ARCTIC CIRCULAR

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THE ARCTIC CIRCULAR

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Ninety-seventh Meeting. The ninety-seventh meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C. on March 8.

Mr. Gordon W. Stead spoke on "Northern sea supply".

Ninety-eight Meeting. The ninety-eight meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C. on April 12.

Superintendent W.G. Fraser, R.C.M. Police, described some of the more important patrols carried out by members of "G" Division in the north.

Archaeological work, Ivugivik and Mansel Island, 1959. By William E. Taylor, Jr. [1].

From late July until mid-September of 1959 I carried out archaeological survey and excavations around Ivugivik and on Mansel Island for the Human History Branch of the National Museum of Canada. Travel to and from Ivugivik was by Austin Airways' Canso based at Moosonee. The field work and local travel depended on a crew of Eskimos and a Peterhead boat.

Two Dorset culture sites (KcGm-1, KcGm-2) on the most northeastern of the Nuvuk Islands, sampled by Douglas Leechman in 1935, were re-found. Test pits revealed excellent middens but the hurried search failed to locate a hoped-for stratigraphy.

1. Human History Branch, National Museum.

Near Ivugivik and at an elevation of 230 feet above sea level a quartz quarry (KcG1-6) was discovered. The quarry pit is roughly twelve by six feet and two feet deep. Although reject material was scattered profusely about the pit the only artifacts discovered were six hammerstones. This site cannot be assigned to any specific prehistoric culture but might well have been associated with the Dorset culture site Eeteevianee (KcG1-1), about a mile distant (see Circular, Vol. 11, No. 4, 1958).

On a rocky point north of Ivugivik settlement and at an elevation of 56 feet above sea level, there is another small Dorset culture site (KcG1-3). The very small sample excavated from this site suggests an occupation very early in the Dorset period. The site consists of a small thin midden. No houses or other features were seen.

On the rocky point between KcG1-3 and the present settlement, three pre-Dorset sites were found (KcG1-4, 5, and 7). Near the south limit of the Meeus site (KcG1-4) there are three obscure house depressions. Otherwise the three sites are indicated only by a thin scatter of artifacts and lithic reject material on the present surface. Elevations range from 105 to 139 feet above sea level. These sites allow a considerable extension to the known area of pre-Dorset occupation in the Canadian Arctic since the nearest related sites, previously reported, are in the Igloolik area, some 500 miles northwest, and on North Knife River, Manitoba, 600 miles to the southwest. Early last winter the National Museum received archaeological collections containing similar specimens from the areas of Cape Dorset (Mr. J. Houston) and Lake Harbour (Mr. J.F. Delaute). Thus a pre-Dorset population of both sides of Hudson Strait is established. Mill, Salisbury, and Nottingham islands are the obvious suggestions as stepping-stones across that strait.

For the Mansel Island work, I returned to Amulet Creek on the east coast, the scene of the 1958 activities when six sites were discovered and excavated (see Circular, Vol. 11, No. 4, 1958). In 1959 an additional seven sites were found. I had thought on the basis of its small 1958 sample, that the Sima site (JIGu-5) was earlier than Collins T-1 site on Southampton Island (H.B. Collins, Ann. Rept. Nat. Mus. Can. Bull. 142, 1956). However, the first few hours of work on this site yielded specimens that showed the two sites were approximately contemporaneous and date to the latter half of the first millennium B.C.

The most important of the sites found about Amulet Creek in 1959 are the Arnapik (JIGu-9) and Roberts (JIGu-12) sites.

These sites are approximately 6,000 and 3,000 feet long respectively and are about 1 1/2 miles apart. They rest on bare, generally unvegetated terraces 1/2 to 2 miles north of Amulet Creek and Digger Lake. The Arnapik site stretches along a headland with its nearest point 3/4 mile from the ocean and with elevations varying from 93 to 139 feet above sea level. The Roberts site, overlooking Digger Lake, is roughly 1 1/4 miles from the sea at an elevation of from 95 to 110 feet. The Roberts site, which seems to be a duplicate of its larger neighbour, was only briefly worked. The Arnapik site consists of about 100 areas of artifact occurrence called findspots. Each findspot of the 63 studied, consists of a surface scattering of chert reject material and artifacts in association with a loose cluster of lichen-encrusted, rounded, igneous or metamorphic stones, fist-sized or slightly larger. These cobbles, from 20 to 200 in a findspot, are scattered on the surface over an area ranging from 12 to 25 feet in maximum diameter. Perhaps they are the fractured, eroded, and scattered remnants of hearths. Some of the findspots also have a faint gravel ring and a few nearly buried limestones indicating remains of structures. In a very few instances vertically-set limestone slabs projected to the ground surface. These features certainly merit excavation, but by a more skilled crew than that which painstakingly collected surface material in 1959. There are about 2,000 artifacts in the Arnapik site collection, all from the surface, and except for a very small percentage of quartz crystal and slate, all are of chert. I have seen no other site in which reject material lay in such tiring abundance.

The elevations and typological similarities suggest that the Arnapik and Roberts sites are close in date to the three pre-Dorset sites at Ivugivik. The material obtained is typologically related to other Eastern Arctic pre-Dorset components such as North Knife River (J.L. Giddings, Amer. Antiquity, Vol. 31, No. 3, Jan. 1956), Independence I (E. Knuth, Proc. 32nd Int. Cong. Amer., Copenhagen 1956, 1958), and Sarqaq (J. Meldgaard, Amer. Antiquity, Vol. 17, No. 3, Jan. 1952; H. Larsen and J. Meldgaard, Medd. om Grønland, Vol. 161, No. 2, 1958). In addition, these sites contain several traits relating them to the Dorset culture and supporting the view that the pre-Dorset culture is a parent of the Dorset (Taylor, Anthropologica, N.S. Vol. 1, 1959). The most difficult question for these Mansel and Ivugivik pre-Dorset sites is their chronological position within the pre-Dorset period which is known to have existed roughly throughout the second millennium B.C. at least. From a preliminary examination of published illustrations, our material generally seems more like Independence I

and North Knife River, and less like the Sarqaq culture. Independence I is held to be the oldest pre-Dorset in the Eastern Arctic and Sarqaq among the latest pre-Dorset. In the Sarqaq culture, burins, an important type in chronological assessment, are remarkably uniform in type while the Arnapik site burins are quite variable. Again early, rather than late, pre-Dorset is indicated. Compared with all the early Dorset sites with their abundant humus, sod, and preserved bone seen in the area, the barren unvegetated surfaces of the Roberts and Arnapik sites with their scarcity of preserved bone suggest, perhaps, a much greater rather than a slightly greater antiquity. Conversely, the elevations for our pre-Dorset materials are as low as 90 feet above sea level while on Mansel, near the Arnapik site, early Dorset material occurs from 45 to 86 feet above sea level. If the Arnapik site is actually of early pre-Dorset time, one would expect a greater gap in elevation although such is not mandatory on present data. Correlation of the Mansel and Ivugivik beaches with Meldgaard's Igloolik area is a temptation prohibited by lack of published data on his material and a general geological fog that still obscures the inter-relationship of Eastern Arctic terraces.

A comment on site names might be helpful. The National Museum assigns sites a code designation based on a grid system. Sites of consequence are also given a name for ease of memory. These names should be distinctive, brief, and of easy pronunciation. Thus, I have foregone the Danish custom of using Eskimo place names - indeed many site locales have no place name or at best, one that applies to a dozen or so places. Consequently, an archaeologist is free to indulge his whims. The Meeus site is named for Father Joseph Meeus, O.M.I., of Ivugivik, who made many valuable contributions to the 1959 field work. The Arnapik site carries the name used by our 1957-8 crews for my wife. The Roberts site is named for Mr. William "Bob" Roberts who for 35 years has been guardian of the National Museum's anthropological collections.

Field activities of the Geological Survey of Canada in the Arctic, 1959.[1] By R.G. Blackadar

The Geological Survey continued an extensive programme of reconnaissance mapping in various parts of the Arctic in 1959 and this work resulted in the mapping of about 200,000 square miles of hitherto little known terrain. Two of the projects were aircraft-supported, one by helicopters and the other by Piper Super Cubs.

Operation Coppermine: An area of about 65,000 square miles lying between Great Bear Lake and the arctic coast was mapped on a reconnaissance scale using two Bell 47-G helicopters supported by an Otter aircraft. The geological party consisted of J.A. Fraser, B.G. Craig, W.L. Davison, and W.W. Heywood, assisted by two university students. The supporting party was one radio operator, two cooks, one labourer, two helicopter pilots and two helicopter engineers, and one Otter aircraft pilot.

The boundaries of the area mapped are: the 124th meridian south from the arctic coast at Darnley Bay to the north shore of Great Bear Lake and thence easterly along the north and east shores of the lake to the 66th parallel near Port Radium. From there it runs east to the 116th meridian and thence south to the 65th parallel, which marks the southern limit. The easterly limit runs north along the 112th meridian from the 65th parallel to the arctic coast, which forms the northern limit.

The gasoline required for Operation Coppermine had been cached in 1958 at Coppermine and near Port Radium, and in June of the operating year much of this fuel was flown to sites throughout the area to be surveyed. A Bristol aircraft was used in addition to the Otter for this phase of the work.

The first camp was established on an unnamed lake about 100 miles east of Port Radium and the movement of personnel from Yellowknife to this camp began on June 10. The first geological flights were made on June 13. In the course of the season six main camps were successively established throughout the area and from these a series of parallel east-west flights were made, the distance between flight lines being about six or seven miles. The last traverse was flown on August 30 and by September 3 all personnel and equipment had been moved back to Yellowknife.

The helicopters were supplied by Spartan Air Services and the fixed wing aircraft by Wardair Ltd. The helicopters flew

1. Published by permission of the Director, Geological Survey of Canada, Ottawa.

501 hours and the fixed wing aircraft 323 hours. The total cost of the operation was about $139,000 or roughly $2.14 per square mile mapped.

Although the summer was cold the last two weeks of August were unusually fine and offered perfect flying conditions between August 14 and 29. Traverses were flown on 56 days or on about 70 per cent of the days that geological work was in progress. The period of break-up was relatively short; the Otter aircraft left Lac Rouvière on June 28 on skis, returned to Yellowknife and landed at the lake again on July 9 using floats.

The northwest boundary of the Canadian Shield, except for scattered inliers, follows a line extending from Coppermine to the head of Dease Arm and convex towards the northwest. Strata north of this line are mainly Palaeozoic in age and for the most part older than middle Devonian although drift-covered areas near Great Bear Lake may be underlain by Cretaceous rocks. Marine shells found near the mouth of Tree River indicate an emergence of at least 495 feet. This emergence apparently decreases along the coast to the west. Similarly, beaches at Hornby Bay, at the east end of Great Bear Lake, indicate a former maximum level 480 feet above the present lake surface. This value also decreases to the west and at longitude 124 degrees no evidence was found for levels much higher than the present. No indication was seen of marine waters having entered the Great Bear Lake basin.

Banks and Victoria islands: In 1959 the Geological Survey continued the use of the Piper Super Cub in reconnaissance mapping. In one season all of Banks, Victoria, and Stefansson islands was examined by four geologists using two Super Cubs. The first geological flight was made on June 27 and the party returned south on September 14.

The geological group was R. Thorsteinsson, E.T. Tozer, J.G. Fyles, and R.L. Christie. The pilots, R.O'Conner and A. McNutt, of Bradley Air Services, the supplier of the aircraft, were joined near the close of the season by R.M. DeBlicquy, and a cook completed the party.

The Piper Super Cub aircraft were fitted with specially designed wheel hubs and moulded tires. The oversize tires, 30 inches in diameter and carrying about 5 pounds air pressure, permitted safe landings on entirely unprepared and extremely varied terrain. In nearly all cases landings were made where required by the geologist and within a short walk of the outcrop which interested him.

Geological study from routine landings on unprepared terrain was pioneered in 1958 by W.W. Phipps of Bradley Air Services

and by R. Thorsteinsson and E.T. Tozer of the Geological Survey on Melville Island (see Circular, Vol. 11, 1958, pp. 59-61). Many hundreds of landings have been made in the last two seasons. This achievement is owing in part to the fine performance of the aircraft used but more to the skill and judgment of the pilots in choosing landing sites and in adapting to varied terrain and flying conditions.

A base camp was maintained throughout the 1959 season at Holman Island settlement on Victoria Island. Light camps with food and fuel stocks were established at several localities and were used as bases for periods of two or three weeks. A considerable amount of flying was done from Holman Island and the working range was increased by laying out small gasoline caches using the Super Cub. The party was also given accommodation for a short time at the Department of Transport weather station at Sachs Harbour on Banks Island and at certain D.E.W. Line facilities on Victoria Island. In all cases the members of the Survey party were hospitably received.

The bedrock formations range in age from Precambrian to Cenozoic and in addition there are extensive surficial deposits. Considerable data were obtained on the latter by J.G. Fyles.

A small area of moderately and steep dipping quartzite with granite was discovered near the head of Hadley Bay on Victoria Island. About 7,000 feet of sedimentary rocks of the Coppermine series type rest unconformably on the quartzite. This series of Precambrian sandstones, limestones, shales, gypsum, and basalt have been thickened considerably by large diabase sills. The sills have resisted erosion and now cause a distinctive cuesta-form topography.

Most of Victoria Island is underlain by no more than 2,000 feet of flat-lying, nearly unfossiliferous dolomite, which in turn rests with slight angular unconformity upon the Precambrian sedimentary rocks. Silurian limestone is exposed on Stefansson Island, and about 4,000 feet of Devonian limestone and sandstone underlie northwestern Victoria Island and northeastern Banks Island.

Most of Banks Island is underlain by poorly consolidated Cretaceous and Tertiary marine and non-marine sedimentary strata which include coal beds. The total thickness is about 5,000 feet. The Beaufort formation, comprising gravels of late Tertiary or early Pleistocene age, is widely exposed on Banks Island.

All of Banks and Victoria islands have been overridden by glacial ice that moved north, northwest, and west, but the last

(Wisconsin) ice sheet apparently did not reach western Banks Island. Numerous erratics, including granite and gneiss presumably derived from the mainland, are distributed across the islands.

Postglacial emergence is greatest to the southeast and decreases to the northwest. In southeast Victoria Island the land has risen at least 550 feet, in the vicinity of Prince of Wales Strait only about 200 feet, and in Banks Island the amount is not known but appears to be slight.

Southern Baffin Island: Reconnaissance geological mapping began in this area in 1958 (see Circular, Vol. 11, 1958, pp. 62-3) and was continued in 1959. R.G. Blackadar and R. Addison with two Eskimos from Cape Dorset, were landed by a TransAir DC-3 aircraft at the abandoned Hudson's Bay Company post at Amadjuak on May 18. During the next two months they carried out a geological reconnaissance extending north from the coast to the vicinity of Mingo Lake. This area was covered by means of a number of back-packing trips, each of which lasted some weeks. Several caribou were seen during this period in addition to geese and arctic hares. The weather was quite stormy and fine periods of more than a few days were rare. The winter ice cleared from Amadjuak Bay on July 13 and the geological work was extended eastwards along Hudson Strait to White Bear Bay using a 20-foot freighter canoe.

The Aivik, a peterhead boat owned by the Pootogook family, met the party on July 24 and this boat was used for the next two months in extending the coastal reconnaissance. By the close of the season, most of the coastal areas between Fair Ness and Diamond Islands had been mapped as had the more accessible interior regions.

Geologically the area comprises a succession of crystalline limestones, rusty schists, quartzite, garnetiferous gneiss, and granite gneiss, the last two being the most abundant rock types. Tabular bodies of amphibolite within the gneisses are often magnetite-bearing but, although several magnetite-rich zones were prospected between 1956 and 1958 by mining companies, there is at present no activity in the area.

Field work was completed on September 16 and Blackadar and Addison left Cape Dorset aboard the C.G.S. N.B. McLean on September 26. They transferred to the C.G.S. Sir Humphrey Gilbert at Cape Hopes Advance and reached Montreal on October 9.

It is expected that this work will be concluded in 1960.

Belcher Islands: The mapping of this interesting group of islands, the scene of some mineral exploration by private companies in

recent years, was begun in 1958 by G.D. Jackson, who completed the reconnaissance study in 1959.

The party, consisting of Jackson and three assistants, was flown from Moosonee to the Belcher Islands on June 25 in a Canso aircraft operated by Austin Airways. Travel within the field area was by an Eskimo-owned boat and also by freighter canoe. Although the weather was generally fair, it proved to be an unusually windy summer causing difficult travelling. Several schools of white whales were encountered and seals seemed to be fairly abundant. The return trip was made to Moosonee on September 16, again using a Canso aircraft.

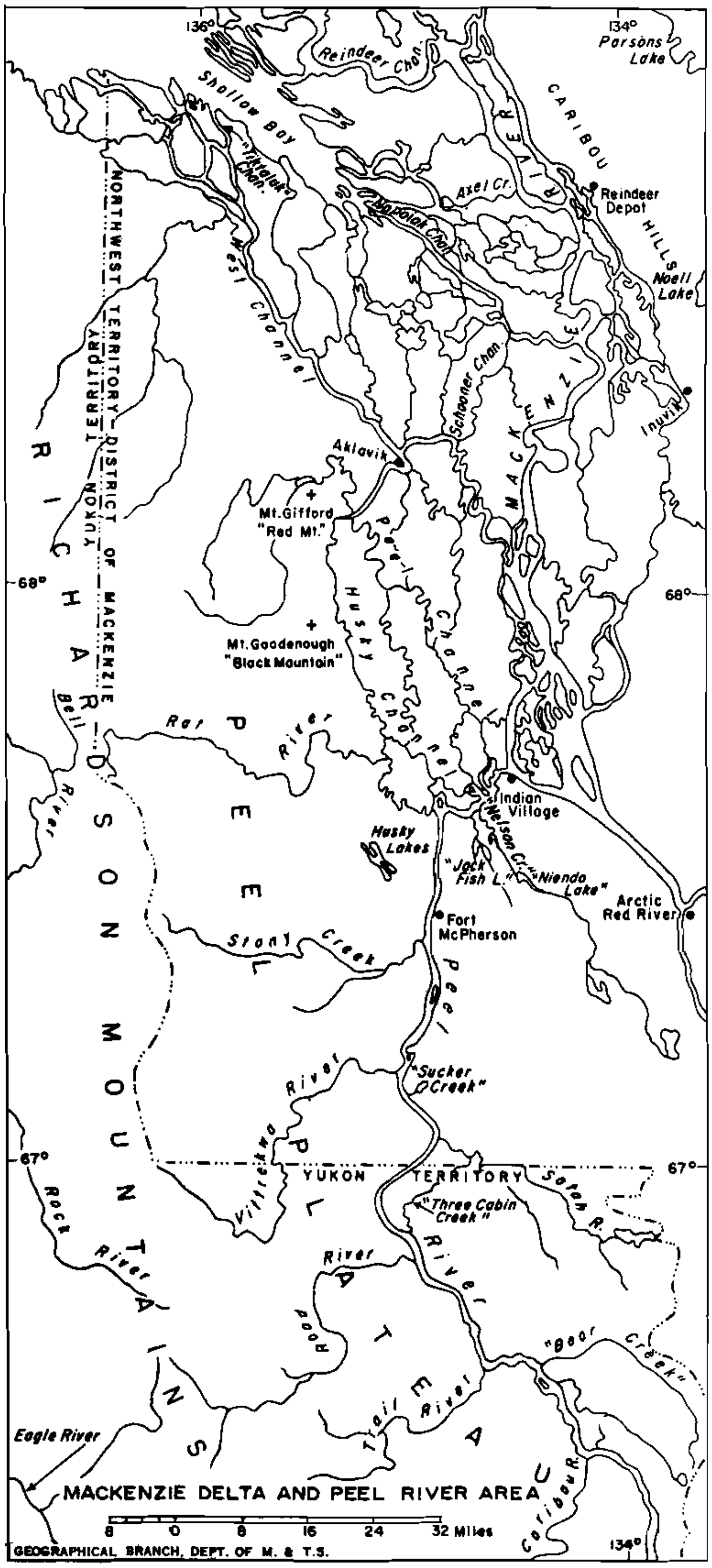
The project resulted in the mapping of about 20,000 feet of Proterozoic sedimentary and volcanic strata including 250-400 feet of iron formation.

Miscellaneous: In addition to the reconnaissance studies described above, several detailed projects were carried out in the north. Palaeontological studies were made by P.J.M.J. Sartenaer in the Mackenzie River basin and by J.A. Jeletzky in western District of Mackenzie and eastern Yukon. C.H. Smith began a detailed investigation of the ultrabasic Muskox Complex in the Big Bend of the Coppermine River, where the Canadian Nickel Company had already made some studies.

Geographical Branch Survey in the Mackenzie delta and Peel River area, 1958.[1] By W.E.S. Henoch

In the summer of 1958 the Geographical Branch sent two parties to the Mackenzie delta and Peel River areas. The first party, consisting of Dr. J. Ross Mackay, of the University of British Columbia, and an Eskimo, Albert Oliver, carried out a geomorphological study of Richards Island in the outer portion of the delta. The second party consisted of W.E.S. Henoch of the Geographical Branch, Donald H. Brown, of the University of Western Ontario, and Angus Firth, a resident of Fort McPherson and grandson of John Firth, one of the first managers of the Hudson's Bay Company in the settlement. This party made a physical and human geographical study in the southern part of the Mackenzie delta in the Peel River area.

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



Reindeer Chan.
Parsons Lake
Shallow Bay
Reindeer Depot
CARIBOU HILLS
Noell Lake
West Channel
Schooner Chan.
Inuvik
Aklavik
Mt. Gifford "Red Mt."
Mt. Goodenough "Black Mountain"
Peel Channel
Husky Channel
MACKENZIE RIVER
Rat River
Bell River
Indian Village
Husky Lakes
"Jack Fish L."
Nelson Cr.
"Niendo Lake"
Arctic Red River
Fort McPherson
Stony Creek
Peel River
"Sucker Creek"
Vittrekwa River
YUKON TERRITORY
NORTHWEST TERRITORY
DISTRICT OF MACKENZIE
RICHARDSON MOUNTAINS
PEEL PLATEAU
"Three Cabin Creek"
Satah R.
Rock River
Road River
"Bear Creek"
Trail River
Eagle River
Caribou R.
68°
67°
136°
134°
MACKENZIE DELTA AND PEEL RIVER AREA
8 0 8 16 24 32 Miles
GEOGRAPHICAL BRANCH, DEPT. OF M. & T.S.

Mackay, Henoch, and Brown left Edmonton on June 12 by Canadian Pacific Airlines and arrived in Aklavik late that night. Although the field equipment was delayed in transit and did not reach Aklavik until June 20, it was possible to collect enough equipment to improvise a reconnaissance trip, using canoes and outboard motors, to the outer part of the delta. On June 17 the combined party proceeded along "Tiktaluk Channel" to its mouth where they camped. From here they made overland and boat trips to the areas of injection domes discovered by Mackay during the Geographical Branch survey in 1957. Five domes were inspected west of "Tiktaluk Channel" where they are flat-topped, oval hills, 100 to 200 feet in diameter and 15 to 20 feet high, rising from an alluvial plain, 15 feet above sea level. Domes are more numerous east of Shallow Bay on low islands subject to flooding. The injection domes in this area are widely scattered and are only 20 feet high and 40 to 60 feet in diameter. Although the islands on which they occur are extremely flat the domes are at first difficult to locate. Four were examined. They are formed of clay and silt with thin layers of peat and outwardly look like incipient pingos, but their origin appears to be quite different, and for this reason the name "injection dome" is used. In most of the domes the sediments have been disturbed indicating upthrusting. The centre of one dome has been exposed by wave action revealing a mud centre from which peat gasses issue.

The return route to Aklavik led through Axel Creek to Reindeer Depot where arrangements were made for the installation of a tide gauge. The water level changes obtained were later used by Mackay in his study of the processes of break-up on the river. The party left Reindeer Depot on the evening of June 22 and reached Aklavik the next day. The following three days, June 24 to 26, were spent sorting equipment, packing the canoes of both parties, installing tide gauges on "Hudson's Bay Channel" a few miles from Aklavik, choosing sites for sedimentation pans, and organizing collection of water samples during the summer from the nearby channels. Mackay's party left Aklavik on June 27 for Richards Island where they worked until mid-August when Mackay returned to British Columbia.

Henoch's party left Aklavik for Fort McPherson in a 22-foot canoe with outboard on June 28. During the next two months studies were made with the ultimate aim of determining the age of the Mackenzie delta and the Peel River valley, the extent, thickness, and direction of glaciation, the limits of marine transgression, and

the processes involved in the formation of the alluvial plains and the channels which cross them. Numerous profiles of the banks and channels in the delta and on Peel River were surveyed.[1] Water samples were collected and later examined by the Mines Branch, Department of Mines and Technical Surveys.[2] The discharge was measured in a number of places, and with the data obtained an approximate figure for river load in suspension can be calculated.

En route to Fort McPherson we studied the morphology of the delta channels and made a short trip overland to the foot of Mt. Goodenough, locally known as "Black Mountain", where we observed various forms of mass movement including slumping, sliding, and mud flow. Our main interest, however, was in the pingos which were unknown in this area until they were examined by J.K. Fraser in 1954. The route through the willow thickets and hummocky muskeg in hot weather (80°F), rain, and swarms of mosquitoes made this trip one of the least comfortable of the summer. On July 1 we reached Fort McPherson and established our base camp.

The population of Fort McPherson consists almost entirely of Indians who live by fishing, trapping, and hunting but whose life and settlement will change rapidly with the completion of the road from Dawson. From July 1 to 20, therefore, information for a demographic study of Fort McPherson was collected, including data on population, housing, and economy.[3]

During this time a two-day overland trip was made to the Stony Creek area where terraces on the escarpment of Peel Plateau were examined. These were previously interpreted as

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[1] W.E.S. Henoch, "Some aspects of the formation of the alluvial plains on Peel River and the Mackenzie delta". To be published in Geographical Bulletin, No. 15, Geographical Branch, Department of Mines and Technical Surveys, Ottawa.

[2] John Unger. Canada, Department of Mines and Technical Surveys, Mines Branch, Industrial Minerals Test Report IM 58-130. "Chemical analysis of surface water samples collected by Geographical Branch field party in the Mackenzie River delta during the period July-September 1958".

[3] W.E.S. Henoch, "Fort McPherson". A study of the settlement and itspeople, to be published in Geographical Paper Series, Geographical Branch, Department of Mines and Technical Surveys,

features controlled by fault lines or as postglacial marine terraces. No faulting was found, but evidence points to their preglacial origin. Another trip was made to Indian Village, an outpost of Fort McPherson near the mouth of Peel River. On this trip we surveyed the whirlpool scars which have resulted from the reversal of the flow of lower Peel River between its mouth and Husky Channel during the spring floods; these scars, excavated in the banks, are several hundreds of feet wide. The result of flooding in alluvial plain formations was studied along "Nelson Creek", the right tributary of Peel River sixteen miles downstream from Fort McPherson.

Between July 20 and August 2 we travelled by boat up the Peel River to the area of "Three Cabin Creek". On the way we made a number of short foot traverses, surveyed profiles of the Peel River valley, and collected soil samples. On several overland trips in the "Three Cabin Creek" area, marginal and subglacial drainage channels surrounding the alluvial plain of Satah River and "Three Cabin Creek" were examined. The data and observations collected should make it possible to interpret the local development of relief since the last glacial advance. During July 27 and 28 we investigated glacial features and several spectacular landslides on the Peel Plateau escarpment north of Road River.

On August 2 we returned to Fort McPherson to replenish our gasoline and provisions. The following day, and on several later occasions, the oil companies conducting geological surveys in the area made it possible for us to secure a number of helicopter flights which greatly extended the scope of our survey. The foothills of the Richardson Mountains were visited in the Stony Creek area where marginal glacial channels were studied in two localities. Channels of this type indicate the maximum westward extent of the last continental ice sheet. The observations verified that the mountains had escaped extensive glaciation during the advance of the last continental ice sheet.

On August 5 a helicopter flight enabled us to study additional glacial and fluvioglacial features between Stony Creek and Vittrekwa River. A reconnaissance flight over Richardson Mountains, the "Three Cabin Creek" area to Arctic Red River, and back to Fort McPherson was made the same day. On August 6 we were taken by helicopter to the foothills of Richardson Mountains in Vittrekwa River area where more glacial channels were examined.

We left Fort McPherson, again by canoe, on August 8 and pitched camp at the confluence of Caribou and Peel rivers on

August 11. The following day we examined a buried channel on the right bank of Peel River, three miles north of Caribou River. On August 13 a helicopter took the party to the right bank of the Peel River five miles south of Caribou River, where other abandoned fluvioglacial channels were examined. Rain interfered with field activities during the next three days, but on August 17 we made a helicopter reconnaissance of the watershed of Caribou River and Peel River, landing at several places on the right bank of Peel River between the camp and 67° 45N. On August 18 another buried channel on the right bank of Peel River north of the mouth of Caribou River was studied and the following day an overland trip was made five miles up Caribou River.

On August 20 we started back to Fort McPherson. On the way north, we examined the tortuous "Bear Creek" and found it navigable for a distance of about 3 1/2 miles when measured in a straight line to the first rapids. The party reached Fort McPherson on August 25, where the next four days were spent collecting further economic data.

On August 30 the last trip was made by helicopter along the west bank of Peel River to Trail River, thence up Trail River and across Richardson Mountains to Eagle River; we did not see any signs of glaciation. On the return trip we flew to Trail River valley, followed it to the eastern edge of the Richardson Mountains, north to Stony Creek, and eastward to Fort McPherson. On August 31 we left Fort McPherson and travelled via Peel River and Peel Channel to Knut Lang's trading post, thirty miles south of Aklavik.

Spring and summer in the delta gave us an opportunity to identify many species of birds. Even an inexperienced bird-watcher can delight in observing such spectacular birds as Whistling Swans (mainly in the outer part of the delta), Canada Geese, and Bald Eagles. All attempts to fish with a rod in the delta of the Mackenzie and Peel rivers and in their tributaries were unsuccessful, but whenever nets were set fish were caught in great numbers. At the end of July, fish were sufficiently plentiful in Peel River for one of the natives to use a fish wheel successfully. This method was introduced from the Yukon River.

Of the large numbers of game reported in Peel River area and Richardson Mountains at the turn of the century only a small percentage remains. Moose tracks were seen frequently on the alluvial plains of the Peel River near Caribou River, but the only moose seen was in the upper part of Eagle River. The

party heard wolves howling near Caribou River. Beavers were observed in the valley of "Sucker Creek" and near the mouth of Caribou River. Black bears were most numerous near Caribou River where we saw five adults and the footprints of two cubs. Signs of another bear were found on the floor of the glacial meltwater channel near Vittrekwa River.

We arrived in Aklavik on September 1. The following days were spent dismantling and packing the tide gauge, and packing water, soil, and rock samples, and instruments. We left Aklavik by air for Edmonton on September 8.

Subscriptions for 1960

Members are reminded that their subscriptions for 1960 ($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, Miss M.C. Murray, 249 Irving Avenue, Ottawa 3.

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 and will transmit them to Canada from time to time. European members should forward their 1960 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, Miss M.C. Murray, 249 Irving Avenue, Ottawa 3, 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,
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Ottawa 2, Ontario

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The Annual Dinner. The Annual Dinner of the Arctic Circle was held in the Clark Memorial Recreational Centre of the Civil Service on 5 May 1960. Commissioner L.H. Nicholson gave an address on the north and the Eskimo.

One hundredth Meeting. The one hundredth meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C. on 11 October 1960.

Mr. J.K. Fraser spoke on "Scenery and settlement in the Western Arctic".

One hundred and first Meeting. The one hundred and first meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C. on 8 November 1960.

Dr. Walter Heikkila spoke on "Rocket experiments at Fort Churchill, Manitoba".

One hundred and second Meeting. The one hundred and second meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C. on 13 December 1960.

Dr. R.L. Christie spoke on "Geological reconnaissance of Ellesmere Island".

Address at the Annual Dinner. By L.H. Nicholson

When asked by your President to speak at your dinner, I realized that I would be expected to speak on the north and more specifically on the northern people - the Eskimo. But let me say at once that I have no fine new prescription to cure all the ills of the north. What I should like to do is to summarize the problems, to re-state and emphasize them, and perhaps to add one or two new thoughts.

When preparing this talk I decided I needed some rules to guide me:

1. I decided not to waste time on what has happened in the past except in so far as we may draw lessons from it. There is a temptation to argue about and to explain past mistakes and accomplishments, but the vital issue is what is to be done in the present and future.
2. I warned myself not to be dogmatic, for who can be certain of the right course to take in dealing with the complicated economic and social problems of the north and of our northern people. We may hold strong views on certain broad principles, but in the detail of application we must expect some mistakes and some use of the "trial and error" technique.
3. I decided I should try to be as specific as possible on principles and their general treatment. We hear too many vague statements on, for instance, "the need to help the Eskimo", "to place him in the same position as other Canadians", and "to recognize him as a citizen". These are desirable sentiments, of course, but those who voice them should say how and where they are to be followed up if they are not satisfied with what is being done.

First, let us remind ourselves of some facts.

Population

There are about 10,500 Eskimos - the population of a medium-sized Canadian town - scattered over hundreds of thousands of square miles of territory from the Mackenzie delta to Ungava Bay, and from the tree-line almost to the tip of the Arctic Archipelago.

Northern Quebec and Labrador	3,500
Arctic islands	3,300
Along the west coast of Hudson Bay and inland therefrom	1,600
Along the central arctic coast	800
The Mackenzie delta area	1,200
Northern Manitoba	100

Of these 10,500 about 3,000 are male adults.

Employment

There is an estimate that for some years at least about one-half of the male adults should be able to support themselves and their families from the land by hunting, trapping, fishing, and handicrafts, mostly in the islands and along the central arctic coast. This means that the other 1,500 need wage employment. About 500 are now so employed, so without too much delay 1,000 jobs are needed, and 1,000 more Eskimo men need to prepare themselves for these jobs. At present some 6,600 men are employed in the Eskimo country, and of these 1,100 are government servants.

Next, let me raise a question of principle. In trying to help the Eskimo are we to assist and encourage him to stay in his own part of the country or, because that part seems to us distant and bleak, should we encourage him to move south into the provinces? This is not the place to debate the issue, but let me mention a few of the main considerations - and you can at once see that I favour encouraging the Eskimo to stay in the north.

1. In the first place, the north is the Eskimo's home, and I think he has a love for it.

2. There is surely more hope of the Eskimo people retaining their identity as a race if they stay together in the north. If encouraged to come south would they not quickly be lost in the comparatively vast white population? And what would be the psychological effect on these people if torn away from their own roots and values, and exposed suddenly to the complexities, pressures, and faults of our system?

I am not a segregationalist - I believe that there should be Eskimos in southern Canada as well as white men in the Eskimo country. Individual Eskimos should be welcomed when they come out for higher education, specialized training, or employment not available in the north.

I am bold enough, however, to say that I think the best course for the Eskimo as a people is to stay in the north, and, with such help as we are able to give them, ultimately to take their place there as a healthy, strong segment of the Canadian population. I also think that any help we give them now to that end will be more than repaid later.

3. From the national - perhaps some might say the selfish - standpoint, surely there is no question but that the Eskimo will be needed more and more in the north. I think there will be a modest but growing demand for workers, technicians, and professional men as the country opens, and, when trained, who is better suited to fill these jobs than the Eskimo? At present, almost all white men in the country are transients and this is likely to continue. Would it not be better to have permanent residents filling permanent jobs? And who else but the Eskimo should continue to harvest the fish, fur, and game resources north of the tree-line?

Now, what lessons may we draw from the past? You will recall that I said in opening that I proposed to refer to the past only to the extent that lessons might be learned by so doing.

1. First, I suggest past experience tells us to look ahead, not just to 1963 or 1965, or even 1970, but to 1980 or 1990, a generation ahead. Think how much better off we would be now if a good "look ahead" had been taken in the 1925-35 period. If, for instance, some careful attention had been given then to the improvement of educational facilities, and if it had been appreciated that all Eskimos might not always remain hunters and trappers. I know other things took our attention in those years; nevertheless I think my point is still valid.

2. The second point which past experience should teach us is that more is involved than physical survival alone. The history of dealings with other indigenous people in our own country as well as elsewhere should tell us this. In some places the record is good, in others anything but good. We may learn something from the treatment of the Maoris in New Zealand and the Eskimos in Greenland, but I am not sure we learn much from the treatment of the Indians in the United States.

I suppose this is largely a question for sociologists, but as a layman I venture to suggest that there is not much value in preserving the Eskimo physically unless we also help him to preserve his spirit, his self-reliance, and his pride. I suggest he retains his pride and position while he continues to support his family by hunting, trapping, fishing, or handicraft work. I suggest he retains and strengthens his pride and position when he

shows that he can successfully fill a wage job in a mine or mill, or in a service occupation, that he can work shoulder-to-shoulder with the white men who have entered his country, and when he realizes that he is accepted as an equal. I suggest he fast loses his racial pride and his self-reliance when circumstances force or allow him to hang about the fringe of a white settlement without regular work, becoming a scavenger, a bum, or a tourist curiosity.

Next, what do we see if we try to look ahead a generation to, say, 1990? I suggest we may reasonably expect to to find these things:

Better transportation, air, water, and ground
More mines and oil wells
More exploitation of fisheries and forests
More animal husbandry
More, much more, service employment for Eskimos, as for example:
    Priests and policemen
    Administrators and other civil servants
    Teachers and traders
    Seamen and aircraft pilots
A standard of literacy comparable with that found elsewhere in Canada
A high proportion of all jobs beyond the tree-line filled by Eskimos
Permanent housing the rule rather than the exception
A greater degree of self-government
Some Eskimos established in universities and professions in the south, and going "back home" for holidays
A northern university, planned if not operating.

Finally, what should be done to help? Much is already being done. I think further steps are largely a matter of adjustment and extension. I have already suggested that we should look well ahead - we should have long-term targets as well as plans for immediate action. But we should not rush these plans. Transition must take time; it cannot be machine-like. There will inevitably be some irritation, waste, and mistakes, and these things must not discourage or scare us.

We should continue to assist the Eskimos to qualify for more and more wage and salary employment, scaled roughly to the anticipated demands of the north. And we should aggressively seek job opportunities for Eskimos in the north - every man placed in a permanent job in his own region represents a victory.

We must also continue and extend our efforts to help those who remain on the land to make a better living and to fit gradually into a more stable social structure. But this work must be handled with delicacy. Who are we to teach the Eskimo how to hunt or to make a suitable arctic habitation? I suggest we must do what we can through the use of competent, dedicated men able and willing to live and work with the Eskimo in the Eskimo's own environment and to show by example and almost casually such new hunting, fishing, and handicraft techniques as we have to offer, and such new housing, either mobile or permanent, as we may devise. There are a few such men and no organization has a monopoly on them - more are needed.

Given the means to earn a respectable living either from the land or by wage employment, other Eskimo needs will be met with relative ease. Experience shows that under these conditions there is no insurmountable difficulty in gradually improving the educational machine, or in providing normal medical and social services and acceptable housing. The vital thing is adequate productive work.

Finally, we must never forget the wishes, inclinations, and feelings of the Eskimo himself. We want him to preserve his sturdy character and pride. Having seen him as a self-reliant hunter, we want him not as a poor relation but as an equal. This is not a one-sided operation. The Eskimo has much to give to Canada, and I feel we should be able to look forward with confidence to the day when his race will be a strong, healthy, and significant segment of the Canadian population.

Archaeological activities in the southwest Yukon. By Richard S. MacNeish

This season the National Museum's archaeological programme in the southwest Yukon was continued with excavations at two important sites. This programme was concerned with the whole problem of the early peopling of the New World. More

specifically, we were attempting to get a complete archaeological sequence in a limited key area in the Canadian Northwest. Previous seasons by Johnson, Leechman, Rainey, and MacNeish were in the nature of reconnaissances. From their surveys we now know of 121 archaeological sites in the relatively small area between Johnsons Crossing, Mayo, Dawson City, and Burwash Landing. The next step in our programme, in which we are still involved, has been the excavation of the best stratified sites found in the survey. In 1959 we dug three stratified sites from which we could place four of our later cultures in their chronological order. These were from early to late—Little Arm, Gladstone, Taye Lake, and Bennett Lake.

The surveys, however, had indicated that there were at least three more cultures in the area and these we had not found in sequence by the end of our digging in 1959. Thus the 1960 season concentrated on this problem. During July we excavated a site which the survey had indicated was stratified, at the mouth of Gladstone Creek on Kluane Lake. Our excavation showed that there were three cultures one on top of the other. In the uppermost layer was a culture called Aishihik which seems to fall in our sequence between Bennett Lake and Taye Lake. The middle culture was Gladstone, one we had already found elsewhere; and the earliest materials were unlike anything we had previously found and we are now calling them Kluane Lake. Thus, our sequence was still only six cultures, not seven, and one period indicated in our survey was still lacking.

Because of this gap, we moved our camp to the Pelly Farm near the junction of the Pelly and Yukon rivers and began to dig another stratified site. The survey had indicated a possibility of two floors one above the other, but as it turned out there were five floors. The earliest two floors contained material of what we called the Champagne culture, as well as a large number of buffalo and elk bones. This culture, geologically, follows our earliest Kluane Lake materials. The next two floors contained material of the Little Arm culture which we had found at the bottom of our sequence in 1959. The top contained a few artifacts of what seems to be the Taye Lake culture, which is widespread throughout the southern Yukon.

In total thus we have seven cultures which from very early to late are called: Kluane Lake, Champagne, Little Arm, Gladstone, Taye Lake, Aishihik, and Bennett Lake. Single period sites of Little Arm, Gladstone, and Taye Lake, have been tested, so we know a fair amount about these three cultures. Single component sites of the others, however, must be tested in future years to gain a fuller knowledge of these periods. At present we are analysing what we have found and some interesting facts are turning up.

In conclusion I shall briefly touch upon some of the significant points. The Kluane Lake culture may date to the period just following the glacial retreat in the Yukon. The artifacts are related to a number of other very early sites in the western mountainous area of North America, specifically the Kayuk Complex of the Brooks Range of Alaska, the Flint Creek culture of Firth River, the earliest culture of the Fraser Canyon of southern British Columbia, and the Five-Mile Rapid period in the states of Washington and Oregon. These seem to represent an early archaeological tradition in the New World which is contemporaneous with the so-called early man sites, such as Folsom and Yuma, in the Great Plains area. Unlike this Plains early tradition, the material from the mountains seems to have fairly marked resemblances to some of the upper Paleolithic of Siberia, and specifically with one site at the mouth of the Amur River, in northeastern Asia.

The second culture in the sequence, called Champagne, has a series of Yuma points and is definitely related to early sites in the Great Plains. It may represent an invasion of these people from the south and east into the mountainous area. The numerous buffalo bones make one suspect that these people were following a western and northward movement of the buffalo. There are few cultural connections of this group with Asia.

The later cultures, Little Arm, Gladstone, and Taye Lake, seem to represent still a third tradition. The earliest part of this sequence, called Little Arm is, except for its projectile points, identical to late Paleolithic or early Neolithic material in Japan, Outer Mongolia, and perhaps in northeastern Siberia. As far as the north is concerned this first stage of this tradition seems to be confined to central Alaska and to only a small part of the southern Yukon. The two following stages, Gladstone and Taye Lake, see

the development of this Asiatic culture into one that is well adapted to the Boreal Forest, one that is less and less related to anything in Asia and more and more widespread in western Canada. There is some indication that this cultural development took place in the north as the Boreal Forest invaded the area.

The final two cultures seem to be directly ancestral to the two Indian groups of the north, and represent still another adaptation to the Boreal Forest. How they connect with cultures from other or earlier times is still not understood.

As we analyse these materials it becomes readily apparent that there are many problems yet to be solved even though we have a fair sequence and even though we can discern some general relationships with other areas.

Commercial development in the Queen Elizabeth Islands

Following the publication in April 1960 of the Canada Oil and Gas Regulations, oil exploration companies took out exploration permits for some forty million acres in the Northwest Territories, almost all of these in the Arctic Archipelago. During the summer a number of oil companies sent geological parties to the Queen Elizabeth Islands. Piper Cub aircraft, fitted with large low-pressure tires, were used for carrying many of these parties and proved both satisfactory and economical. In July and August up to thirty aircraft were operating in the Queen Elizabeth Islands either in these explorations or on work connected with the Polar Continental Shelf Expedition or other scientific activities. The most active oil exploration company is probably Round Valley Oil Company, a subsidiary of Lobitos Oilfields. This company is attempting to reach an agreement with two or three other companies for shipping a drilling rig into the Queen Elizabeth Islands for their joint use. If this can be arranged they would plan on sending the rig to Cornwallis Island during the summer of 1961. Other companies will probably continue with geological work only next season.

Bankeno Limited, one of the companies engaged in the exploration for oil, discovered a promising lead-zinc showing on Little Cornwallis Island. The samples they obtained were of exceptionally high grade and raised sufficient interest for the company to send in a light-weight diamond drill. The drill reached Resolute by ship in August and was taken by Eskimo boat to the

showings on Little Cornwallis Island. Drilling began around September 1 and continued as long as the weather permitted. It will be resumed in the spring. If the grade of ore remains high, if the deposit is found to be continuous, and if the ore proves to be some feet thick and not just a very thin surface layer, a major development could result. As the showings are close to tidewater it would be comparatively easy to ship ore or concentrates during the short open season using commercial shipping.

New northern institutes

Two new northern research institutes have been established recently, the Institute of Northern Studies at the University of Saskatchewan and the Boreal Institute at the University of Alberta.

Dr. J.B. Mawdsley, who is also professor and head of the Department of Geology at the University of Saskatchewan, has been appointed the Director of the Institute of Northern Studies. The Institute will be concerned mainly with the Subarctic and particularly, though not exclusively, with northern Saskatchewan. During the past summer the Institute sponsored a number of academic studies and a start was made in building up a northern library and in establishing liaison with other northern institutes. The Institute will work in close cooperation with the faculties of the University of Saskatchewan and should serve to focus interest on northern studies within the university.

The Boreal Institute is also concerned with collection and dissemination of northern information, training and instruction on the north, and northern research. Its directorate consists of five full-time staff members of the University of Alberta with Dr. W.C. Wonders as Chairman. A full-time Executive Director will be appointed in April 1961.

Annual meeting of the Indian-Eskimo Association

The newly-formed Indian-Eskimo Association of Canada held its first annual meeting of members in Ottawa on November 10, followed by a conference which lasted through the following day. The general topic of the conference was the advancement of Indian communities, with special emphasis in discussion groups on how voluntary organizations can help. Many voluntary organizations, several of the churches, and the three

federal government departments concerned were well represented. Several Indians and an Eskimo also participated. Mr. Ernest Grigg, of the U.N. Bureau of Social Affairs, described the U.N's Community Development programme, which has been found to apply in industrialized as well as non-industrialized societies.

A report of the conference is contained in the December issue of the IEA Bulletin. The address of the Association, which welcomes individual and organizational memberships, is 21 Park Road, Toronto 5.

Eskimo linguistic research in the U.S.S.R.

The Soviet News Bulletin (No. 190(1,462)) of Thursday, 3 November 1960, mentions that Georgy Menovshchikov, senior researcher of the "Northern Peoples' Languages Section" of the U.S.S.R. Academy of Sciences' Institute of Linguistics in Leningrad, is completing a book on Eskimo grammar. The book will be the result of nearly twelve years research and will examine and compare the grammar of the Asian Eskimos with that of the Eskimos in Canada, Alaska, and Greenland.

Mr. Menovshchikov was one of the first Soviet teachers among the Eskimos, and became very interested in their life, songs, and legends. "Fairy Tales", his first book in the Eskimo language, was followed by textbooks and later by a monograph "Eskimos". He is about to take part in a linguistic expedition to the northern peoples of the Soviet Union, said to be the third of such expeditions since the end of the war. Legends, songs, and riddles will be recorded by the expedition which will be divided into three groups - one to the Nivkhs, one to the Koryaks, and the third to the Eskimos. A reported interview with Mr. Menovshchikov mentions his particular interest in the Sirenik dialect:

"I'm interested at present in some Eskimo dialects, and especially Sirenik, which is actually an independent language by its vocabulary, phonetics, and grammar system. Parallels can't be drawn here with the dialects of Eskimos living in other countries.

"A few words about the Nunivak dialect which is comparatively close to the Sirenik dialect. (Some error has obviously been introduced here in the translation or copying. It may mean that a few words from the Nunivak dialect are comparatively close to the Sirenik dialect. Ed. A.C.) I compiled a dictionary of 3,000 words and wrote several texts after my last expedition. Slightly more than thirty people spoke in the pure Sirenik dialect then. They live among the Eskimoes speaking in their main dialect. Because of frequent intermarriage under the present conditions of development of social life people with the Sirenik dialect, naturally, become assimilated. So that's the reason why I've got to hurry along and record everything I can in their pure dialect. They have many words which can't be found in any other paleo-Asian language. It is possible that some ancient Asian people with a language of their own, crossed at one period with the Eskimoes. It is quite possible that an analysis of collected material will help disclose distant historic relations and contacts between the Eskimoes and other nationalities which have long died out or have become assimilated with other tribes. All this, of course, is interesting and important. It goes without saying that the results of our investigation will subsequently be printed in the publications of the USSR Academy of Sciences, which is financing our expedition."

"Problems of the North"

The National Research Council has announced its plans to translate the Russian journal Problemy Severa. This publication, which is produced by the Academy of Sciences, U.S.S.R., contains papers in the fields of oceanography, geography, geophysics, biology, and economics as they relate to the study and development of the north. The Russian editors have a publication schedule of one or two numbers per year; thus far three issues have appeared, of which the first was published in 1958.

Moira Dunbar, of the Defence Research Board, is Editor-in-Chief of the translation Problems of the North and D.A. Sinclair, of the National Research Council, is Translations Editor. The members of the Editorial Board are: W.M. Cameron, C.S. Lord, A.E. Porsild, D.C. Rose, and G.W. Rowley. The first issue, which contains 29 papers, will appear shortly. It will be reproduced by the zerox process and runs to some 400 pages.

The Editors plan to publish numbers 2 and 3 during 1961. The subscription rate is $7.00 per issue; single papers can be purchased at $1.00. Subscriptions and requests for information should be addressed to the Translations Section, The Library, National Research Council, Sussex Drive, Ottawa 2. Remittances should be made payable to the Receiver General of Canada, and marked "credit National Research Council".

"North"

The Department of Northern Affairs has recently changed the name of their former Northern Affairs Bulletin to North. The volume numbering has been retained, thus the first issue of North is Volume 7, Nos. 4 and 5, July-October 1960. Mrs. M. Gillen is still editor, and the format and contents remain very much the same. The magazine is issued bi-monthly. It is available at 50¢ a copy, or $3.00 a year, from the Queen's Printer.

Change of Address

Members are earnestly requested to advise the Treasurer, Miss M.C. Murray, 249 Irving Avenue, Ottawa 3, 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.

THE ARCTIC CIRCULAR

VOL. XIII No. 3 Published by The Arctic Circle 1960
(March 1961)

Annual General Meeting

The Annual General Meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C., on January 10. The Vice-President, Mr. Trevor Harwood, was in the Chair and opened the meeting by calling on the Treasurer, Miss M.C. Murray, to read the financial statement. Following the adoption of the statement, the meeting congratulated the Treasurer on the way in which she had carried out her duties. During the year the Club's finances had improved markedly because of an energetic drive to collect back dues, but the removal of unpaid members had resulted in a slight decline in the Club's membership. At the start of the fourteenth year of the Circle's existence there were 175 Ottawa members and 256 out-of-town members.

In accordance with the Constitution the following members of the Committee had retired: Mr. J. Cantley, Mr. A. Stevenson, Mr. Fraser Symington, Dr. R. Thorsteinsson, and Mr. J.C. Wyatt. The President, Mr. L.A.C.O. Hunt, had resigned because of absence from Ottawa. To fill these vacancies the Committee proposed: for President, Mr. G.W. Rowley; for Committee, Supt. W.G. Fraser, Col. J.F. Richards, Mrs. A.G. Sangster, and Dr. A. Taylor. These candidates were elected unanimously. The Officers and Committee members for 1961 are as follows:

Officers

President:	Mr. G.W. Rowley
Vice-President:	Mr. Trevor Harwood
Secretary:	Dr. R.G. Blackadar
Treasurer:	Miss M.C. Murray
Publications Secretary:	Miss Mary Murphy
Editor:	Mrs. G.W. Rowley

Committee members

Mr. C.M. Bolger
L/Cdr. J.P. Croal
Supt. W.G. Fraser, R.C.M.P.
Mr. I.W. Loomer
Mr. A.H. Macpherson
Mr. E. Menarik
Mr. W.W. Phipps
Col. J.P. Richards
Dr. E.F. Roots
Dr. D.C. Rose
Mrs. A.G. Sangster
Dr. A. Taylor
Maj. Gen. G.R. Turner
Dr. J.S. Willis

Following the election the Vice-President remained in the Chair, in the absence of the new President. He thanked the auditors, Mr. J. Cantley and Maj. Gen. G.R. Turner, and the meeting re-appointed them for 1961. He also expressed the gratitude of the Club to Major R.A.D. Kelly for the use of the Transport Mess and to Lieutenant B.J. Connelly for making the arrangements at the Mess.

After some discussion the meeting agreed that the Club would hold an Annual Dinner,but that the cost must not exceed expenditure, and should be limited to about $4.00 per person.

At the conclusion of the Club business Mr. B.G. Sivertz spoke on "The north and its challenge to Canadians".

Research on Arctic Fox cycles in the District of Keewatin.[1]

By A.H. Macpherson[2]

Arctic Foxes in northern Canada undergo short-term population fluctuations which may be correlated with cyclic changes in the numbers of small rodents. The Canadian Wildlife Service is attempting to find out how the numbers of foxes are controlled by natural conditions, and in particular by lemming availability. The chief methods employed are the examination of samples from winter trapping in ecologically differing areas, studies of breeding success in terms of density of occupied dens, numbers of young born, and numbers of young reared, and studies of feeding habits by analysis of scats and stomach contents. The work is expected to continue for several years.

1. Published with the permission of the Chief, Canadian Wildlife Service.
2. Biologist, Canadian Wildlife Service.

The past two summers have been spent investigating breeding success, food habits, and lemming availability. In 1959, travelling from Baker Lake, I found a suitable site for the work at the west end of Aberdeen Lake. Foxes were very scarce, as were lemmings. The meagre data secured indicated that the foxes had occupied their dens and had mated, but had failed to rear their young to a stage at which they could be weaned.

The following year, I returned to Aberdeen Lake on May 26. Foxes were scarce, but a few occupied dens were found in the area which it was possible to search by dog-team, on foot, and later by canoe. In early June a small prefabricated building was brought in by aircraft, and was erected to serve as a base for accommodation, storage, and laboratory work. June and part of July were spent observing hunting effort and breeding behaviour at occupied dens, studying food habits, and determining lemming availability.

Most of the fox dens known to the Eskimos of the region have been marked on our maps. Much of this information was collected by Cpl. Clare Dent, R.C.M. Police, and Pequiaq (Peryouar), who is a Predator Control Officer in winter and my assistant in the summer. Although, owing in part to the local Eskimos' unfamiliarity with maps, some of the dens marked have not been found, the information has in general been of enormous value. In mid-July Pilot Hornby and I, in a Champion aircraft on floats, found and examined about 130 fox dens, mostly ones that had been reported by the Eskimos. We circled low over each den, and, if it appeared occupied and a lake suitable for a landing was nearby, we visited it on foot. Most of the dens were in the vicinity of Aberdeen Lake, around lakes west of Dubawnt River, near Deep Rose Lake on Back River, and on the course of Kazan River south to Kazan Falls.

Following the completion of the flights, Pequiaq and I visited all the more accessible dens by canoe and on foot to obtain litter counts. In early August we returned to Baker Lake by canoe, and thence I travelled by air to Ottawa.

Lemmings were very numerous during the summer at Aberdeen Lake, and the few foxes which remained (after one or possibly two seasons of little or no production) bred successfully. Between one-half and one-third of the habitable dens found were occupied, and the number of pups successfully weaned in seven dens varied from four to fourteen, nine being the mean.

Many hours were spent watching fox dens from a distance with 16-power binoculars, and much interesting information on the habits of foxes was accumulated. It was found that only the male foxes hunted for their families, at least until the pups were weaned, and that lemmings formed by far the greater part of the food brought to the den.

In the course of the aerial survey it became obvious that the dens were not permanent structures, but progressed from youth to senescence. Youthful dens are distinguishable by their lack of characteristic vegetation, and by the large heaps of bare sand in front of their component burrows. Older dens are typically clothed in tall green vegetation. As the centre of the den becomes undermined and collapses, occupied burrows are found more and more towards the periphery of the den site. Eventually it becomes exhausted and is not reoccupied by foxes, but the tall grasses and knobbly appearance of the ground identify the site for many years.

Although there is evidence to suggest that starvation and disease kill more foxes than are destroyed by other animals, it is possible that predators may affect fox populations locally, particularly in the breeding season when the foxes are most vulnerable. A few dens had been partially excavated by grizzly bears at some time in the past. A golden eagle was seen attacking a fox family at the den. The foxes evaded the eagle with ease by diving into their burrows, but it seemed likely that foxes hunting far from their dens would be less likely to escape if attacked.

We saw only one adult blue-phased Arctic Fox, a male mated to a vixen of the much more common white phase. Of their seven pups five were blue.

The Canadian Wildlife Service cabin on Aberdeen Lake will serve as a useful base for studies on the biology of arctic animals. Its location is suitable not only for Arctic Fox studies, but also for studies on several other species. Throughout the summer there were caribou in the neighbourhood, and large herds crossed the Thelon River system a short distance to the west. In July several hundred moulting geese, including Lesser Snows, Canadas, and White-fronts, made their appearance, and occasionally a Barren-ground Grizzly would come wandering down-river to the lake.

The last three families of the Aqilinermiut, a group of Eskimos which used to live in the neighbourhood of Beverly Lake, spent the months of June and July encamped a mile to the west of the cabin, and observing their way of life added much to the interest of the summer.

Radiotelephone service to northern Quebec and Labrador

The Bell Telephone Company of Canada has announced that it is establishing a radiotelephone service to cover northern Quebec and Labrador. The new service, which will be in operation this summer, will provide direct voice connection between remote radiotelephone outpost stations and the regular telephone network of the south.

A base station will be constructed near Alma, Quebec, southeastern Lake St. John, to serve as the connecting link between the outpost stations and the regular telephone network. Work on the base will begin shortly. It will consist of three units on three different sites. There will be a transmitter unit, with an antenna mounted between masts and an associated equipment building; a receiving unit of similar appearance, placed about ten miles away, and a third unit in the telephone office at Alma where operators will be located.

The base station will operate on 500 watts power, and will be equipped initially to broadcast on two pairs of high-frequency channels. One channel in a pair will be used for sending, the other for receiving. The two pairs of channels may be used simultaneously. Since radio interference,caused by such phenomena as aurora and sun spots, tends to affect some frequencies more than others at a given time, the spare channels will give some measure of protection against interruption as the operators at the control centre will be able to switch to a clearer pair of frequencies as the situation warrants. The quality of transmission, while not up to normal telephone standards, should be comparable with that of transatlantic telephone service before the cable was opened in 1956.

Possible sites for outpost stations are Great Whale River, 550 miles from Alma, and Fort Chimo and Hopedale, both 700 miles from Alma. Among other stations which could be served by the

system are Sugluk, Fort George, Rupert House, and Cartwright.

Some missions, air lines, mining companies, the Hudson's Bay Company, and other organizations are already operating radio networks between their own outposts; the largest of these systems in the region is that of the Oblate Fathers' northern missions. These systems, which cannot now communicate directly outside their own network, will in future be able to tie in to the Bell System and so reach telephone communications anywhere in the world.

As a result of increased activity in this part of northern Canada, the Bell Telephone Company has already established normal exchanges at Frobisher Bay on Baffin Island, at North West River, Goose Bay, and Wabush in Labrador, and at Gagnon in northern Quebec. The new radiotelephone service should meet the existing demand for connections with still more remote points.

The road programme in the Yukon and Northwest Territories

The Arctic Circular included in Vol. 11, No. 3, a description of the road programme in northern Canada. Considerable progress has been made in the two years since this note was published and the following account brings the programme up-to-date.

In the Yukon the development road being built from Flat Creek to Eagle Plain has reached Mile 62. It is 18 feet wide with a good gravel surface. The next ten miles, where there is now a winter road, will be completed by the end of 1961, and the road will then reach Chapman Lake (Mile 72).

The three bridges on the Whitehorse-Keno Highway have been constructed at a cost of over $3 million. The first bridge, that over the Yukon at Carmacks, was started in 1958 and finished the next year. It is 727 feet long and has four spans. The two approach spans are each 101 feet long and the two centre spans are 262 feet. The bridge over the Pelly consists of three main 219-foot spans and two 98-foot approach spans and is 865 feet long. The third bridge, that over the Stewart, is 692 feet long with a centre span of 262 feet and two approach spans each of about 167 feet. The Pelly and Stewart bridges were both begun in 1959 and opened in 1960. All three bridges have a clearance of at least 25 feet above extreme


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
ARCTIC OCEAN
BEAUFORT SEA
BANKS ISLAND
ALASKA
YUKON TERRITORY
NORTHWEST TERRITORIES
BRITISH COLUMBIA
ALBERTA
SASK
PACIFIC OCEAN
TUKTOYAKTUK
INUVIK
COPPERMINE
Coronation Gulf
Richardson
Anderson River
YUKON
Porcupine River
EAGLE PLAIN
FORT MACPHERSON
MACKENZIE RIVER
Peel River
Arctic Red River
GREAT BEAR LAKE
PORT RADIUM
Coppermine River
Clinton Creek
DAWSON
Klondike R.
Chapman Lake
CANOL
FORT NORMAN
Mackay L.
KENO HILL
MAYO
Stewart
STEWART RIVER
YUKON
Macmillan River
Keele River
Snare R.
Lac la Martre
RAE
YELLOWKNIFE
Yellowknife R.
FORT RELIANCE
CARMACKS
Pelly River
ROSS RIVER
AISHIHIK
ALASKA
South Nahanni River
FORT SIMPSON
FORT PROVIDENCE
GREAT SLAVE LAKE
GREAT SLAVE LAKE HIGHWAY
PINE POINT
Kakisa R.
FORT ENTERPRISE
WOOD BUFFALO PARK
FORT SMITH
FORT FITZGERALD
URANIUM
ATHABASCA
PEACE POINT
WHITEHORSE
JOHNSONS CROSSING
Teslin
WATSON LAKE
FORT LIARD
Liard River
SKAGWAY
CASSIAR
ALASKA HIGHWAY
FORT NELSON
UPPER HAY RIVER
JUNEAU
Stikine River
FORT VERMILION
HIGH LEVEL
McMURRAY
Grimshaw
WATER RESOURCES BRANCH
1968

high-water level. They have eliminated ferry services on the road, providing year-round road communication between Whitehorse, Keno, and Dawson.

Maintenance of the Canol Road between Johnson's Crossing and Ross River has been continued and limited improvements have been made.

The first 30 miles of the road from Watson Lake to Ross River has been completed except for the final gravelling. This road is 18 feet wide. The proposed road from Ross River to Carmacks has been surveyed but no work is planned for the present.

The Sixty Mile Road running from Dawson east to the Alaska boundary will be reconstructed on a 3-year programme beginning in 1961.

In the Northwest Territories the road from Fort Enterprise on the Mackenzie Highway to Yellowknife was opened to traffic in July 1960. Construction has taken about five years and cost nearly $12 million. Only the final gravelling from Fort Providence to Frank Channel and the installation of a permanent ferry across the Mackenzie near Fort Providence remain to complete this road, which is 281 miles long. Travel will be interrupted at freeze-up and break-up. During the winter an ice bridge will be used across the Mackenzie. A thrice-weekly passenger and express freight bus service between Edmonton and Yellowknife began in January 1961. Buses leave Edmonton and Yellowknife at midnight and the whole journey is scheduled to take between 30 and 31 hours. In future the road from Grimshaw to Fort Enterprise and then to the crossing of the Mackenzie near Fort Providence will be called the Mackenzie Highway. The road from the crossing to Yellowknife will be the Great Slave Highway. The road from Fort Enterprise to Hay River, which used to be part of the Mackenzie Highway, will now be known as the Hay River Highway.

The reconstruction of the highway between Hay River and the Alberta boundary has reached 24 miles south from Hay River. Clearing of the right-of-way will be finished this winter and it is expected that an additional 26 miles of road will be completed during the year. A bridge will be constructed to carry the Hay River Highway across the west channel of the river to the town of Hay River, which is on Vale Island.

The first 40 miles of the proposed road east from Yellowknife towards MacKay Lake and Fort Reliance is being cleared during the current winter.

The portage road around the rapids on the Slave River from Fort Fitzgerald to Bell Rock has been completely reconstructed. It is no longer intended to provide it with a hard surface.

Clearing has been completed all the way along the route of the planned road in Wood Buffalo Park from Peace Point to the western boundary of the park. Construction of the grade will begin in 1961.

In the "Roads to Resources" programme 109 miles of the Stewart-Cassiar Road have been surveyed. Contracts for construction have been let for 102 miles of this distance including the 36 miles now completed. Work is proceeding from both ends of the road. In Alberta the programme includes reconstruction of the Mackenzie Highway. The provincial part of this road is 300 miles long and 238 miles have been surveyed. All this has been cleared and reconstruction is complete for 145 miles. Surveys are being made of the proposed extension of the High Level-Fort Vermilion road to the boundary of Wood Buffalo Park and clearing has begun. In Saskatchewan construction of the road to Uranium City, which will be over 500 miles in length, is proceeding from the south. Engineering surveys for the first 69 miles have been completed, contracts have been let for construction of 55 of these miles and 27 miles have now been gravelled.

Since this note was written plans have been announced for the construction of a new road in the southeastern part of the Yukon Territory. It will be 130 miles long and will run from Mile 65 on the Watson Lake - Ross River road to the mine site being developed by Canada Tungsten Ltd. near Flat River, just across the Northwest Territories boundary. The first 80 miles will serve the whole area and will be built by the federal government. The remaining 50 miles will be a mine access road and one-third of the cost will be borne by Canada Tungsten Ltd. The total cost to the federal government is estimated at nearly $2,000,000; the first tenders for construction should be called by April 1, and it is expected that the whole road will be in use in 1963.

The Northwest Territories Council

Following elections in the fall of 1960 the Northwest Territories Council met in Ottawa from 16 to 24 January 1961. The elected members were:

A. Pat Carey - Mackenzie South.

E.J. Gall - Mackenzie North - by acclamation.

J.W. Goodall - Mackenzie River - by acclamation.

Knut Lang - Mackenzie Delta.

The only change among the elected members was Mr. Carey of Fort Smith, who had defeated Mr. R. Porritt of Hay River in Mackenzie South.

The appointed members were:

R.G. Robertson, Commissioner of the N.W.T., Ottawa.

W.G. Brown, Deputy Commissioner of the N.W.T., Ottawa.

D.M. Coolican, President, Canadian Bank Note Company, Ottawa.

L.A. Desrochers, Barrister-at-Law, Edmonton.

H.M. Jones, Director, Indian Affairs Branch, Ottawa.

I. Norman Smith, Editor and Vice-President, The Ottawa Journal, Ottawa.

The changes among the appointed members were Mr. Desrochers, Mr. Coolican, and Mr. Smith, who replaced Mr. L. Audette, Mr. C.M. Drury, and Commissioner L.H. Nicholson.

New Hudson's Bay Company post at Broughton Island

On 1 October 1960 the Hudson's Bay Company opened a new post at Broughton Island on the east coast of Baffin Island to service the area between Pangnirtung and Clyde. The construction crew, headed by Len Peacock, a veteran arctic foreman carpenter, reached Broughton Island by air from Frobisher in time to connect with the arrival of the M.V. Eskimo on August 13. This vessel carried the building material and Mr. Alex Buchan, a native of Peterhead, Scotland, who is the manager of the new store.

Three buildings were erected by the construction crew; a combined store and manager's living quarters, a separate warehouse, and a small power house. Construction was completed on September 18 and the crew left for Fort Chimo where they erected a new store on the airbase side of the Koksoak River, a change made necessary by the removal of the entire native population and government installations to the airport. Supplies for the Broughton Island post arrived on the Department of Transport's vessel C.D. Howe in mid-September. Mr. Buchan reports that there is a fair population in the vicinity of the post and that all are pleased with the new service provided.

New vessel for the Hudson's Bay Company

Since the loss of the R.M.S. Nascopie at Cape Dorset in 1947, the flagship of the Hudson's Bay Company's small fleet of arctic supply vessels has been the M.V. Rupertsland, a 702 tons deadweight, twin-screw, diesel vessel. Specially designed for that service by German, Milne and Gilmore (now Milne, Gilmore and German) of Montreal, and built by the Fairfield Shipbuilding and Engineering Company on the Clyde, the Rupertsland proved a worthy successor to the Nascopie. Development in the Arctic and Subarctic, however, made it essential that tonnage and service facilities be increased, even though the Rupertsland was cut in two during the winter of 1956-7 and a 21-foot section added amidships to give her greater capacity.

After a thorough investigation of the shipsale market and study of the specifications of scores of coasting vessels, the M.V. Montclair, built in 1956 by the Collingwood Shipyards, was selected as being best suited to the requirements of the Hudson's Bay Company. She was purchased in December 1960, and delivery was taken at Liverpool, where she was placed in the hands of C. and H. Crichton Ltd. for minor changes and modifications - notably, installation of reefer cargo space. She will sail shortly for her home port of Dartmouth, N.S., where she will remain until the 1961 transportation season begins.

The name Pierre Radisson has been given to the ship after the famed fur trader and explorer who played such an important part in founding "The Governor and Company of Adventurers of England Trading into Hudson's Bay".

The Pierre Radisson was built in a Canadian yard from German plans, and has the clean-cut appearance typical of German coasters. She is an open shelter-decker of 1,465 tons deadweight, of welded steel construction, and strengthened for navigation in ice. She is powered by a 1,500 BHP Werkspoor diesel, and has a service speed, under load, of 12 to 12 1/2 knots. Outstanding features of the vessel are her loading gear, consisting of eight electric cargo winches and eight 5-ton and 7 1/2-ton derricks, a maximum heavy lift of 15 tons, and an exceptionally good cubic capacity, so necessary for the handling of the typically bulky arctic cargos. There will be no passenger accommodation.

The M.V. Pierre Radisson will be under the command of Captain A.C. Lloyd, formerly Master of the Rupertsland, and the Chief Engineer from the Rupertsland, C.E. Bastable, will take over the engine-room of the new vessel.

The Rupertsland has been sold to Euclide Bouchard of Quebec City and will trade on the St. Lawrence.

Discovery of the table desk from H.M.S. "Resolute"

A White House press release carried by the New York Times on 7 February 1961 announced that a desk made from the timbers of H.M.S. Resolute had been installed in President Kennedy's office, replacing the desk used by President Eisenhower. It appears that in the course of acquainting herself with the contents of the White House, Mrs. Kennedy discovered in the Broadcasting Room "'a massive, richly carved table desk'... most of it... 'obscured by a covering of green baize' ". After having this covering removed, Mrs. Kennedy found the following inscription "chiseled in black letters on a gold background set into the carving: ' H.M.S. Resolute forming part of the expedition sent in search of Sir John Franklin in 1852 was abandoned in Latitude 74.41 N., Longitude 101.22. W on 15 May 1854. She was discovered and extricated in Sept. 1855 in Latitude 67. N. by Captain Buddington of the United States whaler George Henry.

" 'The ship was purchased fitted out and sent to England as a gift to Her Majesty Queen Victoria by the President and people of the United States, as a token of goodwill and friendship. This table was made from her timbers when she was broken up and is presented by the Queen of Great Britain and Ireland to the President of the United States as a memorial of the courtesy and loving kindness which dictated the offer of the Resolute'.".

This incident recalls an interesting facet of the Franklin Search. In April 1852 the British Government sent out its last and largest search expedition. This squadron was commanded by Capt. Sir Edward Belcher and comprised the Resolute and Assistance, the steam tenders Intrepid and Pioneer, and the depot ship North Star. The Resolute and Intrepid, commanded by Captain Henry Kellett, proceeded to Dealy Island on the south shores of Melville Island; Belcher with the Assistance and Pioneer went north along Wellington Channel to Grinnell Peninsula on Devon Island, and the North Star remained at Beechey Island, southwest Devon Island. In 1853 Kellett rescued Captain Robert M'Clure and the surviving members of the Investigator, the latter having sailed from England in 1850 and been abandoned on the north coast of Banks Island. In the spring of 1854 Belcher ordered Kellett to abandon his ships and proceed to Beechey Island to board the North Star for the return journey to England, and in August Belcher decided to abandon his own ships.

In the face of strong protests by his officers the four sturdy ships were left in the ice, the Resolute and Intrepid off the south coast of Bathurst Island and the Assistance and Pioneer fifty miles north of Beechey Island. On the return to England a court-martial was held on Belcher's action and after a deliberation of one and one-half hours a decision of acquital was rendered based on the wide discretionary powers given in his orders. Despite the verdict, Belcher has remained a figure of controversy in arctic history.

As mentioned in the inscription on the desk, Captain J.M. Buddington of the whaler George Henry sighted the Resolute in 1855 off Cape Walsingham on the east Baffin Island coast. He found the ship to be seaworthy and with eleven men from his own crew sailed her back to New London, Connecticut, after a hazardous voyage lasting from Oct. 20 to Dec. 24. The British Government waived all claim to the vessel whereupon the United States Congress voted a sum of $40,000 for the purchase of the Resolute from Captain Buddington. She was then refitted and returned to England. G.F. M'Dougall in his "Eventful voyage of H.M. Discovery Ship 'Resolute' " notes that "With such care and attention had the repairs and re-equipment been performed, that not only had the ship's stores, even to flags, been replaced, but even the officers' libraries, musical boxes, pictures, etc." Upon the arrival of the ship in England, Queen Victoria expressed the wish to visit aboard and the Resolute was towed from Portsmouth to Cowes where the Royal party was received by Captain Hartstein, U.S.N., who had sailed her back to England, and who had himself seen arctic service when he rescued Dr. Elisha Kane in 1855. Captain Hartstein returned the ship to the Queen, who then made an inspection of the Resolute. She ordered £ 100 distributed to the American crew and Captain Hartstein presented Prince Albert with a puncheon of "fine old rum" from the stores found on board. After further festivities in various southern ports the American crew returned to the United States early in 1857.

The desk made from the timbers of the Resolute was presented to President Hayes in 1878 and was for many years a part of the furnishings of the President's private study. It was later moved to the upstairs Oval Room and following the remodelling of the White House carried out during Mr. Truman's presidency, the desk was moved to the ground floor Broadcasting Room. The White House announcement concludes " Feeling that the desk, with its connection with the sea, would perfectly complement the naval

battle scenes and the model of the Constitution which she already had secured at her husband's suggestion, Mrs. Kennedy has given the desk to the President and it was placed in his office on Saturday, Feb. 4."

Glaciological investigations in the St. Elias Mountains

Dr. Walter A. Wood, President of the American Geographical Society, is intending to resume his work on glaciology in the general area of the St. Elias Mountains. Dr. Wood worked in this area for some years both before and after the Second World War.

Dr. Wood plans to carry out a reconnaissance this year with a party of six or seven supported by air. The object would be to examine the suitability of the Icefield Ranges of the St. Elias Mountains for glaciological work. The area is mainly on the Canadian side of the international border and the climatic divide between the wet cold environment of the Pacific slopes and the dry cold environment of the interior Yukon plateau appears to pass through it. The area should therefore present very good conditions for investigating the effect of climate on the regime of the several glaciers in the area.

If the reconnaissance proves satisfactory Dr. Wood intends to carry out a long-term programme over several years.

"Danish Arctic Research"

The Arktisk Institut (Danish Arctic Institute) has just published the first issue of "Danish Arctic Research". This will appear in future as a yearly report and will replace the mimeographed "Danish Scientific Activities in Greenland". It will continue to emphasize Danish scientific research in Greenland and to contain abridged or complete translations of reports received from Danish institutions and individuals who have carried out research in Greenland during the previous year. In addition it will summarize Danish research elsewhere in the Arctic and will contain a listing of scientific arctic publications by Danes, as well as by scientists from other nations who have worked for Danish institutions.

The first issue, edited by Dr. Helge Larsen, consists of five reports, the first four being reprints of "Danish Scientific Activities in Greenland, 1955-58", supplemented by reports on work outside Greenland and lists of publications. The language used is English throughout.

"Danish Arctic Research" may be obtained by writing to Arktisk Institut, L.E. Bruunsvej 10, Charlottenlund, Denmark.

"Polar Notes"

The second volume of Polar Notes was published in November 1960. This admirably printed journal has no cover and no unnecessary illustrations. It is an "Occasional Publication of the Stefansson Collection of the Dartmouth College Library". The first number, November 1959, was timed to appear on Dr. Stefansson's 80th birthday, and contained ten papers. The second volume contains three papers and notes on the work of Dartmouth College in the north and on the Stefansson Collection.

Subscriptions for 1961

Members are reminded that their subscriptions for 1961 ($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, Miss M.C. Murray, 249 Irving Avenue, Ottawa 3.

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 1961 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, Miss M.C. Murray, 249 Irving Avenue, Ottawa 3, 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.

THE ARCTIC CIRCULAR

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Ottawa
(May 1961)

One hundred and fourth Meeting. The one hundred and fourth meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C. on 14 February 1961.

Dr. John C. Reed spoke on "Exploration for oil in Naval Petroleum Reserve No. 4, northern Alaska".

One hundred and fifth Meeting. The one hundred and fifth meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C. on 14 March 1961.

Dr. George Jacobsen spoke on "A scientific expedition to Axel Heiberg Island".

One hundred and sixth Meeting. The one hundred and sixth meeting of the Arctic Circle was held in the No. 9 Transport Company Mess, R.C.A.S.C. on 11 April 1961.

Mr. H.B. Dickens spoke on "Building in the north" and showed a recently completed film with this title.

The Arctic Institute of North America Devon Island Expedition 1960-63. By Spenser Apollonio

The Arctic Institute of North America in August 1960 established a research station on the north coast of Devon Island, at 75° 42 N., 84° 26 W. The station will be reoccupied in April 1961, and through the fall of 1963 it will support an integrated programme of research primarily directed toward understanding the relationships between the ice field and glaciers of Devon Island, the atmosphere, and the marine waters of Jones Sound. These relationships are considered to involve, first, the problem of moisture and heat transfer between Jones Sound and the ice field, that is, the mass balance and thermal regime of the ice field and its glaciers as they may be affected by adjacent marine waters, and, second, the effect of discharging glaciers on the biological, chemical, and physical oceanography of Jones Sound.

Devon Island has been neglected in arctic research. Exploration and scientific investigations in the Queen Elizabeth Islands have gone around and beyond the island. In spite of the fact that it was discovered in 1616 and Baffin may then have made the first landing by white men in the Queen Elizabeth Islands on Devon Island, there are scarcely half a dozen brief scientific reports from the island. This neglect is remarkable considering the size of Devon Island, its large completely unstudied ice field, its unique biogeographical position, its probable importance in Eskimo migrations, and its undisturbed palaeozoic stratigraphy. Devon Island is the most readily accessible of the Queen Elizabeth Islands to a supply ship and Jones Sound is probably the only place in Canada where the effects of glaciers discharging into arctic waters, as defined by Dunbar [1], can be conveniently studied.

The Arctic Institute programme calls for the continuous occupation, from 1961 through 1963, of two stations, one at sea level on the shore of Jones Sound (already established) and the other near the centre of Devon ice field at an elevation of about 6,000 feet. The purpose of the 1960 programme was to establish

1. Dunbar, M.J. 1951. 'Eastern Arctic waters'. Fish. Res. Bd. Can. Bull. No. 88.

these two stations and to cache the supplies and equipment that will support the scientific work beginning in the spring of 1961. The 1960 programme also included archaeological reconnaissance and excavation.

The 1960 expedition consisted of S. Apollonio, V.D. Boyd, B.D. Clarke, C.R. Harington, G.R. Lowther, R.S. McCall, D.R. Oliver , and G.E. Stewart. The party and its 50 tons of equipment and stores were landed from C.M.S. d'Iberville on August 20. The equipment included prefabricated houses, diesel tractors, Weasels, and a diesel-powered, ice-protected, oceanographic research boat. A base camp was rapidly set up and at the same time a search for a tractor route to the edge of the ice field began. The unloading schedule from the d'Iberville did not permit time for adequate reconnaissance of the area, but it appears that the party landed at the only point along the north coast of the island from which tractors can approach the ice field. Three trips inland by Weasel located a rough but useable route that avoids ravines, end moraines, and boulder fields, and proved that vehicles can easily drive across the edge of the ice field. After the base camp was securely established the tractors hauled about six tons of supplies through a dry river bed to the top of the plateau (elevation 1,000 feet) that leads to the ice field. The river bed is the only possible route inland but is extremely hard on the equipment. It was therefore disappointing to find that once the roughest part of the route was accomplished, thick mud prevented farther advance inland. It was with some difficulty that the tractors were hauled from the mud, each by two Weasels. The ice field station supplies were then cached and the vehicles and base camp were secured for the winter.

While this work was proceeding Lowther and McCall had excavated a Thule site near the main base and later, joined by Oliver, they walked to Cape Sparbo where for four days they excavated a previously unknown site which has been named "Inavik". This site contains pre-Dorset, Thule, and possibly Dorset elements and yielded over 90 artifacts. Gordon Lowther is preparing a report on this work for the Circular.

The party was picked up on September 11 by helicopters of U.S.C.G.C. Westwind, which lay in Jones Sound, and it was then taken to Thule, Greenland. M.A.T.S. aircraft provided transportation to New Jersey.

The 1961 programme will begin in mid-April when a charter flight will take 14 people and scientific equipment into Devon Island. The work will be supported by a Super Piper Cub aircraft piloted by Ross Carswell of Tanana, Alaska, and this aircraft will ferry several more people to the island from Resolute during the summer. The total number in June and July will be 20. The first job will be to establish the ice field station. The scientific work will then include regular synoptic meteorological and micro-meteorological observations, pibal observations, and solar radiation measurements at both stations. A temporary meteorological station will be set up in the ablation zone during the melt-season. Direct measurements of glacier movement, internal temperatures, ablation and melt-water run-off, and thickness will be made on two glaciers entering Jones Sound. The oceanographic programme will measure the effects of these glaciers on the salinity, temperature, chemical composition, biological productivity, and optics of the marine waters and on the sedimentation rates on the bottom of Jones Sound. The archaeological work will continue with careful excavation of the "Inavik" site and geological work in the palaeozoic sediments will begin.

The principal investigators in 1961 will be:

S. Apollonio, Yale University, Oceanography
J.W. Cowie, University of Bristol, Geology
L. Dahlgren, Uppsala, Meteorology
S. Ekman, Stockholm, Glaciology
B. Holmgren, Uppsala, Meteorology
G.R. Lowther, McGill University, Archaeology
K. Vögtli, Swiss Dept. PTT, Geophysics
Lieut. R. Wemyss, R.E., Survey.

Most of the personnel will be evacuated at the end of August but six people will winter over to continue the meteorological and radiation measurements at both stations. Oceanographic work will be undertaken in Jones Sound in March, April, and May, 1962. The full programme will be continued in the spring and summer of 1962. A second winter party will continue the meteorological work in 1962-3 and it is hoped that the primary objectives will be accomplished by the end of the summer of 1963.

The Arctic Institute will continue occupation of the shore station after 1963 as a permanent research base.

Waterfowl reconnaissance in the Western Arctic. By Thomas W. Barry[1]

With the recent refinements in transportation techniques and the increasing exploration and development of mineral and oil resources in the Canadian north, some concern has been felt by the Canadian Wildlife Service for the migratory birds, especially the ducks, geese, swans, and "sea birds", which nest in the Arctic. These species are greatly affected by undue disturbance of their nesting grounds, therefore under the obligations of the Migratory Birds Treaty with the United States, and in line with established policy, the Department of Northern Affairs and National Resources has been seeking to protect and to safeguard the use of these renewable resources.

In order to plan for this management, many research projects, including extensive inventories of species populations, are needed. Although the breeding areas of some species are well known through the work of Manning, Macpherson, MacDonald, Soper, Smith, and others, much additional information is required. As part of this work, surveys were made by the Wildlife Service in 1958 and 1960 in the Western Arctic (see sketch-map). More are planned in both the Western and the Eastern Arctic for 1962.

The 1958 surveys covered King William Island (in part), Boothia Peninsula, Prince of Wales Island, Somerset Island, part

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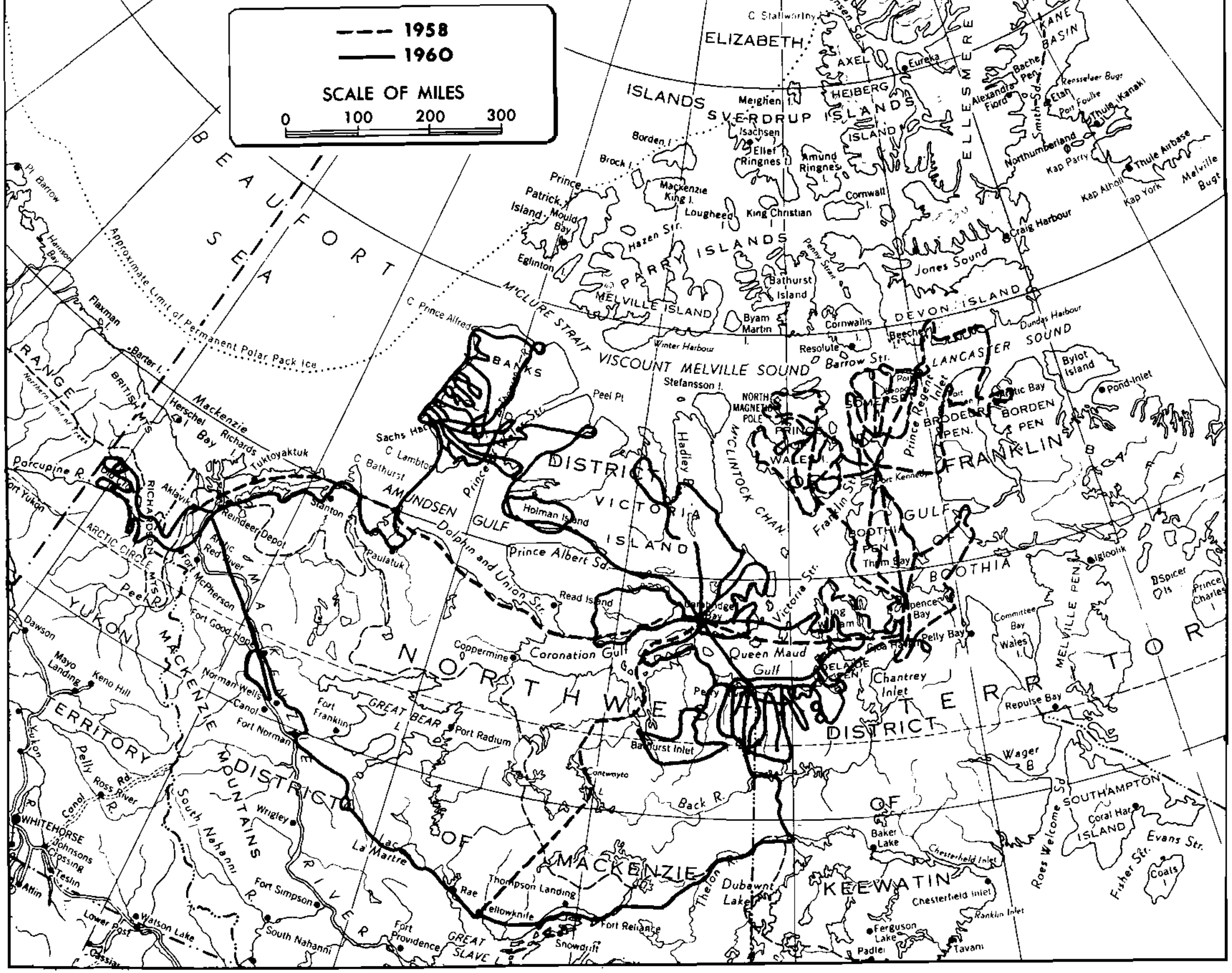
[1] Canadian Wildlife Service



1958
1960
SCALE OF MILES
0 100 200 300
BEAUFORT SEA
Approximate Limit of Permanent Polar Pack Ice
Pt Barrow
Harrison Bay
Flaxman I.
Barter I.
BRITISH MTS
RANGE
Northern Limit of Trees
Porcupine R.
Fort Yukon
ARCTIC CIRCLE
RICHARDSON MTS
Herschel I.
Mackenzie Bay
Richards I.
Tuktoyaktuk
Aklavik
Reindeer Depot
Arctic Red River
Fort McPherson
Fort Good Hope
Peel R.
YUKON TERRITORY
Dawson
Mayo Landing
Keno Hill
Pelly
Ross River
Canol Rd.
WHITEHORSE
Johnsons Crossing
Teslin
Atlin
Lower Post
Watson Lake
Cassiar
MACKENZIE MOUNTAINS
South Nahanni R.
South Nahanni
Fort Simpson
Wrigley
RIVER
Norman Wells
Canol
Fort Norman
Fort Franklin
GREAT BEAR L.
Port Radium
DISTRICT OF MACKENZIE
Lac La Martre
Rae
Yellowknife
Thompson Landing
Fort Providence
GREAT SLAVE L.
Snowdrift
Fort Reliance
Stanton
Paulatuk
C Bathurst
C Lambton
Sachs Har
C Prince Alfred
BANKS
Prince of Wales Str.
AMUNDSEN GULF
Dolphin and Union Str.
Coppermine
Coronation Gulf
Read Island
Contwoyto L.
Bathurst Inlet
Back R.
Peel Pt
Holman Island
Prince Albert Sd.
DISTRICT
VICTORIA ISLAND
Hadley B
Cambridge Bay
Victoria Str.
Queen Maud Gulf
Perry
King William
ADELAIDE PEN.
NORTHWEST TERRITORIES
Chantrey Inlet
DISTRICT OF KEEWATIN
Baker Lake
Chesterfield Inlet
Dubawnt Lake
Thelon
Ferguson Lake
Padlei
Rankin Inlet
Tavani
Wager B
Repulse Bay
Committee Bay
Wales I.
Pelly Bay
Spence Bay
Thom Bay
BOOTHIA PEN.
GULF OF BOOTHIA
MELVILLE PEN.
Igloolik
Spicer Is
Prince Charles I
SOUTHAMPTON ISLAND
Coral Har
Evans Str.
Fisher Str.
Coats I
Roes Welcome Sd.
M'CLINTOCK CHAN.
NORTH MAGNETIC POLE
PRINCE OF WALES
Franklin St.
SOMERSET
Port Leopold
Fort Ross
Port Kennedy
Prince Regent Inlet
BRODEUR PEN.
Arctic Bay
BORDEN PEN
FRANKLIN
Bylot Island
Pond Inlet
LANCASTER SOUND
Dundas Harbour
Beechey I.
Barrow Str.
Resolute
Cornwallis I.
DEVON ISLAND
VISCOUNT MELVILLE SOUND
Stefansson I.
Winter Harbour
M'CLURE STRAIT
Byam Martin I.
Bathurst Island
Penny Strait
MELVILLE ISLAND
PARRY ISLANDS
Hazen Str.
Eglinton
Prince Patrick Island
Mould Bay
Brock I.
Borden I.
Mackenzie King I.
Lougheed
King Christian
Cornwall I.
Ellef Ringnes I.
Amund Ringnes I.
Isachsen
Meighen I.
SVERDRUP ISLANDS
AXEL HEIBERG ISLAND
ELIZABETH
ISLANDS
C Stallworthy
Nansen Sd.
Eureka
ELLESMERE
Jones Sound
Craig Harbour
Alexandra Fiord
Bache Pen
Smith Sd.
KANE BASIN
Rensselaer Bugt
Etah
Port Foulke
Thule (Kanaki)
Northumberland
Kap Parry
Thule Airbase
Kap Atholl
Kap York
Melville Bugt

of the south coast of Devon Island, and Brodeur Peninsula of Baffin Island. The 1958 flights were made in cooperation with Dr. J.B. Bird, who was working on Somerset Island.

In 1960 the surveys began at Inuvik and covered the coast and tributary rivers and lakes of the following areas: Liverpool Bay, Franklin Bay, Darnley Bay, Banks Island, Prince Albert Peninsula of Victoria Island, southeastern Victoria Island and Hadley Bay, King William Island, Queen Maud Gulf from Bathurst Inlet to Sherman Inlet, the Thelon River from Beverly Lake to Fort Reliance, parts of the area between Fort Rae and Norman Wells, and Old Crow Flats, Yukon. Weather and ice conditions prevented our reaching Prince Patrick Island.

In both years the surveys concentrated on probable waterfowl habitats, selected after a study of available maps, air photos, literature, and reports from exploratory flights made by the U.S. Fish and Wildlife Service.

We used a Beaver aircraft equipped with floats and long-range fuel tanks. In some areas gas caches had been put out in the winter but extra gas was also hauled in the aircraft. Flight lines were planned along water areas, and at elevations ranging from 25 to 500 feet depending on visibility and altitude of the terrain. Where possible we had two or more observers who identified and counted the wildfowl. If necessary we could made several runs to assure identification. As a very rough estimate we consider that our results would be accurate to within 25 per cent of the birds depending on the species and area.

In 1958 I made observations while participating in the flights of members of the Somerset Island expedition to supplement my own flights. In 1960 Mr. Alex Dzubin, Canadian Wildlife Service, Saskatoon, and Mr. Tom Sterling, Ducks Unlimited, Saskatoon, accompanied me as observers.

The 1960 surveys, based on our experience in 1958, covered a greater area and were of rather more interest. They extended over a period of five weeks, which included eight days when flying was impossible owing to bad weather. I arrived in the field on May 10 to study the geese nesting in the delta of the Anderson River, and was later joined by Mr. Dzubin and Mr. Sterling on July 11 to help with goose banding. On July 23 Pilot Bob McKinney of Pacific

Western Airlines flew in and we took our specimens and equipment to Inuvik for reshipment to Edmonton. We were then able to begin the main survey. To give some idea of the scope of our work, which continued until August 31, I will mention the areas covered during good weather on two days.

On July 30 we surveyed the west coast of Banks Island as far north as Bernard River, including Lennie River, "Sea Otter River", Storkerson River, Adam River, and "Sandy River". We also stopped at Sea Otter Harbour to see Eskimo Angus Elias and his family. We found them preparing to return to Sachs Harbour, as the ice had moved off the coast one-half mile or more. Constable Phil Bibeau, R.C.M.P., accompanied us on this flight.

On August 2 we surveyed Deans Dundas Bay, Victoria Island, and then crossed Prince Albert Peninsula to Richard Collinson Inlet. We returned via Walker Bay, Fort Collinson, and Berkeley Point, stopping at a small lake southeast of Richard Collinson Inlet to visit Captain D.M. Matheson and his men of the Army survey.

The following summary of the major concentration areas of waterfowl and larger birds includes both the 1958 and 1960 surveys. Anyone planning field investigations should consult Canadian Wildlife Service reports and personnel for detailed information on these or other species.

Population estimates

Old Crow Flats, Yukon

Whistling Swan	200
Canada Goose	100
White-fronted Goose	1,400
Mallard	1,500
Pintail	37,000
Scaup	38,000
Canvasback	6,000
Scoter	64,000

Population estimates

Mackenzie delta

Whistling Swan	5,800
Canada Goose	2,000
Pacific Brant	200
White-fronted Goose	500
Snow Goose	7,500
Mallard	2,500
Pintail	31,000

Liverpool Bay (Kugaluk River, Anderson River, and Mason River)

Whistling Swan	1,500
Canada Goose	600
Pacific Brant	3,000
White-fronted Goose	5,400
Snow Goose	8,000
Mallard	200
Pintail	500
Scaup	2,000
Old Squaw	200
Scoter	500

Cape Parry

Murre	150 (only colony in Western Arctic)

Banks Island (southwest and Thomsen River mouth)

Whistling Swan	200
Pacific Brant	9,000+
Blue-Snow Goose	116,000+ (less than 1% Blue)
Ross's Goose	200 ?
Old Squaw	6,000
King Eider	100,000+

Population estimates

Victoria Island (southeast part and Prince Albert Peninsula)

Whistling Swan	300	
Canada Goose	2,000	
Pacific Brant	3,000	
White-fronted Goose	1,800	
Blue-Snow Goose	1,500	(20% Blue)
Old Squaw	20,000	
King Eider	800,000	(entire island)

Queen Maud Gulf (mainland and coastal islands, Bathurst Inlet to Sherman Inlet)

Whistling Swan	300	
Canada Goose	20,000	(approx. 1/4 non-nesters, large race)
Pacific Brant	3,500	
Atlantic Brant	1,500	
White-fronted Goose	10,000	
Blue-Snow Goose	20,000	(10% Blue)
Ross's Goose	9,000	
Pintail	2,000	
Old Squaw	12,000	
King Eider	8,000	
Sandhill Crane	1,000	

King William Island

Whistling Swan	300	
Canada Goose	1,000	
Brant (Atlantic ?)	2,000	
White-fronted Goose	100	
Blue-Snow Goose	1,000	(45% Blue)

Population estimates

Somerset Island

Snow Goose (half Greater)	800

Prince Leopold Island and Limestone Island

Fulmar	150,000	(inc. Cape Clarence, Somerset Island)
Glaucous Gull	3,000	
Kittiwake	180,000	
Murre	350,000	+
Black Guillemot	4,000	

Suggestions for participation by Eskimos and Indians in the arctic waterfowl programme: In the 1960 field season Dr. F.G. Cooch and I were successful in arranging for Eskimo Toma at Southampton Island to band Blue and Snow geese and brant for us. I had lived with Toma and his family at East Bay, Southampton Island, in 1957. He had worked with me and was capable of gathering other data, such as migration dates, clutch size, and predation rates. Our 1960 instructions to him were translated into syllabics by the Department of Northern Affairs and National Resources. With a banding crew of his own selection, he banded and recorded recovery data on over 6,000 geese and brant.

Because of the success of this pilot programme, and for many other obvious reasons, we think that native participation in such waterfowl programmes, particularly in banding, should be encouraged and expanded wherever possible. In the Western Arctic there are several areas where participation in waterfowl management by Indians and Eskimos is planned, for instance; Old Crow Flats, Yukon; Kendall Island, Mackenzie delta; Liverpool Bay; Banks Island; Wellington Bay and Albert Edward Bay, Victoria Island; Queen Maud Gulf mainland, and parts of King William Island. In some of these places the natives are already familiar with techniques of capturing waterfowl; in many instances they could draw additional income from the use of their own boats and other equipment.

Most promising areas for further waterfowl reconnaissance in the Western Arctic:

1. Mackenzie Bay coast, Yukon: river deltas and shoreline from Clarence Lagoon to Mackenzie delta.

2. "Dalhousie Peninsula": this includes the north shore of Liverpool Bay and the Eskimo Lakes.

3. Anderson and Horton river drainages: this includes the more promising tributaries and lakes west of the Shield.

4. Coronation Gulf: islands, coast, and tributary rivers.

5. Wollaston Peninsula, Victoria Island: area west of 111° W. Longitude.

6. Queen Elizabeth Islands: north of M'Clure Strait and Viscount Melville Sound.

It is hoped that by the end of the surveys in the Eastern and the Western Arctic, the Canadian Wildlife Service will have a representative inventory of the important migratory species of the Arctic, and can then more effectively manage the waterfowl resource for the benefit of northern residents and people along the migration routes.

A new umiak or Eskimo women's boat for the National Museum of Canada. By Asen Balikci

The ethnological collection of the National Museum of Canada includes among the Eskimo material an adequate series of kayaks, but the equally important umiak has been represented by models only. It was thus considered an urgent task to have an umiak built by some Eskimo group for the permanent collection of the Museum.

To find an elderly Eskimo or a small group of Eskimos in northern Canada today possessing the traditional skills necessary for the construction of a "women's rowing boat" proved a very difficult task. Most of the mainland arctic coast Eskimos east of Tuktoyaktuk never used umiaks in historical times; the same probably applies to the East Hudson Bay Eskimos. The Baffin Islanders and the eastern

Labrador Eskimos abandoned the use of umiaks a long time ago, and it was assumed that no living Eskimo in these regions could build such a vessel today. However, as late as the second decade of our century umiaks were still in use along the southern coast of Hudson Strait. Skin-covered whaling boats are still in use in several parts of Alaska so it was assumed that some of the Mackenzie delta people might still be acquainted with umiak technology. A message was sent to the Rev. R. Lechat, O.M.I., inviting him to ask the missionaries along Hudson Strait, and, for the Western Arctic, letters were forwarded to departmental officials at Aklavik and Tuktoyaktuk. From Tuktoyaktuk reports were negative, but encouraging information was obtained from the Herschel Island group, referring mainly to Irish Keogayuk, an elderly hunter who might still possess the traditional skills for such an endeavour. At the same time the Rev. J. Meeus, O.M.I., from Ivugivik, Hudson Strait, reported that old Ainalik from the same settlement was willing to assume responsibility for constructing a women's boat.

It would naturally be very much easier to get the boat transported from Ivugivik than from the Mackenzie delta. Moreover, the Western Arctic boats were very similar to those in use today in Alaska, whereas the ability to build an Eastern Arctic boat might be lost with the death of a few old men. The Reverend Meeus was therefore asked to accept Ainalik's offer. Since this provided a unique opportunity for gathering information on umiak technology, Mr. Eugene Arima, from the National Museum, was asked to make a trip to Ivugivik to study the different phases of umiak building. The following is an account of his findings.

How the umiak was built at Ivugivik, in the summer of 1960. By Eugene Arima

In mid-April of 1960 I was sent by the National Museum to study the building of the umiak at Ivugivik. First,I travelled by the Ontario Northland Railway and Austin Airways to Povungnituk, where I stopped for a few days with the schoolmaster Mick Malan, and greatly appreciated his culinary art. Ralph Knight of the Hudson's Bay Company had arranged the next leg of my journey to Ivugivik with two able dog team drivers,Markossiekadlak and Simeonie. In addition young Daniel Uyakik was enlisted as interpreter.

We left Povungnituk in a snowstorm which we had to wait out for the next two days. On April 29 we reached Ivugivik (population: 99 Eskimo and 1 missionary) after a slow, tedious trip of seven sleeps. "No more sleigh rides for me", I declared to the Reverend J. Meeus, O.M.I., as he welcomed me into the mission. But the warm hospitality of this kind man soon restored my spirits. Ten days later I was on a sled again - to Sugluk where I enjoyed a pleasant visit at the home of the Reverend David Ellis. There I met Tayara, an umiak-building consultant, and following his specifications wrote to the Northern Service Officer at Fort Chimo asking for suitable spruce timber.

To build an umiak you first need wood for the frame and, desirably, udjuk (bearded seal) for the skin cover and the lashings. Following an early breakup, on June 19 the Aivek, one of the two ancient Peterheads at Ivugivik, putted out after the large square-flippered seals among the floes towards Mansel Island. By July a dozen udjuk skins for the umiak were buried in the sandy beach next to the permafrost. The Aivek had also gathered some driftwood, including a 21-foot log which became the gunwales of the umiak and thus set its length at 20 feet. Apparently large-sized umiaks of the Hudson Strait region at the turn of the century were usually several feet longer. (See A.P. Low, "Cruise of the Neptune", 1906: p. 156 and photo facing p. 64).

On Monday, July 4, Henry Ukpik Amaroalik Ainalik, E 9-982, the master umiak-builder, sharpened a handsaw; on Tuesday he marked out the 21-foot driftwood log with pencil and string; the next three days he ripped the log into halves (a tiring task with a crosscut saw); and on the weekend he asked for time off from the umiak project in order to carve soapstone walruses for the annual ships, the N.B. MacLean, which arrived July 17, and the C.D. Howe, which arrived July 21. The hoped-for spruce from Fort Chimo did not come with the ships.

In the last week of July, with ship-time over for another year, work began in earnest on the umiak frame. It was to be built upside-down starting with the gunwales. Ainalik, the master craftsman, with his assistants Iyaitok and Oshuadjuk, bent the gunwale pieces around the thwarts and the upper end blocks. The rectangular result with ends 5-foot wide and the centre 7-foot wide, looked anything but inspiring. Furthermore, because of a shortage

of driftwood, the thwarts were made of heavy dressed lumber from the R.C. Mission, and attempts with a hatchet to camouflage this lumber as driftwood met with little success. Next came the most appealing (for me) construction features, the stem and the stern. The form each end of the umiak a rather massive block, shaped with hatchets, was set on a tripod composed of the end post and a pair of ribs. On these blocks a temporary keel was laid to support five crosspieces for the bottom of the boat. Five pairs of side ribs were lashed on to the bottom crosspieces and the gunwales. For these parts genuine driftwood was used. Old dog traces were used for the lashings.

In the first week of August the three workmen put on the grooved side-bottom stringers and the relatively flimsy keel. More ribs and bottom crosspieces were added for reinforcement. On the weekend a distinguished visitor from Sugluk, old Tayara, gave a qualified "O.K." to the frame. A stringer was lashed on the sides to keep the skin cover off the ribs. Another stringer was put inside just below the gunwales to carry the lashings of the cover. During the second week in August the udjuk skins were dug up, washed, scraped, sewn together with braided white whale sinew, and stretched over the frame. Gaps along the gunwales were patched. Then by lashings running through holes cut in the edges of the cover and around the inner stringer the cover was drawn tightly around the frame. The covering took seven fragrant skins and the sewing services of fifteen women. The rest of August was spent rebuilding an old hunting kayak. Making the rudder, oars, mast, yard, and sail took three weeks in September. The rudder, replacing the steering oar, shows the influence of the white man.

I was not completely satisfied with certain details of the finished umiak, particularly the way the "artificial driftwood" thwarts sat atop the gunwales making unsightly bumps. However, such faults were forgotten when the umiak was launched on September 24 and swiftly rowed out to the MacLean for shipment south. The clumsy-looking craft performed excellently in the water, and its enthusiastic crew had a hilarious time. I only regret that in the excitement of the maiden voyage the Reverend Meeus was forgotten on the shore. After eight years on Hudson Strait, the Reverend Meeus went "out" in a prosaic landing barge instead of the exotic skin-covered boat which could not have been built without his aid. For in all the little transactions that went into the umiak project he was the guide (with his certain understanding of the Ivugivimiut), the interpreter (the people spoke very little English), and the

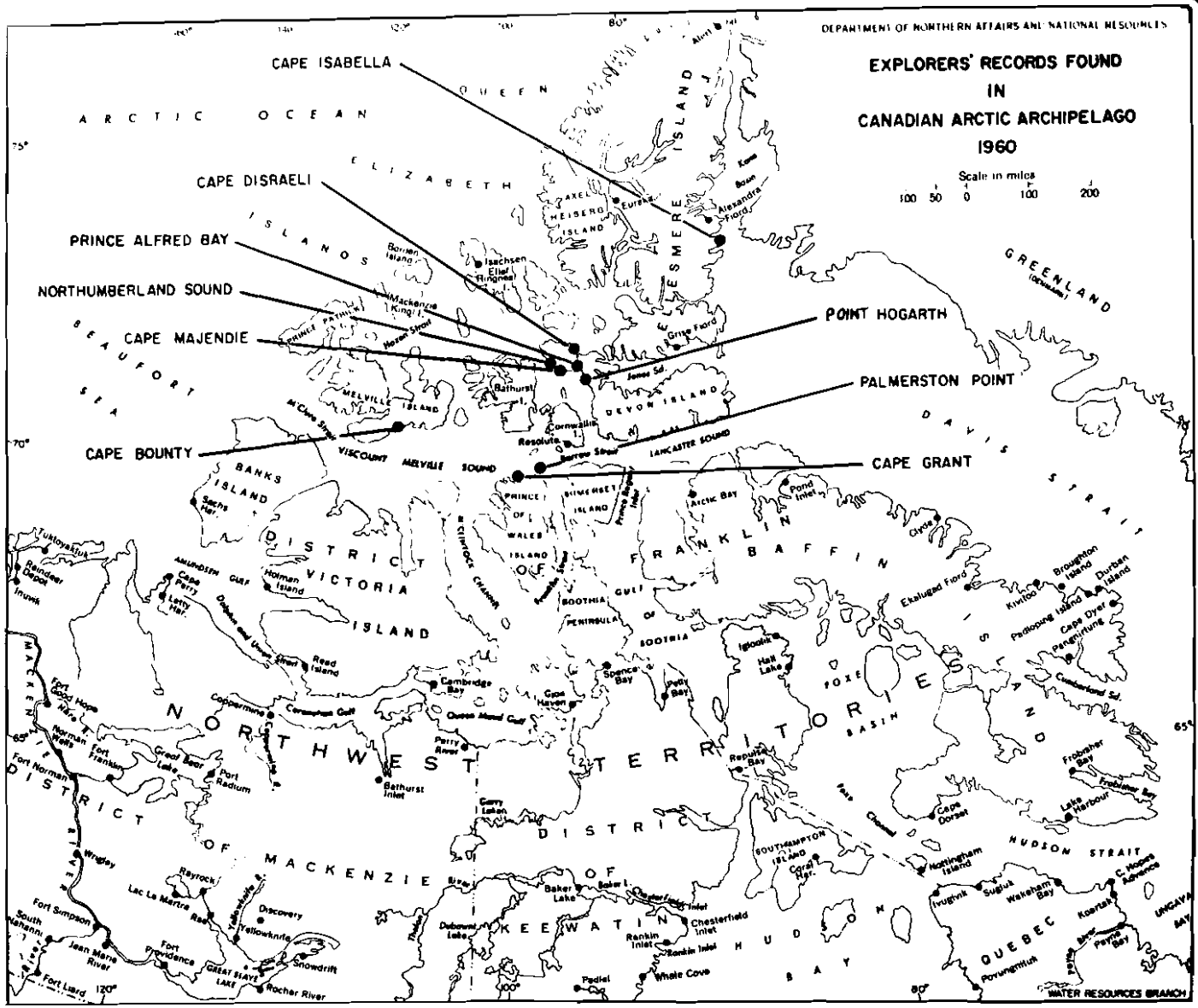
intermediary (in cases of disagreement, usually financial). If the National Museum's umiak is to have a name, "Yosepi" after the patient missionary would be most appropriate. In Eskimo it was variously referred to as "umiatuinak", "nothing but a boat", or jokingly "kaya.aluk", "big kayak", or "umiakadlak", "short stout boat".

Explorers' records found in the Canadian Arctic Archipelago in 1960

One of the by-products of the search for oil and gas in the Queen Elizabeth Islands has been the discovery of a number of records left by early arctic expeditions.

These records were normally left in stone cairns, or buried near them. Sometimes they marked the farthest limits reached by an expedition. Sometimes they were messages for other expeditions or for sledge parties. Many were left by expeditions searching for H.M.S. Erebus and Terror, the two ships which had set out from England in 1845 under the command of Sir John Franklin in an attempt to discover a northwest passage, and were last seen that summer waiting to enter Lancaster Sound.

During the past year no less than nine records are known to have been found in the Arctic Archipelago, seven from expeditions taking part in the search for Franklin. Michael Marsden, of the Arctic Institute of North America, came across two while travelling by dog sled from Resolute to Axel Heiberg Island; two were found by Professor A.H. McNair of Dartmouth College, a geological consultant for Dominion Explorers Limited. G. de Mille, an Imperial Oil Company geologist, discovered two more; and L.R. Singleton, a member of a geological field party from J.C. Sproule and Associates Limited, found one. All these records are from parties associated with the search for Franklin. Two other discoveries were made in 1960. R.W. Craig, a geologist of Round Valley Oil Company, found a record left by Captain J.E. Bernier, and a Royal Canadian Mounted Police patrol recovered a record left by Admiral Donald MacMillan, with a transcription made by him of an earlier record, from Sir George Nares's expedition 1875-6.


DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES
EXPLORERS' RECORDS FOUND
IN
CANADIAN ARCTIC ARCHIPELAGO
1960
Scale in miles
100 50 0 100 200
CAPE ISABELLA
CAPE DISRAELI
PRINCE ALFRED BAY
NORTHUMBERLAND SOUND
CAPE MAJENDIE
CAPE BOUNTY
POINT HOGARTH
PALMERSTON POINT
CAPE GRANT
ARCTIC OCEAN
BEAUFORT SEA
QUEEN ELIZABETH ISLANDS
EUREKA
ALEXANDRA FIORD
GREENLAND
GRISE FIORD
JONES SD.
DEVON ISLAND
MELVILLE ISLAND
BATHURST
CORNWALLIS I.
RESOLUTE
BARROW STRAIT
LANCASTER SOUND
M'CLURE STRAIT
VISCOUNT MELVILLE SOUND
BANKS ISLAND
PRINCE OF WALES ISLAND
ARCTIC BAY
POND INLET
DAVIS STRAIT
FRANKLIN DISTRICT
BAFFIN ISLAND
CLYDE
EKALUGAD FIORD
BROUGHTON ISLAND
DURBAN ISLAND
KIMMIRUT
PADLEIMIUT ISLAND
CAPE DYER
PANGNIRTUNG
CUMBERLAND SD.
VICTORIA ISLAND
HOLMAN ISLAND
AMUNDSEN GULF
CAPE PERRY
LETTY HBR.
DARNLEY BAY
PRINCE ALBERT SOUND
READ ISLAND
CAMBRIDGE BAY
COPPERMINE
COPPERMINE GULL
QUEEN MAUD GULF
GJOA HAVEN
SPENCE BAY
PELLY BAY
BOOTHIA PENINSULA
GULF OF BOOTHIA
IGLOOLIK
HALL LAKE
FOXE BASIN
FOXE CHANNEL
NORTHWEST TERRITORIES
DISTRICT OF MACKENZIE
DISTRICT OF KEEWATIN
FORT GOOD HOPE
NORMAN WELLS
FORT NORMAN
FORT FRANKLIN
GREAT BEAR LAKE
PORT RADIUM
BATHURST INLET
PERRY RIVER
CURRY LAKE
REPULSE BAY
FROBISHER BAY
LAKE HARBOUR
CAPE DORSET
HUDSON STRAIT
SOUTHAMPTON ISLAND
CORAL HBR.
NOTTINGHAM ISLAND
C. HOPE ADVANCE
IVUJIVIK
SUGLUK
WAKEHAM BAY
KANGIRSUK
QUEBEC
PAYNE BAY
PORPUNGNIUK
WRIGLEY
RAYROCK
LAC LA MARTRE
FORT SIMPSON
SOUTH NAHANNI
JEAN MARIE RIVER
FORT PROVIDENCE
DISCOVERY
YELLOWKNIFE
SNOWDRIFT
GREAT SLAVE LAKE
ROCHER RIVER
FORT LIARD
BAKER LAKE
BAKER L.
QUOEICH INLET
CHESTERFIELD INLET
RANKIN INLET
WHALE COVE
PADLEI
DUBAWNT LAKE
HUDSON BAY
WATER RESOURCES BRANCH

Those found by Professor McNair were in cairns on opposite sides of Russell Island. Both were left in 1851 by Captain Horatio Austin's expedition which wintered at Griffith Island. A detailed account of how they came to be deposited, and of the journeys during which the cairns were built, appears in the British Parliamentary Papers. ("Additional papers relative to the arctic expedition under the orders of Captain Austin and Mr. William Penny", 1852, pp. 34 and 48).

The other five records of the Franklin search were all found on Devon Island and come from the squadron commanded by Captain Sir Edward Belcher. These five ships formed the largest and last of the Admiralty expeditions searching for Franklin.

Belcher spent the winter of 1852-3 in Northumberland Sound in Penny Strait and the following winter at Cape Osborn in Wellington Channel. Two records, one found at the mouth of Northumberland Sound and the other on a hill north of Prince Alfred Bay, had been exposed to damp and drying and appeared to have been reduced to pulp. It seemed impossible to unwrap and read them, but the Archives had the brilliant idea of sending them to the R.C.M.Police Crime Detection Laboratory. Here Sergeant de la Durantaye succeeded in making them legible.

The Northumberland Sound record, found in a canister near a lead plate recording a cache left by Belcher's expedition, lists the contents of this cache and of the principal cache left by the expedition at Cape Lady Franklin. It also outlines the achievements of Belcher's expedition up to that time (14 July 1853), and includes a small-scale map. The list of supplies in the cache is identical with the list in the British Parliamentary Papers ("Further papers relative to the recent arctic expeditions in search of Sir John Franklin", January 1855, p. 103) except for the last item - Rum, concentrated. This, instead of 10 12/32 gals., is shown as 8 gals. 12 gills. Somebody must have found a use for two gallons of concentrated rum. The Prince Alfred Bay record is dated 30 May 1853, and was left by Captain Belcher, who had travelled by sled from Northumberland Sound along the north coast of Devon Island and down Arthur Fiord. Part is written in pencil and is no longer legible.

Another of the records was found at Cape Disraeli, written by Captain Belcher 16 days earlier than the one he left at Prince Alfred Bay on a printed form. His account of this journey is given in the British Parliamentary Papers. ("Further papers relative to the recent arctic expeditions in search of Sir John Franklin," January 1855, pp. 12-14).

At Point Hogarth a third document signed by Captain Belcher was found. It records his landing on 10 August 1852, to examine a stone pillar he had mistaken for a cairn. This incident is described in the British Parliamentary Papers. ("Papers relative to the recent arctic expeditions in search of Sir John Franklin", 1854, p. 63).

The last record from Belcher's expedition bears the same date but was left at Cape Majendie and signed by Commander G.H. Richards. It gives directions for finding a cache of provisions he had established that day. ("Papers relative to the recent arctic expeditions in search of Sir John Franklin", 1854, p. 63).

The record signed by Captain Bernier was at Cape Bounty in Melville Island. Dated 14 July 1909, it had been left after he had wintered at Winter Harbour. It was accompanied by a newspaper clipping from a Quebec newspaper for 13 June 1908, describing the plans for the voyage of his ship the Arctic.

The record found by the Royal Canadian Mounted Police at Cape Isabella is signed by D.B. MacMillan in 1917. Admiral MacMillan had also transcribed an earlier record he had found which had been left there by Sir George Nares in 1876.

Subscriptions for 1961

Members are reminded that their subscriptions for 1961 ($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, Miss M.C. Murray, 249 Irving Avenue, Ottawa 3.

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 1961 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, Miss M.C. Murray, 249 Irving Avenue, Ottawa 3, 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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