogen generator to provide a vertical antenna. The radio was most effective and from the north coast of Ellesmere Island I was able to have excellent two-way R/T communications with the Spartan stations at Pelly Lake, Coral Harbour, and King William Island.

On all flights I carried concentrated emergency rations for thirty days, a tent, sleeping bag, and other standard survival equipment. I also had a complete spare set of radio tubes, which proved fortunate as one tube was required.

The experience of the trip more than fulfilled my expectations and confirmed my convictions that a Super Cub could provide a service in the far north which could only be replaced by the complexity and high cost of a helicopter operation.

The National Film Board Expedition to Eureka, 1956. By Dalton Muir

On 26 May 1956 a two-man party of the National Film Board of Canada arrived by aircraft at Eureka weather station in Ellesmere Island. The party consisted of Dalton Muir, representing the Science Film Unit of the Film Board, and his assistant, Norval E. Balch. In early August Welland Phipps joined the party for several days with a Piper Cub on charter from Spartan Air Services. (For details of the aircraft operation see note by Phipps in this number).

The purpose of the trip was to obtain material for two films on the Queen Elizabeth Islands. The first film will deal with the geography, geology, climate, and other physical features of the islands and surrounding waters, and the second with the biology of the area from an ecological point of view. Both films will be in colour with sound and will be released in 1958. A black and white television version from this footage, with a more popular presentation, has already been released under the title "Islands of the frozen sea".

The party spent four and a half months in the Queen Elizabeth Islands in order to cover the entire growing season. From a base at Eureka weather station we travelled on skis, on foot, by canoe, and by light aircraft, making trips of up to three weeks in duration. We used 16-mm. motion picture cameras, both electrically driven and spring wound. The accessory equipment included lenses of various focal lengths up to twelve inches, batteries, and remote controls, and lights, tanks, and dredging apparatus for marine invertebrates, as well as all standard accessories. Complete stills equipment was also taken.

Early in the season the spring thaw, run-off, and beginning of the growing season were photographed. During the height of the growing season, bird and animal breeding, plant growth and flowering, and environmental conditions were filmed. The onset of fall and winter conditions and their effect on growing things was followed, and spectacular scenery was recorded at every opportunity.

On one trip in the Piper Cub the writer and Welland Phipps flew from Eureka to Alert, stopping at Fort Conger on the way. From Alert, the coast was followed westward to Cape Columbia, where a landing was made on Cooper Key Mountain and Peary's cairn of 1906 was photographed. During the trip, shots of ice caps, glaciers, shelf ice, and the polar pack were recorded. On shorter trips, the gypsum deposits, coal outcrops, and ice cap of Axel Heiberg Island were photographed.

For photographing the biological subjects, a variety of techniques was used. Flocks of geese, herds of muskox, and arctic hares were photographed from a helicopter belonging to the C.G.S. d'Iberville. Muskox were successfully stalked on foot where ground relief gave concealment, or approached directly in the open ~~on~~ flat areas. Birds were photographed in three ways: a remote control was used in some cases, a duck hunters' type of "blind" on others, and long lenses were employed where no nest was present to draw the birds back to a particular spot. A gyrfalcon fortunately accepted a blind and returned to an old squaw duck which it had previously wounded, and a wolf was photographed when it approached a greater snow goose nest as the writer sat in a nearby blind. Extreme close-ups of flowering plants, mosses, lichens, and fungi were made with lens tubes. Marine specimens were photographed by artificial light in aquaria.

The writer wishes to thank Mr. S.D. MacDonald for his information and advice and Mr. Welland Phipps for his personal efforts which made it possible to film many otherwise inaccessible subjects. The cooperation and assistance of the joint Canadian and American staff at Eureka, Mr. R. Ethrington O.I.C. (1956), is gratefully acknowledged.

Ornithological research at Pelly Bay in the summer of 1956. By Andrew Macpherson

In 1955 I began a study of the relationships of Canadian Arctic Larus gulls, under the direction of Dr. M.J. Dunbar of McGill University. Field work was carried out that summer near Cape Dorset, southwest Baffin Island, with a grant from the National Research Council and the preliminary field results have been reported in the Circular (Vol. 8, No. 4, pp. 74-8). The project was continued in 1956 with funds provided by the Arctic Institute of North America through the Banting Committee.

Pelly Bay, at the head of the Gulf of Boothia, was selected as a suitable place for the second season's field work. Information from the Pelly Bay mission indicated the presence nearby of both cliff- and ground-nesting gulls. These proved to be Thayer's Gulls and Glaucous Gulls. Unfortunately no American Herring Gulls were found at Pelly Bay, although they occur at a higher latitude on Melville Peninsula.

In order to reduce costs a cooperative plan was arranged with Dr. W.F. Black, who held an Arctic Institute grant for the study of marine animals in arctic waters. Our start, which had been planned for early May, had unfortunately to be delayed for a month. Through the courtesy of the Foundation Company of Canada, subcontractors for the construction of the eastern section of the D.E.W. Line, we were able to reach the vicinity of Pelly Bay by air on June 8. On the arrival of our equipment we were taken by over-snow vehicles belonging to the Western Electric Company, from the landing field to our summer camp, twelve miles north of the Pelly Bay mission, where we arrived on June 19. There was little sign of thaw; the snow-fall had been unusually heavy and travel on foot was laborious. The next day we were joined by Alexis, a 24-year-old Eskimo, who accompanied us for the rest of the season.

On June 21 Alexis and I went by dog-team for a two-day trip to examine gull rookeries on nearby islands and to collect on the flat limestone country to the north and east of the coastal Precambrian hills around our camp. Shortly afterwards we enjoyed the hospitality of the resident missionary, the Rev. Franz Van de Velde, O.M.I., who kindly made available to us his faunal observations and notes over a period of nineteen years in the region. The Rev. Guy Mary - Rousseliere, O.M.I., archaeologist, ethnologist, and editor of Eskimo, who had sledged over from King William Island in the spring, also contributed greatly to our enjoyment and profit. We did some collecting at the mission with the help of a young Eskimo called Charlie.

On June 29 I found a gull rookery on a cliff near Login Bay, but, as in other rookeries of the region, the nesting ledges were for the most part inaccessible, and the plan of studying nesting in detail was abandoned. The bird fauna was much more abundant and varied on the limestone country to the east than it was on the Precambrian ridges near camp. I therefore set up a small tent near the head of Login Bay on July 8, and used it intermittently until July 17.

We spent the latter part of July working from two camps in the neighbourhood of the mission, and the first nine days of August on the east side of Login Bay. After a subsequent stay of five days at the mouth of the Kellett River, we spent a few days packing specimens and repairing equipment at the mission. Between August 18 and 25 Alexis and I worked on Simpson Peninsula opposite the north point of Helen Island and examined a rookery

north of this island, but ice was plentiful in the region and we decided to return to the southern part of the bay. After a spell of bad weather at the mission we all went south by canoe on September 2 to a large island at the head of the bay. On the 6th we travelled north along the west side of the bay to Arrowsmith River. Farther progress along the westward-trending shore was considered hazardous, if not impossible, as the bay was filling with heavy ice under the influence of strong northerly winds. Conditions had become worse by September 11, and we returned to the mission, which we reached next day. Although the first heavy snow had fallen on August 31, and the land had been fairly well covered for the first ten days of September, it was again bare when we sledged (with three teams) to the landing-field through which we had entered the region. We arrived there on September 22, and were back in Montreal a few days later.

About 280 specimens of birds and mammals were collected during the summer, and these are now in the National Museum of Canada. We collected jointly some 52 species of plants for the National Herbarium and a large number of insects for the Bureau of Systematic Entomology.

An electric storm over the north pole

On 26 July 1957 the Russian drifting station NP6 in the polar basin reported an electric storm. The sky became covered with dark clouds, and this was followed by rain and a powerful thunderclap. For 15 minutes the camp was illuminated by flashes of lightening and then thunder was again heard. In 75 minutes 13 mm. of rain fell, equalling a month's normal precipitation for a drifting station. After the storm the wind changed direction from SE. to NW. and a strong smell of ozone was noted. This is the first time an electric storm has been reported from a drifting station.

Subscriptions for 1958

Members are reminded that their subscriptions for 1958 (\$2.00 for Ottawa members, or \$3.00 for combined membership for husband and wife, and \$1.00 for out-of-town members, other than institutions), are payable to the Treasurer, Mr. J.E. Cleland, P.O. Box 68, Postal Station D, Ottawa.

Owing to currency regulations it is not always convenient for members of the Arctic Circle residing in Europe to pay their subscriptions to the club in Ottawa direct. Through the courtesy of the Director, the Scott Polar Research Institute will now receive the subscriptions of members from the United Kingdom and from the Continent of Europe and will transmit them to Canada from time to time. European members should forward their 1958 subscriptions (5/-) to the Director, Scott Polar Research Institute, Cambridge, England and mark them "Arctic Circle Subscription".

Change of Address

Members are earnestly requested to advise the Treasurer, Mr. J.E. Cleland, P.O. Box 68, Station D, Ottawa, promptly of any change of address.

Editorial Note

The Editor would welcome contributions from those who are at present in the Arctic or have information about work in the Arctic. All material for the Circular should be sent to

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Ottawa 2, Ontario.

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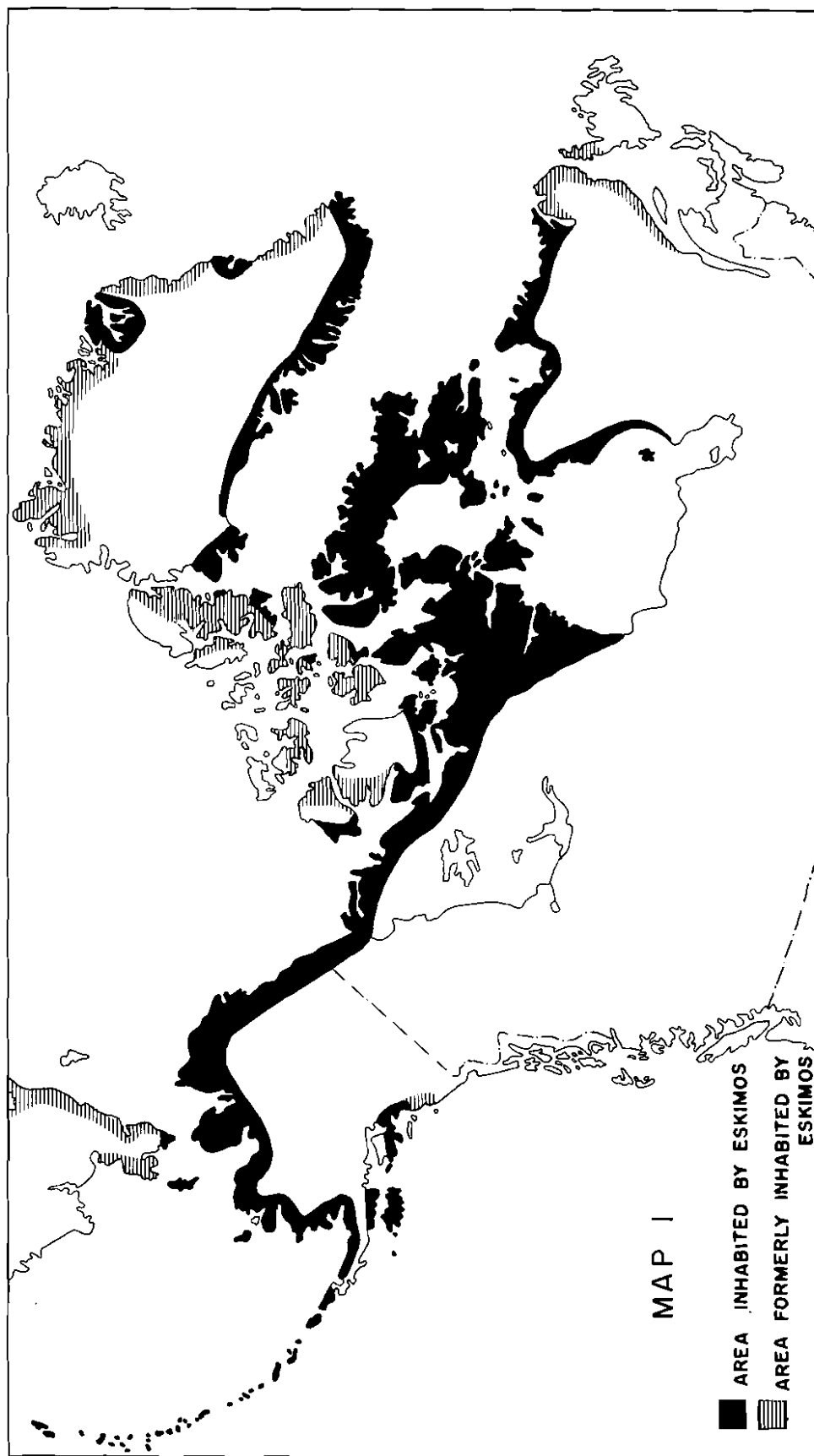
The Eskimos. By Graham W. Rowley

People have a number of strange ideas about the Eskimos. One of the strangest is that they are a little-known people. Nothing could be further from the truth. Ever since the Eskimos were discovered people have been writing about them. There are a number of detailed scholarly accounts covering almost every aspect of the life of several Eskimo tribes. There are some general accounts and a fair number of novels. Then there is a constant flow of books by people who have visited the north and have spent varying lengths of time there. These books are an interesting mixture of fact and fiction, of understanding and misunderstanding. With the increased number of people going north these days this flow has recently become a flood.

With so much being written about the Eskimos it is difficult to retain a sense of proportion. In fact there are only about 50,000 Eskimos in the whole world - and only some 10,000 of these are in Canada. The population of the world is increasing by about 100,000 every day - each day the number of people in the world increases by twice the whole population of Eskimos.

Though there are only about 50,000 Eskimos, they cover an enormous area, and archaeology and early accounts show that at some time they have extended still further (Map 1). They are the only native people who live in both Asia and America. They live on both sides of the Iron Curtain, and form part of four nations, Russia, the United States, Canada, and Denmark.

Most Eskimos call themselves "Inuit", which simply means "Men". The word "Eskimo" to describe a member of this race appears





to be Algonquin Indian, for "Raw Meat Eater", and was absorbed into French, being first used in 1611. A race can be defined by its language, its physical type, or by how it lives and thinks, or what anthropologists call its material and intellectual culture. It is rare for these three characteristics to coincide, for instance English is now spoken by many other races as well as the English, and many races have a wide variety of physical types. Among the Eskimos however there is a very good agreement between all three characteristics. They have their own language, spoken by themselves and by nobody else; they have a well-marked physical type; and they have a distinctive culture. Only in the southwest part of their area are there any marked differences in these characteristics.

The Eskimo Language

The Eskimo language is not related to any North American Indian language and appears in fact to be unrelated to any other group of languages, though attempts have been made to show a connection with Uralian and with Indo-European. The grammar is very complicated, and the meaning of words can be modified by adding suffixes. For instance tuktoo means "a caribou"; tuktoojuak is "a big caribou"; tuktoojuakseok is "hunt a big caribou"; tuktoojuakseokniak "will hunt a big caribou"; tuktoojuakseokniakpunga is "I will hunt a big caribou". In this way one long word in Eskimo can take the place of a whole sentence in English. The most remarkable thing about the Eskimo language is its uniformity over a wide area - an Eskimo from Greenland in the east can make himself understood, though with some difficulty, all the way to Bering Strait, three or four thousand miles away. From Greenland to Norton Sound in Alaska there are only comparatively minor differences in the language. South of Norton Sound, and in Siberia however a very different situation exists. There are many distinct dialects and an Eskimo living there cannot be understood by those who live north of Norton Sound. Aleut, the language spoken by the Aleuts of the Aleutian Islands, is now recognized to be an Eskimo language, but it is so different that it was once considered to be a completely separate language. Sometimes therefore the Eskimo language is divided into three branches - called Inupik, north of Norton Sound, Yupik, on the Alaska mainland south of Norton Sound and in Siberia, and Aleut (Map 2). Some philologists believe that by studying the difference between two related languages it is possible to determine accurately the time that has passed since they separated. This is a very controversial subject, and many philologists will have none of it. The dates derived for Eskimo, for what they are worth, are that Inupik and Yupik separated about a thousand years ago and that Aleut split off about four thousand years ago. These dates appear to agree remarkably well with archaeological evidence.

Physical type

The physical type of the Eskimos is distinctive. Like all Mongoloid people they have straight black hair, dark brown eyes, high cheek bones, and wide faces. Their skin is yellowish-brown but it is surprisingly light, lighter than one would expect from their faces which are usually sunburnt from the sun on the snow and ice. The babies often have a distinct blue patch at the base of the spine which disappears after a year or two. The Eskimos have shorter arms and legs than the North American Indians and are therefore rather smaller in stature, but they are not in fact a short race by anthropological standards and they are as tall as people in many places in western Europe. They are muscular and well covered and this, together with their bulky and loose-fitted clothes and rather short legs makes them appear to be stout, but this is a false impression. The ratio of skull breadth to length shows that they are mainly long-headed or dolichocephalic, except in the southwest, where the number of broad-headed Eskimos increases until in the Aleutians the population is as definitely broad-headed as the central Eskimos and Greenlanders are narrow-headed. The Eskimo skull is unmistakable to a physical anthropologist, and has a number of distinctive features which make it easy to recognize. As well as being long and narrow it is high and has a pronounced longitudinal ridge from front to back, and at the back there is a marked protrusion. The cranial capacity is large, and the nose is very narrow, narrower than in any other people. The cheek bones are high and prominent and the face is wider than the skull itself and has a squarish shape. To white men all Eskimos seem to look the same at first, just as white men all look the same to the Eskimos. Their faces are really however very different and they range from the rounded cheerful face so often illustrated to the narrow, more dignified oval-shaped face with a well marked nose usually regarded as being North American Indian.

The Eskimo culture

The distinctive and remarkable Eskimo culture allows them to live under more extreme conditions than any other race. The typical form of the culture is the arctic form which is found among the majority of the Canadian Eskimos. Except in the summer it is an ice-hunting culture, based on hunting sea mammals either through the ice at their breathing holes, from the ice at the floe-edge, or on the ice when the seals lie enjoying the sunshine in the spring. The sea mammals provide the Eskimos with meat for food, oil for heat and light, and skins for many purposes. For this hunting the Eskimos have dogs and sledges and since there is little else to use in the way of building materials they live in snow houses.

In the short summer sea mammals are again hunted, but from kayaks and umiaks, or nowadays often from canoes and whale boats, and the Eskimos live in tents. At this time too fish are speared in the rivers and, more important, caribou are hunted, partly for their meat but particularly for their skins which provide splendid winter clothing. Nothing made in civilization is as warm, as light, or as comfortable for the arctic winter as the Eskimo skin clothing.

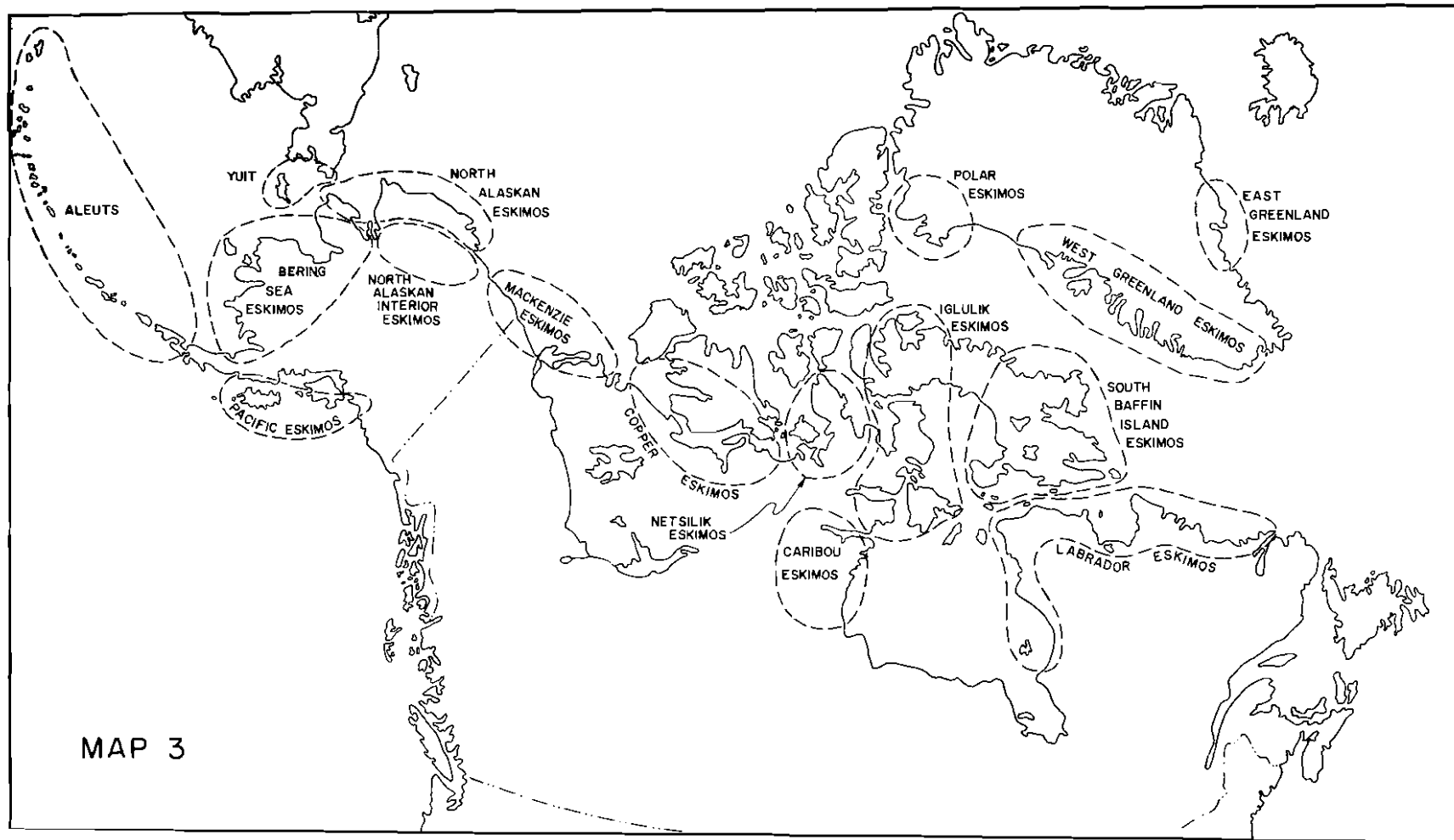
This typical arctic form of Eskimo life is necessarily modified where conditions are not typically arctic. The most northern Eskimo, the Thule Eskimos of Greenland, have so little summer that the summer phase is less important. In fact the kayak, the fish spear, and the bow and arrow, all of which are associated with the summer phase, had been forgotten and were unknown to the Thule Eskimos when they were discovered by Ross in 1818. They were reintroduced by immigrant Eskimos from Baffin Island in the early 1860's. Among the southern Eskimos on the other hand, roughly those living south of the Arctic Circle, the winter phase becomes less important. In the subarctic culture of southern Greenland, southwestern Alaska, and the Aleutians, there was little hunting on the ice, but hunting by kayak and umiak was much more developed.

Though the great majority of the Eskimos live by the sea, hunting sea mammals, there are three areas where they have developed an inland culture. These are in the flat deltas of the Yukon and Kuskokwim, on the Colville and Noatak rivers in north Alaska, and in the barren lands east of Hudson Bay. The people in the first two of these areas were always dependent on the sea to some extent, obtaining blubber for their lamps and other things from the Eskimos who dwelt on the coast, but the Caribou Eskimos of the barrens lived almost completely on the caribou herds and fish of the interior, making fires from shrubs instead of blubber, and visited the sea rarely if at all.

Tribal groups

The Eskimos are usually divided for the convenience of anthropologists and others into a number of groups, based largely on the Eskimos' own tribal divisions. These are shown on Map 3. The differences between the tribes in each group are mainly minor, but between the groups may be quite marked.

In addition a distinct tribe, called the Sadlermiut, used to live in Southampton Island. They were very different from other Canadian Eskimos. Their numbers must have been declining in the



nineteenth century and they became extinct in the first years of this century, probably from an epidemic of typhoid fever which killed the last remnant of the tribe apart from three children who were adopted by other Eskimos.

Archaeology

The question most frequently asked about the Eskimos is "Where did they come from?" This is easily answered as their physical type shows that they come from Asia and in fact there is really nowhere else that they could have come from. The question which follows from this is "Where did they learn to become Eskimos?" - in other words where did they learn to hunt sea mammals and to build up this remarkable culture which enabled them to spread right across North America to Greenland? There have been two main schools of thought. One was that they were a people who moved from inland North America down to the arctic coast of Hudson Bay and there learnt to become Eskimos - in other words that the Eskimo was a Canadian invention. Others believed that it was around Bering Strait, and probably on the Asian side, that the Eskimo culture evolved. There has been a long controversy, but the evidence seems to be very much in favour of a Bering Strait origin.

In the greater part of the Canadian Arctic four main Eskimo cultures have been distinguished. The latest is the modern people, the Eskimos who are living there today. Seven or eight hundred years ago a people, called by archaeologists the Thule people, since they were first identified from excavations at Thule in Greenland, spread from Alaska over the Canadian north and into Greenland. They lived almost exclusively on sea mammals and dwelt in stone houses and they have usually been believed to have been a different people from the modern Eskimo, but it now seems probable that the modern Canadian Eskimo are the direct descendants of the Thule people.

The Thule people seem to have replaced an earlier people, called the Dorset people because they were first identified from specimens collected at Cape Dorset. Traces of the Dorset people have been found all over the Eastern Arctic and as far west as King William Island and well into Greenland. They were certainly completely different from the Thule people but little is known about them, and in particular it is not yet known whether they entered the Eastern Canadian Arctic from the south or the west. Radio-carbon dating indicates that the Dorset culture began about two thousand years ago. A number of Eskimo legends refer to a strange people called the Tunit who lived in stone houses and were gradually dispossessed by the present Eskimos. It has been thought that

the Tunit were the Thule Eskimos, but the evidence indicates rather that they were the Dorset people.

Signs of a fourth and still earlier people have been found recently at several places in the Arctic, especially in north Foxe Basin. We do not know whether these people were Eskimo or not but they were probably the first people to spread widely over the Canadian Arctic, and arrived there some four to five thousand years ago, probably not long after the ice had retreated from the land.

History

When the Vikings discovered Greenland in the tenth century they did not see any Eskimos, but they found signs of earlier inhabitants. The first contact between Europeans and Eskimos probably took place during the Vinland voyages in the first years of the eleventh century when the Vikings visited Labrador and possibly Baffin Island. They found and fought with a race whom they called Skraelings and who seem to have been Eskimos. The next heard about the Eskimos is in the fourteenth century when they moved south down the Greenland coast and met the Norse colonists. Some time after this the contact between Greenland and Europe was broken. When it was restored at the end of the sixteenth century the Eskimos were in complete possession of Greenland. Mystery surrounds the fate of the Norse. They may have died out, they may have been killed by the Eskimos, or they may have been absorbed into the Eskimos. A few ruins were all that was left of the Norse colonies in Greenland which at one time had a strength of eight or nine thousand and had included sixteen churches, a bishop, a monastery, and a convent.

The first contact with the Eskimos in the Canadian north was when Frobisher discovered the Canadian Arctic in 1576. He met a number of Eskimos during his three voyages but his relations with them were unhappy. He captured some of them and they captured some of his men, and each side developed a hearty dislike for the other. Frobisher was followed by other explorers many of whom met the Eskimos and left accounts of them so that the limits of the country they occupied were more or less known by the end of the eighteenth century. It was Parry's second expedition 1821-3 however that seems to have been responsible for arousing popular interest in the Eskimos. He spent two winters in Foxe Basin in the centre of the Eskimo country and both he and his second in command Lyon left excellent accounts which were widely read in England and elsewhere. It is probably from their accounts that most of the children's stories about Eskimos spring. The most important influence on the Canadian Eskimos in the nineteenth century was not however the explorer but the whaler. There were two types of whalers,

the Scottish whalers who normally sailed each year from Scotland and who worked in Baffin Bay, and the American whalers who for the most part worked in Hudson Bay and did not go home until their ships were full of oil and baleen, which might take two or three years. The whalers, particularly those in Hudson Bay, saw a great deal of the Eskimos and used them as crews on their whale boats. The Eskimos probably suffered a lot from this contact particularly from the diseases that were introduced, but they also learnt much that was useful to them. At the same time the resources on which they depended were greatly depleted. Whales were virtually wiped out; many walrus were slaughtered and they became scarce where they had been plentiful, and the muskox was eliminated from the coastal regions. In the west it was not until the end of the nineteenth century that whalers penetrated into the Canadian Arctic. They were there for only a few years before the whaling industry collapsed, but their effect appears to have been much more disastrous than in the east. As whaling declined in the twentieth century the fur trade gradually took its place. Trading posts had been established by many of the whalers and these were gradually taken over by the great fur trading companies, particularly the Hudson's Bay Company. The life of the Eskimos underwent a very great change. From being hunters, depending on the north for everything, they became largely trappers, who had to trap foxes in order to obtain the southern goods they had come to rely upon. This change in occupation did not however have much effect on their customs and social life. It is only in the past few years that the full force of civilization has begun to be felt.

Numbers of Eskimos

One question often asked about the Eskimos is how many there used to be and whether they are now increasing in number. It does not seem possible that the maximum number of Eskimos was more than 200,000 and probably it was a good deal less, perhaps under 100,000. Before white contact the great centre of Eskimo population was southwest Alaska where there were probably far more Eskimos than in all the rest of the world put together. These people, especially the Aleuts, suffered very greatly from their first contacts with the Russians, and they continued to decline in numbers for some time after the Alaska Purchase. There are now some 20,000 Eskimos in Alaska and 1,000 in Russia. In Canada there probably were never more than 20,000 to 25,000, and the biggest concentration seems to have been in the Mackenzie delta area. Elsewhere in Canada the population was probably always small. The population of Greenland, now nearly 25,000, is believed to be higher than it has been before, and it has been increasing steadily for 150 years. In Canada the lowest point the Eskimo population ever reached was probably

between 6,000 and 7,000 and may have been in the 1920s. It is difficult to tell because only the last two censuses have been reasonably complete. It is certain that the population is now increasing and has been increasing for the last twenty years or so. The present very rough figures by areas are:

Mackenzie area	1,200
Copper Eskimos	1,200
Netsilik Eskimos	600
Caribou Eskimos	1,100
Iglulik Eskimos	1,200
South Baffin Islanders	1,750
Quebec	2,000
Labrador	1,000

In this very brief account much has had to be left out. There is nothing on the social organization of the Eskimo or their intellectual achievements. In particular nothing has been said about the most remarkable feature of the Eskimos - their unfailing courtesy, their kindness to one another and to any white man who needs their help, and their cheerfulness under all conditions. All those lucky enough to know them well will agree that it would be impossible to find a nicer people.

National Museum expedition to Adelaide Peninsula, 1957. By
T.H. Manning

In 1957 Andrew Macpherson and I spent the summer in Adelaide Peninsula collecting birds and mammals for the National Museum of Canada. We were accompanied by Mrs. Macpherson, who was studying parasites and fishes on a grant from the Arctic Institute of North America.

We travelled by truck from Ottawa to Edmonton, arriving on May 12, and continued by air to Cambridge Bay on May 15. We spent the night there with Mr. Jameson Bond, the Northern Service Officer, and left by air the following day for Gladman Point, King William Island.

Unfortunately the King William Island Eskimos were short of dogs and dog food and not anxious to do any travelling, but with the help of Mr. Bond, arrangements were made for two Eskimos to come from Hat Island, and we left in the evening of May 22 with these two Eskimos and two local teams. Next day fresh snow made heavy going, and on the 25th one of the Hat Island Eskimos decided to go home, so that part of our load had to be left and arrangements made for it to be relayed to us later. On May 28 we arrived on the east side of Sherman Basin, where we had decided to make our base camp.

On June 9 two Eskimos arrived with the rest of our load, and we were able to hire a pack dog for the summer. We should have liked at least two dogs, but even at the exorbitant rate of \$30.00 for the summer we could not persuade them to part with a second.

Before leaving King William Island we had made arrangements for a 22-foot canoe, lent to us by the Arctic Institute of North America, to be taken by sledge from Pelly Bay either to our base camp or, if that were not possible, to one of two places on the north coast of Adelaide Peninsula. As the canoe had not arrived by break-up, we made plans to walk across the peninsula in search of it as soon as the bird breeding season was over. We left camp on July 25 and arrived at Barrow Inlet the next day. We found the canoe in good condition about a mile up the river which flows into the head of the inlet. From Barrow Inlet we crossed on foot to the east coast of Adelaide Peninsula; then down that coast past Montreal Island to Elliot Bay, and finally back to our base on Sherman Basin.

Judging that Barrow Inlet and Simpson Strait would be clear of ice, we walked over to the canoe on August 8, and on the 12th launched the canoe and left for Gladman Point, which we reached the following morning. The weather was excellent throughout this canoe journey, and we got back to Sherman Inlet on August 15. After two days at Falcon Inlet, at the southwest corner of Sherman Basin, we returned by canoe to our base camp by way of the south coast of the basin. Because of the lateness of the season it did not seem worth retracing our route around the peninsula to visit Chantrey Inlet, the west coast of which we had already visited on foot. On August 25, therefore, we left for the Kaleet River, which we ascended for about fifteen miles before being blocked by a series of rapids. The main purpose of this trip was to add to our collections of caribou and Arctic Hare. However, we saw no sign of the former, and the country appeared more suitable for the latter near the mouth of the river. We therefore did not try to go farther inland, either by portaging or on foot, and returned to the river mouth where we obtained a good series of Rough-legged Hawks and Peregrine

Falcons but only one hare. On August 28 we arrived back at our base. The small passerines were now in good autumn plumage, and we spent the next few days adding to our collections.

On September 8 we finally packed up the base camp and left with a very heavily loaded canoe to return to King William Island. After picking up the cache about eight miles north of our camp, where we had had a small tent for overnight trips, we followed the north shore of Sherman Basin to its northwest corner, where we spent three days examining the country and collecting. On September 12 we paid another visit to Falcon Inlet in the hope of getting more caribou and Arctic Hares. We were disappointed in the former, but obtained several hares and added to our series of hawks.

It turned cold on the 13th, and on the 15th we decided it was time to get back to King William Island. There was ice on the small lakes, and we had to break our way through a little on the inlet in order to get out. We reached Gladman Point on September 16. Some of the small lakes would now bear our weight, but there was little or no snow on the land, and as lemmings were plentiful we decided to remain there for a few days.

On September 25 we flew to Cambridge Bay, where we were again hospitably received by Mr. and Mrs. Bond. The next day was spent in trapping lemmings, and on the 27th we flew to Edmonton, where we arrived late in the evening. We left for Ottawa by truck on October 1, and arrived there on October 5.

Adelaide Peninsula as a whole is not very rich in birdlife. However, our base camp proved to be in one of the best places. It was beside a salt marsh which was frequented by shore birds, geese, and swans during the spring migration and early summer. To the north there were rolling hills of glacial debris and to the south rocky Precambrian country. The more southern arctic birds which we had expected to find, at least in small numbers, were unfortunately absent. Neither did we see any casual wanderers from the south, perhaps because of the late spring. There was no standing water, and the flat country was completely snow covered until June 12, when we had the first real thaw. Both Brown and Varying Lemmings were quite numerous, as were also weasels and foxes, but it was disappointing not to find any Red-backed Mice or shrews.

Andrew Macpherson and I obtained some 1,150 specimens of birds and mammals, and in addition Mrs. Macpherson obtained 108 specimens. We preserved complete skeletons of most of the lemmings, and long bones of most other mammals and a few species

of birds. Almost all the birds and mammals were weighed before they were skinned, and the colours of the soft parts of a number of the former were recorded in terms of the Villalobos colour atlas. Notes were kept on trap nights and on the number of birds seen on our timed walks. No archaeological sites worth excavating were seen, but a few fairly recent surface artifacts were collected. All members of the party collected plants, which have been given to the National Herbarium.

Geographical Branch survey on Melville Peninsula, 1957¹. By V.W. Sim²

From mid-May to early September 1957 Donald Bissett and I carried out a reconnaissance study of the geomorphology and human geography of the northern part of Melville Peninsula for the Geographical Branch of the Department of Mines and Technical Surveys. We arrived at our base near Hall Beach on the east coast of the peninsula on May 19, having been flown from Churchill in a Norseman chartered from TransAir. The following day the aircraft established food caches at the north end of Hall Lake, at the west end of Quilliam Bay, the long indentation west of Igloolik Island, and at the west end of the chain of lakes which drain to Mogg Bay. We planned to use these caches during walking trips later in the season, though as events turned out we were able to make use of the Hall Lake cache only.

An Igloolik Eskimo, Kunnuk, was employed and between May 25 and 28 we made a short trip by sledge to the west end of Hall Lake where fuel and a small collapsible canoe were left for use later in the summer. We followed the north shore of Farry Bay and then went up the Ikerasak River to Hall Lake, returning by way of the northeast corner of the lake and over the narrow land strip to the west end of Foster Bay. Coming south along the coast we visited the Eskimo camps at Nugsanarsuk and Kingmitokvik.

Between May 31 and June 13 we sledged to Igloolik Island and Fury and Hecla Strait. After a brief stop at Igloolik we travelled to Amherst Island by way of Quilliam Bay and the low pass separating the bay from Fury and Hecla Strait. Badly hummocked ice west of Amherst Island prevented our continuing to the west end of the strait. Studies were made on Amherst Island and the adjacent mainland coast. The return trip was by way of Griffiths Bay along a system of fracture valleys in the Precambrian terrain to Richards Bay. The Bouverie Islands and Northeast Cape were visited before returning to Igloolik on June 8, and we reached our base camp on June 13.

1. Published with the permission of the Director, Geographical Branch, Dept. of Mines and Technical Surveys, Ottawa.

2. Geographer, Geographical Branch.

A final sledge trip was made between June 15 and June 20 to Parry Bay. A supply of gasoline was cached near the western end of the bay and a reconnaissance trip carried out in the country west of Amitioke Peninsula. Following a visit to the Eskimo camp at "Tikerak" we returned to Hall Lake by way of South Ooglit Island, where Arthur Mansfield and Dan Perey of the Fisheries Research Board Arctic Unit were working. Travelling conditions, excellent during the previous month, deteriorated rapidly after June 20. Owing to melt-water on the sea ice no more sledge journeys were made, though they would have been possible for several additional weeks. During this first phase we had reconnoitred much of the northeastern coast of Melville Peninsula and visited all the Eskimo camps there.

By the end of June melting of the snow allowed more detailed geomorphological studies. On June 26 we were flown to the west coast of Melville Peninsula where a comprehensive study of the south part of Garry Bay was carried out before returning to our base camp on July 3.

On July 8 we left our camp on foot on an extended trip to the interior of the peninsula west of Hall Lake. Walking was difficult across the swampy lowland east of the lake but much easier on the higher land to the north and west. On July 10 we reached the cache which had been established by air and during the next ten days we made geomorphological studies along the contact zone between the Palaeozoic sediments of the eastern lowland and the Precambrian crystallines of the interior. We also investigated the limits of marine submergence. Weather conditions were very nearly perfect; warm sunny days occurred with pleasing regularity and mosquitoes became a nuisance only after July 16. On the return trip walking was easier as the lowland was much drier. We reached our base on July 19 after covering a distance of approximately 175 miles in twelve days.

On July 25 we flew to Sarcpa Lake in the centre of Melville Peninsula. Here we made a number of one-day traverses and took some soundings of the lake. The greatest depth found was 66 feet. On July 29 we walked to the west shore of Hall Lake at the mouth of the "Kingora River". We had planned to use the collapsible canoe we had cached there to travel around the shores of Hall Lake and if possible to ascend the two larger streams entering on its western side. Unfortunately, even at this late date the lake ice was almost solid, and the narrow shore channel was closed in many places by a steady east wind, so we had to

follow the shore on foot. The canoe was used only to cross the mouth of the "Kingora River". We returned to Sarcpa Lake on August 3 and were flown back to our base on August 5. This trip completed the second phase of the season's programme.

By this time the sea ice in Foxe Basin had broken up enough to allow travel along the east coast using a 16-foot aluminium boat. We spent a week at the base preparing the boat and outboard motors and making additional traverses in the vicinity. On August 12 we left for Parry Bay accompanied by Kopar, an Eskimo from Kingmitokvik. Masses of loose floe ice at the mouth of the Ikerasak River prevented us from ascending it to Hall Lake to recover the collapsible canoe. During the next week stormy weather delayed our work but studies were carried out in the valleys of the larger streams entering Parry Bay and on Amitioke Peninsula, and we returned to Hall Lake on August 21. We found the aluminium boat to be well suited to the conditions we met on this trip.

We had planned to leave immediately for another boat trip north along the coast, but extremely bad weather and severe ice conditions delayed us until August 25. A few miles north of the base we were forced to return by ice jammed against the shore. The following day ice conditions had improved and we reached the settlement of Igloolik. The summer was now too far advanced for us to visit the coast west of Igloolik, and following a day of windy weather we returned to our base on August 30. On September 4 we were flown to Frobisher and thence to Montreal via NordAir.

Inuvik

On 18 July 1958 the Commissioner of the Northwest Territories, on the advice of the Council of the Northwest Territories, proclaimed Inuvik to be the name of the new town being built on the East Channel of the Mackenzie River about thirty-five miles east of Aklavik.

Nearly five years ago the Canadian government decided that the settlement of Aklavik could not be expanded to cater for the increased services necessary for the Mackenzie delta and the surrounding district, and that a new centre must be built. After detailed surveys in the summer of 1954 a site was chosen and construction of the new town began. The site was one of four considered on the east side of the delta and became known by its survey designation of East Three, but this was not a suitable

permanent name. Though many of those now living at Aklavik will move to the new town, some will remain so the name of Aklavik could not move with the town. At the July session of the Council of the Northwest Territories the Commissioner asked the Council's advice on a name for the new town. Councillor Knut Lang, the member for the Mackenzie Delta, said that Inuvik was the choice of the residents of the delta. The name means in Eskimo "The Place of Man", and is pronounced IN-U-VIK with the second syllable accented.

Arviligjuarmiut names for birds and mammals. By Andrew Macpherson

The names listed below with their English equivalents were obtained with the invaluable assistance of the Rev. Franz Van de Velde, O.M.I. during several consultations with natives of Felly Bay. Specimens obtained locally were used for many of the identifications, and the plates of Peterson's "Field guide to the birds" (second edition) were used for others. Descriptions and drawings were employed to identify some of the larger and rarer mammals. Names without known equivalents are placed in what appears to be their correct taxonomic position. This list should not be taken as a complete list of the birds and mammals of the region, nor should all the species listed be considered native to Felly Bay. Species which have not been seen either by Van de Velde or myself are starred.

The "Tireardjuark" is probably a mythical animal. It is between a polar bear and a wolverine in size, and is white with a black tail-tip. There is an interesting account of other mythical and prehistoric animals of Felly Bay by the Rev. Guy Marie-Rousseliere, O.M.I. in Eskimo (Vol. 42, December 1956, pp. 10-12).

Birds

Yellow-billed Loon	Toolik
Arctic Loon	Kaglulik
Red-throated Loon	Kaksaut
Fulmar	Kakorluit
Whistling Swan	Kugjuk

Canada Goose, large form	Akto
Canada Goose, small form *	Uluagudlik
White-fronted Goose	-----
-----	Nerlerk
-----	Nerlernark
Lesser Snow Goose	Kangor
Oldsquaw	Adgerk
King Eider	Mittierk
Rough-legged Hawk	Krinuajok
-----	Kajuark
Golden Eagle	Naktoralik
Gyrfalcon	Kidgavik
Peregrine Falcon	Kidgaviardjuk
Rock Ptarmigan	Akredgerk
Sandhill Crane	Tatitgak
Semipalmated Plover	Kodlerolerk
Golden Plover	Tudlik
Turnstone	Taligvak
Purple Sandpiper	Sigzareark
White-rumped Sandpiper	Livilivila
Baird's Sandpiper	Tuituark
Red Phalarope	Saarkrak

Parasitic Jaeger	Isungatkok
Long-tailed Jaeger	Isungak
dark-phased jaeger (all species)	Iggarlerk
Glaucous Gull	Naujavak
Thayer's Gull	Nauja, Koksiardjuk
Ivory Gull	Naujaviar
Arctic Tern	Imetkotailak
Black Guillemot	Pitsiolak
Snowy Owl	Okpik, Okpikdjuark
Horned Lark	Tudliujok
Common Raven	Tulugak
Water Pipit	Kujaomertok
Lapland Longspur	Manuilitark
Snow Bunting	Kopenuark

Mammals

Cinereous Shrew *	Ugjugnark
Arctic Hare	Ulhalerk
Parry Ground Squirrel	Siksik
Varying Lemming	Kajuitok
Brown Lemming	Avingnuk
Red-backed Mouse	Avingnuk naulajumik
White Whale	Kenalugark

Narwhal	Kenalugark tugalukimik
Arctic Fox	Tiriganeark
blues phase, brownish	majok
blue phase, silvery	Kreangartok
Coloured Fox	Tiriganiardjuark
red phase	kajortok
silver phase	kernertok
cross phase	senningajok
Polar Bear	Nanuk
Ermine	Tireak
----- *	Tireardjuark (see above)
Wolverine	Krabvik
Harbour Seal	Kassigiak
Ringed Seal	Netjerk
Harp Seal	Kairolik
Bearded Seal	Ugjuk
Hooded Seal (?) *	Netjivak (said to be very rare)
Barren -Ground Caribou	Tuktuk
Muskox	Omingmak

Change of Address

Members are earnestly requested to advise the Treasurer, Mr. J.E. Cleland, P.O. Box 68, Station D, Ottawa, promptly of any change of address.

Editorial Note

The Editor would welcome contributions from those who are at present in the Arctic or have information about work in the Arctic. All material for the Circular should be sent to

Mrs. Graham Rowley,
245 Sylvan Road,
Rockcliffe,
Ottawa 2, Ontario.

T H E A R C T I C C I R C U L A R

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Eighty-fifth Meeting

The eighty-fifth meeting of the Arctic Circle was held in the P.L.D.G. Mess, 60 Queen Street, Ottawa, on Tuesday, October 14. The President, Dr. D.C. Rose, was in the Chair and introduced the speaker, Dr. Dean Fisher. Dr. Fisher described the role of the Department of Fisheries in extending our knowledge of the arctic sea resources.

Eighty-sixth meeting

The eighty-sixth meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C., Bank and Catharine Streets, Ottawa, on Tuesday December 9. The President, Dr. D.C. Rose, was in the Chair and introduced the speaker, Mr. Welland Phipps, who spoke on "The operation of light aircraft in the Canadian arctic islands".

The Trail of '98 by the Gravel River¹ Route. By E.J. Corp

Introduction by the Editor

In the spring of 1898, lured by the stories of the great riches being won in the goldfields of the Yukon, Mr. E.J. Corp left his home in Hamilton, Ontario and travelled to the Yukon by what

1. Now officially named the Keele River. Ed. A.C.

was known as the "All Canadian Route". This overland route had many disadvantages compared with the Pacific approach, and was not used to any great extent during the "Rush" days. On the "All Canadian Route" many different crossings were made from the Mackenzie drainage to that of the Yukon and accounts of most of these have been written. It appears that no description has so far been published of the Gravel, or Keele, River route. Few used it and fewer still remain who did, thus the Circular is most fortunate to have this opportunity of recording the experience of one man who did make this journey.

Mr. Corp and his companions went down the Athabasca, Slave, and Mackenzie rivers to the mouth of the Keele River and then up that river to the height of land and thence into the headwaters of the Stewart River and finally to the Yukon River. He and his companions arrived in Dawson City in the summer of 1899 and for the next fifty-two years Mr. Corp was a resident of the Yukon, serving for many years on the Yukon Council as the member for Mayo District.

Mr. Corp became primarily a placer gold prospector, and with his partner, Dave Ryan, made considerable stakes on Hunker Creek. In the 1920's when the lode silver-lead discoveries of Keno Hill caused a rush to the Mayo district they followed it and put their fortunes in lode prospecting in which they were not so successful. In sinking a shaft Ryan was injured and remained an almost complete invalid for the rest of his life. With dogged tenacity and the persistence of "natural-born" prospectors the partners kept their discouraging lode claims in good standing and in the end were able to sell them profitably and to retire to White Rock in 1951.

Narrative by E.J. Corp

A.D. 1897-8, and the Klondike Gold Rush at its height. Tales of the marvellous gold deposits found there had reached practically every part of the civilized world; men from every walk in life (even a few women), the majority of whom were without the experience or knowledge required to undertake the hazardous journey to the goldfields, or for success or survival after reaching there, many of them married men with families, were carried away with the hope of acquiring an easy fortune.

While the great majority of those headed for the Klondike went in from the Pacific Coast, many hundreds started by what was called the "All Canadian Route", via Edmonton (then the end of steel), the jumping-off place, to the then little-known region of the great Canadian Northwest. Living in Hamilton, Ontario, at the time, where circumstances had created in me a desire for a change and travel, the great Klondike gold excitement seemed an opportune excuse to start out on the road to adventure and an entirely new way of life.

Thus, one day calling on a friend of mine, Jack Phillips (who had a thriving merchant tailor business on James Street), I said, "What do you say we go to the Klondike?" After a few moments' thought he replied, "All right, I'll go if you will, and we'll get up a party and be ready to start in the spring." So we got a party of six together, and during the following weeks we outfitted for the trail. Our party consisted, besides Phillips and myself, of Dr. Dillabough Jr., Chas. Krugg, Vic McFarland and Alf Willis. We bought most of our outfit from the local wholesale houses, excepting flour and rolled oats, which we bought later in Edmonton. At that time aluminum utensils were but little used, and, wanting to avoid unnecessary weight when packing on the portages, two of us went to Buffalo, N.Y., and bought a complete outfit of aluminum cooking utensils. Our heavy winter clothing, sleeping bags, and oilskin clothes were all in Phillips' tailor shop, and when we were ready to start we had as complete an outfit as could be secured.

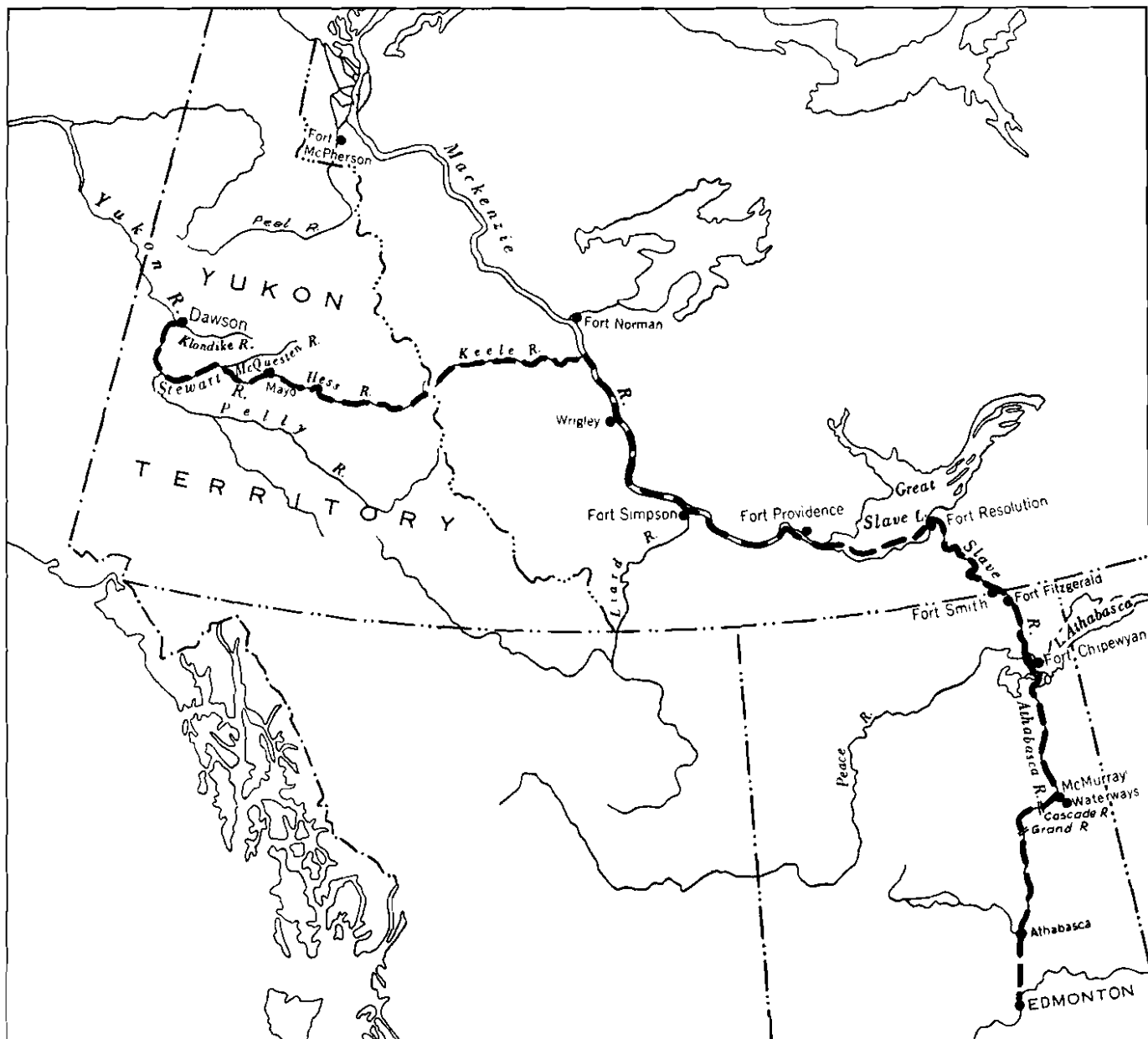
Spring 1898. Just about this time there was a rate war on between the C.P.R. and the Grand Trunk Railway, and our tickets to Edmonton cost us only \$25.00. Each Monday morning in March and April, various parties for the Klondike or the Prairies left the railway station on Hunter Street, and quite a crowd would gather to watch the departing travellers. For many of these it would be a final farewell. It was fifty years before I again saw our starting point, and felt somewhat like a Rip Van Winkle. The old places looked familiar and yet strange. We arrived in Calgary, the first stop on our journey, on Saturday evening, and had to stay over until Monday, when the train left for Edmonton. Sunday, while wandering around Calgary, we were rather surprised to see

people on their way home from church queueing up at the G.P.O to get their mail, and going on down the street reading it. A mail train had arrived from the east the previous evening.

Arriving at Edmonton, we found it a small prairie town, with one main street (Jasper Avenue) north of the Saskatchewan River. South of the river, apart from the sheds of the railroad terminus, there were but few houses; later, during the first world war, this was named Strathcona. In '98 when we were there, there was no bridge over the river, though the piers on each side for the railway bridge were already built and travel across in winter was on the ice, and by boat in summer.

We got our outfit freighted across the river, and pitched our tents in a cottonwood grove in what is now near the heart of the city. We camped here about a week, then arranged to have our whole outfit freighted to Athabasca Landing over the old Hudson's Bay Company's road, about seventy-five miles. The freighter made two trips to take our six tons. Arrived here, we made our camp, and started to get our boat ready. It had been made for us in Hamilton by an old boat builder, and had a rock elm keel and ribs, and Georgia pine planking; each piece was marked and knocked down, which made it easy to reassemble. This, I think, was the strongest boat built here; the scores of other boats were built of fresh-sawn local lumber, and were just flat-bottom scows. Except for the unusually strong construction of our boat, our trip would have ended disasterously a few days after starting, as we struck a bad rock in running the Boiler Rapids (so called because the boiler for the first Hudson's Bay Company steamboat was wrecked and lost here), but instead of being ripped to pieces as an ordinary scow would have been, just the bow was bruised, and needed but little repairing.

May 1898. When we were all ready to start down the river, our party, in conjunction with another party of nine men, also from Hamilton, engaged a river guide to go with us until we were past the rapids on the Athabasca River. He, of course, went on the larger boat. We left about noon the day after the ice went out, early in May of 1898, and after a while our boats got separated.



Thinking it was the intention to run all night, we hoisted a hurricane lantern to the mast top when it got dark, and all turned in and went to sleep, leaving the boat to drift on its own, which none of us would have thought of doing after some experience of what rivers are like. When daylight came, our boat was grounded on a bar at the tip of an island, but was easily pushed off. Then a few miles below, we were carried sideways on to a succession of bars just off the main stream. We reluctantly decided to follow our guide's advice and to lighten the boat by taking some of the freight over to the bank in the dinghy, when suddenly a stiff breeze sprang up and I had a happy idea. We had several hundred feet of 3/4-inch manilla rope on board, and it occurred to me that, if we could get a line across the main channel to the bank, and make it fast, if the boat went ahead the rope would haul it round. Fortunately, when the rope was made fast to the bank and the big square sail was hoisted, the boat went across the bars like a scared cat and into the channel, and we were ready to go on our way.

We next came to the Grand Rapids. These rapids are too dangerous, if not impossible, to run, so boats are rowed across to Grand Island, which lies parallel to the rapids, and is about a mile and a half long. Here boats are unloaded and freight packed across the island to the lower end, which is just below the rapids, the empty boats carefully lowered to this point, reloaded and again are ready to proceed.

Our next stop was at the Cascade. This is caused by a rim of rock stretching across the river, over which the water flows as over a dam, the drop being from six to nine feet according to the stage of water. Empty boats can safely be jumped over, whereas a heavily laden boat may quite likely swamp. The accepted procedure is to lower the loaded boats along the bank to the very brink of the falls, tie them to rings fastened in the rock by the Hudson's Bay Company for this purpose and unload after which the empty boats are hauled back upstream a short distance, rowed out, and jumped over, and brought back to the bank about fifty feet from where they were unloaded and again reloaded. Here again we came very near to losing the big scow of our party. Normally, the loaded boat is brought to the bank, a strong stern line attached and held on to by several men, and lowered slowly toward the Cascade, while a light line is attached to the bow of the boat, with just one or two men to hold it. All went well with our boat until the men holding the stern

line, instead of climbing up over the point of the rocks, mistakenly followed the river bank until they arrived where the rock jutting out into the deep water cut off further advance. One after another they dropped off as they came to the rock, which jutting out into the water, cut off any view between the boat and the men on the line. Finally, with the guide's frenzied shouts of "Let her come!" we let go of the stern line. The boat immediately swung around in an arc, and was left hanging half over the falls, with nothing but the light tracking line holding it from certain destruction. Luckily, there were lots of men waiting here, and they jumped into the boat at the risk of their lives and unloaded about eight tons in as many minutes. The empty boat was then dropped over the falls, hauled out, and, with the help of a Spanish windlass, pulled back into shape, and was ready to proceed after a little patching and caulking. The other boat was lowered without incident. Here we paid off our guide, Billy Clark, who returned up river to guide other parties. These guides made big money (we paid him one hundred dollars), but it was well worth the fee.

Next we came to Fort McMurray (now Waterways and the end of steel). From here it was easy going to Lake Athabasca and Fort Chipewyan. This lake swarms with a variety of fish. Our companion boat put out a gill net to get a few fish for breakfast, but soon had to haul it up for fear of losing it to the swarms of fish getting caught in it.

Leaving Chipewyan, our route lay across the end of the lake, where a short river named the La Roche¹ is found. This river, where it joins the mouth of the Peace River, forms the Slave River, which runs into Great Slave Lake. The country between Lake Athabasca and the mouth of the Peace River is practically flat, so that in spring the waters of the Peace River coming from the south are in flood before the lake has risen, causing the slow running La Roche River to reverse its flow and go back into the lake for a

1. Now officially named Rivière des Rochers. Ed. A.C.

day or two. We had been warned about this by our guide, and, when the reverse flow started we got out and tracked our boat downstream to the junction of the Peace. Here there were great whirlpools, and our boat got sucked into one and was whirled round and round, and we had a hard time getting out of it.

At the mouth of the Peace River we came in contact with quite a number of men who had left Edmonton in the fall of '97 to go overland to the Klondike from there, some of whom we knew from Hamilton. It appears that the thrifty, wide-awake business men and storekeepers of Edmonton had hired a gang of men to cut a trail from Edmonton about fifty miles out into the country, supposedly in the direction of the Yukon, with a dead end, and called it the overland trail to the Yukon. Many outfits started out with pack horses, or sleds, but few made it through, more turned back. I was told by several men who followed it through the winter that in the Swan Hills dead horses by the score lay across the trail. Those who got through to the Peace River, after a hard winter's trip, built boats and came down the river, where we met them.

Our next hard work occurred when we came to the Mountain Portage. Here the river takes a short U-turn around a high rocky point, over which freight and boats had to be packed, as the river opposite this rocky shoulder was impassable to boats, being a mass of boulders. The boats were hauled up by block and tackle, lowered down to the water and reloaded. From here to Smith's Landing (now called Fort Fitzgerald) was easy going, but for about the next fifteen miles there was a succession of rapids and travellers had the choice of making several short portages or getting their goods hauled to Fort Smith by an ox team. Fort Smith was at the head of navigation for the Hudson's Bay Company steamboat which plied between here and Fort McPherson near the mouth of the Mackenzie during the short summer.

After Fort Smith our next port of call was Fort Resolution, where the Slave River enters Great Slave Lake, which we reached without incident. From there our journey continued along the south shore of this great inland sea to Hay River, where at the time there was a Protestant Missionary and his wife, and an Indian School with a young white school teacher. We stopped here over night, and next day with a favourable breeze we reached Fort

Providence. Now, being well on in the month of June, the continuous daylight enabled us to run day and night. Close by this Hudson's Bay post was a large Catholic mission and convent, and word had been left with the Factor to ask the first doctor who came by to call, as one of the Sisters was sick, so the doctor with our party made the call. I went along with him, and while he was treating the patient, I looked over the garden, and was surprised to see such a lovely, well-kept garden so far north. All kinds of vegetables and flowers were growing luxuriantly. The following day we started down the great Mackenzie River, and thought it the best we had seen.

Our next stop was Fort Simpson, the Hudson's Bay post where the Chief Factor, Mr. Camsell lived. This post is on a high gravel bank at the mouth of the Liard River. At this point, another party of gold seekers were ready to start up the Liard River, consisting of several strapping young fellows and one old prospector who said he came along to show the young fellows how to do it. I will always remember seeing them starting up the river, the young fellows on the tracking line and the old man on the boat handling the sweep and calling out in his shaky old voice, "Good-bye, boys, it's only the old-timers will get through!" The upper reaches of the Liard River are very tough going, and I heard later from others who went that way that this party broke up, and the old man died there.

Here at Simpson we first heard of the Gravel River, flowing into the Mackenzie from the west about two hundred miles farther down, where the Indians who travelled along it hunting said there was plenty of gold in the gravel bars and that the divide at the head was the Yukon watershed. This story was corroborated by the Factor. After talking it over, we decided to leave the Mackenzie River and go up this river (instead of going on down to the Peel River which had been our original plan), prospect along the bars, and eventually cross over the divide to the Yukon and down to Dawson, if meanwhile we failed to find gold in sufficient quantity to warrant starting a new camp.

Leaving Fort Simpson, we next passed Fort Wrigley, and came to the mouth of the Gravel River, about twenty-five miles above Fort Norman. Here we left the Mackenzie and began tracking our boat up this small, swift river on the 12th of July, 1898. We soon found that pulling large boats up a swift river was a man-sized job, and that our many pleasant days of easy floating downstream were a thing of the past. This river was well-named the Gravel River, being broken up in many places into several channels flowing between gravel bars and islands, and in places it was miles wide, stretching as far as the eye could see. Just why this very appropriate natural name "Gravel River" has now been changed to "Keele River" is hard to understand.

We spent the remainder of the summer hauling our big scows upstream. At times some humorous and nearly tragic things happened. Where the channels were much broken up, we would get up to the head of one island we were on and catch the lower end of one across the channel. Once we missed, and so had to do it all over again, so we adopted the plan of two of us crossing over in the dinghy to be ready to catch the bow line from the big boat when the bowman threw it. The gravel banks of the islands were usually from three to six feet high and straight up, and a man leaping ashore from a boat was quite likely to go into the river if the edge of the bank crumbled with his weight. On one such occasion, two of us crossed over in the dinghy and stood ready to catch the bow line. The bowman threw the rope, but unfortunately for him he dropped a coil, which caught around his ankle. We caught the end of the line and held on, but he, poor fellow, was dragged into the water as the boat swung away from the bank. Unable to release himself, he held on desperately to the rope with both hands, but fortunately we managed to drag man and boat to the bank, and hauled him out.

During the warm weather it had been easy to dry out our wet clothes overnight ready for the next day, but as fall weather approached we had to get into wet clothes in the morning, which was very disagreeable. Miraculously neither of us caught cold.

October 1898. By October, it was too cold to continue tracking, so we decided to camp, build cabins, and wait until the river ice was safe to travel on. We reckoned we had come about one hundred miles after leaving the Mackenzie. My party camped at the mouth of a small creek, with plenty of good timber. We built a large cabin, 15 feet by 30 feet. The other Hamilton party we had been travelling with built cabins across the river on an island. Later two of them came over to visit us on the first ice, and spent the night with us. During the night an ice jam occurred lower down, backing up the water several feet, and our visitors had to stay until the jam broke two days later. I decided to go with them, and see how their mates had fared during the high water. A desolate scene met our eyes. The island was covered by huge blocks of ice stranded when the jam broke, and their large woodpile had floated away, but the cabin still stood. It had been flooded half-way to the top, and they had piled their goods on the upper bunks and cut a hole in the roof so that they could climb out if it became necessary. Fortunately, the water had receded before reaching the roof.

Meanwhile, we got busy making sleds for the winter trip, but those we made, having narrow runners, were not at all suitable, as we found out later. We were expecting to start soon so two of us, one clear cold day at forty below zero, snowshoed up the river about ten miles to where some other fellows we knew were camped, to arrange for as many as possible to set out together in order to make trail breaking easier. Knowing they were camped on an island somewhere in the vicinity, we decided to cross a slough and explore an island. When across the slough, we took off our snowshoes, and my partner climbed up the bank. As I stepped ahead to do the same, the ice broke like a trap-door, and I dropped into water up to my waist. We decided to build a fire to avoid my getting badly frostbitten, but just then, luckily, I saw a column of smoke going straight up above the treetops not far away. I started straight for it, as fast as I could go in my now stiffly-frozen clothes. Reaching the cabin, I banged open the door. A welcome sight met my eyes - a large fire in an open fireplace and a friendly greeting from my hosts. After stripping off my clothes, my moccasins had to be cut off. We stayed overnight, and returned to our own camp next day without further mishap.

One day we had visitors. Five Norwegians arrived overland from Fort Norman, a distance of about fifty miles. They too were going to Dawson by way of the Gravel River. Seeing their sleds, we knew at once that they were the kind we needed - sleds about six feet long, with runners three inches wide. They camped with us a while, and helped us in making the sleds. They were followed shortly by several more parties from Fort Norman, where they had spent the early part of the winter - about thirty men and two women.

We started our winter sled trip three days before Christmas, 1898, and put in the whole winter relaying our outfits to the continental divide and down into the Yukon watershed. I might mention here that hardly a party that started out together from home did not split up later. Some quarrelled so bitterly that they even sawed their boat in two. Our own party split up just before we started on our winter sledding. Two of us, Alf Willis and myself, decided to go on our own, and the others of our party joined in with different outfits.

We carried extra socks and moccasins on the sled, as quite often in an overflow our feet would get wet and dry footwear was essential to prevent frozen toes. The sleds, having no shoeing, and being made from green lumber, often got roughened up, which made them very hard to pull. One day, by accident, we found out how to remedy this, by turning the sled over and icing the runners by a quick swipe with a wet cloth when we came by an open water hole. However, this was too haphazard, and we made a practice of taking a can of hot water along, well wrapped up, on the sled.

As the weeks passed by, our supplies were gradually getting lighter, and we could move the entire outfit in three loads, two trips with about 300 to 400 pounds each, and one for the camp outfit - tent, bedding, and stove. At noon we often had our lunch on the open river, where we built a fire and boiled water for tea or coffee. One day it was forty below zero, and a fair breeze blowing and the coffee pot sitting at the edge of the fire with steam coming out of the spout, when I noticed a small icicle about an inch long hanging from the spout lip.

While this daily hard work of pulling a sled got very monotonous, I never felt better in my life, and had an enormous appetite that was hard to satisfy. Another thing we noticed was that we craved lots of fat in our food, whereas hitherto I could never stand fatty foods. Moving all the time gave us little opportunity to make yeast bread, and continuous baking powder biscuits were hard on the stomach, but yeast pancakes were just the thing. At breakfast I set a large batter of yeast in a dishpan with a top, covered it up in the bed, and cooked a pot of rice and set it on the back of the stove. When we came in at noon for lunch, I dumped the still warm rice into the yeast batter and covered it up again. When we came back for supper, this mixture would be light and foamy. After supper I would set to with two or three frying pans, making pancakes on top of the box stove. After three or four hours, I would have a pile of pancakes eighteen inches high, enough for two weeks, which, when frozen, were handy to pack and easily thawed out, and very healthy and palatable.

March 1899. It was near the end of March when we reached the continental divide. While the eastern slope had been very long and gradual, the west side was very much steeper and shorter in distance to the heads of the rivers. In fact, one could walk in a day from the watershed to where we later built our boats. Luckily on the trip to the divide there were only a few places where we could not get spruce wood for heating our tents, and elsewhere we found enough dry willow, which makes a hot fire but does not last. Before starting, I had imagined that we would not have any comfort living in a tent all winter, with such low temperatures, but I found we could be quite comfortable in any weather once we learnt how.

I think about seventy-five people came through this route. A few were ahead of us, but many far behind, and, of course, many got fed up with the hard work and extreme cold and went back. I was told that the Hudson's Bay Company steamboat on its last trip up the Mackenzie was loaded to the guards by those who had given up and wanted to get back to civilization. They were all taken out, with or without payment, as the Hudson's Bay Company would have had to look after them if they had stayed in over the winter.

We went down the western slope until we reached a place where sufficient timber grew to build another boat for the final stage of our long trip. Here again many new partnerships were formed. My partner and I joined up with a young doctor and his father whom we met and liked on the trail. We whipsawed lumber and built a boat, and as soon as the ice went out were ready to start. But, when the ice broke up and moved out, what had appeared to be a good-sized river showed up to be just a swift, shallow, rocky stream. We had to take things as they were, so we loaded up and cast off into a swift, swirling mass of water and foam. We had gone perhaps half a mile when the boat was lifted up and crashed on a rock, making a hole in the bottom. We pulled ashore, unloaded, and turned the boat up and patched and recaulked it. Next day we were ready to make another start. We now had better luck, emerging into a much larger stream. It was good for short distances, but had rapids and canyons on and off for two hundred miles. This was a daily hazard to parties drifting down an unknown river, but we were lucky, and came through without mishap.

We still did not know what river we were on, but thought maybe it was the Pelly River, until one day we saw a large blaze on a tree, on which was written: "This is the South Fork of the Stewart River, fifty miles above the Fraser Falls." We had heard of the Fraser Falls, and were relieved to find it could be easily side-passed by unloading the boats and hauling them on skids across a flat shoulder of rocks, only a very short distance. From here on it was a pleasure trip after what we had come through, as even a steamboat from Dawson came up this far.

We had prospected the gravel bars both on the Gravel River and on the Stewart, but it was all fine gold - some so fine that when dry it would float on the water in the pan - and only a few favourable spots were worth the time and energy to save it.

We arrived at the mouth of the Mayo River, now the site of the town of Mayo. At that time there were just a few shacks

and a trading post and the Indian Village just across the river. Our next stop was the McQuesten River. The salmon run was on, and the Indians had their willow traps across the river and were trapping lots of fish. We traded a plug of tobacco for a fifty-pound salmon. While here, a party of prospectors in a poling boat arrived from Dawson, and we heard the latest news of the gold camp and the outside world. Among other things, they said horse feed was very scarce, and hay was \$200 a ton, and many were feeding their horses oatmeal as feed oats were practically non-existent.

Farther up the river, we had noticed luxuriant patches of red-top,¹ waist high, along the river bank, and it occurred to us that if we could cut and raft a few tons to Dawson it would be easy money. This we suggested to the men from Dawson, but they said it would be folly for us, not knowing the river. However, being used by this time to taking all kinds of chances, we decided to try it anyway. We were lucky enough to be able to borrow two scythes from an old prospector, and we tracked our boat back up the river about fifteen miles to the place where the grass was growing. Here we cut and cured five tons of splendid hay. One day while camped at our hay meadow, we saw a party a short distance up the river. Thinking they might be someone we knew, I walked up to their fire, and, to my surprise, found the man at the fire was one we met on the winter trail, but thought must have died months ago, as when we last saw him he was almost helpless after having his frozen toes amputated by a doctor during the winter, then later he had scurvy. He told me the story of his survival. He had finally got so weak he could not eat, and spoke only in a whisper. One day, just as his partners had camped for the night they shot a moose, and, being practically out of grub, proceeded at once to cook some of the meat. The aroma of this floated to the helpless one, and they heard him whisper, "Give me some". They took him a tender bit, which he ate, and wanted more, but they were afraid to give him any, and he went to sleep. However, next morning he ate a frying pan full, and at

1. This must have been above Clear Creek where the old Lefevre Ranch was later established. Ed. A.C.

every meal he was ready for more. Inside of two days he was up and walking about. I can quite believe this almost miracle of fresh meat, as I have had a bad spell of scurvy or what is called "Canadian black leg". In the early summer of '99, my legs turned black in spots, and the flesh was like putty, with no rebound when pressed in. I was not able to walk without awful pains in the legs, and sat in the boat with my legs held up. One morning, drifting downstream, we saw on an island bar what looked like a stranded tree with its roots sticking up, but which on close approach we found to be a dead moose, bloated up with its four legs sticking straight up. Just then, a man we knew came in view, sharpening a knife to begin cutting up the carcass. He told us he had shot it the night before and propped it up, but was too tired to do more. However, such as it was, it looked good to us, and we ate moose fried or boiled for every meal for a week, in spite of the unbled meat acting like an overdose of physic. Then, suddenly, to my surprise and delight, the pains all left me, and my legs got all right.

Our hay was now ready to be moved, and our next job was to build rafts to float it down the river. Still farther up the river we had seen a fine stand of spruce, through which a fire had passed a year or two before. Now the trees stood along the bank of the river, tall and straight like ship's masts. Returning to this place, we cut timber enough to make two rafts, on each of which, when we had floated down to the hay, we piled 2 1/2 tons. The idea of making two rafts was that, if we got hung up on a bar, two smaller rafts would be easier to handle than one large one. Having brought the rafts of hay down to the McQuesten River, we left the bulk of our outfit there in an old abandoned R.C.M. Police cabin, as we intended returning to this river to prospect during the winter.

We then started on the last leg of our trip, and were lucky enough to get through without any mishap, and landed our hay and rafts on the beach in front of Dawson. We sold the hay for 10¢ a pound, and the log rafts for \$200, giving the four of us \$1,200 for about three weeks of pleasant work. Not much by present-day wages, but fifty-five years ago, when \$60 a month was considered very good, we were well satisfied with it.

We had been in Dawson about three days when each of us had a bad cold. We had been on the trail for over a year, often in soaking wet clothes, but felt none the worse for it, and now, living in comfort, bad colds caught us all. There were many thousands of people living with very little sanitary arrangement, and of course the air was loaded with all kinds of germs. Funerals were a daily occurrence, and several men we had known on the trail were dead and buried by the time we arrived in Dawson. Meanwhile, we decided not to return to the McQuesten for the winter, but to try our luck on the local creeks. This necessitated getting the outfit we had cached, so two of us started back with a poling boat, even though we were feeling anything but fit to travel. We poled all day, and slept in the open at night, and were surprised that in two or three days our colds had disappeared, and we were our old rugged selves.

Arriving back at the McQuesten, we found our poling boat was too small to hold our cached outfit, so we made a small raft, loaded the outfit and fixed a canvas shelter with a large tarpaulin, our old faithful box-stove, and plenty of stovewood. We then cast off, let our raft drift, and lay in the warm shelter (it was quite cold weather now, and ice forming), but kept an eye out to see when the raft needed handling. We arrived back in Dawson shortly before the river was running thick with ice.

Again, on our return to Dawson, the cold germs were waiting for us, and in two days we were feeling as bad as ever, and did not get rid of our colds until we went out to the creeks on a prospecting trip.

Thus ended our epic trip over the All Canadian Route to the famous goldfields, and we were left more experienced if not wiser men.

Road programme in northern Canada

The Canadian government is planning major road programmes in the Yukon and Northwest Territories to extend over the next few years. Construction is already underway on a number of projects.

In the Yukon a development road will be built northeast from the existing Yukon road system at Flat Creek, about 25 miles southeast of Dawson, for 200 miles to the Eagle Plain Reservation, where large-scale exploration for oil is now in progress. This road is estimated to cost about \$14,000,000. Detailed surveys were made during the past summer and contracts for construction will be let by early 1959.

Three bridges are being built at a total cost of about \$3,000,000 where the Whitehorse-Keno Highway crosses the Yukon, Pelly, and Stewart rivers. The bridge across the Yukon at Carmacks was started in 1958 and all three should be completed by 1961. These bridges will replace summer ferries and winter ice bridges, and will make year-round traffic possible. At present freeze-up and break-up interrupt travel along the road for a total of some three months each year.

The programme begun last year to renovate the 130-mile section of the Canol Road between Johnsons Crossing on the Alaska Highway and Ross River was completed in 1958 at a cost of about \$270,000. The Canol Road was built during the war to serve the Canol pipeline from Norman Wells to Whitehorse. It has been abandoned for several years but prospectors have urged the repair of this western section of the road to assist mineral exploration in the promising Ross River area.

The last major project in the Yukon Territory is a 200-mile road west from Ross River to Watson Lake, and a 125-mile road from Ross River to Carmacks. Estimated cost of the entire project is some \$20,000,000.

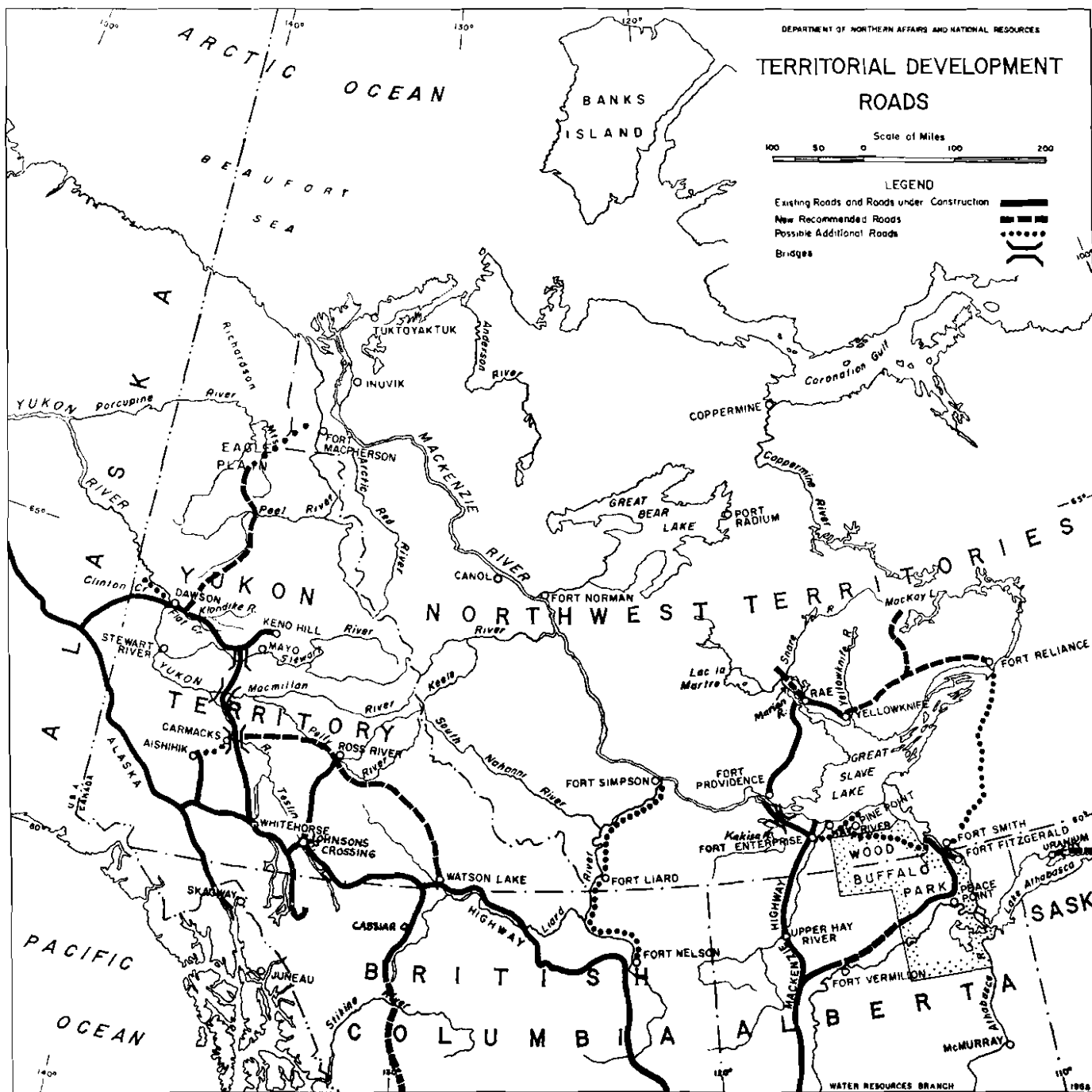
DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

TERRITORIAL DEVELOPMENT ROADS

Scale of Miles
100 50 0 100 200

LEGEND

- Existing Roads and Roads under Construction
- New Recommended Roads
- Possible Additional Roads
- Bridges



In the Northwest Territories a major project to be completed in 1960-1 is the road from Fort Enterprise to Yellowknife. This 281-mile road joins Yellowknife with the Mackenzie Highway; it runs north from Yellowknife to Fort Rae and then west of Great Slave Lake to join the Mackenzie Highway at Fort Enterprise some 30 miles south of Hay River. As part of the road, a bridge over the Kakisa River will be completed this year, another bridge will be built over the Northwest Arm of Great Slave Lake, and a ferry will be used for crossing the Mackenzie River. In the Marian River area near Fort Rae a 30-mile road will be constructed to connect with an existing road now serving local mining developments.

A major project contemplated is a road from Yellowknife east to Reliance, a distance of some 250 miles, with an 80-mile branch road leading northeast from a point about 50 miles east of Yellowknife to MacKay Lake.

Another project planned for the Territories is the reconstruction of the 84-mile territorial section of the Mackenzie Highway.

Freight on the Mackenzie River system is trucked over a 24-mile portage road from Fitzgerald to Bell Rock in order to avoid the rapids on the Slave River. This road is being provided with a hard surface at a cost of about \$1,250,000.

Work is underway on a road in Wood Buffalo Park which will be important for the development of the Northwest Territories though lying outside its boundaries. It will cost \$3,000,000 and will run from Peace Point to the western boundary of Wood Buffalo Park, a distance of 74 miles.

Several of the northern roads in the provinces being built in cooperation with the provincial governments as part of the federal government's "Roads to Resources" programme will be important to the Territories. In British Columbia, the Stewart-Cassiar road will connect with a road already built from the Alaska Highway to Cassiar. In Alberta, the provincial section of the Mackenzie Highway will be reconstructed and the

present branch road from High Level to Fort Vermilion will be extended to the western boundary of Wood Buffalo Park where it will join the road being built by the federal government, thus providing for the first time a year-round overland route to Fort Smith from the south. In Saskatchewan, a road will be built from Lac la Ronge via Reindeer Lake and Stony Rapids to Uranium City. This could in some future programme be extended to join the Northwest Territories roads system near Fort Smith.

Department of Transport icebreakers

The Department of Transport has seven icebreakers and one ice-strengthened vessel at present in service. During the summer of 1958 six icebreakers were in operation in the Arctic. Two of these, the d'Iberville and the Labrador are major vessels; three, the Montcalm, the Ernest Lapointe, and the Edward Cornwallis are smaller icebreakers, and the sixth, the N.B. McLean, is intermediate in size and power. The small Saurel was not employed in the north during the summer. The ice-strengthened C.D. Howe carried out her annual patrol in the north as usual. Characteristics of these vessels are as follows:

<u>Name</u>	<u>Gross Tonnage</u>	<u>H.P.</u>	<u>Engines</u>	<u>Cargo (tons)</u>	<u>Passengers</u>
<u>d'Iberville</u>	5,678	10,800	Steam	500	70
<u>Labrador</u>	6,802	10,000	Diesel electric	35	14
<u>N.B. MacLean</u>	3,254	7,000	Steam	600	15-20
<u>Montcalm</u>	2,017	4,500	Steam	700	12
<u>Ernest Lapointe</u>	1,179	2,500	Steam	75	7

<u>Name</u>	<u>Gross Tonnage</u>	<u>H.P.</u>	<u>Engines</u>	<u>Cargo (tons)</u>	<u>Passengers</u>
Edward Cornwallis	1,965	3,000	Steam	700	12
Saurel	1,176	3,000	Steam	250	3
C.D. Howe	3,628	4,000	Steam	1,000	90 (incl. 35 Eskimos)

A number of ships for use in ice are at present under construction. One is a major icebreaker, the others are mainly small icebreakers. Approximate characteristics are as follows:

<u>Size</u>	<u>H.P.</u>	<u>Engine</u>	<u>Remarks</u>
1. 300 ft. long	15,000	Diesel electric	Triple screw.
2. 2,017 gross tons	4,000	Steam	Sister ship to Montcalm.
3. 200 ft. long	4,250	Diesel electric	
4. 200 ft. long	4,250	Diesel electric	Sister ship to (3)
5. 180 ft. long	2,900	Diesel electric	For search and rescue as well as icebreaking.
6. 180 ft. long	2,900	Diesel electric	Sister ship to (5)
7. 210 ft. long	3,550	Diesel electric	For use in Great Lakes.
8. 270 ft. long	4,250	Diesel electric	Supply vessel, heavily strengthened but not an icebreaker, for use in Maritimes and on Labrador coast.

Appointment to the Northwest Territories Council

On 6 December 1958 Mr. E.J. Gall was appointed to the Northwest Territories Council to represent the constituency of Mackenzie North to fill the seat left vacant when Mr. John Parker was appointed Judge of the Yukon Territorial Court in June. The appointment brings the Council to full strength: four elected and five appointed members, who have about two years more to serve.

Scotty Gall was born in Aberdeen and joined the Hudson's Bay Company in 1923. Most of his life has been spent in the Western Arctic. At first he served aboard the Company vessels Bay Maud and Bay Chimo and was later captain of the Aklavik. It was in 1937 that he took the Aklavik through Bellot Strait for the historic meeting with the Nascopie. This was the first time a ship had passed through the strait and the first time a ship from the west had made contact with a ship from the east along the Northwest Passage. Since 1951 he has been manager of the Company's store at Yellowknife.

Gazetteer of the Northwest Territories and Yukon

A provisional gazetteer listing names and geographical features in the Northwest Territories and Yukon Territory with their latitude and longitude has been compiled by the Canadian Board on Geographical Names from names appearing on maps of the Territories. The great majority of these names, but not necessarily all, have been approved by the Board. Some 10,000 names are listed in the gazetteer. Copies can be obtained from the Queen's Printer, price \$1.00.

"New Aklavik" postmark

Mr. Gale Raymond, one of our members, is seeking a (1958) envelope bearing the "New Aklavik N.W.T." postmark. This postmark was in use for a short period before the name "Inuvik" was officially adopted for the new site of Aklavik. Mr. Raymond would be very grateful if any reader could give him one of these envelopes for his collection of polar postmarks. His address is: 6035 Hornwood Drive, Houston 36, Texas, U.S.A.

Subscriptions for 1959

Members are reminded that their subscriptions for 1959 (\$2.00 for Ottawa members, or \$3.00 for combined membership for husband and wife, and \$1.00 for out-of-town members, other than institutions), are payable to the Treasurer, Mr. J.E. Cleland, P.O. Box 68, Postal Station D, Ottawa.

Owing to currency regulations it is not always convenient for members of the Arctic Circle residing in Europe to pay their subscriptions to the club in Ottawa direct. Through the courtesy of the Director, the Scott Polar Research Institute will now receive the subscriptions of members from the United Kingdom and from the Continent of Europe and will transmit them to Canada from time to time. European members should forward their 1959 subscriptions (5/-) to the Director, Scott Polar Research Institute, Cambridge, England and mark them "Arctic Circle Subscription".

Change of Address

Members are earnestly requested to advise the Treasurer, Mr. J.E. Cleland, P.O. Box 68, Station D, Ottawa, promptly of any change of address.

Editorial Note

The Editor would welcome contributions from those who are at present in the Arctic or have information about work in the Arctic. **All material** for the Circular should be sent to

Mrs. Graham Rowley,
245 Sylvan Road,
Rockcliffe,
Ottawa 2, Ontario.

T H E A R C T I C C I R C U L A R

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Activities of the Geological Survey of Canada in the Canadian Arctic, 1958. By R.G. Blackadar

During the 1958 field season Geological Survey parties were working in seven main areas in the Arctic. Full accounts of this work will be published at a later date in various publications of the Geological Survey of Canada.

Northwestern arctic islands. A reconnaissance survey of parts of Melville, Prince Patrick, Eglinton, Brock, Borden, and Mackenzie King islands was carried out by R. Thorsteinsson and E.T. Tozer. The party was transported in the field by a Piper Super Cub PA 18A aircraft piloted by W.W. Phipps of Bradley Air Services of Carp, Ontario. In 1956 Mr. Phipps had demonstrated the advantages of using a light fixed-wing aircraft on scientific surveys in the far north (see Arctic Circular, Vol. 11, pp. 7-10) and in 1958 the party had a most successful summer, making about 400 landings on unprepared surfaces. Their main base was at "Tingmisut Lake" at the southeastern end of Sabine Peninsula, Melville Island, the site of a large cache left on Operation Franklin. Little use had been made of this cache in 1955 owing to bad weather and some 2,500 gallons and 600 man-days food rations remained.

Mr. Phipps flew the aircraft north alone, leaving Carp airport on June 15. His route to Resolute lay through Winisk, Churchill, Baker Lake, and Shepherd Bay. On the way some time was spent with Mr. Tom Manning and Mr. and Mrs. Andrew Macpherson on Prince of Wales Island and Phipps reached Resolute on June 19, the same day that Thorsteinsson and Tozer arrived by R.C.A.F. aircraft from Churchill.

The airlift of equipment to Melville Island began the following day and by June 25 the party was able to start geological investigations. A temporary camp was established on the north side of the Raglan Range, northwestern Melville Island. On July 11 the party moved to Mackenzie King Island where ten days were spent studying Brock, Borden, and Mackenzie King islands from two camps in the northwestern part of the island. The landings made on these three islands are the first since their discovery by the Canadian Arctic Expedition of 1913-18, led by Vilhjalmur Stefansson. Between July 21 and 26 the party worked out of Mould Bay weather station on Prince Patrick Island, making flights to other points on this island and Eglinton Island. The next four days were spent at a camp set up on the north side of Ibbett Bay, Melville Island, from where they returned to the base camp at "Tingmisut Lake". By September 1 the party had completed their study of Melville Island and the return airlift was started, but adverse weather delayed the final evacuation until September 10.

As a result of the party's work the geology of 23,800 square miles was mapped and a preliminary geological map of Melville, Prince Patrick, Brock, Borden, and Mackenzie King islands will be published at a scale of 10 miles to the inch. Rocks of Ordovician, Silurian, Devonian, Pennsylvanian, Permian, Triassic, Jurassic, Cretaceous, and probably also Tertiary age occur. In addition, the Beaufort formation, of Tertiary or Pleistocene age, forms a blanket-like deposit covering the older formations and extends from southern Prince Patrick Island to northern Borden Island. The Palaeozoic rocks up to the Devonian occur in the Parry Islands fold belt which cuts across Melville Island. This belt was deformed between the Devonian and the Pennsylvanian and parts were folded again in the interval between Pennsylvanian and Permian time.

In northern Melville Island, which lies within the Sverdrup Basin, an essentially conformable section is exposed which ranges in age from Pennsylvanian to Cretaceous and probably even Tertiary. Brock, Borden, and Mackenzie King islands lie on the northwest edge of this basin. The beds exposed on these islands, except for the Beaufort formation mentioned above, are of Triassic, Jurassic, and Cretaceous age. The piercement domes of Sabine Peninsula, like those of the Ringness islands and Axel Heiberg Island, consist of Pennsylvanian or Permian evaporites.

The party also found glacial deposits in southern Melville Island which suggested that Pleistocene glaciers had crossed Viscount Melville Sound.

In 1958 Mr. Phipps had equipped his aircraft with very large low-pressure tires (5 lb. pressure; 25 X 11 X 4-inch) for landing on rough terrain. These proved very satisfactory. With the large tires the cruising speed of the 150 h.p. Lycoming engine was reduced from 115 m.p.h. to 95 m.p.h. The fuel tanks on the aircraft normally carry 30 gallons which at the average gasoline consumption of 6 1/2 gallons per hour gives a range of about 400 miles. For the flight north an extra fuel tank was added in the form of a 45-gallon drum, so arranged that fuel could be pumped into the wing tanks in flight, increasing the range to 1,000 miles. The take-off run of the aircraft is about 200 feet and the landing roll is somewhat greater, both distances depending very much on wind speed. In Canada the aircraft is licensed to carry a disposable load of 700 pounds.

During the operation radio communication was maintained between the aircraft and the weather stations at Resolute and Mould Bay and daily flight plans were filed. In addition a 2-watt radio set at the base camp permitted intermittent contact with the aircraft and the weather stations. Emergency and survival equipment was carried on all flights, which totalled 300 flying hours. The performance of the aircraft throughout was most satisfactory and there were no mishaps; on six occasions it became mired on landing but it seldom sank deeper than the height of the hubs and one man lifting on the wing strut while the other built a support of rocks under the tires was sufficient to extricate the machine.

The 300 hours flown include the flight from Carp to Resolute and return, about 60 hours. Approximately 450 landings were made during the investigation of which about 400 were on unprepared surfaces, involving 249 different places. One hundred and sixty of these places were on Melville Island, 29 on Mackenzie King Island, 27 on Prince Patrick Island, 15 on Borden Island, 10 on Eglinton Island, 4 on Brock Island, 3 on Cameron Island, and 1 on Emerald Island.

Belcher Islands. The geological reconnaissance of these islands was initiated by G.D. Jackson. His party was flown from Moosonee on June 19 in a Canso aircraft of Austin Airways Ltd., and brought back in the same manner on September 16. The eastern part of the Belcher Islands group was examined and also several of the clusters of small islands lying to the north, including the Bakers Dozen. The party used the services of local Eskimo and a whale boat but were not able to travel as much as they had hoped

because the ice remained around the coasts later than usual and the weather was very foggy. The area comprises a succession of Proterozoic sedimentary rocks and includes some iron-formation. It is expected that work in this region will be continued in 1959.

Fort Enterprise. The geological mapping of this area was completed in 1958 by J.A. Fraser. The region, 150 miles north of Yellowknife, is one of low relief underlain for the most part by granitic rocks of Precambrian age. The northern half is almost devoid of trees but south and west of Winter Lake are sparse stands of spruce. Field work was carried out between June 27 and August 23 and in this time the party saw little game. A cow moose and two calves were sighted on July 10 southwest of Long Legs Lake at least 10 miles from the nearest trees. On August 21 a cow moose was seen along Starvation River more than 30 miles north of the trees. One caribou was seen on August 1 south of Baldhead Lake and small groups of caribou numbering half a dozen or less appeared in the area south of Point Lake on August 18.

Southern Baffin Island. R.G. Blackadar accompanied by three assistants, S.H. Kranck, J.O. Sund, and D.K. Murphy left Churchill for Cape Dorset on May 28 in a Dakota aircraft of Trans-Air Ltd. The party was unable to reach Amadjuak on the south coast, where a standard 4-mile reconnaissance map-area was to be initiated, and during June carried out mapping between Cape Dorset and Andrew Gordon Bay using dog teams and the services of Cape Dorset natives. It was proposed to move to Amadjuak following break-up but although the winter ice cleared from Dorset Harbour on July 6, strong southeast winds soon brought pack ice into the harbour and from July 17 to August 18 scarcely any open water was to be seen. This belt of pack ice, held close against the southwest coast of Baffin Island by unusually prolonged southeast winds, extended east to Markham Bay and was reported to be 50 miles in width. It twice prevented the C.G.S. C.D. Howe from reaching Cape Dorset and not until August 22 was the C.G.S. Edward Cornwallis able to enter Dorset harbour and only on August 25 was it possible to discharge cargo with any ease. On August 18 a Canso aircraft of Austin Airways, beached at Cape Dorset by the ice since July 17, was able to take off and S.H. Kranck and J.O. Sund returned to Ottawa via Moosonee. By August 30 the ice had cleared entirely and Blackadar and Murphy proceeded to Amadjuak aboard the Peterhead Aivik owned by Pootogook, a leader of the Cape Dorset community, who has since died. Geological mapping was carried out between September 1 and 18. Unusually fine weather prevailed during the first week of September although the latter part was more typical with overcast skies and frequent snow flurries.

Blackadar and Murphy returned to Cape Dorset on September 18 and left on September 23 aboard the C.G.S. C.D. Howe, reaching Quebec on September 30. It is expected that mapping will be continued in the Amadjuak area in 1959.

Southeast District of Mackenzie. A reconnaissance survey of an L-shaped area in southeast District of Mackenzie, between latitudes 60° and 62° north and extending from Nonacho Lake in the west to Wholdaia Lake in the east, was carried out by F.C. Taylor thus completing mapping in this part of the Precambrian Shield except for a small area west of Wholdaia Lake. A party of ten was in the field from the first week in June, when ice covered all the larger lakes, until the first week in September. Canoe parties, consisting of two men, were supplied from Uranium City by Otter aircraft. Glacial deposits, such as eskers, drumlinoid ridges, and morainal ridges, cover much of the area. In these parts a float-equipped Cessna 180 aircraft was used for a period of three weeks and proved valuable in moving ground parties and in making spot observations.

The area lies athwart the tree-line and small black spruce trees are dominant. Game is scarce except during the caribou migration. Lake trout is common in the lakes and most streams contain grayling.

Western District of Mackenzie. J.A. Jeletzky continued the study of the stratigraphy and palaeontology of the Cretaceous and uppermost Jurassic strata southwest of the Mackenzie River delta initiated in 1955. Field work was carried out on the eastern flank of the Richardson Mountains between the latitudes of Aklavik and Fort McPherson. A few days were also spent on parts of the Porcupine River in the Yukon. J.V. Ross and R.D. Lawrence, seasonal employees, completed detailed mapping in the Mesa Lake and Rodriques Lake map-areas north of Great Slave Lake.

Northern Ellesmere Island. R.L. Christie made reconnaissance studies in the Lake Hazen region of northern Ellesmere Island and was attached to the Defence Research Board's "Operation Hazen" for administrative and logistical purposes. This work had been started in 1957 and was continued this year with the assistance of B.P. Walker.

Field work began on May 4 with a flight to Ward Hunt Island by Dakota aircraft. The valleys tributary to Disraeli Bay

and Clements Markham Inlet were examined from the air, and the valley of Clements Markham Inlet was chosen as a suitable route for a traverse of the north slope of the United States Range. A landing was made on a snowfield above the head of Yelverton Bay, some 130 miles southwest of Clements Markham Inlet, and a fossil collection was obtained from the gently inclined limestone and sandstone strata which seem characteristic of the higher parts of the United States Range.

On May 18 the geological party, with dogs and sledge, was landed near the head of Clements Markham Inlet to make a reconnaissance along the main valley and glacier flowing toward the inlet. Several fossil collections were obtained from folded limestone and gypsiferous strata and the contact between these and the more tightly folded Cape Rawson beds was located. A collection of sheared and distorted fossils from the Cape Rawson beds may be the first collection to be obtained from this formation. The main expedition camp on Gilman Glacier was reached on May 30 and travel to the base camp at Lake Hazen was by dog team and snowmobile.

On June 4 the geological party and Dr. M.S. Maxwell, the expedition archaeologist, started down Ruggles River for an extended trip in the vicinity of Lady Franklin Bay. Dr. Maxwell remained at the site of some ancient Eskimo encampments near Miller Island while the geologists went on towards Cape Baird on June 8. The melt also began on this day, and, about five miles south of Cape Baird, sledging had to be abandoned for travel by foot on land. The highly folded, fossiliferous rocks at Cape Baird were examined and a collection of petrified wood was obtained from the locality discovered in 1882 by Sgt. David L. Brainard of the Greely expedition. On June 18, using dogs with packs, a traverse was made inland on Judge Daly Promontory, starting from the shore of Archer Fiord, about thirty miles from Cape Baird. The first rush of meltwater had receded by this time, the streams were easily crossed, and a major stream was followed southward well into the promontory. The geologists then returned by the same route to the archaeologist's camp. On the 25th the whole party sledged across the water-covered fiord ice to Sun Bay. As the ice of Ruggles River seemed an uncertain route for return at this stage of the melt season the sledge, specimens, and heavy equipment were cached. The party moved up Black Rock Vale on June 27, and reached Lake Hazen the following day. A party from the base camp later welcomed the travellers at a rendez vous and all returned to the main camp by Bombardier snowmobile on June 29.

On July 2 the geologists set out overland to Alert from the northeast end of Lake Hazen, and once again Dr. Maxwell was left part-way along the route to look for archaeological sites. The rolling plateau at the foot of the United States Range was traversed, using five dogs with packs. Here, mosquitoes were abundant and caused considerable discomfort; inflammation from bites and rubbing nearly closed the eyelids of some of the dogs. An enthusiastic welcome was given the itinerant geologists by the personnel of Alert weather station on July 13. It was assumed by some that an aircraft had landed unnoticed, and only the travel-worn dogs convinced them of the authenticity of the geologists' claims. The return route to Lake Hazen lay close along the foot of the mountains. The only serious incident involving the dogs and wildlife occurred about half-way to the lake. Three dogs scampered over a saddle, obviously intent on the chase; they rejoined the men and remaining dogs about half an hour later with the pack of one of the dogs badly torn and the entire collection of specimens missing. A short distance farther on a lone muskox was encountered. This animal possessed the only implement for many miles capable of tearing the pack so effectively, and it is suspected that he was as truculent as he appeared. The party reached Lake Hazen on July 21 and found the ice still unbroken. By July 27 the ice had melted and moved off shore allowing a boat party from the base camp to push through to the end of the lake and the geologists and Dr. Maxwell returned to camp.

On August 11, a flight to Ward Hunt Island by Dr. Terris Moore in his Piper Super Cub gave Christie an opportunity to revisit fossil localities discovered in 1954. Dr. Moore landed his aircraft in a narrow lead of water along the edge of the floating ice on the small lake on the island.

Field work was concluded on August 14, when the geological party were landed by helicopter at Watercourse valley, east of Fort Conger, and visited the fossil plant locality discovered by the Nares expedition of 1875-6. Several hours were spent there while the icebreaker U.S.C.G.C. Atka worked through heavy ice in Lady Franklin Bay. The thick coal seam, which provided fuel for the Nares and later expeditions, was examined and numerous plant remains were collected from the overlying shaly strata. The specimens and equipment cached earlier in the season on the shores of Lady Franklin Bay were recovered by helicopter at this time.

The work of the geological party was greatly assisted by data collected by other members of "Operation Hazen" and also by other agencies working in the area, notably the O.I.C. of the joint weather station at Alert, the crew of the R.C.A.F. Dakota aircraft, the officer commanding U.S.C.G.C. Atka, and Dr. Terris Moore.

Archaeological work in Ungava and Mansel Island. By W.E. Taylor

During the 1958 field season, Mr. Charles A. Martijn, my wife, and I carried out archaeological field work for the Human History Branch of the National Museum of Canada. This work followed a reconnaissance survey we had made in northern Ungava the preceding year (see Arctic Circular, Vol. 10, No. 2, pp. 25-7).

The party left Ottawa on July 1 and travelled in the C.G.S. Montcalm to Frobisher Bay and then in the M.V. Rupert Island to Sugluk. While at Frobisher the Crystal II site, excavated by Henry B. Collins in 1948, was examined (Ann. Rept. Nat. Mus. Can. Bull. No. 118, 1950). The M.V. Rupert Island arrived at Sugluk on July 30 and camp was set up and work begun on Sugluk Island the following day. A number of local "Eskimologists" were hired for the season to participate in the excavations. At the "dazzling" hour of midnight on August 10, the party sailed by Peterhead boat for Mansel Island. On the way we saw the remarkable murre colonies on the Wolstenholme-Digges Island cliffs at close range, and stopped at Ivugivik to add to the crew two men who were familiar with Mansel Island. On August 12 the party landed on the island and set up a camp at the mouth of a river near the centre of the east coast. On August 31 a Peterhead boat arrived to carry our crowd back to Ivugivik, but after six hours of sailing, the Eskimo captain decided to return to Mansel Island to wait for better weather. The party reached the mainland the following day and camp was set up at "Eeteevianee", a small cove one mile from Ivugivik. On September 6 we left Ivugivik and returned to Sugluk Island, remaining there until September 27, when we went back to Sugluk to prepare for the trip south. On October 2 we boarded the C.G.S. Montcalm and on October 4 she sailed for Churchill. The voyage from Sugluk to Churchill was completed in the impressive time of fifty hours. A Trans-Air flight from Churchill to Ottawa on October 7 concluded the season.

On Mansel Island six sites were found in a very restricted area about the river valley. Four of these were pure Dorset culture in content and representative of various stages in the development of that culture. A fifth site contained both Dorset and later houses and artifacts. A sixth site, extending along the river bank for half a mile, was pure Dorset culture in some areas and mixed in others. Again, houses of more than one period were represented. The most significant preliminary results of the Mansel Island work were (a) a Dorset site that seems to be typologically earlier than the proto-Dorset site, T-1, on Southampton Island (Henry B. Collins, Ann. Rept. Nat. Mus. Can. Bull. No. 142, 1956); (b) the finding of many Dorset culture house ruins, and (c) the recovery, in a pure Dorset culture site, of human skeletal material including a mandible and a femur - only the second find of analysable human bone in a Dorset culture context.

On Sugluk Island work was continued on proto-Dorset and terminal Dorset period sites discovered in 1957. Significant in this was the excavation of a late-period Dorset culture house ruin. In addition a fourth site was found on this little island and it proved to be the most enlightening of the season. It consisted of three superimposed culture strata, the topmost of which contained proto-Dorset material; the lower layers were earlier but also proto-Dorset in typology. Excavation was not carried beyond the third stratum because of permafrost at a depth of four feet.

In the top stratum of this site a human mandible and three ribs were found. These are, for the moment, the oldest human bones excavated in the North American Arctic and have been dated by radiocarbon analysis to 500 B.C. Both this mandible, from an early Dorset period, and the mandible from Mansel Island are morphologically Eskimo. The same may be said of the skeleton excavated at a Dorset site near Payne Bay in 1957 (Arctic Circular, Vol. 10, pp. 25-7). These constitute the only analysable human remains from the Dorset period. Though the sample is small, it is consistent, and provides convincing evidence against the theory of an Indian migration as the origin of the Dorset culture, formerly held by several Eskimologists.

The small village site at "Eteevianee" belongs in the middle of the Dorset time span. The most remarkable observation on this site was the high incidence of seal bones, which totalled more than 90 per cent of the animal bone sample.

It was my good fortune to be flown from Sugluk to Deception Bay by a helicopter of the C.G.S. Labrador to examine a site found by the Rev. David Ellis of Sugluk, who helped me with the excavation. Although stone caches and several stone houses were recorded, not a shred of animal bone or artifact was found. The site, therefore, cannot be dated at present.

Anthropological field work at Great Whale River and Povungnituk.
By Asen Balikci

In 1957 and 1958 I was sent north by the Human History Branch of the National Museum of Canada to study the cultural changes that have taken place during the past fifty years among the Eskimo inhabitants in the Great Whale River and Povungnituk areas. From a description of the traditional elements that have been replaced by new ones and from the transformation of whole aspects of socio-cultural life, it is hoped to discover processes or tendencies of socio-cultural change along the east coast of Hudson Bay. Such a study involves not only the mechanical replacement of traits but also internal factors of change such as - redistribution of population, new group formation, inter-and intra-group tension, messianic-nativistic movements, and changes in kinship relations. The comparative nature of the study, which is based on data from several neighbouring communities, makes it possible to separate the processes of change from the primary data.

The first field work towards this study was done in 1957 at Great Whale River, a settlement where background data was available from the study made by J.J. Honigmann during the summers of 1950 and 1951. The initial phase of the study involved an examination of the new interactional system resulting from the arrival of a large number of white workers. The effects of the employment opportunities which brought white men and Eskimos into daily contact have been discussed in a paper to be published by the National Museum. They are as follows:

1. Concentration at Great Whale River of most Eskimo groups traditionally spread along the coast between Cape Jones and Richmond Gulf and a consequent disorganization of the local migrations.

1. "Relations inter-ethniques à la Grande Rivière de la Baleine baie d'Hudson, 1957."

2. Loss of the traditional balance between the natural resources of the country and the distribution of the human groups which resulted in a decrease of the local meat supply.
3. A split in the native community along occupational lines. Soon various jealousies created tensions between native hunters and native labourers and strengthened the divergent cultural orientations of the two occupational groups.
4. Some prostitution practices adopted by a small number of native women increased anti-white feeling and the Eskimos expressed the desire to have their camp removed from the vicinity of the white establishment. Eskimos also objected to the local employment policy. They disliked some of the wage work they performed as tending to make them dull and thus destroying their traditional image of manhood.
5. The Eskimo perception of Euro-Canadian society became somewhat widened. First, two groups could be distinguished: "our" whites, which comprised those actively interested in Eskimo welfare such as the Northern Service Officer, missionary, nurse, and teacher, and the "other" whites, or workers temporarily stationed at Great Whale River. Secondly, the "other" whites could be divided into two categories: the "good" whites, those the Eskimos learned to know particularly well such as their foreman, and the "bad" whites, or all the others. Thirdly, the Eskimos learned that our society is highly hierarchal, "there are only bosses on top of each other".
6. During this period of intense culture contact the Eskimo perception of their own culture deepened; they tended to become "culture conscious" and to compare the ways, advantages, and disadvantages of the two cultures. Those who had been treated in southern hospitals met native peoples from various parts of the Arctic and their knowledge of the Eskimo world widened.

Practical difficulties prevented any significant time perspective from being obtained at Great Whale River, but in 1958 at Povungnituk several older informants were able to give information on the traditional ways of the Povernitormiut. Four acculturation levels were distinguished in this region:

1. The first, the traditional period, continued until the close of the last century and is characterized by an Eastern Arctic type of social organization - very small communities living on the coast, with some permanent inland communities, collective caribou hunting with bow and arrow, and relatively short inland migrations. Important traits are wintering on the sea ice, bird dart hunting, "manak" (ligne dormante) fishing, and spring sealing with the long, sliding harpoon. Intergroup trade with the Belcher Island people took place at Little Whale River during the annual trip to the Hudson's Bay Company post. The conversion to Christianity of the Povernitormiut dates back to this period.
2. The second, or adaptive period, covers the end of the last century and the first three decades of this century and is characterized by the decrease and withdrawal inland of the caribou herds, resulting in long inland summer migrations of entire Eskimo groups. At the same time seal hunting specialization took place around Cape Smith and fishing specialization occurred near the estuaries of the larger rivers. The establishment of trading posts in the region shortened the trading trips and encouraged trapping. The inland territory thus became covered with a network of individual trap lines "inherited" usually along kinship lines. The trader had an important role in the group and through the debt system he influenced the prestige structure of the community. His native helper also exerted considerable influence. A unique type of iron harpoon was adopted, sealing at the floe edge became prevalent, and fish nets and steel hooks came into use.
3. The third period was one of crisis and reaction and ended with the beginning of the present decade. New forms of collaboration within the kin groups were developed to allow the purchase of large production goods. Long inland migrations came to an end and were superseded by an efficient, restricted, system of intensive spring sealing, summer movements to nearby lakes, and a winter individual sealing-trapping pattern with the group remaining in the central locality. This period saw the appearance of messianic-nativistic movements based on the beliefs of the immediate arrival of Christ determined by the disappearance of the caribou.

4. The last phase is marked by the concentration of the groups along Povungnituk Bay, the adoption of new hierarchal forms (elected chiefs and group accounts), the increased relief distributed by the Federal Government, the introduction of new occupational activities (carving), the development of trade, and a decrease in hunting. During this last period the acculturation process seems to be intensified and can be analysed in relation to the corresponding period at Great Whale River.

The following tendencies seem quite well established: a concentration into larger more stable communities and longer individual hunting and trapping trips, the immediate acquisition of more efficient weapons and tools whenever possible, and an increase in the volume of trade and occupational diversification. However, some resistance to the creation of complex organizational forms and the appearance of messianic movements show that these Eskimos are still a long way from identification with Canadian society to the south.

Folklore material, folk tales, local legends, folk songs, and traditional games were also collected. The basic vocabulary was recorded on tape at both settlements and traditional artifacts, mainly models, were obtained. Some of these are now being shown in the National Museum and a large collection of carvings depicting legends is being assembled at Povungnituk and will form the centre of another temporary exhibition.

Geographical Branch survey on Melville Peninsula, 1958¹. By Victor W. Sim

In 1957 the Geographical Branch of the Department of Mines and Technical Surveys began a study of the physical and human geography of the northern part of Melville Peninsula (Arctic Circular, Vol. 11, No. 2, pp. 27-9). During the field season of 1958 I continued this study with the assistance of Richard Moskal, an undergraduate at the University of Western Ontario.

I reached Hall Beach on the east coast of the peninsula by air from Frobisher Bay on May 16. Unfortunately, Moskal was

¹ Published with the permission of the Director, Geographical Branch, Department of Mines and Technical Surveys, Ottawa.

delayed en route and it was not until May 29 that we were able to leave Hall Beach by sledge for W.G. Smith Bay on the west coast. An Igloodik Eskimo, Pacome Kalaut, was employed for this trip. We travelled westward over the snow-covered Palaeozoic lowland to Hall Lake and then across to the mouth of the "Kingora River" at the southwest corner of the lake. We then followed the river valley to Sarcpa Lake which we reached on June 1. Travelling conditions, at first good, deteriorated in the valley where deep, soft snow impeded the heavily loaded sledge. From Sarcpa Lake the route lay west along the valley of a river draining into the lake and over a low divide to the stream flowing to W.G. Smith Bay. Blowing snow forced a one-day stop and it was not until June 6 that we reached the west coast. Caribou, although not numerous, were noted in small groups in the interior of the peninsula.

On June 11 we left W.G. Smith Bay and sledged along the west coast of the peninsula toward Fury and Hecla Strait. We planned to travel quickly to the western entrance of the strait and then to retrace the route more slowly to our base. Extremely rough ice made travelling difficult, however, and we had to turn back at Franklin Bay, 30 miles south of Fury and Hecla Strait. This was the farthest point reached by Dr. John Rae of the Hudson's Bay Company in 1847, the only previous traveller along this part of the coast. On the return trip stops were made at the mouths of all the larger stream valleys and foot traverses were made inland. The weather was very foggy in the early days but improved considerably after June 20. We returned to W.G. Smith Bay on June 29.

On July 1 a short sledge trip was made to Erlandson Bay, 25 miles south of W.G. Smith Bay. Here there occurs a narrow coastal lowland possibly underlain by flat-lying sedimentary strata flanking the interior Precambrian crystalline rock. Wales Island, lying just offshore, is almost certainly underlain by Palaeozoic formations and these are possibly of similar age to those found on Simpson Peninsula. Caribou were plentiful on the coastal slopes in this area. The sea ice on Committee Bay in the lee of Wales Island was smoother than that encountered farther north. Large numbers of ringed seal were often seen basking in the sun at the edges of open cracks in the ice. A few square-flipper seals were seen in early July. We returned to W.G. Smith Bay on July 4.

Among other studies we determined the limit of postglacial marine submergence at approximately ten places along

the west coast. The limit of submergence is very clearly defined and appears to lie between 460 and 500 feet above the present sea level. In the former submerged areas the valleys draining to the west coast are filled with what appears to be terraced outwash deposits. Following a period of foggy weather we returned to Hall Beach with the dogs and sledge aboard a Dakota aircraft on July 18.

We flew to Sarcpa Lake on July 24 while Kalaut returned temporarily to Igloolik to hunt walrus. Between July 24 and August 5 two foot traverses, each lasting several days, were made northwest and southwest of the lake to areas which it had not been possible to visit in 1957. We returned to Hall Beach by aircraft on August 5.

Kalaut was waiting for us at Hall Beach and on August 8 we travelled to Igloolik in the 16-foot aluminum boat we had used in 1957. In contrast to the previous summer we found very little drift ice along the east coast. Brief visits were made to the Eskimo settlements at Kingmitokvik and Pinger Point. Between August 9 and 14 we visited Richards and Quilliam bays. In the vicinity of the Bouverie Islands the limit of marine submergence was found to be approximately 330 feet, considerably lower than on the west coast and at points farther south on the east coast of the peninsula.

We made a particularly interesting foot traverse across the peninsula from Mogg Bay to Franklin Bay between August 15 and 21. Travelling with the assistance of pack dogs we passed through areas of Palaeozoic sedimentary lowland, fluted till plain, and Precambrian crystalline upland to the outwash-filled valley leading to Franklin Bay. Glacial features in the area indicate that the direction of the last glacial movement was from the east-southeast toward the west-northwest. In addition, erratics of sedimentary rock which occur in the interior appear to be similar to the underlying country rock on the east side of the peninsula. These erratics decrease in number toward the west providing additional evidence of an east to west movement. We returned to Mogg Bay on August 25 and to Igloolik a day later.

On August 27 it was necessary to return to Hall Beach to obtain more supplies. On the following day the Fisheries Research Board's vessel M.V. Calanus arrived at Hall Beach from Rowley Island, and on August 29 we returned to Igloolik aboard her.

We left Igloolik by 22-foot freighter canoe for Fury and Hecla Strait on August 31. At Northeast Cape, near the eastern entrance to the strait, we visited a cairn built in 1956 by personnel from

H.M.C.S. Labrador, which contained a message giving the details of the passage of the strait by the icebreaker in that year. Ice concentration was light and we visited Liddon and Amherst islands on September 1. The following day we ran into heavy pack ice west of Amherst Island, which prevented further westerly progress. We therefore returned to Igloolik on September 3 and to Hall Beach on September 4. During the period from August 6, when we first put the aluminum boat in the water, until September 4 much travelling was done by open boat. Fortunately, exceptionally clear and calm weather prevailed.

The study of Melville Peninsula will be continued during the summer of 1959, working from Repulse Bay.

"Eskimo Yo-Yo". By G.W. Rowley

When I was at Point Barrow in 1955, I learned that the Eskimo there played a game known among the white population as "Eskimo Yo-Yo". The yo-yo consists of two similar balls joined separately by strings to a small handle. The balls, each about an inch and a half in diameter, are made of sealskin and enclose pebbles, to give weight, covered with a padding of deer hair. The strings, each about 2 1/2 feet long, are of plaited caribou sinew and the handle is a short piece of baleen or a walrus tooth. The Eskimo at Barrow sell a number of these yo-yo's to white visitors.

The object of the game is to get the balls spinning about the handle in opposite directions, one clockwise and the other counter-clockwise, in a vertical plane, and to keep them spinning in this way by moving the handle up and down. Once the knack has been learnt it is very easy, but learning the knack takes time and patience, in my case about two hours, which is probably about average. I had never seen this game among other Eskimo and as far as I know it is not reported in any account. I thought therefore that it must have originated locally.

Since that time I have shown one of these yo-yo's on separate occasions to two Eskimos in my house in Ottawa, Mary Panagoosho and Idlaut, both of whom come from the Pond Inlet region of Baffin Island. At first they said they did not know the game, but as soon as they saw me playing it they remembered having seen it as children and when they tried to copy me they were immediately successful, which they would not have been had they not learnt it before. It seems therefore that it is a widespread

culture element among the Eskimo but it has, rather surprisingly, escaped the notice of the extremely observant anthropologists who have worked in the Eastern Arctic, and who have described other Eskimo games such as ayagag and nuglutang.

One evening at Mr. Tom Manning's house I picked up an Eskimo bola and found that the game could be played by holding it at the knot in the centre and spinning two of the bola balls. This may well indicate the origin of the game as the bola is believed by Mathiassen to be an old culture element common to all Eskimos, though it is rarely used now.

A commercial version of this game has appeared recently on the North American market under the name "Wing-Ding".

Change of Address

Members are earnestly requested to advise the Treasurer, Mr. J.E. Cleland, P.O. Box 68, Station D, Ottawa, promptly of any change of address.

Editorial Note

The Editor wishes to thank Dr. R.G. Blackadar for his assistance with the Circular.

The Editor would welcome contributions from those who are at present in the Arctic or have information about work in the Arctic. All material for the Circular should be sent to:

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