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Annual General Meeting of the Arctic Circle

The Annual General Meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Thursday January 12. The retiring President, Mr. A.E. Porsild, was in the Chair and opened the meeting with a report on the progress of the Club. Club membership had continued to increase and at the start of the third year of the Club's existence there were 160 Ottawa members, 224 out-of-town members, and 20 not yet classified, making a total of 404 as compared with 363 at the Annual General Meeting in 1949. During the past year there have been eight regular meetings and one special meeting, all of which have been well attended. At the end of his report, the retiring President thanked the members of the Committee and Officers of the Club who had assisted him during the two years he had held office as President. The Club wished to thank Col. R.C.D. Laughton for the use of the R.C.A.S.C. Mess and Cpl. R.S. Pushman for making the arrangements at the Mess.

After the President's statement an amendment to the Constitution was approved and the meeting was asked to vote for Committee Members. In accordance with the Constitution the President, Mr. A.E. Porsild, the Vice-President, Mr. Frank Davies, and the following five members of the Committee resigned: Dr. T.N. Freeman, Supt. D.J. Martin, Mr. G.W. Rowley, Dr. L.J. Weeks, and Mr. J.A. Wilson. To fill their place the Committee proposed the following names: President, Mr. Frank Davies; Vice-President, Insp. Henry Larsen; Committee Members, Mr. A.E. Porsild, Dr. George Hooper, S/L A. Copland, Dr. Y.O. Fortier, and Dr. H.A. Proctor. The list proposed by the Committee was accepted unanimously. The Officers and Committee Members for 1950 are as follows:

President:	Mr. Frank Davies
Vice-President:	Insp. Henry Larsen
Secretary:	Mr. T.H. Manning
Editor:	Mrs. G.W. Rowley

Committee Members

S/L A. Copland, R.C.A.F.
F/L J.F. Drake, R.C.A.F.
Dr. Y.O. Fortier
F/L K.R. Greenaway, R.C.A.F.
Dr. George Hooper
Mr. A.C. Jones
Mr. R.G. Madill
Mrs. T.H. Manning
Mr. A.D. McLean
Capt. B.P. O'Connell
Mr. A.E. Porsild
Dr. H.A. Proctor
Mr. F.C. Goulding Smith
Mr. A. Stevenson
Mr. B.J. Woodruff

Following the election of Officers and Committee Members the Secretary, Mr. T.H. Manning, asked the meeting to approve the annual financial statement. After this the meeting thanked and re-appointed the Auditors, Mr. W.K.W. Baldwin and Dr. George Hooper.

The new President, Mr. Frank Davies, then took the Chair. After expressing the gratitude of the Club to Mr. A.E. Porsild, the retiring President, who had held office during the first two years of the Club's existence, he introduced the speaker for the evening, F/L Barney Hartman, R.C.A.F. F/L Hartman described "Mercy Flying and Search and Rescue in the Eastern Arctic" illustrating his talk with kodachrome slides taken on flights from Goose Bay, Labrador.

Amendment to the Constitution

At the fifteenth meeting of the Circle on 8 December 1949 it was proposed that Paragraph 4 of the Constitution should be amended to include a standard fee for Libraries and Public Institutions. Due notice having been given, this proposal was voted on at the Annual General Meeting on 12 January 1950 and carried unanimously. Paragraph 4 should now read: "The annual membership fee shall be Two Dollars for residents of the Ottawa District, and One Dollar for non-residents (defined for this purpose as those living more than ten miles from Ottawa). The fee for Libraries and Public Institutions irrespective of their location shall be Two Dollars. A combined membership of $3.00 covering husband and wife may be paid by couples requiring only one copy of the Arctic Circular and other club papers. Membership fees become due on January 1st each year, but fees paid by members joining in October or later shall cover the period to the 31st December of the following year. Members whose fees remain unpaid after March 1st shall have their names removed from the club list."

A Biological Exploration of Banks and Victoria Islands.
By A.E. Porsild

A welcome opportunity to carry out a much needed reconnaissance of the flora of Victoria and Banks Islands presented itself last spring when Dr. A.L. Washburn, Executive Director

of the Arctic Institute, extended an invitation to the National Museum and the Geographical Bureau to join in a summer's field season in Banks and Victoria Islands. Dr. Washburn intended to continue his geological work in Victoria Island (See: Washburn in Geol. Soc. Amer. Mem. 22, 1947) and, if time permitted, to carry out some preliminary work in Banks Island. He had already completed arrangements with Canadian Pacific Airways to charter a Norseman aircraft which was to be piloted by the veteran northern flyer, Ernie Boffa, who had had considerable flying experience over Victoria and Banks Islands.

Dr. Washburn had originally planned to commence this season's work at Cambridge Bay in May. When quarantine followed the influenza epidemic there, he chose Holman Island Post instead, where Ernie Boffa landed him and Mrs. Washburn at the end of May. It was on the return from this flight that Ernie Boffa had a forced landing some fifty miles north of Coppermine when his aircraft became a total wreck. Fortunately, owing to expert handling, neither Ernie Boffa nor his mechanic was hurt, and both were rescued a few days later as the result of a most successful R.C.A.F. search directed by W/C D.R. Miller.

Accompanied by Mr. J.L. Jenness of the Geographical Bureau I left Ottawa on July 5 for The Pas, Manitoba, in an R.C.A.F. Canso piloted by F/O Cuthbertson, which was taking north a magnetic survey party headed by Ralph Hutchinson of the Dominion Observatory. At The Pas we transferred to an R.C.A.F. Dakota, which landed us at Yellowknife on July 7.

At Yellowknife we received the discouraging news that the season north of Great Slave Lake was unusually late; reports from Holman Island Post even indicated that it would not be possible for an aircraft on floats to land there until the end of the month, or fully two weeks later than anticipated.

The delay afforded a long hoped-for opportunity to visit the Scented Grass Hills - the 2,100-foot high peninsula which separates the two westernmost arms of Great Bear Lake. In late August 1928, at the conclusion of six months of exploration on Great Bear Lake, my brother Robert and I had made a brief visit to Etacho Point. Lack of time, and a brewing storm without safe anchorage for our boat, permitted only a hurried ascent. However, the botanical discoveries we had made strongly suggested that the summit of the peninsula might have escaped glaciation, or at least that its upper levels might have stood above the latest advances of the ice, acting as a refuge for a number of plants not known to occur elsewhere in the area.

The ice on Great Bear Lake was still unbroken but Ernie Boffa believed that he might find enough open shore water, or a suitable lake, where he could land us with our equipment.

Accordingly we left Yellowknife on July 9, stopping over at Port Radium to pick up some supplies and a light canoe. Crossing the lake, we circled the Scented Grass Hills. The hills are dotted with small lakes, a few of them large enough for a small aircraft to land on, but all were still ice-covered. Along the south shore of the peninsula was a narrow lead where Ernie Boffa managed to land us, eight miles west of Etacho Point.

Except for one day when the ice moved out from the shore, Keith Arm remained choked with ice during the next two weeks. Jenness and I spent this time making a botanical survey of the limited area which we could reach on foot. On July 20 Ernie Boffa returned and succeeded in landing us on a lake near the summit of the peninsula. A few hours on the ground convinced me that, although there was abundant evidence of glaciation, the composition of the flora strongly supported my earlier contention that the plateau might have escaped the last advances of the ice, and have remained a nunatak refuge for a group of plants otherwise of Cordilleran range.

After returning to Radium we learned that Holman Island Radio now reported open water on the lakes near the post and on the 25th we were able to resume our journey. Arriving at Holman Island Post on the 28th we were warmly greeted by Link and Tahoe Washburn, and by the Hudson's Bay Company's Post manager, Bill Calder who, with Father Buliard of the Roman Catholic Mission, and a few Eskimo families, made up the entire population. Most of the natives of the district were at their sealing camps at Minto Inlet and elsewhere. Even Father Buliard was at the time living at his sealing camp ten miles up the coast, where he had 200 large seals temporarily buried in the sand of the beach. In this manner the seals keep tolerably well preserved.

Although the sea was still icebound, as far as we could see from the air, summer appeared to be at its height in the Holman Island area and the landscape, which from the air had appeared rocky and barren, on closer inspection was ablaze with colour. In full bloom on the hillsides back of the Post were masses of creamy-white mountain avens, purple loco weeds, and magnificent yellow cinquefoils. On south-facing slopes we could even find miniature "rock gardens", all gay with purple gentians, daisies, and Lapland rhododendrons, yellow arnicas, and in rock crevices even three kinds of rock ferns.

With the season so far advanced time was at a premium. Fortunately, two weeks of exceptionally fine weather followed, and together with the continuous daylight made it possible to do a good deal of flying. Our first excursion took us to southern Banks Island. Crossing from Cape Wollaston to De Salis Bay we saw open leads far to the south. Southern Banks Island

looked quite summerly with scarcely any snow left on the land and most of the lakes free of ice. Flying through Masik Pass we saw open water in Beaufort Sea as far north as Cape Kellett. After a brief landing at Sachs Harbour on the west coast we continued along Thesiger Bay. To the south of this bay the coast is spectacular with perpendicular cliffs rising sheer from the sea to heights of 1500 feet. We landed on a small lagoon to inspect the trap-sedimentary sequence which characterizes the cliffs. On the south-facing talus, below a cliff where a colony of herring gulls and a pair of peregrine falcons nested in apparent harmony, we found a lush vegetation in part composed of plants that had not been recorded from Banks Island.

A second flight from Holman Post took us first to the head of Minto Inlet, thence south to the head of Prince Albert Sound and east by way of Tahoe and Washburn Lakes to Cambridge Bay. The return trip was by way of the south coast as far as Richardson Island from where we crossed to Prince Albert Sound, thence north and west back to Holman Island Post along the strike of the probable contact between the trap-sedimentary sequence of the Holman Island area and the sedimentary rocks to the southeast.

The weather thus far had been good; but with the long overdue breaking-up of the sea ice we entered upon a period of unsettled weather with frequent fogs and overcast. During the remainder of the month, Dr. Washburn continued his study of geomorphological problems in western parts of Victoria Island ... while, on August 10, Jenness and I set up an advance base on a small, unnamed lake in northeastern Banks Island, about thirty miles west of Russell Point. After landing us there Ernie Boffa returned to Holman Island Post for a load of gasoline. Bad weather prevented his immediate return and not until the 21st were we able to set out on a flight to the northwest and north coasts. During the preceding ten days northerly wind had prevailed causing a low overcast over the northern part of the island. Poking his way through this overcast, with occasional landings when the visibility became too low, Ernie Boffa got us through to the west coast on the 22nd, landing on the south shore of Bernard Island which lies off the combined deltas of two large rivers. From 2,500 feet up Beaufort Sea appeared to be clear of ice as far north as Bernard Island, from where the edge of unbroken polar ice stretched in a northwesterly direction. After a brief stop we followed the coast north but we soon encountered dense fog again which forced us a considerable distance inland. Through the broken undercast we looked down on a plateau of sedimentary rocks cut by a complex system of broad canyons and river valleys that now carried very little water. In many of the canyon walls we saw fine exposures of well stratified sedimentary rocks, and in one place a thick, black band which might have been coal. Unfortunately the absence of large lakes prevented landings, so we were unable to examine this interesting landscape

more closely. Flying along the southern edge of the overcast, Ernie Boffa at last picked up Thompson River, which he was able to follow to Castel Bay on the north coast. Castel Bay, as well as the nearby Mercy Bay, was open, as were narrow leads along the south shore of McClure Strait while to the north the strait itself appeared unbroken.

We landed at the foot of Mercy Bay abreast of a conical hill which is a prominent landmark, approximately 500 feet in height. The lateness of the day and the threatening fog, which was slowly creeping in from the Polar Ice pack, made it inadvisable to remain here long enough to explore the foot of the bay for remains of McClure's winter quarters of 1851-2 and 1852-3 where his ship, the Investigator, was abandoned later to be broken up by Eskimo. On the beach I picked up bits of flotsam that undoubtedly were from the Investigator. The surface of the wood was bleached white, but scraping revealed one piece to be English oak and another to be mahogany; both were perfectly fresh and sound after nearly a hundred years on the beach. Climbing the hill to the east we could not but wonder how many times McClure and his men, during the three years they were frozen in here, had climbed this identical hill to look toward the Polar Sea that never opened enough to release their ship. In the steep cliffs facing the bay we found beautifully preserved fossil corals in beds of Devonian rocks.

On the return flight to our base camp west of Russell Point we ventured a short distance out over the Polar Ice for a glimpse of the high and forbidding cliffs which, between Russell Point and Mercy Bay, where we crossed the coastline, rose sheerly to heights approximatating 600 feet. In deep river canyons cut to sea-level were fine exposures of well stratified sedimentary rocks. Similar exposures were subsequently examined in the canyon walls near the mouth of a small river which flows into Prince of Wales Strait, approximately thirty miles south of Russell Point. Fossils obtained there, and at Mercy Bay, have been identified as Devonian by Dr. Alice Wilson.

During the last few days the weather had been distinctly autumnal but the following day the temperature dropped to 26°F. with a blizzard from the North which covered the ground with snow and put an end to further collecting of plants. So backward had the season been in northern Banks Island that only half a dozen species of plants had succeeded in maturing seeds, while the majority were overtaken by winter when their flowers had only just opened.

Breaking camp on the 24th we spent the next two days in the southern part of the island, where landings were made at De Salis Bay, Nelson Head, and on a small mountain lake near

the summit of the 2,400-foot plateau which forms the southern portion of the island south of Masik Pass. From Nelson Head west to Cape Lambton and thence north the coast over a distance of about forty miles is formed by sheer cliffs rising from the sea to heights varying from 500 to 1500 feet. The cliffs are formed of well stratified sedimentary rocks and are capped by a great thickness of trap. Flying in perfect weather along this cliff we obtained some very fine photographs of this most spectacular part of Banks Island.

Back of the cliffs the plateau is everywhere covered by a thick mantle of angular rock debris weathered in situ which completely covers the underlying bedrock; this suggests that the plateau was not overridden by the glaciers which covered the middle part of the island. However, a small esker which forms the very summit of the plateau shows that at any rate a local ice cap once rested here.

North of Masik Pass the centre of Banks Island is occupied by rolling hills which probably nowhere exceed an altitude of 1000 feet. Toward the north end of the island the north and south trending watershed approaches to within eight miles of the east coast. The eastern portion of these hills has undoubtedly been glaciated and submerged at least to the 500- to 600-foot level. Flying over this part of the island I was forcibly reminded of a huge tidal flat from which the sea has just recently receded. More than half of the surface is lake-covered and lacks well-defined drainage patterns. Here, as everywhere on Banks Island, the land surface bears abundant marks of frost action, either in the form of solifluction stripes or of soil polygons. The latter are such a characteristic feature in the landscape that in the course of the summer we jokingly came to refer to Banks Island as "Polygonia".

The northernmost part of the island is somewhat higher than the middle part and may reach altitudes of nearly 1500 feet. This highland may have escaped glaciation; from the air, there appeared to be no pronounced glacial deposits such as eskers or moraines; furthermore, the rivers which empty into McClure Strait have eroded deep canyons that extend at least fifty miles inland. Neither at Mercy Bay nor at a lake where we landed near the southwestern edge of the highland, approximately fifty miles southwest of Castel Bay, did I see evidence of glaciation. Likewise, the presence on the west coast of Banks Island, of high cliffs which contain fossil ice such as is common on the unglaciated north coast of Alaska and in the Yukon, may indicate that the north coast, and possibly also the west coast of Banks Island, was never glaciated.

Owing to difficulty of access by sea, Banks and Victoria Islands have until lately been among the least known islands in the Canadian Arctic Archipelago. No professional botanist had

previously visited these islands and for floristic information we had largely depended upon the collections of plants made by officers of the early British expeditions under McClure and Collinson. It was not surprising, therefore, that in the first two hours of botanizing in Banks Island I doubled the known number of species of vascular plants. Although we made landings in ten different places in Banks Island and in eleven places in Victoria Island, in only one or two did time permit long enough stops for thorough collecting of plants. Nevertheless, at the end of the season the total number of vascular plants known to occur in Banks Island had been increased from 65 to 174 and that of Victoria Island from 106 to 201 species. Although the total number of species is low, a relatively large percentage is endemic to the Canadian Arctic Archipelago, a fact which suggests long isolation. Contrary to expectation the flora of both islands proves phytogeographically to be more closely related to the Cordillera than to the flora of Alaska and the Northern Yukon.

As already stated the summer of 1949 was climatically an unusually backward one in the Western Arctic; the break-up occurred almost three weeks later than normal and not until late August did the first boat get in to Cambridge Bay.

Animal life, naturally, was greatly affected by the late season and many migratory birds that normally breed in Banks and Victoria Islands either did not reach their nesting grounds or failed to breed. Throughout the summer we saw very few small land or shore birds and some of those we did see obviously had not bred. All summer we saw only one brood of rock ptarmigan and one flock of 28 black brant. We did see a number of yellow-billed and red-throated loons but they, too, had reared no young. In fact, the only breeding land birds that were at all common were falcons and rough-legged hawks. But even those had experienced hard times, for a pair of gyrfalcons which had nested on a cliff at Mercy Bay had raised but one young and this, when almost full-grown, had starved to death below the nest. On August 5 the nest of a pair of peregrine falcons south of Washburn Lake contained four unhatched eggs.

Judging from the abundance of their burrows, lemmings formerly had been abundant on both Banks and Victoria Islands; last summer they were very scarce. On Banks Island we saw collared lemmings in one place only, on a strand flat twenty miles south of Russell Point. On Victoria Island, although generally speaking very scarce, they were reported to be increasing in the vicinity of Cambridge Bay. Foxes, too, were very scarce and only a few tracks were seen. In a letter written just before Christmas, Bill Calder reports that only ten foxes had been traded at Holman Island Post and that the outlook was very poor. Wolves and Arctic hares were seen on a number of occasions; caribou appeared to be relatively

plentiful and fresh tracks were seen everywhere; in late August scattered small herds, composed mostly of does with their fawns, were seen in the northern part of Banks Island. Although we kept a sharp look-out for musk-ox, we did not actually see any. However, a few may still exist on the island for we saw tracks of a small number at Mercy Bay. When crossing Amundsen Gulf on August 25, we saw a large bowhead whale which obligingly remained surfaced while we circled low over the perfectly calm sea.

Although much too short for the work on hand the field season of 1949 had been a profitable and most enjoyable one for all of us. This was very largely due to the splendid and enthusiastic collaboration by all members of the party, not least from our pilot, Ernie Boffa, and his mechanic, Glenn McKinnon, who maintained the keenest interest in the work of all members of the party, and in the face of the multifarious demands made upon them in the interest of geology, geography, and botany, remained ever unperturbed and helpful.

Eskimo style clothing of synthetic fur. By W.E. Cowie

The comfort, lightness, and warmth of Eskimo caribou skin clothing is well known to Arctic travellers. For centuries the Eskimo has lived under extremely rigorous conditions and his existence today is a tribute to his clothing.

In January 1947 the writer carried out repeated trials of vision devices at Churchill. Wearing Army issue clothing and restrictive face coverings the whole equipment was so heavy that walking over drifted snow resulted in a feeling of exhaustion and inability to contend with the elements. In fact wearing this clothing man was the slave to arctic conditions and not their master.

It became obvious that the lightness and comfort of the Eskimo caribou clothing was most desirable. But with the limited supply of caribou skin it was necessary to search for a synthetic substitute. In this connection reports of traveller's that wolverine skins prevented frost and ice forming on a parka ruff to a greater extent than any other parka trimming deserved investigation. A wolverine skin was obtained and taken back to Ottawa, but with no help to work on the problem the skin was placed in cold storage. However, in the fall of 1947 a scientist, Mr. A.E. Blouin, was put on to the wolverine problem.

From the wolverine came the answer to the required physical characteristics for good frost removal. Working on this information a nylon pile fabric was designed to incorporate, as closely as materials and production facilities would allow,

the warmth, flexibility, and weight of the caribou skin and the good frost-removal characteristics of the wolverine.

Nylon is particularly suitable for synthetic clothing. The filaments are smooth, strong, and relatively light in weight. They are flexible at low temperatures, have a high melting point, and do not burn with a flame. Nylon is very resistant to fungus and rot. In addition, it has a high lustre which produces a beautiful sheen on a pile fabric.

It was found that a round smooth nylon filament with a diameter similar to that of caribou guard hairs would provide just as good frost-removal characteristics as the animals' fur. The fabric devised is woven with a very tight back and a pile to simulate fur. The finished material is rubberized to reduce the air permeability to very low levels. However, it will transmit a large amount of water vapour, which helps to prevent the accumulation of moisture in the clothing. A low air permeability is extremely important in arctic clothing as it prevents the escape of warm air next to the skin.

The first suit was made with a $1\frac{1}{2}$-inch pile. The suit was very heavy and, according to F/L S.E. Alexander, who tried it on, much too warm. A second attempt produced a suit with a 3/8-inch pile which made a garment weighing only $12\frac{1}{2}$ pounds complete with Eskimo type mitts and boots. This clothing was worn at Cambridge Bay in February of 1949 and used on overland travel in company with an Eskimo guide. The Eskimo liked the parka but found it a little too warm. The temperatures ranged from -35° to -55°F. with winds of 10 to 45 mph.

The clothing was made after the Western Arctic pattern with the exception of the peaked hood of the Eastern Arctic used on the inner and outer parkas. The parkas and trousers are worn pile in and pile out in a similar manner to Eskimo clothing. The garments may be cleaned by washing with soap and water and combing out the pile when dry with an ordinary or wire comb.

Nylon clothing described in this note was worn by the expedition to Foxe Basin in the summer of 1949, led by T.H. Manning. The party considered the clothing very satisfactory; like other clothing suitable for summer use, however, it did not prevent some of the members from feeling cold occasionally under the severe conditions encountered in a small boat with ice in the sea.

It has been announced that flying suits made from the nylon pile fabric will be used by aircrew on Exercise Sweetbriar, which will take place in the Canada/Alaska boundary area during February 1950.

Royal Naval Survival Experiments

On January 27, H.M.S. Truelove (Commander A.S. Jackson, R.N.) sailed from Rosyth for northern waters. Aboard were Professor R.A. McCance, Dr. E.M. Glaser, and Mr. R. Luff, of the Department of Experimental Medicine at Cambridge, England, and nine volunteers for experimental work.

The naval and scientific party planned to carry out experiments on the ability of men to survive in very cold conditions at sea. Both equipment and rations were to be tested for periods of three to five days.

The new equipment consists of an oval inflatable rubber raft, which has a pneumatically-stressed tent and is capable of taking from eight to twenty men; a survival suit which on being inflated covers the wearer from head to foot; a life jacket which has been developed from the Royal Air Force type; and paraffin heaters and sea-water stills for use inside the raft.

Two sets of survivor's rations were to be tested; one complete diet of 3,000 calories, and one minimum diet of 1,500 calories. The complete ration consists of toffee, condensed sweetened milk, oatmeal block, and shortbread.

Records were to be kept of the physiological and psychological reactions of all the subjects. Canaries and mice were carried to give warning of monoxide fumes from experiments with paraffin heaters in the raft.

It has since been announced that a five-day trial on the 1,500-calorie diet has been completed satisfactorily. Each man received two tubes of condensed milk, a small bag of toffee, and two-thirds of a pint of water daily. All volunteers came through the test well and with very high morale; temperatures were below freezing with snow and gales. Further tests are continuing and it is planned that the same volunteers will carry out similar tests in temperate and tropical waters during the next nine months. The volunteers are: Lieut. J.L. Watkinson (in command), Petty Officer L.A.F. Hawkey, L/S J. Thompson, A/B G. Lewis, A/B G.C. Tonkin, A/B W.S. McDonald, A/B E.F.J. Bartlett, and Stoker Mechanic H.R. Rackham.

R.C.A.F. taking over operation of Fort Chimo and Mingan airfields

It was announced in November 1949 that the R.C.A.F. had taken over the operation of Fort Chimo and Mingan airfields, in Quebec, from the U.S.A.F. Both fields came under the Newfoundland Base Command of the Military Air Transport Service U.S.A.F. and formed part of the ferry routes to England during the war.

Fort Chimo and Mingan served M.A.T.S. as emergency landing strips, provided communications facilities, and transmitted weather reports. Buildings and facilities of these airfields were bought by Canada from the United States in 1944.

The site of Fort Chimo airfield was first surveyed in 1941, and in the fall of that year a small detachment of U.S. forces, in cooperation with the Canadian authorities, set up a weather and transmitting station there. Construction of landing facilities was completed in 1942 and the structural work was finished in December 1943. Mingan was first used by U.S. forces in April 1943.

To facilitate the changeover a few U.S.A.F. communications and weather personnel will remain at the two airfields for some months until their work can be undertaken by the Canadian Department of Transport.

Reductions in U.S.A.F. units on the Canadian section of the North West Staging Route

After the war small units of the U.S.A.F. Military Air Transport Service remained at the Canadian air bases at Edmonton, Fort Nelson, B.C., and Whitehorse. These three stations, which form part of the North West Staging Route, are controlled and maintained by the R.C.A.F. It has recently been announced that the U.S.A.F. units at these bases, mainly Airways and Air Communication Service, Air Weather Service, and Continental Division personnel have been considerably reduced as from 1 November 1949. A minimum number of M.A.T.S. weather and liaison personnel remain to service M.A.T.S. transport operations between the United States and Alaska.

Lifting of quarantine in the Keewatin District

The quarantine, which has been in force since February 1948, in the Eskimo Point to Chesterfield Inlet area has been lifted by an Order dated 10 January 1950, under the Public Health Ordinance of the Northwest Territories. Accounts of the poliomyelitis epidemic which started in this region in July 1948 and reached its most serious proportions from October to December 1948, have been given in the Circular for March (pp. 33-34) and November 1949 (pp. 84-86). So far as can be determined no new cases have occurred since March 1949.

Blueberries on the Belcher Islands

Mr. Jack Ballantyne would be grateful for any first-hand information on the quality and quantity of blueberries on the Belcher Islands. His address is R.D.1. Springville, N.Y., U.S.A.

Authorized as Second Class Mail, Post Office, Department. Ottawa

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Eighteenth Meeting of the Arctic Circle

The Eighteenth Meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Thursday February 9.

The President, Mr. Frank Davies, was in the Chair and introduced the speaker, Mr. A.E. Porsild.

Mr. Porsild spoke on "Plant life in the Arctic", and illustrated his talk with kodachrome slides.

Nineteenth Meeting of the Arctic Circle

The Nineteenth Meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Thursday March 9.

The President, Mr. Frank Davies, was in the Chair and introduced Mr. D. Wilkinson, who spoke on the National Film Board's activities in the North. Three kodachrome films produced by the Film Board in their Arctic Note Book Series were shown.

Arctic Note Book Series

The three films shown at the Circle Meeting on March 9 were produced by the National Film Board and are the start of a new Arctic Note Book Series. These documentary films are particularly planned for schools and are intended to bring information on the north country to as many people as possible. The first three were released in February 1950, and others in the series are at present being worked on.

Arctic Note Book Number I, "How to build an Igloo", and Arctic Note Book Number II, "Arctic dog team", were both produced from footage taken in the spring of 1948 in the

Eskimo Point area by a U.S. Camera man on leave from Fort Churchill. The commentary was written by Doug Wilkinson, who was also responsible for the technical side; Michael Spencer produced the films. Note Books I and II are in 16 mm. colour and consist of one reel each lasting 10 minutes. The photography of both is excellent and the commentary is straightforward, simple, and accurate.

Arctic Note Book Number III, "Across Arctic Ungava", is rather different from the first two in the series as it deals with the story of an expedition across Ungava led by Dr. Rousseau in the summer of 1948. As a record of a trip it is most interesting, but as a documentary film perhaps not as satisfactory as the others. J. Michéa, the archaeologist on the expedition, was the photographer and Doug Wilkinson wrote the commentary and edited the film. The photography, as would be expected on an expedition, is not quite up to the excellent standard of the first two films, but is extremely good. There are one or two cases where the commentary might have been phrased slightly differently, and a reference to Flaherty's journey would have seemed in order. The film is in 16 mm. colour and consists of 2 reels, lasting 20 minutes in all.

The National Film Board is to be congratulated on a most enterprising series and particularly for the very excellent start with these first three films. The films can be obtained through the Carnegie Library in Ottawa, or through the National Film Board Regional Offices elsewhere.

Seismic Observatory for the Arctic[1]. By P.C. Bremner

In the summer of 1948, P.C. Bremner of the Dominion Observatory accompanied the American Task Force 80 to the Arctic to determine whether it would be possible to install a seismograph station in the extreme north, with particular reference to Resolute Bay, Cornwallis Island. During this summer the area around the weather station settlement was carefully studied. Bedrock, the prime requirement for any seismic observatory, was located about one-third of a mile south of the station. Other requirements such as electrical power, suitable buildings and communication with Ottawa were

[1] Published by permission of the Director-General of Scientific Surveys, Department of Mines and Technical Surveys, Ottawa.

discussed with personnel on the station, whose knowledge and experience solved many of the difficulties. The conclusion, drawn from this survey, was that it would be possible to install a first class seismic station at Resolute Bay but that there would be some difficulties.

During the summer of 1950 P.C. Bremner and Rodney Andrews, a student at the University of Toronto, will carry out the construction and installation of the seismic observatory at Resolute Bay. Bremner will make observations during the first year and will be relieved by Andrews in the summer of 1951.

An interesting and somewhat unusual feature of the installation will be the great distance between the instruments detecting earth motion and the recording unit. In most observatories the seismometers, which are firmly seated on bedrock and detect earth motion, are separated from the recording apparatus by only a few feet, and are located in the same room. In this instance, in order that the operator, who must service the recorder at least once a day, need not travel long distances in the dark period, the observatory buildings will be located at the main settlement and connected by electrical cables to the detectors some 1600 feet away.

Special stressed skin plywood buildings for permafrost areas are being supplied by George Jacobsen, who has erected many buildings in the Arctic. The observatory building will have a double wall for temperature control and will be buried in gravel to prevent high winds from vibrating the building and disturbing recording apparatus.

With these exceptions the observatory will be very similar to other seismic stations in Canada. At present it appears that the seismic equipment and staff will be transported to Resolute Bay during the coming summer. Operation should begin around the end of August or early September.

The main purpose of this station is to record earthquakes of world wide interest. Its geographical location will make it particularly valuable for determining epicentres of earthquakes occurring in the northern hemisphere. Seismic data compiled from records at Resolute Bay will be communicated daily to Ottawa for a broader interpretation and will be included in the monthly bulletin put out by the Dominion Observatory. The station will also provide the first opportunity for studying the local seismicity of the Arctic Islands, where numerous earth tremors are reported each year.

Within a short time this station should become one of the chain of seismic observatories stretched around the world. It should contribute a great deal of information which will aid seismologists in the study of the structure and character of the earth.

The Charles Camsell Indian Hospital. By W.L. Falconer

The Charles Camsell Indian Hospital at Edmonton commenced operations under the management of Indian Health Services of the Department of National Health and Welfare early in 1946. Its present capacity is 460 beds.

The original intention was to treat Indians and Eskimo with tuberculosis. Its scope has been broadened since that time to include indigent White and Metis from the North-west Territories and the Yukon, and some D.V.A. patients whose homes are in the vicinity of Edmonton. Small sections in the hospital are set aside for the care of Indians ill with diseases other than tuberculosis, and include a maternity and general medical and surgical services.

The area served covers the Province of Alberta, the northern part of British Columbia contiguous to the Alaskan Highway, the Yukon, and the Northwest Territories. The hospital staff are responsible for the T.B. surveys in this area and last year X-rayed about 20,000 people. This included the Coronation Gulf area where Dr. J.C. Callaghan and his clinic took plates on about 800 Eskimo.

In the treatment of tuberculosis the northern Mission Hospitals are used as an adjunct to the Camsell Hospital and play a very important part. When natives are found to have tuberculosis, they are admitted to the nearest Mission Hospital (if there is one in the area). After a more thorough investigation in the Mission Hospital, it is then decided whether they will continue treatment there or be transferred to the Camsell Hospital for more specialized treatment. From the Coppermine and Cambridge area, patients requiring treatment are transferred directly to the Camsell Hospital.

Members of the Arctic Circle will be particularly interested in the patients who come from "the far away places - North of 67". Indians from Old Crow, Fort McPherson, and Great Bear Lake are represented. Eskimo patients have been here from Aklavik, Tuktuk, Coppermine, Read Island, Holman Island, Cambridge Bay, Bathurst Inlet and Boothia Peninsula. At the time of writing there are 31 Eskimo in the hospital. Of

these, 26 have tuberculosis in one form or other. In the two Aklavik hospitals at the end of December, 1949, there were 46 Eskimo and 39 Indians with tuberculosis.

Dr. Callaghan's survey of the Coronation Gulf area showed that there were 30 Eskimo requiring treatment in hospital for tuberculosis.

As could be inferred, this vast area of Canada supplies a very polyglot group of patients. The greater portion are Indians, and in this group alone about a dozen different languages or dialects are spoken.

The Eskimo patients come from an area extending from the Delta east to Boothia Peninsula, along the northern rim of the continent and Arctic Islands. Their habits and costumes vary according to the extent of their exposure to the white man over the past years. In a matter of a few hours they are whisked by plane from their native surroundings to a large progressive city with a hospital and modern facilities. It is surprising how quickly they conform to hospital routine.

Other patient groups consist of D.V.A. patients from the Edmonton area, Whites from the Yukon and Territories. This latter group again varies from Anglo-Saxon stock and various Central European nationalities to the enfranchised Indian, Half-breed, or Metis.

As well as being a centre for the treatment of tuberculosis and promotion of better health standards, there is an extensive educational programme that should not be overlooked. The Welfare and Training Division of Indian Affairs supply four full-time teachers and at present 297 pupils are enrolled in various courses and school grades. Indian Affairs is now in the Department of Citizenship and Immigration, and there is a combined inter-departmental programme to improve not only the health and welfare, but raise the educational standards of the patients.

Geodetic Survey work during the summer of 1949

During the 1949 field season the Geodetic Survey established a record number of astronomical control points, partly because of good weather and partly because of transport facilities. As a result of the summer's work 136 points were put in, including 19 in Foxe Basin for which the Geographical Bureau's expedition was responsible, providing control for 40,000 square miles of arctic and subarctic territory. The work was carried out in close cooperation with the R.C.A.F..

Number 10 Detachment of 413 Squadron travelled 146,980 miles transporting Geodetic parties, and commercial aircraft 12,220 miles. The greater part of the commercial mileage was flown in northern Quebec.

Two main Survey groups were responsible for the northern astronomical work. One under A.A. Johns worked in northern Quebec; the other under G.A. Corcoran worked north from Great Slave Lake to the Arctic Islands. In addition precise levelling and triangulation was carried out along the Mackenzie and Alaska Highways.

The Quebec group, which consisted of two parties, established 27 astronomical points in the territory between Ashuanipi Lake and Ungava Bay. In this area the weather was not good; during August there were 50-mile-an-hour gales and snowstorms, and rain was frequent. Knob Lake, the airport for the Labrador iron mining companies, was used as the main base for the aircraft transporting the parties. The members of this group, which included S.L. Kao, L.A. McHattie, and G. Gregoire, reported that there seemed to be an unusual number of mink and fewer caribou than expected.

The Great Slave Lake group was divided into four parties. Surprisingly good weather enabled this group to establish 90 points, 25 of them on the arctic coast or on the islands of the Arctic Archipelago. Four Canso and three Norseman aircraft were employed for transport. Work was started in the Great Slave Lake area and was carried northward and eastward as weather permitted. On the arctic coast a strip about 200 miles in depth was covered between Amundsen Gulf and Simpson Peninsula (Gulf of Boothia). The parties continued on to the southern coast of Victoria Island and northward through the Boothia Peninsula to Fort Ross on Somerset Island. Eastward progress was much more rapid than expected and Baker Lake was reached by the end of the season. The members of the parties, which included W.D. Forrester, A.C. Rae, A.J. Shama, J. Woodruff, and D.M. Knox, reported difficulty in obtaining astronomical data under the conditions of almost continuous daylight.

D.C. Coombs of the Geographical Bureau's expedition to the islands in Foxe Basin, led by T.H. Manning, put in 19 points in the Hudson Bay area. The majority were in northwestern Foxe Basin and included fixes on Prince Charles, Airforce, Rowley, and the Spicer Islands.

Northern precise work was carried out by two Survey groups. R.W. Serviss was responsible for two levelling parties which continued previous work northward along the

Mackenzie Highway to Great Slave Lake to provide precise elevations for detailed mapping and for engineering developments. Four triangulation parties under F.P. Steers worked along the Alaska Highway in the vicinity of Watson Lake, tying in surveys along the British Columbia - Yukon boundary, and established an accurate control framework for further surveys and development in the area adjacent to the Alaska Highway.

The Varying Lemming in captivity in Ottawa

In many places in northern Canada, the lemming cycle was at a high peak during 1949. Lemming were therefore easy to catch, and four separate groups of the Varying Lemming, Dicrostonyx groenlandicus were brought back to Ottawa. One group, of which 4 males and 7 females arrived alive, was shipped from Churchill to Dr. J.S. Hart of the National Research Council. Several of these bred soon after they arrived, and 27 young have been born. There are now 6 of the original group and 20 young left. Although some of the latter are apparently quite mature, no second generation captives have yet been born. Another group of 3 males was brought from Churchill by Dr. G.P. Holland. Mr. Stewart McDonald of the National Museum brought a pair back from Prince Patrick Island. These had three litters, all of which have died. The female also is now dead, and has been replaced by one of a fourth group from Igloolik. This fourth group, which originally consisted of 16 individuals, was brought from Igloolik by Mr. Andrew Macpherson and myself while we were on the Geographical Bureau's expedition to Foxe Basin. They were captured on September 14, and arrived in Ottawa on October 13, after travelling by Peterhead boat, plane, and train without any ill effects. Since then, one drowned, one died from eating cement, 4 were killed by a cat, and 2 died from an undetermined cause after first becoming very thin. The first litter, a male and a female, was noticed on February 19, and may have been a day or two old at that time. The male offspring was killed when about four weeks old by an adult male with which both the young had been placed about a week before. The same parents gave birth to a litter of 4 on March 13, and another, also of 4, on April 6. A second pair had a litter of 3 on March 23, and a third 5 on April 8.

Varying Lemming are easily tamed - in fact, some will probably climb up one's sleeve within a few minutes after capture. They like to use a swing or climb up a string. They thrive on rolled oats, lettuce, cabbage,

carrots, raisins, orange peel, or a similar assortment of food. They will occasionally eat a small amount of cheese or meat or the carcase of a dead companion.

To determine their sex, it is usually necessary to anaesthetize them. This can be done by placing them in a glass jar with a little ether until they become quiet. They recover in about 30 seconds, and usually start to eat within three or four minutes.

Macpherson and I also brought home 7 Brown Lemming, Lemmus trimucronatus, captured at Chesterfield and Morso Island between September 27 and October 3. These never became tame, and always attempted to avoid being picked up. Six died between October 20 and 25, and the last one escaped. Three of the carcases were examined by Drs. P.J.S. Plummer and J.L. Byrne of the Animal Diseases Research Institute, Department of Agriculture, and were found to be heavily infected by the unicellular organism Listerella monocytogenes which had presumably been the cause of death. Tests for virus infection and negri bodies were negative. The first two died while I was away, and their carcases had been almost completely eaten by the survivors when I returned after two days, although there was ample food in their box.

The Varying Lemming has previously been kept in captivity several times. The most complete report appears to be on seven which were brought to Denmark from Greenland in 1936, and their progeny kept until 1942[1]. In August, 1944, 4 Varying Lemming were sent to the National Museum of Canada by Supt. D.J. Martin R.C.M.P.[2]. They had no young, and the last one died about two years later. As far as I am aware, the Brown Lemming has never survived long in captivity.

1 Degerbøl, Magnus, and Møhl-Hansen, U. "Remarks on the Breeding Conditions and Moulting of the Collared Lemming (Dicrostonyx)", Medd. om Gron. Vol. 131, No. 11, 40 pp. København, 1943.

2 Anderson, R.M., and Rand, A.L. "The Varying Lemming (Genus Dicrostonyx) in Canada." J. Mamm., Vol. 26, No. 3 (1945) pp. 301-306.

Ice reconnaissance of Hudson Bay

In April and May 1948 and March 1949 (Arctic Circular Vol.I (1948) pp. 60-62 and Vol.II (1949) pp. 41-42) ice reconnaissance flights were carried out over Hudson Bay. As a continuation of this study the Meteorological Division of the Department of Transport proposed that a regular series of flights should be made during the winter of 1949-50 to provide information on the times of ice formation in different parts of the Bay and its appearance throughout the winter.

The RCAF agreed to assist and the 408 Squadron, 22 Photo Wing, was assigned the responsibility of supplying the crew and Lancaster aircraft. Observers were provided by the Meteorological Division of the Department of Transport, the Defence Research Board, and McGill University.

On November 22 the first flight of the series was carried out. Far more ice was found in Hudson Bay than had been expected at that time of the year, the entire section north of an approximate line Port Harrison to Churchill being covered by ice. In December flights were made on the 14th and 15th, when the only remaining large area of open water lay west of the Belcher Islands. By January 5 and 11, when the next reconnaissance was made, the Bay was completely frozen over except for narrow coastal leads. Other flights took place on March 2 and 3 with another, possibly the last in the series, scheduled for early May. It is hoped that a more detailed account will be published in the Circular when this programme has been completed.

The Ice Wagon

A new RCAF North Star aircraft, specially modified for experimental studies of aircraft icing and prevention against this hazard, will go into operation in March on a year-round search for the worst weather on the continent. The aircraft, known as the "Rockcliffe Ice Wagon", is the successor to half a dozen RCAF aircraft employed on this type of work since 1941. Virtually a flying laboratory, the Ice Wagon is manned by an RCAF crew and carries a team of scientists from the Cold Weather Laboratory of the National Research Council.

The new Ice Wagon is equipped with a high shark-like fin set in the middle of the fuselage, and a number of perspex observation blisters strategically placed throughout the

aircraft. The fin is used for experimental work in electro-thermal wing de-icing. On the inside of the aircraft intricate equipment measures the density of clouds and their water content, determines the effect of ice on propellors, and gives the pilot visual warning of icing conditions.

Icing conditions, dreaded by all pilots, are encountered at temperatures ranging from above freezing to 40 below zero. National Research Council personnel have pioneered in anti-icing research, and as early as 1935, Gen. A.G.L. McNaughton, then head of the Council, pointed the way to electro-thermal heating as an answer to the problem. Today one of the N.R.C. devlopments in general use is a special leading edge cover for propellor blades, which when electrically heated, can rid propellors of any type of ice.

Captain of the Ice Wagon is F/L O.C. Brown, of Prince Albert, Sask., and co-pilot is F/L J.J. Higgins, Winnipeg. Others in the crew are: F/O D.B. King, DFC, DFM, Winnipeg; F/O J.W. Whelan, Toronto; F/S R.E. L'Abbe, Ottawa; Sgt. W.I.W. Sheppard, Toronto; Cpl. R.A. McKay, London, Ont.; Cpl. S.M. Howes, Woodstock, Ont.; Cpl. F.E.J. Dewan, Ottawa; LAC W.C. Short, Edmonton; LAC R.K.W. Turner, Ottawa.

National Research Council personnel are headed by Donald Fraser of Ottawa, and include E.H. Bowler, J.A. Lynch, and R.C. Brown, all of Ottawa; and from the Department of Transport, K.G. Pettit of London, Ont.

Yellowknife Broadcasting Station, CFYK

On February 18 the Yellowknife Broadcasting Station, CFYK, was officially opened. There had previously been no reliable radio reception in the Yellowknife area. The station is a cooperative system set up between the R.C.C.S. and the Yellowknife residents. Regular C.B.C. programmes are beamed north through the Army Signals shortwave transmitter station at Edmonton and, whenever reception conditions are good, can be used for re-broadcast. In addition, many broadcasts are of local origin. A large stock of recordings are held and local events such as hockey games and bonspiels are covered, while a number of community broadcasts are also arranged. The regular programmes include weekly broadcasts by the Daughters of the Midnight Sun, the Board of Trade Hour, religious services, and children's stories. Each day starts at 6:30 a.m. with a "rise and shine" programme.

CFYK is a non-commercial station with no source of income other than donations. Programmes are arranged by a voluntary committee which includes on its executive a newspaper editor, a housewife, a geologist, and an accountant.

Collection of arctic photographs at the Arctic Institute of North America

The Arctic Institute of North America, Montreal Office, has formed the nucleus of a collection of photographs taken in the Arctic. It numbers at present some 1400 prints taken over a period of many years, and includes a variety of subjects such as: topography, records of expeditions and journeys, portraits of explorers, primitive and modern Eskimo types and their settlements and dress, primitive and modern methods of transport, places of historical interest, serial photographs of coastal and inland regions under winter and summer conditions, snow and ice formations, and permafrost.

The Institute feels that a collection of this sort has a definite use both for purposes of reference, teaching, and illustration, as well as for a permanent historical record, but that it is necessary to extend it considerably before its full purpose can be achieved.

The Montreal Office of the Arctic Institute would welcome contributions of photographs, old or new, from readers of the Circular who have travelled in the North and have photographic records of their journeys or those taken by others in the Canadian Arctic, in Greenland or in Alaska. Wherever possible a short note on subject, locality, and source should be written on the back of each picture.

The address of the Montreal Office of the Arctic Institute is 3485 University Street, Montreal, P.Q.

Lecture on Project Snow Cornice

The Ottawa Section of the Alpine Club of Canada invited members of the Arctic Circle to attend a lecture given by Mr. Walter A. Wood at the National Research Council's Auditorium on February 26. Mr. Wood described the work of the Arctic Institute's party in the St. Elias Mountains in 1948 and 1949 and showed the Kodachrome film taken by his wife and himself on the expedition, which was known as Project Snow Cornice.

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,
Editor Arctic Circular,
411 Echo Drive,
Ottawa

Authorized as Second Class Mail, Post Office Department, Ottawa

In 1906 Sam Ford was transferred to Fort Chimo as interpreter and general assistant to the H.B.C. post manager, Mr. H. Cotter. At this time there was keen competition between the Hudson's Bay Company and Revillon Frères, and from 1909 until 1914 he was employed by the latter company as interpreter.

Following this period, Sam Ford and his family lived outside for two years, at St. John's, Newfoundland. He soon found that he did not care for city life and rejoined the Hudson's Bay Company in 1917 as interpreter and assistant to Mr. John Nichols, the post manager at Wolstenholme. In 1919 he was moved to Coats Island where he remained until 1924 when he was sent to Southampton Island to establish a new post. In 1937, after a brief furlough, he was transferred to Clyde River where he was post manager until 1940. Later he took over the Cape Smith post. At the time of his retirement from active service with the Hudson's Bay Company in 1945, Sam Ford was in charge of the post at Povungnituk. He then went to St. John's, Newfoundland, where he lived with his sister, Mrs. Elizabeth Watson.

Sam Ford was recognized as Canada's most outstanding Eskimo linguist and his knowledge in this field will be very difficult to replace. He had undertaken a number of commissions for the Department of Resources and Development, the most notable being his translation of 'The book of Wisdom for Eskimo'.

All those who knew Sam Ford well, and particularly his many Eskimo friends, will be deeply moved by the news of his death. Explorers, administrators, and scientists, all of whom valued his intimate knowledge of the north, will recall with gratitude his constant help and kindnesses. In his later days he often expressed the wish to make the Arctic his last resting place.

S.J. Bailey

Correction to the February-March number

The Editor regrets that in the February-March number of the Circular Mr. T.H. Manning's name was omitted from the note he had written on "The Varying Lemming in captivity in Ottawa" (pp. 20-21).

ships will load at a special stage built at Igarka, the river port on the Yenisei, and will be away some two to three months. It was announced that they would leave in three groups, the last on August 20, and would be guided from Murmansk to the Yenisei River.

Sam Ford

The death of Sam Ford in an accident near Fort Chimo on 5 August 1950 meant for many Canadians the loss of a loyal and lifelong friend. The North, to which he devoted the greater part of his days, has lost a valued and faithful servant.

This summer Sam Ford went north for the Department of Resources and Development as interpreter for the Eastern Arctic Patrol Administrative Officer travelling on the C.D. Howe. The accident occurred at the mouth of the Koksoak River when a helicopter, in which he was a passenger, was flown from the deck of the C.D. Howe. Immediately after take-off the aircraft crashed into the sea and sank. The pilot, Charles Parkin, and G. Johnston, Department of Resources and Development official, were saved through prompt action by the second mate of the C.D. Howe. Sam Ford was lost; his body has not been found at the time of writing.

Sam Ford, who was born in 1880 at Northwest River, Labrador, had a long and eventful career with the Hudson's Bay Company in the Eastern Arctic. His grandparents had come from Devonshire in England and had settled at Paul Island, Labrador, where the family, the only white people in the area at first, engaged in trade with the Eskimo. In 1876, Sam's father, John Ford, joined the Hudson's Bay Company at Northwest River and subsequently was moved to various posts, including Fort Chimo and George River.

Sam Ford was educated at Twillingate, Newfoundland. On leaving school he went to Port Burwell as a clerk for Job Brothers of St. John's, Newfoundland, where he stayed for three years. At the age of twenty-five he rejoined his father at George River, entering the Hudson's Bay Company as post servant. Here he stayed only eight months and was then promoted to post manager's assistant at Great Whale River where he remained for two years, during which period he married Mary Edmonds, daughter of Mr. John Edmonds, the post manager there. Mrs. Ford died in 1938; their three boys and four girls have settled in various parts of Canada.

for a month. During this period it moved across country about 250 miles, carried out carefully planned experiments with rations and equipment, and tried new tactics against an imaginary enemy. It encountered as severe weather conditions as can ordinarily be found even in the barrens. On the worst day, the temperature ranged from 25 to 32 degrees below zero, with a gusty wind of 25 miles an hour."

The Second Bishop of the Arctic

On 30 May 1950 the Ven. Archdeacon D.B. Marsh, D.D., was consecrated Anglican Bishop of the Arctic following Bishop Fleming's resignation on 19 September 1949 (Arctic Circular Vol.2(1949) pp. 88-9). Bishop Marsh has spent over twenty years in the Canadian Arctic. In 1922 he came out from England to prepare for missionary work at Emmanuel College and was ordained in 1929. He was first sent to Eskimo Point where he built his own mission house and spent seventeen years working on the west coast of Hudson Bay. In 1933, while on furlough in England, he married and brought his wife back to Eskimo Point. Mrs. Marsh's paintings of Eskimo costumes and arctic scenery are well known to northerners, and Ottawa members of the Circle will recall the exhibition of her work at the National Museum during the summer of 1948. In 1939 Donald Marsh was appointed Archdeacon and in 1943 he went to Aklavik and later to Toronto.

Archdeacon Marsh was consecrated Second Bishop of the Arctic by the Archbishop of Rupertsland assisted by the Bishops of Calgary, Keewatin, and Brandon. The ceremony took place at St. John's Cathedral, Winnipeg, and he was later enthroned in All Saints Pro-Cathedral, Aklavik, by the Rev. Canon Montgomery on June 18. Bishop Marsh has just returned on the new eastern Arctic Patrol ship, C.D. Howe, from a visit to his Diocese.

Chartering of ships to load timber in Siberia

On July 13 the Times reported that some twenty ships, mostly British, had been chartered in England by Russian authorities to load timber from Siberia for the United Kingdom. These ships have been taken by the Russians on time charter, with delivery at United Kingdom and continental ports, whereas those used to load timber in the White Sea are chartered on British account for the voyage. The

and a very much larger proportion of bulldozers to pull sleds and to make roads for wheeled vehicles. The Canadian snowmobile, or Penguin, seemed to be the best of the over-snow vehicles for the conditions encountered during the exercise...

"The longer radio links between units on the ground were not very satisfactory. This was not so much due to actual defects in signal equipment as it was to the effects of screening by mountains and the existence of unfamiliar propagation conditions...

"The experiences of the Air Force produced no new or unexpected problems. This was the first time that jet fighters had been operated in the Subarctic in large numbers on an exercise of this kind. Experience confirmed the view that the jet engine is particularly suited to arctic operation. It is simple, relatively easy to start and easily protected against the effects of cold. Even now, it is fairly easy to maintain and it is certain that future jet engines will require even less attention in the field. The overall record of 80 per cent serviceability of all aircraft engaged in the exercise is, in itself, sufficient testimony to the success of air operations...

"In the Arctic and Subarctic, the Air Force will play an important part in nearly all operations and in many it will be the dominant factor. Aircraft can operate successfully in all parts of the Arctic and Subarctic though there is considerable room for improvement in navigational aids, methods of detection and control of aircraft, and in ground servicing, where windchill is high."

Exercise Sweebriar was "primarily a test of the present state of training and equipment for subarctic conditions. It involved little novel equipment and no new weapons, and the weather conditions were not the worst that can be found in the Arctic...Probably the most important single lesson of the exercise was the renewed demonstration of the ease with which Canadians and Americans can work together in harmony."

The exercise force on Sun Dog I "consisted of a Company of the Royal Canadian Regiment, with supporting detachments from the Signal, Medical and Electrical and Mechanical Engineering Corps, totalling in all, 240 men. This force was entirely self-contained and fully mobile. It lived on the edge of the barrens, south and east of Churchill,

latest developments in clothing, food, aircraft, vehicles, weapons, and other equipment and material. It also provided a most important opportunity for gaining experience in joint and combined planning and in truly integrated Canada-United States and Army-Air Force command."[1]

To those interested in the effects of arctic conditions on men and equipment Exercise Sun Dog I, which was carried out by an infantry company group of the Canadian Army in the Fort Churchill area, was the more important as the force was entirely self-contained and operated on the edge of the barrens for one month under severe conditions.

Exercise Sweetbriar lasted for eleven days, from February 13 to 23. Over 5000 personnel of the United States and Canadian armies and air forces took part, nearly half being Canadian. "The tactical assumption was that an Aggressor force had captured the airfield at Northway in Alaska, and had forced down the Northwest Highway, almost the whole three hundred and fifty miles to Whitehorse. The task of the Allied Force was to drive the Aggressor back and recapture Northway.... Some idea of the size and complexity of the operation is given by the fact that more than 978 motor vehicles and 100 aircraft took part in it." The whole of the exercise took place south of the trees under subarctic conditions. Temperatures on the whole were disappointing and were not as low as had been expected.

"Food, clothing and personal equipment, such as sleeping bags and tents, were, in general, quite satisfactory, though a good many suggestions were made for minor improvements...

"The weapons and equipment of the Army proved generally satisfactory, but the exercise did disclose ways in which they could be improved. There was a very general feeling that the mobility of the ground forces must be increased. This could be done by providing more and better over-snow vehicles that would be capable of operating off roads

[1] All quotations in this note are taken from the text of a speech given to the Empire Club of Toronto on March 30 by Dr. O.M. Solandt, Chairman of the Defence Research Board.

Igloojuak, but they were too weak to stand and returned to the igloo. About this time they started to use the bodies for food.

Meanwhile lack of news from Piling was causing concern at Igloojuak. Two Eskimo, Otagoochoo (E5-399) and Kowpa (E5-456), set out to look for the party but returned without finding them owing to bad weather. On February 24 a second search party of Otagoochoo, Kyakjuak, and Kyoochuk (E5-846), found the igloo. The two women were still alive but in a deplorable condition. They were unrecognizable, their eyes seemed to be starting out of their heads and when they tried to speak their voices could not be heard. In addition to the young boy, part of the older boy had been eaten but not the old man. It seemed unlikely that the younger woman could live, but with careful attention both rapidly gained strength and have now recovered completely from their ordeal.

During a visit in the spring to the site of the tragedy Kyakjuak found the cache, containing the meat from thirteen deer, within 600 yards from the igloo.

This episode parallels in many ways a similar occurrence in the Igloolik area some forty or fifty years ago which was reported in detail by Knud Rasmussen[1]. It must also have taken place within a few miles of the starvation at Ipiuting in about 1835 of three boat crews of Eskimo from Cumberland Sound mentioned by Boas[2].

Exercise Sweetbriar and Exercise Sun Dog I

During February of 1950 two army exercises were carried out in the Canadian North. The larger, Exercise Sweetbriar, was a combined Canadian and United States exercise which took place along the Yukon-Alaska boundary. "The main object of the exercise was to develop doctrine and procedures for the employment of combined Canadian and U.S. forces operating in the Subarctic, and to test in the field the

1 Rasmussen, Knud, "The Intellectual Culture of the Igloolik Eskimo". Report of the Fifth Thule Expedition, Vol.7, No. 1, pp. 29-32.

2 Boas, Franz, "The Central Eskimo". Ann. Rep. Bureau of American Ethnology, Vol.6 (1884-5) p. 432.

on the National Topographic Series 8 mile map of Foxe Basin. The names Air Force Island and Foley Island were officially adopted by the Board on Geographical Names on 1 September 1949 and the high ground on Foley Island, previously officially named Anderson Island, was named Anderson Bluff on 6 April 1950. Foley Island was named after the navigator of the R.C.A.F. plane which sighted the islands and who was later killed in a plane crash near Ottawa.

The members of the 1949 expedition to the islands in Foxe Basin were:

W.K.W. Baldwin, botanist
C.A. Burns, geologist
D.B. Coombs, geographer and geodesist
A.H. Macpherson, cook and assistant zoologist
T.H. Manning, leader, geographer, and vertebrate zoologist
C. Merrill, geographer and engineer
R.W. Packer, geographer

Starvation near Piling, Foxe Basin, N.W.T.

During the summer of 1948 an old Eskimo, Ootogoochoo, (identification No. E5-569), cached some deer a few miles west of Piling. In the fall he made camp with another Eskimo, Kyakjuak (E5-459), at Kashookat, about half way between Piling and Steesby Inlet. Early in December Kyakjuak decided to move to Igloojuak on Steensby Inlet. He left a number of seals at the camp for Ootogoochoo, who continued to live there until they were finished, when he decided to move to Piling to live off his deer cache.

Ootogoochoo had with him his young wife, her two sons by a previous marriage, one six and the other four years old, and a seventeen-year-old adopted daughter. On arrival at Piling he looked for his cache, but repeated attempts failed to locate it. The old man's eyesight was apparently weak and his mind and memory failing. He had a rifle and ammunition but there were no signs of game. First the little party ate their dogs and then much of their deer-skin clothing and sleeping skins. On January 30 the younger boy died, probably of cold rather than direct starvation. The old man then started eating the body and using it as a source of fat for the lamp, though attempting to conceal his actions. On February 13 however he died of starvation and was followed by the older boy a week later on February 20. The two women then tried to walk to

around the shallow lakes and ponds which characterize the low interior of the island. A few dwarf willows occur in the better drained sites. The dry, gravelly ridges and the disintegrated limestone surface of the northern part of the island are largely barren, but do support scattered colonies of the arctic poppy and the purple saxifrage. Air Force Island provides another habitat around the low, rocky hills at the northern end where the arctic white heather and the mountain sorrel are common. The list of species from the islands is relatively small and, as would be expected, is typical of these low island habitats.

Previous history: On 3 September 1932 Captain W.A. Poole, C.G.S. Ocean Eagle, Department of Railways and Canals, anchored 4 miles from land in latitude 67°47'28 N. The coast was visible for 15 miles both to the NNE and to the SSW. The land did not extend south to latitude 67°18 N. in longitude 76°20 W. This discovery was recorded in the log of the Ocean Eagle[1] and in a report submitted to Ottawa in September 1932, with a map showing the known and probable extent of the new land. The island was named Poole Island (Department of Marine, 1933, p.8). This island is clearly the same as that photographed by the R.C.A.F. in 1948 and officially named Prince Charles Island by the Canadian Board on Geographical Names on 7 April 1949. The name Poole Island had not previously been submitted to the Board, and on 6 April 1950 the Board approved naming the most westerly point of Prince Charles Island Poole Point after Captain Poole.

In February 1939 the British Canadian-Arctic Expedition saw the hills of the northern part of the south-east island (Air Force Island), but mistook them for two small islands. During the same month, they saw the northern part of the north island (Foley Island) which was named Anderson Island for Dr. R.M. Anderson, of the National Museum of Canada, with the approval of the then Geographic Board of Canada in 1941. A map and description showing the known extent of these islands was published[2]. They were also marked

1 "Navigation conditions in Hudson Bay and Strait during the Soason of Navigation 1932", Department of Marine, 1933, p.36.

2 Manning, T.H., Geographical Journal, Vol. 101 (1943) pp. 225-257.

in the north where there are three areas of granite hills rising to about 120 feet. Foley Island is 28 miles from north to south, and 14 miles from east to west. The south and west parts of the island are very low and covered with swamp and lakes. In the northeast of this island is an area of high land about 8 miles from north to south, terminating in a bluff about 300 feet high at the north end with an almost vertical scarp of 90 feet. The land falls away rapidly to the west and south to the low areas.

The total land area of the three islands is approximately 6,000 square miles.

Although these islands may have been visited occasionally by travelling Eskimo they do not appear to have been inhabited regularly and the expedition found no traces of Eskimo occupation. When G.W. Rowley was at Igloolik he was told by an Eskimo that the grandfather of Peewatok (identification disc No. E5-628) had once spent a winter hunting caribou on a large island in eastern Foxe Basin. This island was identified on a large scale map as Prince Charles Island.

The party had originally hoped to leave Moosonee a month earlier but were held up waiting for the boat. They therefore reached the islands rather late in the season for observing the fauna and flora. Polar Bear were fairly numerous on the islands and Barren Ground Caribou were plentiful near the southwest point of Prince Charles Island and there were signs of caribou on the north end of Prince Charles Island and on Air Force Island. 1949 was a peak year for Lemming in Foxe Basin and there were numerous burrows on both Prince Charles and Air Force Islands. Arctic Fox and Ermine were found and Bearded Seal were fairly common. The following birds were seen on Prince Charles or Air Force islands: Pacific Loon, Red-throated Loon, American Brant, Snow Goose, Old Squaw, King Eider, Gyrfalcon, Rock Ptarmigan, Golden Plover, Black-bellied Plover, Purple Sandpiper, White-rumped Sandpiper, Semipalmated Sandpiper, Red Phalarope, Pomarine Jaeger, Parasitic Jaeger, Herring Gull, Sabine's Gull, Arctic Tern, Snowy Owl, Horned Lark, American Pipit, Lapland Longspur, and Snow Bunting. Of these the American Brant, Golden Plover, White-rumped Sandpiper, Semipalmated Sandpiper, Red Phalarope, Parasitic Jaeger, Sabine's Gull, and Snow Bunting had probably nested on the islands.

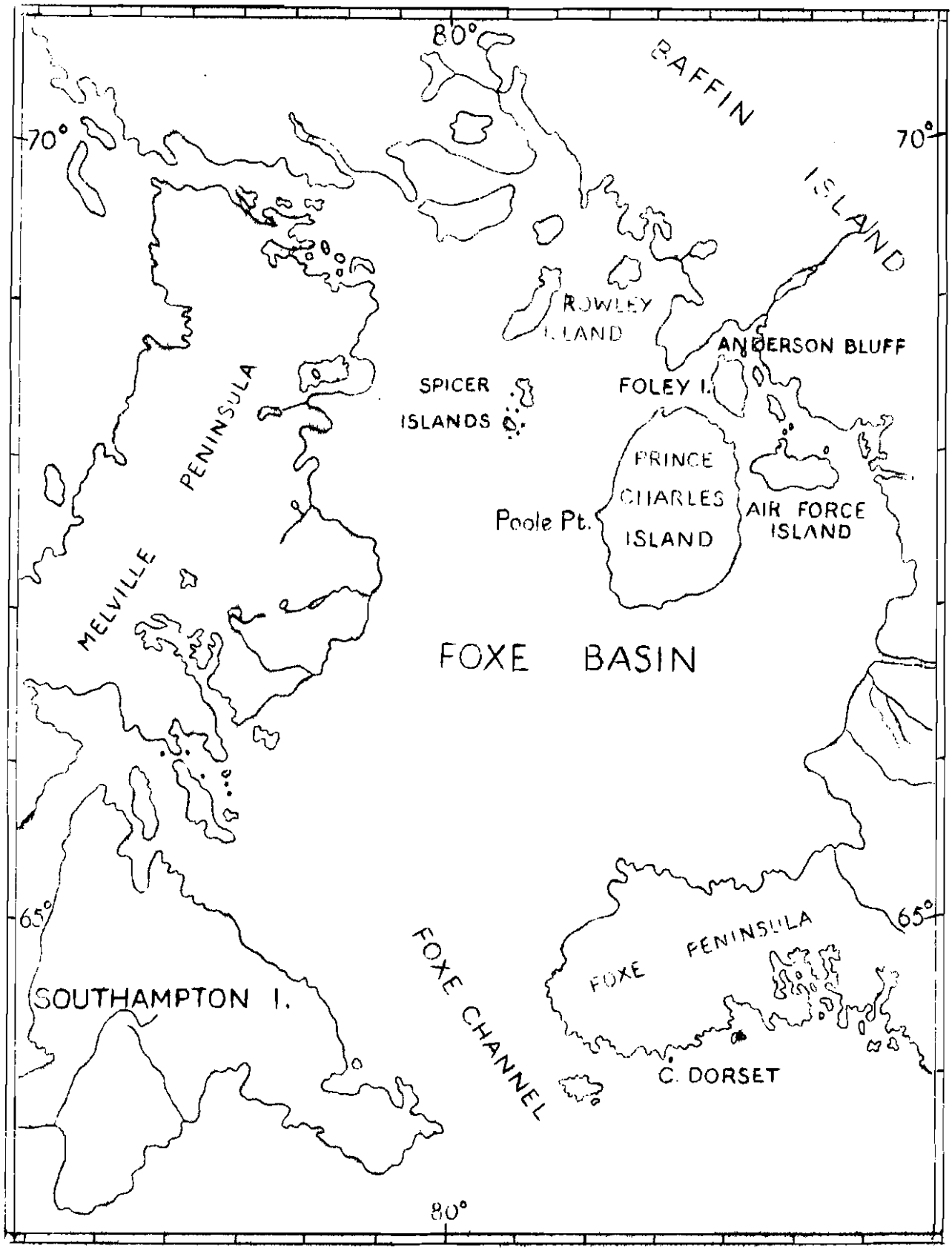
The greater part of Prince Charles Island is covered with wet meadows of sedges and grasses. These become richer

map on a scale of 3.95 miles to 1 inch was prepared by the Department of Mines and Resources. At the time the islands were believed to be a new discovery (Arctic Circular Vol. 1 (1948) pp. 73-5), but it has now been shown that parts of all three islands had, in fact, been sighted previously.

In the summer of 1949 the Geographical Bureau of the Department of Mines and Resources sent a party north to study these islands. The party was led by Mr. T.H. Manning and travelled in the Nauja, a 45-foot Peterhead boat specially built for the expedition. The Nauja was shipped overland from Nova Scotia to Moosonee, where the expedition started on July 8. In only three months the party travelled up the east side of Hudson Bay to Cape Dorset and thence north round the northern coast of Foxe Basin, returning along the west coast of the Basin and down the west side of Hudson Bay to Churchill on October 5, stopping wherever practicable to make scientific observations. This expedition, which brought back valuable scientific information, accomplished one of the most outstanding summer voyages in the history of the Canadian Arctic.

On 14 August 1949 the party landed near the south-west point of the southwest island (Prince Charles Island). They obtained an astronomical control position, and studied the geography, geology, zoology and botany of the surrounding area. The southeast, east, and north coasts were then followed to the northwest point where this work was repeated. On August 23 the party made a landing on the northwest point of the southeast island (Air Force Island). An astronomical position was obtained, and the island's geography, geology, zoology, and botany studied by foot and canoe parties which penetrated to the centre of the island and also followed the north and east coasts. On August 28 a geographer and a geologist were landed on the north point of the northern island (Foley Island) for a period of four days.

These three islands are situated in northeast Foxe Basin between latitude 67°10 N. and 68°45 N., and longitude 73°20 W. and 77°25 W. The largest island is Prince Charles Island, the southwest one. It is 80 miles from north to south, and 60 miles from east to west. The island rises to about 50 feet inland, and is composed of disintegrated lime-stone, which has been worked by wave action and subsequently raised above sea level. The areas between the strand lines are filled with shallow lakes and swamp. Air Force Island is 36 miles from east to west, and 20 miles from north to south. It consists of a flat marsh and shallow lakes except


80°
BAFFIN ISLAND
70°
70°
ROWLEY ISLAND
ANDERSON BLUFF
SPICER ISLANDS
FOLEY I.
PENINSULA
PRINCE CHARLES ISLAND
AIR FORCE ISLAND
Poole Pt.
MELVILLE
FOXE BASIN
65°
65°
FOXE PENINSULA
FOXE CHANNEL
SOUTHAMPTON I.
C. DORSET
80°

THE ARCTIC CIRCULAR

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Ottawa, Ontario

Twentieth Meeting of the Arctic Circle

The Twentieth Meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Thursday April 13.

The President, Mr. Frank Davies, was in the Chair and introduced the speaker, Mr. T.H. Manning.

Mr. T.H. Manning spoke on the Geographical Bureau's Expedition to Foxe Basin in 1949. A short account of his talk, which was illustrated by a kodachrome film taken by Mr. D.B. Coomb is given later in this number of the Circular.

Twenty-first Meeting of the Arctic Circle

The Twenty-first meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Thursday May 11.

The President, Mr. Frank Davies, was in the Chair and introduced the speaker, Miss Margaret Montgomery.

Miss Montgomery gave a talk on ice conditions in Hudson Bay. Following this Dr. R.T. Gajda showed two kodachrome films of the ice in Lancaster Sound, Smith Sound, Kennedy Channel and Robeson Channel taken on the 1948 Supply Mission to the joint Canadian-U.S. weather stations.

The voyage of the C.G.M.V. "Nauja" to Foxe Basin in 1949

In the summer of 1948 three islands, previously almost unknown, were noted by an RCAF photographic plane in Foxe Basin. They were photographed from 20,000 feet, and a

Cover

Dr. Wallace W. Atwood recently sent a donation to the Arctic Circle. We should like to thank him for this and we decided that it could most suitably be used for providing stiff covers for Volume II of the Arctic Circular.

Editorial Note

The Editor regrets that the Circular has not been coming out to time recently. She will be away for the months of April and May in England, but hopes that it will be possible to put out a number either in her absence, or shortly after her return.

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

Mrs. Graham Rowley,
Editor Arctic Circular,
411 Echo Drive,
Ottawa

Authorized as Second Class Mail, Post Office Department, Ottawa

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

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Ottawa, Ontario

Twenty-second Meeting of the Arctic Circle

The twenty-second meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Thursday October 12. The President, Mr. Frank Davies, was in the Chair and introduced the speaker, S/L A. Copland, who described his fur-trading experience in the Arctic.

S/L Copland explained that he had been brought up at Peterhead near Aberdeen. This little seaport had always been a whaling centre and he had as a boy spent many a day on the whalers, spoken to some of the old whalermen and seen his first Eskimo there. This atmosphere made it a favourite recruiting ground for the Hudson's Bay Company, and at the age of twenty he signed a contract with the company agent for five years' service beginning at $20.00 a month, all found.

In the summer of 1923 he sailed from Cardiff in the S.S. Nascopie. After a call at Montreal, the Nascopie steamed up the Labrador coast and into Hudson Bay, where S/L Copland was given his first job as clerk at the post at Chesterfield Inlet. Here he met Peter Freuchen of Knud Rasmussen's famous Fifth Thule Expedition.

His first five years in the north were spent in Hudson Bay. From Chesterfield he went to help in the establishment of the Southampton Island post and was then appointed post manager at Repulse Bay, Eskimo Point, and Southampton Island in turn.

After a year's leave he returned to the north as manager of the South Baffin Island Section, which consisted of the four posts, Cape Dorset, Amadjuak, Lake Harbour, and

Frobisher Bay with the small supply schooner Nanook. His stay here was cut short after two years by his having to return to civilization for an operation for appendicitis. His next assignment was as manager of the Ungava Bay Section with the seven posts, Fort Chimo, Fort Mackenzie, Payne Bay, Leaf River, Whale River, George River, and Port Burwell. After two years in Ungava, he became assistant manager and then manager of the whole Ungava District with headquarters in Winnipeg, spending a summer during this period as purser of the Nascopie. He was then sent down the Mackenzie to take charge of the Western Arctic District, which stretched from Arctic Red River to King William Island. At the time of joining the R.C.A.F. he was in Winnipeg in the headquarters of the Fur Trade Department of the Hudson's Bay Company.

S/L Copland described the life led by the fur trader in the days when he first went in to the country, and the changes brought about by the radio and aircraft. He stressed the importance of transportation in the development of the north and illustrated from his own experiences the characteristics of the various tribes, both Eskimo and Indian, with whom he had traded.

Hudson Bay Ice Reconnaissance 1949-50. By Margaret Montgomery

Continuing the 1948 and 1949 ice reconnaissance over Hudson Bay, four flights were made during the winter of 1949-50. These sorties were arranged by the Defence Research Board with the R.C.A.F. who very kindly made available Lancaster aircraft manned by crews from 408 Squadron, 22 Photo Wing at Rockcliffe. F/L Keith Greenaway was chief observer and was accompanied on the flights by observers from the Department of Transport (Meteorological Division), the Defence Research Board, and McGill University.

The dates and routes of the flights were as follows:

22 November 1949 (see Arctic Circular Vol.3 (1950) p.22)

Ottawa - Moosonee - Belcher Islands - Port Harrison - Churchill - Winnipeg.

14 - 15 December 1949

14 December: Ottawa - Moosonee - Belcher Islands - Port Harrison - Chesterfield Inlet - Churchill.

15 December: Churchill - Mansel Island - Nottingham Island - Sugluk - Cape Smith - Cape Henrietta Maria - Ottawa.

5 and 11 January 1950

5 January: Ottawa - Moosonee - 55°N., 80°36W. - Chesterfield Inlet - Churchill.

11 January: Churchill - Mansel Island - Ottawa Islands - Belcher Islands - a changing course to 52°N., 79°20W. - Dorval.

2 - 3 March 1950

2 March: Ottawa - Charlton Island - Long Island - Gilmour Island - Sugluk - Digges Islands - Cape Kendall - Churchill.

3 March: Churchill - along south coast of Hudson Bay to Cape Henrietta Maria - Hanna Bay - Ottawa.

On the December flight mail was dropped at Nottingham Island but, owing to local conditions on arrival, similar drops scheduled for Sugluk, Ivugivik, and Cape Smith could not be carried out. On the March flight, mail and medical supplies were dropped at Sugluk.

The purpose of these reconnaissance flights was to observe the dates of freeze-up in various parts of the Bay and to note the characteristics of the winter ice cover over the areas as a whole. The following account is a summary of conditions observed in the main areas.

JAMES BAY

On November 22, although most of the rivers flowing into the bay were partly frozen over, the bay itself was almost entirely free of ice. By mid-December the rivers were completely frozen except for small patches of open water at their mouths, and along the coast of the bay a shelf of fast ice, varying in width from half-a-mile to a mile-and-a-half, extended as far as could be seen. Beyond this, large, unbroken pans of ice, irregular and jagged in outline, gave a cover varying from about 4/10 in the south to about 7/10 in the north. The open water between these pans appeared to be covered with sludge or patches of brash ice. Sea smoke was rising over all areas where open water was present.

In early January the ice cover was 9/10 complete and open water was limited to small patches near river mouths or to the shore lead and to the east-west leads, which crossed the entire bay and which became noticeably fewer about 40 miles north of Moosonee. The fast ice now appeared to be between 2 and 3 miles wide. Around Akimiski Island leads and patches of open water were in the process of refreezing and were covered by sludge and brash ice.

On the return flight of January 11 a shore lead, 10 to 15 miles wide, extended along the entire eastern coast but was freezing over rapidly. It had possibly resulted from the strong easterly winds of the preceding days. Over the whole region the ice was more rugged than at the time of the November flight and considerably more snow covered the area.

By early March James Bay had a 10/10 ice cover broken only by the widely spaced east-west leads which appear to be characteristic of the area. Snow cover had increased so that drifts could be clearly seen around the pressure ridges.

HUDSON BAY

East Coast: Except for scattered patches of ice, this area was unfrozen as far north as Port Harrison at the time of the November flight. From here northwards the ice appeared to be continuous and from its colour and thin snow cover was judged to have formed very recently.

By mid-December the Belcher Islands themselves were icebound but, as far as could be seen through the haze and sea smoke, open water, covered probably with sludge and brash ice, lay to the west and possibly to the east. From about 58°N. the ice cover increased to 7/10 with scattered elliptical patches of open water and north-south leads between the snow-covered islands.

By early January the ice cover northwards from James Bay appeared complete with the possible exception of some large patches of open water south and west of the Belcher Islands. Arctic sea smoke in this area limited visibility but betrayed the presence of open water. On the return trip on January 11 broken ice and open water patches were seen from a distance in this vicinity, while a stretch of loose pan ice about 40 miles across extended south and east of the Belcher Islands, gradually narrowing in the east until it joined the shore lead along the Quebec coast, and in the west extending in the direction of Cape Henrietta Maria.

This appears to mark the boundary zone between the ice of James Bay and that of Hudson Bay, and although no wide lead was evident on March 2 the area was crossed by a series of narrow east-west leads with long pressure ridges between, oriented in the same direction. On the flight of March 3, the shore lead off Cape Henrietta Maria was seen curving off in this direction, thus tending to confirm the impression that a lead or at least a belt of broken, disturbed ice is a characteristic feature separating the ice sheets of the two bays.

On the March 2 flight a large lead in process of refreezing curved northeast towards the coast from an area of open water immediately north of the Belcher Islands. Between the islands themselves the leads ran north and south, while those nearer to the coast appeared to run normal to the shoreline.

From the vicinity of the Ottawa Islands, a wide lead continuing the arc of the east coast islands, curved northward towards Cape Smith where it seemed to loose itself in the network of leads running parallel to the coast, of which the widest was 1 to 2 miles across. Poor visibility made it impossible to determine how far north this series of leads extended, but it seems probable that it merged into the wide zone of broken ice, open water, and irregular leads observed later on the same flight between the Ungava coast and the tip of Southampton Island.

Centre and North: On November 22 the Bay appeared to be icebound north of a line drawn approximately from Port Harrison to Churchill. By mid-December, the entire Bay was covered by a continuous ice sheet except for the east coast section already mentioned. The central part was heavily criss-crossed by pressure ridges which were estimated to rise anywhere from a few feet to twenty-five feet in height. Deep snowdrifts were packed along their eastern slopes and the long narrow leads, which tended to have a north-south direction towards the centre of the Bay, became fewer on leaving the vicinity of the shore lead. By January the open water west of the Belchers was frozen. This condition of continuous and rough ice cover in the central area apparently persisted until break-up.

On the December flight it was observed that westward from Coats Island the leads changed from their original north-south direction to parallel the coast of Southampton Island in an east-west orientation. It was also noted that in the area between Coats, Mansel, and Nottingham islands

and the Ungava coast, the solid ice of the central area gave way to a zone of irregular leads, rectangular patches of open water, and floating pans of jagged ice. Similar observations on the January and March flights showed that this condition persists throughout the winter and apparently extends along Hudson Strait.

On the March flight, a wide east-west lead extended from the southeast tip of Southampton Island as far as Evans Strait, where it deteriorated into a series of narrow leads parallel to the shoreline. From this main lead smaller leads ran north to the fast ice, which at this time completely covered South Bay and the Bay of God's Mercy. Farther west a wide lead was again evident, being about 2 to 3 miles across off Cape Kendall, where it joined the tongue of open water leading up Roe's Welcome Sound. This wide tongue was seen to penetrate northwards at least 25 to 30 miles up the sound, and from Cape Kendall ran southward towards Chesterfield Inlet. The line of flight being direct from Cape Kendall to Churchill did not permit any observations of the southern limit of this lead.

West Coast: Churchill was the approximate southern limit of ice cover in the Bay on November 22 and as this was the destination of the reconnaissance flight no observations were possible regarding the existence or non-existence of a shore lead to the north at that time.

The December flight showed that a lead, varying in width between 2000 yards and 3 miles, ran parallel to the coast north and south of Chesterfield Inlet as far as could be seen. It was separated from the shore by the shelf of landfast ice which at Churchill extended seaward between 4 and 5 miles. By January this fast ice varied in extent from a few yards off the steeper promontories to 5 to 10 miles in the area between Chesterfield and Churchill.

On January 5 the shore lead beyond the fast ice was 5 to 10 miles across and narrow leads either parallel or normal to it extended 60 miles to the east. Sea smoke was rising over the entire area, being most dense over the main lead where it rose in clouds as if from a grass fire to about 1200 feet. With the light west wind which prevailed at the time this sea smoke was carried 50 to 55 miles eastward across the ice-covered Bay and could be clearly seen from the shore at Churchill. The lead was followed as far as Churchill and appeared to be covered by a great deal of sludge and brash ice along its eastern edge.

On the return flight on January 11 the main shore lead had been reduced by the east winds of the previous days to a series of narrow leads parallel to the coast. Beyond this stretched the continuous ice cover of the central area in which nearly all leads had been closed by new ice.

On the March flight the route from Southampton Island lay too far to the east for observation of the coastal lead itself. However along the route of flight the ice was broken by leads running approximately parallel to the line of flight with occasional east-west leads appearing off the vicinity of Chesterfield and Tavani. Off Churchill many new-frozen leads were evident.

South: This area was observed on the return flight in March and poor visibility again limited observations in some places, particularly around Churchill. From around the mouth of the Nelson River a number of narrow leads, 15 to 20 yards wide, ran parallel to the coast and were joined at right angles by shorter leads from the central ice sheet. This condition persisted as far as Cape Tatnam. From here to Cape Henrietta Maria, although all leads were closed as a result of the wind direction, there was a broad zone of confused ice with long pressure ridges and newly frozen leads running parallel to the shore. This appeared to mark the limits between the heavy ice of the Bay and the broad belt of landfast ice which along this coast was as much as 20 to 30 miles wide.

In this zone of confused ice, a lead about 5 miles wide developed off Cape Henrietta Maria and after curving southward about 20 miles into James Bay narrowed and swung northeast in the direction of Long Island. Along its northern edge it was joined by a number of narrow leads oriented NNE - SSW.

Summary

The pattern of Hudson Bay ice as seen from the reconnaissance already completed shows that by late December or early January the region is covered by a continuous sheet of ice, of which the area south and west of the Belcher Islands is the last to freeze. This is separated from the land floe along the shore by a zone of open water or confused ice which deteriorates in the section between Ungava and Southampton Island into a wide belt of broken ice, open water, and short irregular leads. A similar area across the mouth of James Bay separates the ice there from that of Hudson Bay itself.

The smaller leads tend to run at right angles either to the shore or to the main lead and in James Bay have a regular east-west direction.

The shore lead appears to be widest along the south coast of the Bay and in sheltered areas such as the Bay of God's Mercy. It is narrowest off the promontories in the northwest.

Supply mission to the northern weather stations

This summer the annual mission to the joint Canadian/United States weather stations in the Canadian Arctic managed to reach three of the stations. Resolute on Cornwallis Island and Eureka and Alert on Ellesmere Island were supplied, and the stores for Isachsen and Mould Bay were landed at Resolute. This is the fifth year that this work has been carried out by the U.S. Navy. (For accounts of previous missions see Arctic Circular Vol. I (1948) pp. 2 and 90; Vol. II (1949) pp. 70-1).

The supply mission during the summer of 1949 had succeeded in reaching only the station at Resolute, where the stores for all stations were landed; this was largely because there was only one icebreaker. This year the Eastwind was again in commission, after the fire which severely damaged her on 19 January 1949. The ships supplying Resolute found Lancaster Sound completely free of ice and encountered only a few small fields of scattered ice in Barrow Strait. As was expected very heavy ice was met on the way to Alert, and at times the icebreakers passed through pack ice up to 30 feet in thickness. The weather was excellent except for fog during the four days the ships were anchored off Resolute.

The 1950 supply mission left Boston on July 12 and returned on September 5. It was commanded by Captain G.E. Peterson, U.S.N., and consisted of four ships: the U.S.S. Edisto and the U.S.C.G.C. Eastwind, both icebreakers; and the U.S.S. Whitley and the U.S.S. LST-533, serving as cargo vessels. Except for the Whitley all three ships have been used on earlier supply missions to the Canadian Arctic. The Edisto has been on all missions since 1947, the Eastwind in 1948, and the LST-533 was used for the first time in 1949.

Long-range ice reconnaissance was provided by R.C.A.F. aircraft from 405 Squadron, based at Greenwood, N.S., Maritime Group, Halifax, commanded by Air Commodore R.C. Gordon. The three helicopters carried with the mission were used extensively for short-range ice reconnaissance.

During the first part of the supply mission Captain G.E. Peterson was embarked in the Edisto, and during the latter part in the Eastwind. The second in command and Commander Supply Unit was Captain M. Van Metre, U.S.N. The Edisto was commanded by Commander W.F. Morrison, U.S.N.; the Eastwind by Captain O.A. Peterson, U.S.C.G.; the Whitley by Captain E.E. Garcia, U.S.N.; and the LST-533 by Lieutenant Commander J.E. Vautrot, U.S.N.

The senior Canadian representative was Mr. J.W. Burton of the Arctic Division of the Department of Resources and Development. Mr. C.J. Hubbard, Chief of Arctic Projects, United States Weather Bureau, was the senior U.S.W.B. official until his death in an aircraft accident at Alert on 31 July 1950, when Mr. J. Glen Dyer was assigned to this position. The accident at Alert is described in a further note in this issue. Colonel Robert Sykes has recently been appointed to succeed Colonel Hubbard as Chief of Arctic Projects, United States Weather Bureau.

Aircraft accident at Alert

On 31 July 1950 an R.C.A.F. Lancaster aircraft crashed at the weather station Alert, near Cape Sheridan, north Ellesmere Island, killing Colonel C.J. Hubbard of the United States Weather Bureau, Dr. D.W. Kirk of the Geographical Branch, Department of Mines and Technical Surveys, and the seven members of the crew. The crew were: W/C D. French; F/O T.D. Martin; F/L L.M. Maclean; F/O J.R. Dube; F/L J.F. Swinton; F/O J.E. McCutcheon; and LAC R.L. Sprange.

The Lancaster was one of two, based at Greenwood, N.S., used for long-range ice reconnaissance by the joint supply mission to the northern weather stations. The aircraft was dropping supplies to the weather station when a parachute caught in the tail assembly causing the aircraft to crash. All the occupants were killed immediately and were buried at Alert. It had been intended that their bodies should be brought out, but a Canso which was sent north for this task hit some ice off the station and was damaged; the crew however escaped safely.

Colonel C.J. Hubbard was chief of Arctic Projects in the United States Weather Bureau, and at the time of his death was acting as senior U.S.W.B. official on the supply mission. He had had considerable northern experience on the Labrador and during the war in the development of aviation facilities in the Hudson Bay area. He played a major part in the setting up and maintaining of the joint

Canadian/United States weather stations in the far north and had been on the 1948 expedition which chose the site for Alert.

This station is the most northerly permanent weather station in the world. It was named after Captain Nares' ship, the Alert, which wintered in the Cape Sheridan area in 1875. The station was established in April of 1950 by airlift from Thule in Greenland. Some stores and equipment had been landed at the site by the supply mission in 1948, and it had been hoped that the 1949 mission might have succeeded in putting in the station. The Canadian Officer in Charge is Mr. J.L. Lafranchise and the United States Executive Officer is Mr. C.J. Clifton.

Death of Joshua

During the winter of 1950 Joshua Kimukjuak (Identification Disc No. E5-624) was lost while hunting walrus near Jens Munk Island. Mr. R. Ploughman, post manager at Igloolik, has described the incident in a letter to Mr. G.W. Rowley.

Joshua and several other natives were hunting at the floe edge when they shot a walrus on a large pan of ice. The pan then moved out with the tide taking the natives and their dog-teams with them. Fortunately there was a severe frost shortly afterwards and the gap between the pan and the floe edge froze over. The ice was very thin but all except Joshua decided to risk the crossing. "They were taking a chance, but managed after some miraculous escapes of falling through to reach the main ice, but apparently Joshua, realizing the danger, decided to wait until the ice got a bit thicker, but unfortunately the wind freshened and the new ice broke up leaving no anchorage for the pan." No trace was found of Joshua but one of his dogs was later found alive in the vicinity of Kangmat (probably the same place as Quarman).

Readers of the Circular will recall a similar hunting accident in Foxe Basin when five men and one boy were marooned on the moving ice near Quarman, Melville Peninsula, and later made their way back safely. (Arctic Circular Vol. II (1949) pp. 72-3). "It is not uncommon for parties to be marooned on the moving ice, and this occurs in Foxe Basin probably once every three or four years on the average. Near Quarman it is not considered as dangerous as farther north, where the current may carry the ice far off-shore" (p. 72). Presumably this was what happened when Joshua was lost.

Mr. Ploughman writes that the winter of 1949-50 at Igloolik was exceptionally severe, and that it was the coldest he had ever encountered in the north country. Up to the middle of August the weather had continued bad and in July there were only four good days.

Condition of the fish inland from Fort George

Mr. T.H. Manning spent the months of June to September studying the birds of eastern James Bay. While he was at Fort George, Mr. Thorburn, the Hudson's Bay Company's post manager, told him that the Indians who trapped a hundred miles or more inland had complained that the lake trout were gradually decreasing in all the lakes. Mr. Manning interviewed some of these Indians through an interpreter, and learned that there had been a gradual decrease in the fish of this inland region over the past ten years. The Indians reported that fish, heavily infected by internal parasites, were frequently found dead along the edge of the lakes, and that others caught in their nets, were also heavily infected and so wasted as to be useless for food.

These Indians supply a high percentage of the Fort George fur, and owing to the failure of the fishing are finding it increasingly difficult to maintain themselves inland near their traplines. Hares are very scarce and in the winter ptarmigan is the only food which can be obtained besides fish. The Indians are therefore concentrating on ptarmigan hunting and this may eventually cause a reduction of these birds.

Mr. Thorburn has made arrangements to obtain some of the infected fish during the winter and to send them out by air in a frozen state for examination.

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,
Editor Arctic Circular,
411 Echo Drive,
Ottawa

Authorized as Second Class Mail, Post Office Department, Ottawa

THE ARCTIC CIRCULAR

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Ottawa, Ontario

Twenty-third Meeting of the Arctic Circle

The twenty-third meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Thursday November 9.

Because of unforeseen circumstances the lecture by Major J.M. Berry on "R.C.A.S.C. tractor train to Ennadai Lake" had to be postponed until later in the season.

The President, Mr. Frank T. Davies, gave a short talk on the Canadian Polar Year Expedition of 1932-3 at Chesterfield, N.W.T., of which he was the leader.

Mr. Davies illustrated his talk by slides which showed aspects of the geophysical work of the expedition at Chesterfield, Baker Lake, and Marble Island. These included meteorological balloon and kite-meteorograph flights, magnetic and electrical observations, and auroral studies using a spectrograph and two-station photographic techniques for measuring the height of aurora. Several members of the Arctic Circle, present in the audience, appeared in the pictures as they were eighteen years ago.

Eskimo Education. By W.T. Larmour

The education of Eskimo children in the arctic regions of Canada is the responsibility of the Northern Administration and Lands Branch, Department of Resources and Development, and comes under the jurisdiction of the Commissioner of the Northwest Territories. On matters of policy the Administration is advised by a committee engaged in the study and planning of a distinctive system of education for the north.

This system must take into consideration the nomadic character of the Eskimo who move about in a pattern determined by the wildlife on which they depend. Eskimo children cannot follow a fixed school term as white children do and cannot observe strict school hours. They cannot embark on a standardized course of studies leading up to and ending in the university, unless they abandon the Eskimo way of life, and this is not desired by anyone, least of all by the Eskimo themselves. Yet it is felt that they must, in their own interest and for their own protection, be taught to write, read, and speak English; to do simple arithmetic; how to keep healthy; to appreciate the need for conservation of their wildlife resources, and to understand the nature of the social world in which they will take their place.

Six Eskimo schools are now functioning in the Canadian Arctic under the direction of the Northern Administration. These are at Coppermine, Cape Dorset, Fort Chimo, Coral Harbour, Port Harrison, and Tuktoyaktuk. Some Eskimo children also attend the Government school at Aklavik. The wives of teachers at Coppermine, Cape Dorset, Fort Chimo, and Coral Harbour operate health centres under the direction of the Department of National Health and Welfare and are, therefore, able to help their husbands in many different ways. This recent employment of married couples has proved to be a very happy arrangement for all concerned. The schools at Port Harrison and Tuktoyaktuk are also run in conjunction with government health centres.

In charge of the school and health centre at Coppermine are Mr. and Mrs. D.B. Lord; at Cape Dorset, Mr. and Mrs. A.F. Applewhite; at Fort Chimo, Mr. and Mrs. K. Emond; and at Coral Harbour, Mr. and Mrs. W.H. Copeland. The teachers at Port Harrison and Tuktoyaktuk are Miss E.M. Hinds and Miss D.L. Robinson respectively.

Teachers employed in schools operated by the Department of Resources and Development are now, by the terms of a recent Order in Council, civil servants. They are classified as welfare teachers and their salaries are set according to their experience and qualifications. In addition to their salaries they receive the same northern living allowance as other employees of the Government in the north, that is $900 a year for a single teacher and $1,500 for a married teacher or one with dependents living with him. The teachers are provided with comfortable living quarters for which they are required to pay a small rent.

In 1947 the first Government school for Eskimo was opened at Tuktoyaktuk in the Anglican Mission School building, which had been acquired by Northern Administration. The classroom is large, about 40 feet by 18 feet. It contains two space heaters and four low tables, each eight feet long, with benches on both sides. There is ample blackboard space all around the room, and, as there are two doors, this one room could be used as two classrooms if this were required. The room is bright and clean. There are no desks; the children of each grade sit around their own table and this creates a pleasant, informal atmosphere. Attendance, however, is not dependable. As Miss Robinson observed in a recent report to the Arctic Division:

> "As attendance is not compulsory it is difficult to do much with parents who are not willing to listen to persuasion. In most cases it is not that the parent does not wish the child to go to school, but that they are reluctant to force the child. If the child wishes to stay up all night and sleep all day, it is allowed to do so. While most of the parents are willing to co-operate, and the older children will themselves listen to reason, there are always the exceptions..."

The school at Fort Chimo, a prefabricated building, was erected in October 1949. The walls are of panel wood and the roof is of sheet aluminum. There is a small domestic science room and one large classroom which can seat about fifty pupils. The school workshop is busy both night and day, and a number of komatiks have been made for local Eskimo. The building is heated by two space heaters, chemical toilets are supplied, and water is obtained from spring-fed streams one and a half miles away in winter and a quarter of a mile away in summer. Power is supplied by Department of Transport equipment.

At Coral Harbour the school was set up, prefabricated, in 1949, and the teacher was established there in 1950. The buildings are in a good location near a small lake and there are good playground facilities. The school is well equipped, and has four wash sinks, two each for girls and boys, and washrooms with arctic chemical toilets. These toilets are built in and are cleaned and emptied from the outside of the building. There is electric wiring with fluorescent fixtures for daylight lighting. The interior colour scheme was supplied by a child psychologist, and the paint is fire resistant. The building was designed to be heated by one or two oil space heaters.

At Coppermine, a new school and health centre, combined with living quarters for the staff, was completed in 1950. The Eskimo in this region are almost entirely nomadic, and it is thought that, if this school is to be completely successful, it will eventually be necessary to provide accommodation at Coppermine where children may stay when it is not essential for them to be with their parents to learn the native way of life.

The prefabricated school building erected and opened at Cape Dorset in 1950 is on the same plan as the other prefabricated school buildings.

There are probably more Eskimo children within reach of Port Harrison than at any other point in Eskimo territory, and it is expected that a school building will be put up there next year. In the meantime, Miss Hinds has been operating from the health centre of the Department of National Health and Welfare. She reports that after the term had officially ended on Friday, June 30, the children all returned to the school the following Monday, saying they did not want holidays. "So, of course, I let them in", she writes, "and I have been holding school ever since with a much better attendance than there was in June!"

To make education attractive to the Eskimo, many different techniques are being employed, and of these probably the most effective is the film strip used as the background for a lecture. Film strips and films have been used for some time, but it was only recently that a set of strips was created specially for Eskimo schools. A series of four films has now been produced: "The Eskimos and their Fellow Canadians", "Conservation of the Caribou", "Food for Eskimos", and "Dogs". These films are now being distributed to the welfare teachers at the six Eskimo schools. Of these, "The Eskimos and their Fellow Canadians" is the principal film strip. It shows the Eskimo what sort of people his fellow Canadians are, some of their professions, and the origin of the materials and goods which the Eskimo receives in kind for Family Allowances. If the experiment proves as valuable as officers of the Administration expect, the series will be enlarged.

The idea of using the film strip for the Eskimo was approved by the sub-committee on education which advises the Northwest Territories Council on such problems. The Council commissioned Dr. Carter Storr of Ottawa to go north in 1949 to find out whether visual education would appeal to the Eskimo. The Eskimo responded readily. They entered into the spirit of the experiment, watched the artist while he sketched and were eager to act as models and critics.

From the preliminary sketches the strips were later worked out in consultation with officers of the Administration, the Canadian Wildlife Service, and the R.C.M.P. The drawings were designed to supplement the third edition of the "Book of Wisdom for Eskimos" now being prepared by the Administration.

Older Eskimo do not show any great desire to learn English, but the children must be encouraged to use this language as well as their mother tongue in their daily living. This will be a long and difficult task. The contact with whites is so infrequent that the children, when they return to the camp from the school, easily forget their English and for fear of ridicule may be reluctant to use the speech of the white man. Their own language, both spoken and written, can serve them well enough for their mode of life today, but it is most certainly not always going to be sufficient.

As well as teaching his classes, a welfare teacher must also organize activities which encourage a sense of community life. His welfare work will take him from the classroom to the native homes in the settlements and in the camps where he must attempt to encourage healthy living, handicraft work, recreational sports, and adult education.

Port Harrison has been the centre of great activity in the Administration's new experiment in handicraft among the Eskimo. Although the motive for this experiment was largely economic, it has obvious educational value.

The Eskimo have always made certain articles for daily use, bowls, knives, and the like, and carved dolls and kayaks and animals for the amusement of their children. When these were taken outside they became curiosities, sometimes objects of art. Eskimo skill in carving in ivory and soapstone had long been recognized and the Hudson's Bay Company posts were always willing to put on sale any carvings that were brought in to them. It remained for the Administration and the Canadian Handicrafts Guild to encourage and advise the Eskimo and to foster an outside market.

Assisted by a substantial grant from the Government, the Guild sent Mr. James A. Houston into the field. He visited the Port Harrison, Povungnituk, and Cape Smith areas during the early part of 1950, and bought over 11,000 pieces. More than seventy-five per cent of the adult population took part in producing work and although not all of this was art, or even handicraft, some of the pieces revealed a strong creative spirit not without a sense of humour. This material

has been well received by the public through various outlets of the Guild which is marketing it on a non-profit basis in order that the greatest benefits may be gained by the Eskimo. This handicraft experiment illustrates the more practical side of Eskimo education.

One of the attractions at Government schools in the Arctic is the serving of a noonday lunch. This varies according to the supplies available, and may consist of only cocoa and biscuits. A pattern was set by Nurse Andrews when she organized a Breakfast Club at Port Harrison in 1949. The breakfast consisted of approximately three-quarters of a pint of hot rolled oats porridge, a pint of rich milk, cod liver oil, a vitamin pill, and one of the special hard-tack biscuits which are supplied for the Eskimo by the Administration. There were 23 children, the youngest being 3, the oldest just under 16 years of age. Subsequently, when an influenza epidemic hit that area, the children who were attending the Breakfast Club escaped except for a few who had minor symptoms. The Eskimo parents who survived were impressed.

In addition to the schools operated directly by the Northern Administration, there are also a number of mission day schools in the Arctic, operated by the Church of England, the Roman Catholic Church, and, in one case, by the Northern Canada Evangelical Mission. The Federal Government assists these schools by annual grants.

The Northern Insect Survey for 1950. By T.N. Freeman

This survey is a joint project of the Defence Research Board and the Division of Entomology of the Department of Agriculture. The main objectives involve the study of the distribution, relative abundance, and systematics of biting flies and other insects indigenous to arctic and subarctic Canada.

Since the inauguration of the Northern Insect Survey in 1947, a total of 27 localities have been investigated. In 1950, parties were established at the following places: Fort Simpson, Fort Smith, Cambridge Bay, Repulse Bay, Chesterfield, Padlei, and Eskimo Point in the Northwest Territories, and Gillam in Manitoba.

Approximately 125,000 insects were added to the Canadian National Collection of Insects in 1950. These specimens represent many distributional extensions and species new to science. Although vast gaps still exist,

it is now practicable to prepare distributional maps for northern mosquitoes, tabanids, and black flies. Relative abundance maps for biting flies throughout most of the north are now available. The taxonomy of mosquitoes has been sufficiently developed so that most of the species can be accurately identified from either larvae or adults. Consequently the laborious and time-consuming task of individual rearing is no longer necessary and it is possible to carry out more adequate sampling of the larval and adult populations of any northern locality.

The general collections have added considerably to our knowledge of the insects, and some important principles of insect distribution have become apparent. No exceptions have been found to the hypothesis that all phytophagous insects (except minor intrusions) indigenous to the barrens are specifically distinct from those indigenous to the coniferous tree zone to the south. Furthermore, the collections provide considerable evidence that the barren land species invaded that area mainly from a Pleistocene refugium that must have existed west of the Mackenzie River delta in northern Alaska and Siberia. Approximately 50 per cent of all barren land species appear to extend into Siberia. Some of these species extend southward in the Cordilleran mountain system to alpine regions of Colorado; and in the east, isolated populations extend south to similar regions in the Presidential Range of New Hampshire. An invasion from the northwest of a few species of the coniferous forests took place after the Pleistocene glaciation. Within the coniferous zone there are further distributional subdivisions. These principles may be applied to all insect groups and are fundamental to an appraisal and the solution of the biting-fly problem in northern Canada.

Films of the Eastern Arctic to be produced by the National Film Board

Over the past few years many thousands of feet of movie film have been exposed in the Canadian Eastern Arctic, the greater part during the summer months. Almost all of it has been shot by amateurs, who have gone north to do specific jobs and have taken movies in their spare moments. Some of the footage obtained has been excellent, a good deal fair, and some very bad. Throughout all the footage there is a lack of continuity. The only complete regional or seasonal films shot have been made for the Department of National Defence, or made by professional cameramen of the silent movie era.

With the increased activity and interest in the Arctic it is important that there should be an accurate and complete record of the country and of the Eskimo. In order to make a coordinated series of films during the arctic year, the National Film Board has sent a crew of three to spend the period July 1950 to September 1951 in the Canadian Eastern Arctic. Script outlines have been prepared for the following list of films, which it is hoped will be shot in the course of the year:

The Eskimo

The Eskimo Child

The Natural Economy of the Arctic

Arctic Weather Station

Birds in the Arctic

Arctic Settlement

The entire film coverage will be on 16 mm. Kodachrome stock. 16 mm. rather than the usual 35 mm. film was chosen because of the difference in bulk and weight of the stock and equipment. Providing it is shot with good 16 mm. cameras and lenses, Kodachrome can be blown up to 35 mm. quite satisfactorily.

The production unit, consisting of Mr. D. Wilkinson, director; Mr. Jean Roy, camerman; and Mrs. D. Wilkinson, cook-business manager, left Montreal for Chesterfield Inlet on July 6 aboard the Regina Polaris. After setting up their headquarters in an abandoned house at Chesterfield their plan, which is very flexible, calls for a trip to Baker Lake in August to photograph the inland caribou hunt. In September the walrus hunt by Peterhead boat to the north of Chesterfield should provide a good sequence. October and November are to be spent at Chesterfield where coverage can be made of the freeze-up period and, as soon as travelling improves, interior scenes can be shot in nearby camps for the film "Eskimo Child". It is possible that a trip to Churchill may be desirable in February for consultation with the Film Board. March will again be spent with the Caribou Eskimo, completing interior and exterior shots of winter activities inland from Eskimo Point. In April the party hopes to fly to Pond Inlet, and to spend the next two months in Navy Board Inlet gathering coverage on seal hunting. June and July will be devoted to photographing the flora and fauna, and in August the break-up period and the natives congregating at the post for shiptime will be filmed. The party plans to return in the C.D. Howe from Pond Inlet, some time in September.

Pribilof Fur Sealing Operations, 1950

In the early summer of 1950 two serious fires hampered preparations for fur sealing operations on the Pribilof Islands. On June 3 a fire occurred on the tender Penguin while the vessel was moored at Seattle preparing for a scheduled departure for the islands on June 13. No one was aboard the vessel at the time flames were detected and the fire had gained considerable headway before fire-fighting equipment could be brought into operation. Most of the superstructure was burned out, resulting in damage estimated at between $50,000 and $75,000.

Fortunately, the U.S. Fish and Wildlife Service was able to obtain a suitable surplus vessel from the U.S. Army at very short notice. On June 12, the replacement vessel, Lt Raymond Zussman, was made available and departed for the islands on June 17 with essential personnel and supplies for the season's sealing operations. The Zussman is a somewhat larger vessel of 540 gross tons as compared with the 394-ton Penguin. It is planned that the Zussman will be reconditioned during the winter to serve as the permanent supply tender for the Pribilof Islands. The Penguin had served as supply tender for the Pribilof Islands since 1930, and was a familiar sight to residents of the Territory, particularly along the Alaska Peninsula and the Aleutian Chain.

The second fire occurred on St. George Island early on the morning of June 8, and resulted in the destruction of all of the buildings used in the curing and barrelling of skins on the island. The automotive equipment garage, machine shop, and cement house were destroyed, as well as the sealskin wash house, blubber shop, salt house and barrelling shop. A supply of barrels, salt, and essential sealing equipment was transferred from the neighbouring island of St. Paul, forty miles away, and a warehouse and other buildings were converted for use in the curing and barrelling of skins taken this season. Approximately twenty per cent of the annual take of sealskins is obtained on St. George Island. The take of skins on that island in the past season was not materially reduced as a result of the fire, although it was necessary to suspend sealing operations for four days early in the season because of a shortage of salt. The damage by fire on St. George Island was estimated at $60,000 and action is being taken to replace buildings and equipment before next summer.

The causes of the two fires have not as yet been determined, but it seems probable, at least in the case of the St. George Island fire, that the damage was the result of defective wiring in one of the buildings. Fortunately there were no injuries to personnel in either fire.

The total take of sealskins on the Pribilof Islands in 1950 was 60,090, made up of 48,696 on St. Paul Island and 11,394 on St. George Island. This figure is substantially less than the total of 70,991 obtained last year. The average annual take for the past ten years has been 66,290 sealskins. Apparently the relatively small take of skins this year can be attributed to normal fluctuations in the population of the herd. The stabilization of the annual take of skins at about 67,000 indicates that the Alaska fur seal herd has probably reached its maximum size.

Deadman and Marble islands. By Frank T. Davies and Graham Fowley

T.H. Manning in his talk to the Arctic Circle on the 1949 expedition to the new islands in Foxe Basin, mentioned being puzzled by finding a brass rod cemented into the rock on Deadman Island. This rod was a marker for a magnetic site occupied by Frank T. Davies in 1933, when he was at Chesterfield during the Canadian Polar Year Expedition. Deadman and Marble islands have both been connected with early explorers as well as with the magnetic survey of more recent times.

Some forty miles southwest of the entrance to Chesterfield Inlet on the northwest shore of Hudson Bay lies the ten-mile stretch of quartzite, known from its white colour as Marble Island. In 1719 two ships of the Hudson's Bay Company's expedition under Captain James Knight were lost here and during the following two years all the members of the crews died. Their tragic story has been pieced together by other explorers, among them Samuel Hearne, from tales handed down by the Eskimo. Their fate was not known until 1767 when Joseph Stephens, who was engaged in the whale fishery for the Hudson's Bay Company, discovered a new harbour on the southwest side of the island, now called Knight Harbour, and the wrecks of Knight's two ships, the Albany and the Discovery.

The south side of the outer part of Knight Harbour is formed by Deadman Island, a small flat island distinguished by a row of graves, probably of whaling seamen, along a pebbly ridge. On the 1948 edition of the 8 Mile to the Inch sheet of the National Topographic Series this island is incorrectly shown as lying to the north of Marble Island, and Knight Harbour is shown on the northwest coast of Marble Island instead of the southwest. When Mr. Manning visited these islands in 1949 he counted twenty-four graves on Deadman Island and two on Marble Island.

Marble Island is well-known to the Eskimo and is treated by them with respect. Boas[1]. records the Eskimo legend that "In olden times Marble Island was a low black rock on which the ice used to be piled up. One day a widow was looking out to sea. When she gazed at the piles of ice, the ice became displeased, and was turned into stone. A hole which the water had melted through the ice may be seen in the rock at the present day. When the people go to this island in winter, they step from their sledges a short distance from the shore, and crawl up on their elbows and knees. When they visit the island in the summer, they do the same, after landing." Knud Rasmussen[2]. spoke to an Eskimo woman who had lived on Marble Island when she was a girl: "There were many people there at that time, and life was very amusing. The men often had boxing matches, and there were great song feasts at which all were assembled.... I remember the first time we came to that island, we had to crawl up on to the land, and were not allowed to stand upright until we reached the top. That was done then, and it is done to this day, for the Island is a sacred place; magic words made it, and if we do not show respect for it by crawling it will change to ice again, and all the people on it will fall through and drown."

Among the few white visitors to these islands during the past eighty years have been three magnetic survey observers.

In 1834 A.R. Gordon, in 1912 W.E.W. Jackson, and in 1933 Frank T. Davies, made magnetic observations on Deadman Island. Little change in magnetic values occurred between 1884 and 1912 but during the following twenty-one years the compass direction changed five degrees farther to the west and the inclination decreased from 87°16' in 1912 to 86°37' in 1933. This indicated that the position of the North Magnetic Pole changed little during the earlier period but moved west and north during the later period.

Ross in 1831 and Amundsen in 1905 found the Magnetic Pole in much the same position, near the west coast of Boothia Peninsula. R.G. Madill and his colleagues of the Dominion Observatory have shown that the position of the Magnetic Pole in 1948 was nearly two hundred miles north-northwest of its old position. It thus appears that the

1. Boas, F. "The Eskimo of Baffin Land and Hudson Bay". Bull. Amer. Mus. Nat. Hist. Vol. 15 (1901) p. 151.

2. Rasmussen, K. "Intellectual culture of the Iglulik Eskimos". Report of the Fifth Thule Expedition 1921-24, Vol. 7, No. 1, Copenhagen, 1929, pp. 26-7.

North Magnetic Pole remained in much the same position through the greater part of the nineteenth and at least the first decade of the twentieth century. Some time after 1912 and before 1933 the drift to the north-northwest began. The magnetic observatory recently established at Resolute, on Cornwallis Island, will afford a check on the future drift of the North Magnetic Pole, now only some 150 miles to the southwest.

The "Sauna" at Resolute Bay

Mr. Walter Heikkila, who is employed by the National Research Council, built a steam bath at Resolute Bay early in the summer and has sent us the following note describing its construction and use. Mr. Heikkila is such an enthusiast that he has the birch twigs to which he refers flown in from Ontario.

The "sauna", or Finnish steam bath, is very common among Finns, each family usually having its own, especially on farms or at summer cottages. Among most other nationalities, though, and especially in the Canadian Arctic, it seems to be somewhat of an oddity.

The steam room has to be well built and insulated to keep the heat in. Mine is built of 93 packing boxes, each 10 inches x 11 inches x 31 inches, used in the manner of bricks. The boxes are filled with gravel for insulation and weight. The walls are lined with tarpaper and then covered with 1 inch boards. The roof is double, with fiberglass for insulation, and tarpaper and a tarpaulin for waterproofing. The inside dimensions are 8 feet x 8 feet x 6 feet, a bit small as saunas go.

In one corner there is a "kiuas", or furnace, consisting of one 45 gallon drum on its side, split open along its top, containing a 5 gallon drum rigged up as a firepot. Around this firepot are placed stones and odd pieces of iron, held close to the firepot by the outer drum. In two or three hours a wood fire heats the rocks to a high temperature. Water is then thrown on the rocks, and steam is immediately formed. On the opposite side of the room is a raised platform where the bather can sit and take the steam. The steam is very hot, and there is so little moisture in the air that there is no mist or fog. The hottest we have had it is 166°F. It is a Finnish custom to beat oneself in the sauna with a "vasta", a bunch of birch twigs, with the leaves on them, of a size that can be easily grasped in

one hand. The twigs are first softened by putting them on the hot rocks and throwing water on them. They emit a delightful smell. The beating is done when the temperature gets high, and it stimulates perspiration. After this it is possible to go outside for several minutes without feeling cold at 30 degrees below. The explanation, I believe, is that there is a layer of warm air next to the skin. It is also a custom to roll in the snow, or swim in cold water, after the bath.

You are welcome to try the sauna any time you happen to be around Resolute!

Editorial Note

The Editor is very pleased to report that she is now being assisted by Miss Margaret Murray.

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,
Editor Arctic Circular,
411 Echo Drive,
Ottawa

Authorized as Second Class Mail, Post Office Department, Ot

THE ARCTIC CIRCULAR

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Twenty-fourth Meeting of the Arctic Circle

The Twenty-fourth Meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Thursday December 14.

The President, Mr. Frank Davies, was in the Chair and made a few introductory remarks before the U.S.N. film "Silent Land". This film was taken on Operation Highjump, the United States Naval expedition to the Antarctic during the winter of 1946-47.

A sketch of road development in the Yukon Territory[1].

By H.S. Bostock[2]

The completion of the new mining road from Whitehorse to Mayo was recently announced by the Hon. Robert H. Winters, Minister of the Department of Resources and Development. This road, built by the Federal Government, is a great step forward and calls to mind stories and memories of the roads of former days which were in part forerunners of this latest step towards a trunk road to develop the interior of the Yukon Territory.

Before the discovery of the Klondike gold, winter travel in the Yukon was with dog-teams along the rivers and the route to the "outside" led up the Yukon River and thence

1 Published by permission of the Director-General of Scientific Services, Department of Mines and Technical Surveys, Ottawa.

2 Geological Survey of Canada.

over one or other of the passes to Skagway. With the great influx of population that came from the rush to the Klondike a regular mail and passenger service for the winters became essential. A winter wagon and carriage road was built by dint of horse-drawn ploughs and spades northward from railhead at Whitehorse to Dawson. The service on this "winter trail" was mainly in the hands of the White Pass and Yukon Route which also operated the railway.

The trail was equipped with stopping posts at intervals of 20 miles or less along the whole route of 300 miles. Each post was a complete establishment, with roadhouse, stables, storehouses, and cabins. Here board and lodging as well as fresh teams of horses and drivers were provided for the travellers and the mail stages. The posts contained all the necessities of life and the comforts of those days for winter travel and were a welcome and vital refuge for man and beast from the intense cold. Today ruins of the posts are still to be seen in some places on the abandoned parts of the roads where they are seldom visited or disturbed.

The roadhouses, themselves, were large two-storey log buildings with gently sloping gable roofs, dirt-covered to keep out the cold, and sheeted with boards to shed the summer thunder showers. A few, like the one at Grand Valley, north of Fort Selkirk, looked out upon splendid views of great open meadows, hills, and mountains. They usually faced the road and their large, low, flat-roofed log stables stood opposite. Several storehouses and cabins were clustered around, each flanked by wood piles that denuded the surrounding slopes of their forest. Now, with roofs fallen and those walls that still stand tilted by the frost, the forest creeps back upon them. In some places trappers have used the roads for their trap trails, the best of the small buildings for their line cabins and the remains of the others for fire wood. Grasses and flowers grow luxuriantly on the old manure piles. Tree and flying squirrels create havoc of any bedding and paper that remain - and the moose visit the back of the roadhouse for the salt left in the waste from the kitchen sink. The moss spreads over the ground smothering many curious relics of harness and carriages which still remain remarkably well preserved in the cold climate. Few post sites any longer contain habitable buildings and some are almost overgrown and obscured.

Legend for Map

((((((((General boundary of mountain barriers.

Road in use by motor traffic at present or during the last few years.

= = = = Old and new winter roads and winter trails.

(1) Original winter road to Dawson.

(2) Winter road via Scroggie and Black Hills creeks.

(3) Conservative winter road from Dawson to Mayo.

(4) Liberal winter road from Dawson to Mayo.

(5) Final winter road route linking Whitehorse, Dawson, and Mayo.

(6) New mining road to Mayo.

(7) New road to Atlin.

(8) Alaska Highway.

(9) Haines Road.

(10) Canol Road.

(11) White Pass Railway.

(12) Road to Sixtymile placer mining area and Walkers Fork and other camps in Alaska.

(13) Klondike Hydro Electric Power road.

(14) Local Klondike road system.

(15) Local Mayo road system.

(16) Road to Clear Creek dredge camp.

(17) Road to Henderson Creek dredge camp.

(18) Road to Thistle Creek dredge camp.

(19) Road to Snag airport.

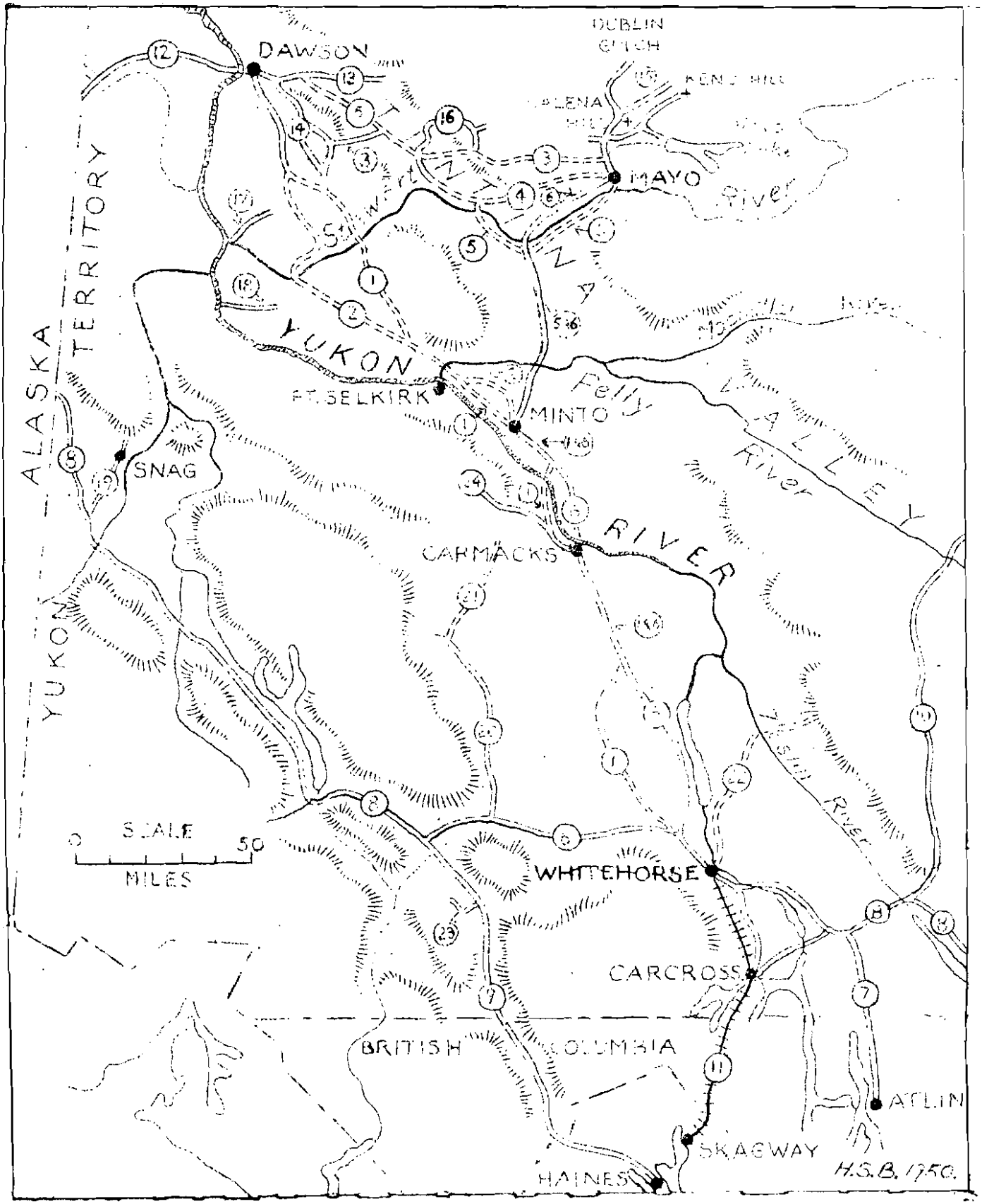
(20) Road to Aishihik airport.

(21) Winter road to Brown McDade prospecting area.

(22) Winter road to Livingstone Creek placer camp.

(23) Road to Shorty Creek placer camp and Mush Lake.

(24) Road to Freegold Mountain prospecting area.


DUBLIN GULCH
DAWSON
KENO HILL
GALENA HILL
MAYO
River
YUKON
ALASKA TERRITORY
FT. SELKIRK
MINTO
Pelly
River
SNAG
CARMACKS
RIVER
YUKON
SCALE
0
50
MILES
WHITEHORSE
Teslin River
CARCROSS
BRITISH
COLUMBIA
ATLIN
SKAGWAY
HAINES
H.S.B. 1750.

This road to Dawson ((1) on the map) followed a relatively straight course much the same as that of the new road (6) as far as Minto, except that it lay west of Miners Range and crossed the Yukon some 11 miles or more below Carmacks instead of just above that settlement. From Minto it continued northwest to cross the Pelly River 3 miles up from the river mouth opposite Fort Selkirk. From here, with numerous bends, it headed for Dawson, up hill and down dale, crossing the Stewart River at Rosebud Creek and climbing eight summits 3,000 to 3,500 feet or more above sea level on the way.

The river crossings of the Yukon, Pelly, and Stewart were equipped with cable ferries. Until the last few years the high, gaunt, red-painted log towers that held the cables clear of summer steamboat traffic, remained picturesque landmarks. Now they too are gone, rotted at the base, undermined by their rivers, or pulled down.

Many a tale has been told of the journey over the "winter trail"; of horses falling dead in the harness from the cold; of crossings at freeze-up and break-up in row boats with the ice running, when the large ferries could not be used, in the endeavour to keep the mail and travellers moving. Some of the roadhouses were renowned for the outstanding characters of the ladies whose rule held sway over the daily lives of the travellers and those employed around them through the long winter months. How often one hears an old timer say, "I met him at Mrs. Shaeffer's roadhouse", not the Minto roadhouse or Carmacks.

The spreading of the gold mining to Black Hills, Scroggie and Mariposa creeks in the years about 1910 led to the abandonment of this road (1) from a point a few miles northwest of the Pelly to Eureka Creek on the southern border of the Klondike District. A new road (2) complete with roadhouses and all was built, threading a more westerly course through the hills and following down Walhalla and Scroggie Creeks to Stewart River. It crossed the river at Scroggie Creek and ran eastward up the Stewart valley to ascend Black Hills Creek and thence to rejoin the earlier route near Eureka Creek. This road, though longer, had fewer summits and was more carefully located on the sunny sides of valleys.

In the same years a winter road developed between Dawson and Mayo, but as a whole it was more moderately equipped and the travel on it was never so heavy. This road, too, went through its own troubles of route. After an election in which the ruling party changed it was rebuilt along a new course so that, to many, the two alternate routes became known as the "Liberal" (4) and "Conservative" (3) trails.

In the 1920's, with the growing importance of the silver-lead mining in the Mayo district which outstripped the Klondike gold production from 1925 to 1932, as it has again in recent years, the old direct routes ((1) and (2)) between Minto and Dawson were finally abandoned. Another road designed to serve both mining camps more economically was built extending north from Minto through a broad transverse valley that extends from the Yukon across the Pelly to the Stewart. This valley offers the best grades and elevations to be found in the country and with those valleys followed by the new road of 1950 farther south forms a broad, low, natural passage through the Territory from Whitehorse northward. On this route only one summit between the main rivers is higher than 2,500 feet and most are considerably lower in elevation. On approaching the Stewart, the new road (5) branched, extending northeast up the south bank along the Stewart River valley to Mayo and northwest along the great Tintina Valley to the Klondike River and thence to Dawson.

This road was also equipped with roadhouses but the population in the Klondike had decreased to less than a tenth of what it had been in the rush. Winter passenger traffic almost died away. Currently with these changes the day of horse-drawn winter transport passed. Tractors hauling 4 to 7 sleighs took their place and at the same time the employment that had been caused by the horses disappeared. The stables were turned into "cat" garages and the big hay meadows so laboriously cleared a few years before went back to the willows. Although the cat trains normally included a caboose with a stove, the journey over the winter trail became a thing to be undertaken only under dire necessity, and much less was done for the comfort of the passengers than formerly.

Soon trucks came into use during favourable spells of weather in early winter. They made the journey much more quickly and came into general all-winter use on local roads

around the Mayo and Klondike districts about 1935. Finally the winter mail was carried by aeroplanes in the 1930's and regular passage over the road ceased. The road gradually fell into disuse and became impassable except for occasional tractor and truck freight hauling trains which travelled only when the streams were well frozen and the bridges not needed.

The route of the new road (6) of 1950 from Whitehorse north makes good use of the natural hollows of the country and follows much the same course as the last of the old roads (5), until it crosses the Stewart River at the mouth of Crooked Creek and then turns northeast to Mayo along the north bank of the river. When the time comes the branch westward to Dawson can now be built along the north bank of the Stewart River to join the earlier route (5) where it met the Liberal trail (4). From there it will follow the general route of (5) into Dawson.

In this system only one bridge over the Stewart River will be necessary and Mayo and Dawson will be connected without crossing that river. The new road occupies a good central location and will be able to serve as a trunk for future branch roads into all parts of the south central section of the Territory.

It is of interest in this connection that this road and all its predecessors pass through the gap between Fort Selkirk and the junction of the Pelly and Macmillan rivers. To the west of Fort Selkirk the Yukon River, swollen by the Pelly and flowing into a great almost canyon-like valley, becomes a major obstacle to all north-south roads and to the east, up the Pelly and Macmillan rivers, the terrain becomes rougher and mountainous.

The new road forms an outlet for the tree-like system of local roads (15) that extends north from Mayo to the silver-lead mines of Galena and Keno Hills, to Dublin Gulch and Highet Creek placer gold areas and to the district's summer resort on beautiful Mayo Lake. It makes Dublin Gulch, north of 64 degrees of latitude, the north tip of the connected road system of Canada.[1] It can be

[1] Norman Wells could claim this distinction had the Canol Road not fallen into disuse and Circle, Alaska, 65° 45N., is the northernmost point on the connected road system for North America.

but a short time before the westward branch is built to link with the local road system of the Klondike and the road (12) extending westward to Sixtymile placer camp as well as beyond Walker's Fork and other points in Alaska.

As a whole the Yukon terrain is an easy one in which to build roads with bulldozers, and a number of local roads connecting outlying placer camps to the navigation system of the main rivers have been made, the most notable being that extending 40 miles from the Stewart River to the dredge camp on Clear Creek (16). Some of these roads will be easily linked with the trunk road but others will probably remain isolated by the main rivers and dependent upon them for their connections.

The benefit to the Territory of the trunk road cannot be overestimated. A country can only develop to a certain point without good transportation. The Yukon had reached such a stage where no further expansion of the principal mining camp in its interior was feasible without a decided improvement in its transportation. The production of the Mayo camp was limited to the tonnage that could be carried by the steamboats on the Stewart River. The closing of all but air transport to the "outside" for eight months in the year and the uncertainty of the river transport necessitated the storing of sufficient supplies each fall for virtually a whole year. These factors and the high cost of the long water route made mining very expensive and held the minimum grade of economic ore to a spectacularly high figure resulting in mining on what is called a high grading basis where only the richest discoveries can be prospected and only the most valuable pockets of ore are mined.

The opening of the road promises to go far towards correcting this situation by lessening the difficulties of transportation. This year some thousands of tons of concentrates and ore in addition to those brought down the Stewart River have been hauled over the road from Mayo to Carmacks by-passing the worst hazards of the navigation system. From Carmacks the trucks are able to return to Mayo with loads of coal. In August the first truck load of concentrates was brought the whole way from Galena Hill to Whitehorse. Although the long truck haul to Whitehorse is not expected to become general for the bulk of the production, it marks a significant milestone.

Heavy supplies and equipment can now be freighted in at any time of year and the carrying of large emergency stocks is no longer necessary. Now prospectors from any part of the road system of Canada and the United States can drive in their own trucks all the way to Keno and Galena Hills. They can continue prospecting north of the Stewart River or in any locality near the road through the autumn with the knowledge that they do not have to beat the freeze-up to escape with their trucks and equipment to work in a milder climate for the winter, and they can come in before break-up to use to the full the summer months.

These and numerous other smaller benefits attributable to the road will make prospecting more economical and more promising as, besides the very high grade discoveries, the more numerous lower grade mineral deposits will be worth investigating. In the case of the Mayo district the hydroelectric plant to be constructed on the Mayo River will be an added important factor in reducing the cost of mining and in the expansion of mining in the camp. With the great improvement in access and export that the road will give, it is reasonable to believe that sooner or later some new camp will be started bringing in turn more development and still further extension of the road system.

The 1950 Eastern Arctic Patrol. By Alex Stevenson

The 1950 Eastern Arctic Patrol, the twenty-eighth since the Patrol was inaugurated,[1] marked the maiden voyage of the C.D. Howe, the new 3,600 ton Department of Transport vessel.

The C.D. Howe was specially designed for arctic service and is fitted with the latest electrical and mechanical equipment. Although not an icebreaker in the usual sense of the term, she is strengthened for use in ice. She is designed to carry 1,000 tons of cargo, and 88 passengers and crew. The medical section includes an operating room, sick bay with beds for six patients, a dispensary, a complete dental office, an X-ray room and a dark room for developing X-ray plates. In addition the vessel has a mail room, a hydrographic charting office, and a laundry. (For further details see reference (1) above).

1. For a brief history of the Eastern Arctic Patrol see Circular Vol. 1, No. 2 (1948) p. 11.

The C.D. Howe carried a helicopter which it was planned would be used for transporting members of the Patrol, mail, and medical supplies to points where the vessel could not enter the harbour. It was also to be used in mapping terrain elevations in the vicinity of various ports of call and along the coast. Unfortunately the helicopter was lost off Fort Chimo on August 5 causing the death of Sam Ford (see Circular, Vol. 3, No. 3 (1950) pp. 36-37).

The C.D. Howe sailed from Montreal on July 17 with Captain A. Chouinard in command, and returned to Quebec on September 25. The vessel called at Cape Harrison, Port Burwell, Fort Chimo, Churchill, Cape Dorset, Lake Harbour, Pangnirtung, Clyde, Pond Inlet, Arctic Bay, and Dundas Harbour, the most northerly placed reached, and at Frobisher Bay on the way back to Quebec. Using the helicopter members of the patrol also visited Makkovik from Cape Harrison, Labrador, and George River while the ship was in Ungava Bay. Craig Harbour was not reached this year owing to lack of time. It had been planned that the R.C.M.P. detachment at Dundas Harbour was to be taken north to reopen the post at Craig Harbour, but this move had to be postponed.

Fort Chimo has not usually been visited on the Patrol, but this year freight was brought in for the weather and ionospheric stations. The freight for Port Harrison, Cape Smith, and Sugluk, normally carried by the Patrol, was handled by the Hudson's Bay Company's ship Rupertsland and the Roman Catholic Mission ship Regina Polaris, both of which were in the Bay during the summer.

In recent years the scope of the Patrol has been enlarged as a result of the increased activity in the north. It is now a combined effort of six government departments: Resources and Development, National Health and Welfare, Transport, Mines and Technical Surveys, Justice, and Post Office.

The Officer in Charge of this year's Patrol was Mr. A. Stevenson of the Arctic Division, Department of Resources and Development. He was assisted by Mr. R.G. Johnston of the same Department whose duties were chiefly statistical in connection with family allowances, relief, the decennial census, vital statistics, and old age allowances for the Eskimo.

Members of the Patrol organized plans for taking the 1951 decennial census in the Arctic. Making accurate returns for the 8000-odd Eskimo scattered over the Arctic

will be one of the most difficult census assignments in Canada. It will be carried out by the R.C.M.P. and must be completed by shiptime next summer.

At each port of call the senior medical officer, Dr. J.C. Osborne of Edmonton, examined the Eskimo. Dr. Osborne was assisted by F/L J.R. Wynne and Nursing Sister M.P. Brown of the R.C.A.F. who joined the ship at Churchill. The general standard of health of the Eskimo appeared to be good and over a thousand were X-rayed. Eighteen sick Eskimo, mostly suffering from tuberculosis, were moved to Pangnirtung Hospital or outside hospitals for further medical treatment. Dr. R.S. Robertson, a dentist from Cobourg, Ontario, was kept busy checking, extracting, and filling the teeth of both whites and Eskimo.

Mr. R.A. Hadden of Ottawa, was in charge of postal service. He noted a marked increase in the use being made of the mails by the Eskimo, who communicate with each other in syllabic script which nearly all can read and write.

Among the passengers picked up or dropped along the route were the Right Reverend D.B. Marsh, Anglican Bishop of the Arctic, several Oblate missionaries, Mr. J.W. Anderson and other officials of the Hudson's Bay Company; Inspector Henry Larsen and Staff Sergeant W.C. Dodsworth of the R.C.M.P.: and Dr. J.H. Nesbitt. At Clyde fifteen members of Mr. P.D. Baird's expedition were taken on board, after having spent three and a half months in the Clyde area.

Weather conditions were exceptionally good and only loose ice was encountered in Lancaster Strait and Admiralty Inlet.

Operation Magnetic, 1950. By R.D. Hutchison

This expedition, continuing a project begun in 1947, was less fortunate than its predecessors but managed to obtain a total of magnetic observations not far below the average for previous years. It is to the credit of the R.C.A.F. that after the accidental sinking of the expedition's Canso in a northern lake, the party was speedily rescued and re-equipped and was back on the job in two weeks.

The object of the expedition was to extend the magnetic survey of the Canadian arctic in regions accessible only by long-range amphibious aircraft. The first requirement is to improve the mapping of declination required for

navigation by compass. It has sometimes been suggested that fixing the position of the north magnetic pole would solve the whole problem. That has been done, but the Arctic is an area of regional and local anomalies which influence the compass so that it does not point directly toward the pole. Thus in order to provide reliable information, observations must be spread out over the area for which they are required.

There is also the question of the reliability of the compass as the magnetic pole is approached. Here the horizontal component of magnetic force diminishes, so that the compass is useless in a fairly large area; but outside that area it is an aid to navigation if the navigator knows its mean direction and the deviations likely to result from daily variation and disturbances.

Daily variation can be considered as a periodic change in the north and east components of magnetic force. An analysis of previous years' observations shows that the variation in these components has the same general character and amplitude for all parts of the Canadian Arctic. Therefore the change in declination at any point depends on the magnitude and direction of horizontal force: the lower the value of horizontal force the greater will be the swing of the compass during an average day. Unfortunately the daily variation is confused by disturbances and is not systematic enough that one can give a "correction to the compass for time of day". What can be given is - either a warning or an assurance - that the compass should be within a certain number, say three, degrees of the values shown on the chart. This information is now being provided by the Dominion Observatory for new editions of northern charts.

The need to observe all the elements of the magnetic field rather than declination alone may help to explain why it is necessary to have a widespread network of stations, and to have at each point continuous observations extending over a period of 24 hours or more. The Dominion Observatory is responsible for this sort of magnetic survey. Other surveys, notably the geodetic, hydrographic, and topographic, and special expeditions, such as that of the Arctic Institute to Baffin Island, provide a valuable contribution in the form of compass readings, which help to complete the picture.

This summer's expedition, as in previous years (Circular, Vol. 1 (1948) pp. 20-23 and 79-81, Vol. 2 (1949) p. 83), was an R.C.A.F. operation. F/O A.G. Carswell was pilot and detachment commander. The scientific observers

were R.D. Hutchison and Kenneth Whitham, of the Division of Terrestrial Magnetism, Dominion Observatory.

The party left Rockcliffe for Churchill on July 7 and by the 15th had established four new magnetic stations stretching west from Hudson Bay just north of the 60th parallel. These stations lie across the region of maximum field strength for North America, though some 900 miles south of the magnetic pole.

It was at the fourth point - Spitfire Lake, 60°52N., 107°44W. - that the Canso sank, having struck a submerged object while taxiing into position for a take-off. The pilot managed to reach a small island before the plane went under, and the party landed, wet and cold but without casualties. Distress signals from a portable emergency transmitter were picked up during the night by signal stations a few hundred miles away, and the next day a Canso from Northwest Air Command arrived and took the party to Edmonton. There they achieved newspaper fame as "nine shivering survivors", though by that time they were much warmer and nearly dry.

Returning thence to Rockcliffe, the same party, with another Canso and new instruments, was on its way north again before the end of July.

Observations were made at Coral Harbour in Southampton Island and at Cape Dorset on the south coast of Baffin Island, the latter being a repeat station established in 1922 and re-occupied several times since then for the determination of secular change in magnetic values.

Having received favourable ice reports from farther north, the expedition then proceeded to Resolute Bay, Cornwallis Island. It had been hoped to reach several parts of Ellesmere Island not open for water landings in previous summers; but these hopes were dashed by bad weather, which kept the plane grounded for a week. During this time scientific work was confined to instrument tests and experiments in the magnetic recording station established at Resolute Bay by the Dominion Observatory in 1948.

By the time the weather began to improve, the summer was too far advanced for operations in the far north, so the party returned to Churchill. Three more stations were occupied in this vicinity, which completed the season's work.

The results are listed below:

TABLE I

STATION	LAT.	LONG.	DECLINATION	INCLINATION	FIELD INTENSITY
Eskimo Point	61°07N.	94°02W.	0°42'3W.	85°00'0	.61276 c.g.s units
Padlei	61°54	96°40	7°30'8E.	85°18'9	.60496
Sherwood Lake	60°54	103°22	21°14'9E.	83°50'7	.61383
Spitfire Lake	60°52	107°44	27°30'6E.	83°02'5	.60663
Coral Harbour	64°11	83°22	28°46'1W.	86°09'8	.59142
Cape Dorset	64°14	76°34	49°12'0W.	84°41'9	.58472
Churchill (1)	58°45	94°14	3°44'8E.	83°52'3	.61079
(2)	58°47	94°11	2°57'6E.	83°50'5	.60776
(3)	58°45	94°04	2°46'5E.	83°59'1	.60945

The purpose of occupying several stations at Churchill was to clear up some uncertainty about secular change. Many previous magnetic observations had been made there, some of them on the east side of the river near the present town, but most of them on the west side near the former Hudson's Bay Company post. Several post-war observations at Churchill town had shown results notably different from those of the 1930's, which were made across the river. The simultaneous occupation of the old and new survey sites showed a significant "station difference" which can be applied to previous readings to give a more accurate picture of secular variation for the past few decades.

TABLE II

YEAR	DECLINATION	INCLINATION	FIELD INTENSITY
1725	21°00 W.		
1738	18°00 W.		
1742	17°00 W.		
1769	9°41 W.		
1846	12°06 E.	84°47	
1879	11°00 E.		
1908	9°59 E.	84°38	.6372 c.g.s.
1908	10°06 E.	84°35	.6388
1910	9°40 E.	84°33	.6362
1912	9°29 E.	84°40	.6516
1923	7°15'3 E.	84°25'0	.62573
1930	5°40'5 E.	84°18'2	.62159
1934	5°03'3 E.	84°12'4	.61403
1937	4°38'7 E.	84°08'8	.61355
1945	3°47'6 E.	84°05'7	.61412
1948	2°44 E.	83°57	.61007
1950	3°44'8 E.	83°52'3	.61079

Table II shows the magnetic values at Churchill through the years. The declinations suggest a cyclic variation having a period of roughly 450 years. The observed values can be approximated by an equation:

$$D = -10^\circ + 22^\circ \sin \frac{2\pi}{450}(t-1770),$$

where t is the year of observation, and easterly declinations are taken as positive, westerly declinations negative. The observations however are not extensive enough for such

analysis: any period from 400 to 500 years can be fitted to them, and only time - another century or two - will show whether such a cycle actually exists. The observations of inclination and intensity are too recent to indicate any long-period formula, but both show a continuous decrease from first to last.

The French Arctic Research Expedition to Greenland, 1950

The 1950 French expedition to Greenland sailed from Rouen on 13 April 1950, in the Norwegian freighter, Hillevaag, to continue the work carried out during 1948 and 1949 (see Arctic Circular, Vol. II (1949) pp. 36-7, 106). This year's expedition of thirty-six men, was again under the leadership of M. Paul-Emile Victor.

At Reykjavik part of the cargo was unloaded and was later parachuted to the expedition's main camps and the central research station (71°N., 40°W.). On entering the pack southwest of Greenland, the Hillevaag's propellor was broken, and the ship had to be towed to Ivigtut. There the cargo and members of the expedition were put aboard the Force, the Norwegian vessel which transported the 1948 expedition. On May 28 the Force anchored in Atâ Sund about six miles from the coast. Landing operations on the winter ice were completed by June 8. Some members of the expedition proceeded immediately to the ice cap, while others transported equipment and material to the central research station and the ice cap.

A note from the headquarters of the expedition in Paris, dated July 31, states that the summer's scientific work was proceeding satisfactorily. Some members of the 1949-50 wintering party returned to France in early August. It was expected that the remaining members of this group and the 1950 summer party would return in September, while another group of eight men would be left at the central research station to operate the station during the winter of 1950-51.

The French Antarctic Expedition

In addition to the expedition to Greenland, an expedition to Adélie Land has also been organized by the Expéditions Polaires Françaises. This expedition, composed of eleven men, with M. André F. Liotard as leader, sailed from Brest in September 1949, in the Commandant Charcot.

On December 30 the ship entered the pack at 64°40 S. and 145°E. For the next seventeen days she cruised in the area between 145°E. and 138°E. trying to find a channel to the land. Twenty-one reconnaissance flights were made in the expedition aircraft and it was found that the pack was more than forty miles wide. On January 15 the vessel succeeded in passing through the pack and reached the coast. She anchored in the vicinity of Cap Découverte and a base was established on the coast. When landing operations were completed the Commandant Charcot left for France, leaving the members of the expedition established at the base.

The 1949 expedition was primarily of a reconnaissance nature. Surveys of the land surrounding the base were made and meteorological observations were begun in preparation for the more detailed scientific programme of the 1950 expedition. This second expedition was expected to leave France in September 1950.

Anthropological studies at Great Whale River

We have received the following information from Dr. J.J. Honigman, Assistant Professor of Anthropology at New York University. In the summer of 1950 Dr. Honigman and his wife visited the community at Great Whale River, Que., to continue anthropological investigations begun there in 1949. In addition to studying the general structure of community relations among the Eskimo, Indians, and whites, they made a special study of the child rearing methods followed by the Eskimo and some aspects of family allowances. In 1949 it had been found desirable at Great Whale River to remove flour and sugar from the list of foods available to the Eskimo from their family allowances. Dr. Honigman notes that during the following winter the Eskimo caught more seal, ptarmigan, and other native foods than during the winter of 1948-9, and intensified their production of handicrafts.

Photographs

"Polar Photos", an English firm, have asked us to mention that they are seeking to extend their library of photographs of the Canadian Arctic and of Alaska. They offer "the usual agency rates for pictures handled in the United Kingdom or on the continent, that is 50% of all fees earned for the holder of the copyright". Their address is Room No. 20, 3 Bloomsbury Street, London W.C.1, England. Prints sent should be good quality glossy enlargements, 8 inches x 6 inches in size.

Subscriptions for 1951

Members are reminded that their subscriptions for 1951 ($2.00 for Ottawa members, or $3.00 for combined membership for husband and wife, and $1.00 for out-of-town members) are due on January 1, and are payable to the Treasurer, Mr. James Cantley, 215 Gladstone Ave., Apt. 11, Ottawa. It will be greatly appreciated if members would pay promptly. Members in England should send 5/- to the Scott Polar Research Institute at Cambridge.

Changes of Address

Members are earnestly requested to advise the Secretary, Mr. A. Stevenson, 73 Fifth Ave., Ottawa, promptly of any change of address.

Note from the Committee

The Committee would like to express its thanks to Mr. H.V. Serson, Mr. E.L. Hagg, and Mr. J.A. Warwick who have jointly operated the projectors for films and slides and have brought the equipment to each meeting during the past year.

Editorial Note

The Editor wishes to thank Miss Moira Dunbar and Miss Margaret Murray for their assistance with the Circular, Mr. A.E. Porsild and Mr. T.H. Manning for their advice, and Mr. J. Curran for drawing the maps.

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,
Editor Arctic Circular,
411 Echo Drive,
Ottawa.

Authorized as Second Class Mail, Post Office Department, Ott

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