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THE ARCTIC CIRCULAR

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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 Wednesday January 9. The retiring President, Mr. Frank Davies, was in the Chair and opened the meeting by calling on the Treasurer to read the financial statement, which was then approved by the members. The Treasurer pointed out that the finances of the Club were satisfactory and that membership had continued to increase. At the start of the fifth year of the Club's existence there were 174 Ottawa members and 287 out-of-town members, making a total of 461 as compared with 438 at the Annual General Meeting in 1951.

The retiring President then asked the meeting to vote for Officers and Committee members. In accordance with the constitution the President, Mr. Frank Davies, the Vice-President, Inspector H.A. Larsen, and the following members of the Committee resigned: S/L K.R. Greenaway, Mr. A.D. McLean, Capt. B.P. O'Connell, and Mr. F.C. Goulding Smith. S/L Copland also resigned as Publications Secretary. The following nominations had been received from Club members: President, F/L S. Alexander; Committee members, Miss Moira Dunbar and Dr. V. Solman. The Committee proposed the following names: President, Inspector H.A. Larsen; Vice-President, Mr. A.D. McLean; Publications Secretary, Mr. S.J. Murphy; Committee members, Mr. D'Arcy Charles, Mr. Frank Davies, and Mr. J.A. Warwick. Mr. A.D. McLean and the five Committee members proposed were accepted unanimously. A ballot was taken for President, and Inspector H.A. Larsen was elected. The Officers and Committee members for 1952 are as follows:

President:	Inspector H.A. Larsen, R.C.M.P.
Vice-President:	Mr. A.D. McLean
Secretary	Mr. A. Stevenson
Publications Secretary:	Mr. S.J. Murphy
Treasurer:	Mr. J. Cantley
Editor:	Mrs. G.W. Rowley

Committee members

F/L S. Alexander, R.C.A.F.
Mr. D'Arcy Charles
Mr. Gordon Corcoran
Mr. Frank Davies
Miss Moira Dunbar
Dr. Y.O. Fortier
Dr. George Hooper
Mr. T.H. Manning
Mr. A.E. Porsild
Mr. G.W. Rowley
Lt/Col. G. Sangster
Dr. V. Solman
Mr. J.A. Warwick
Mr. J.A. Wilson
Mr. J.C. Wyatt

While the vote for President was being counted Mr. G.W. Rowley showed a short film entitled "Operation Lyon", taken at Igloolik during the summer of 1949.

Following the election of Officers and Committee members the retiring President, Mr. Frank Davies, thanked the Officers and members of the Committee who had assisted him during the two years he had held office as President. The new President, Inspector H.A. Larsen, then took the Chair. Mr. A.D. McLean proposed a vote of thanks to Mr. Davies, which was seconded by Mrs. G.W. Rowley. The new President then thanked the auditors and reappointed them for 1952. He also expressed the gratitude of the Club to Lt/Col. J.R. Chisholm for the use of the R.C.A.S.C. Mess and Major B.H. Tobin for making the arrangements at the Mess, and to Miss Elizabeth Rought of the Scott Polar Research Institute for handling the subscriptions from European members.

At the conclusion of the Club business a colour film entitled "Greenland in the Sun" was shown. This film was directed by Hagen Hasselbalch and was made available to the Club by the Danish Legation in Ottawa.

The R.C.A.F. High Latitude Twilight Computer. By S/L K.R. Greenaway

The time and duration of twilight have peculiar significance in arctic air navigation, because of the important part played by astronomical observations. Owing to the unreliability of the magnetic compass over much of the Canadian Arctic, steering is done by a directional gyro,[1] and frequent astronomical observations are necessary to

1. This is not a north-indicating gyro as used in marine navigation, but can be set to any heading. The north-seeking gyro is unsuitable for arctic air navigation because of the extreme convergency of the meridians and the speed of the aircraft.

check the heading held by the gyro. Astronomical aids are also of great importance in fixing the position of the aircraft, as much high latitude flying is over water or land which is not well charted, and radio navigation aids are scarce. It will be appreciated, therefore, that the twilight period, when neither sun nor stars are available for observations, is something to be reckoned with in flight planning, and avoided whenever possible.

Twilight as it affects the air navigator may be regarded as a belt subtending an angle of approximately 6 degrees at the centre of the earth and is about 360 miles wide at sea level. This belt is thus the same width regardless of latitude. To an observer in outer space it would appear as stationary, the earth rotating behind it once in 24 hours. At the equinoxes the band would be perpendicular to the equator and the edge nearest the sun would pass through both poles. At the solstices this edge would be inclined 23°27' on one side or other of the poles.

At the equator the earth rotates through approximately 15 degrees of longitude or 900 nautical miles in one hour, and it therefore takes only a few minutes to traverse the twilight zone. But the linear velocity of the earth's rotation decreases with increasing latitude (in proportion to the cosine of the latitude), so that the time taken to cross the twilight band also increases. Added to this factor is the greater obliquity of the sun's apparent path in relation to the horizon, which further prolongs the twilight period.

This long duration of twilight becomes a complicated problem for the air navigator because of the effect of aircraft speed. In low latitudes, where the twilight period is short, aircraft speeds have, up to the present time, been low in comparison with the linear speed of the earth's rotation. For navigational purposes the practice of calculating the duration of twilight from data tabulated in the Air Almanac or given in graphical form, without considering the speed and direction of flight, has been satisfactory. Towards the poles, however, as the linear speed of the earth's rotation decreases, aircraft speeds have an increasing effect. For example, whereas an aircraft flying westward along the equator would require a speed of 900 knots to keep pace with the apparent motion of the sun, at 77°N. a speed of 200 knots is sufficient. Thus in high latitudes it is possible to keep pace with or even overtake the sun in its apparent passage around the earth. As a result of this, twilight can be prolonged indefinitely on an east-west flight. In the Arctic, therefore, where astronomical observations are required frequently, it is most important to take into consideration the speed of the aircraft and the direction of the flight when calculating the duration of twilight.

The difficulty arises from the necessity to compound these factors of speed and direction of flight with the easterly drift caused by the earth's rotation, since the aircraft's track in space is not the same as its track in relation to the earth's surface, and it is this track in space that must be compared with the position of the twilight belt. To our observer in outer space the twilight belt will, over a period of a day or so, appear fixed, with the earth rotating behind it, while the observed motion of an aircraft will consist of its movement in relation to the earth's surface, combined with a steady drift to the east at a rate of 15 degrees per hour. For example, if the observer is over the North Pole and the aircraft flying due north, its track will appear as a spiral to the left which in 24 hours will make a complete revolution.

In the past the only method of calculating the duration of twilight on a high latitude flight was by plotting the track and determining twilight conditions at various points along the route. This method required considerable time, was tedious, and failed to give a complete picture of twilight conditions. Templates and one or two computers have been developed to do this, but all give the twilight conditions at fixed points along the route. In other words they treated the problem as a static, not as a dynamic condition.

In 1948 the R.C.A.F. High Latitude Twilight Computer was developed to solve this problem. This computer treats the question dynamically and compounds the speed and flight direction of the aircraft with the earth's rotation. The aircraft's track in space is presented in graphical form and is shown in relation to the twilight belt.

The computer consists of a slider which moves under a transparent rotatable disc mounted in a holder. The outer edge of the disc is marked in degrees and hours and there is an index on the holder. On the lower half of the slider is a map of the area north of latitude 60°. The top part of the slider contains a line representing sunset and sunrise and a shaded area showing the twilight zone. A series of lines in the shaded area indicates the width of the twilight belt for different altitudes. Normal to the presentation of the twilight zone is a declination scale with a height correction applied by displacing the declination scale by the amount appropriate to the sunrise-sunset angles. Allowance can be made for heights up to 40,000 feet.

To use the computer the flight track is plotted on the map and positions at successive hours are marked in succession from the point of departure, commencing with zero and including any stopovers. The slider is then moved into the holder until the North Pole on the

map coincides with the centre of the transparent disc. The disc is rotated until the 000 hour angle, marked on the outer edge, coincides with the index. The point of departure is then traced through onto the disc and indicated as zero hour. Then the disc is rotated clockwise until the 1 hour (GHA 345) mark comes under the index. The 1 hour point on the track is traced through onto the disc and indicated as 1 hour. This point is joined with that indicating the point of departure. This procedure is repeated for each successive hour of the flight plan. The line so drawn, which will be curved, represents the aircraft's track in space.

In the next step the slider is moved through the holder until the declination index on the holder coincides with the appropriate declination of the sun and flight altitude. To determine the most satisfactory time of take-off in respect to twilight, the disc is rotated until the track in space lies outside the twilight zone or cuts through the zone at a point along the route where astro observations are not of primary importance. The Greenwich Hour Angle of the sun for the time of take-off will appear against the index on the holder. The time of take-off is found by converting the GHA to GMT.

If the time of departure has been pre-arranged, the GHA of the sun for the time of the take-off is set against the index on the holder. The track is then in the correct position relative to the twilight zone.

The same procedures can be applied to determine the availability of any planet for observations.

On the reverse side of the computer is a high latitude planisphere, which provides the navigator with a readily available means of selecting and locating stars and planets most frequently used for navigation north of latitude 60°.

The twilight computer was used to flight plan the first R.C.A.F. flight to the North Pole, which was made out of Whitehorse by the Specialist Navigation Course of the Central Navigation School in May 1949, and since then has been in regular use on high latitude flights.

Northern activities of the Geodetic Survey 1950-1. By J.E.R. Ross, Dominion Geodesist[1].

During the last two decades, geodetic field work has been carried out by the Geodetic Survey of Canada from year to year in various parts of the Northwest Territories and the Arctic Archipelago

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

as far north as southern Ellesmere Island. From 1929 to 1937 the work consisted almost entirely of the establishment of precise and second-order astronomical stations for mapping control at settlements along the Arctic coasts. The establishment of a series of points on the 60th parallel, marking the boundary line between the Northwest Territories and the adjacent provinces to the south, dates from more recent years (for accounts of geodetic work during the summers of 1947, 1948, and 1949 see Arctic Circular, Vol. 1 (1948) pp. 24-6 and pp. 83-4; and Vol. 3 (1950) pp. 18-20).

During 1950 and 1951 three different types of geodetic work were carried on in the Yukon and Northwest Territories - shoran trilateration, precise astronomical surveys, and precise levelling.

The shoran trilateration consisted of the projection, with the cooperation of the R.C.A.F., of an arc of triangulation from central Canada north and northwesterly as far as the Arctic coast. This new system of survey permits the extension of ground control for mapping and charting into remote areas in a much shorter time than would be required by the use of the conventional type of triangulation. While not yet attaining the degree of accuracy of first-order triangulation, shoran is able to place the relative positions of isolated points more accurately than by astronomic means.

Shoran ground stations forming the apexes of a series of overlapping triangles are selected at suitable sites separated by distances up to 330 miles. The length of each triangle side is measured to a high degree of accuracy by electronic methods. Part of the necessary radar equipment is installed at the ground stations marking the terminals of the line undergoing measurement. The remainder is mounted in an aircraft which flies back and forth across the line near its midway point at an elevation of about 20,000 feet. By recording, photographically, the dial readings of the various airborne instruments during each crossing, a corresponding number of determinations of the desired length becomes possible.

The R.C.A.F. aircraft, from which the line crossing measurements are made, usually fly at too great a height to be seen or heard by those on the ground below; much less could they be seen or heard by those at the terminal stations 100 or 150 miles distant. The measurement of the minute periods of time required for the passage of the high-frequency radio signals between the aircraft and the terminal stations forms the basis of the length determinations. Fortunately, neither wind, darkness, rain, nor clouds interfere seriously with this type of distance-measurement operation.

The selection and preparation of the station sites were carried on by geodetic crews which were provided with aircraft transportation by the R.C.A.F. The preliminary mathematical analysis was carried out at the base camp by geodetic field personnel. The "Least Squares" adjustment of the network and the computations of the geographical positions, azimuths, and lengths were made by the Geodetic Survey in Ottawa.

Field officers engaged on this work included W.J. MacLean, L. Luke, C. Hunter, S. Yaskowitch, A. Hamilton, A. Grant, D. McLellan, P. Monaghan, F. Hawkins, R. Johns, W.D. Forrester, and L. MacHattie.

In the winter of 1950-1 an astronomical survey party established four precise stations along the 60th parallel between the Mackenzie Highway and the northwest corner of the Province of Alberta. These points will be used in 1952 for survey control in the demarcation of the boundary line between Alberta and the Northwest Territories defined by law as the 60th parallel of latitude.

Transportation of the party was provided by a heavy tractor which pulled two cabooses used as living quarters for the geodetic personnel and the tractor-trailer crew. A bull-dozer blade attached to the front of the tractor was effective in clearing a pathway through the light stands of spruce and poplar which sparsely cover the country in that locality. Considerable difficulty was encountered throughout the season in the muskeg areas because early falls of snow had blanketed the ground to a depth of three to four feet; as a result the frost had only penetrated two inches in some places and would not sustain the weight of the tractor. In the area west of the northwest corner of the Province of Alberta, the lack of frost prevented the continuance of the work although temperatures of 35 to 50 degrees below zero had prevailed for several weeks. Geodetic personnel taking part in this operation were W.D. Forrester, G.A. Corcoran, D.B. Coombs, and S.L. Kao.

In the winter of 1951-2, this work will be continued with the help of aircraft and dog-team transportation.

In the sumers of 1950 and 1951 five precise astronomic stations were established on the same parallel of latitude adjacent to the northern boundary of British Columbia east of the Smith River. In 1950 C.H. Ney descended the Fort Nelson and Liard rivers by boat to establish a point at the intersection of the 60th parallel with the Liard River. He then continued downstream to Fort Liard where he ascended the Petitot River for 85 miles during the period of early summer run-off. Two stations were located at intersections of this river with the 60th parallel - one at the most easterly crossing and

and another, on the return trip, at the most westerly crossing. This little-known section of country had abundant wildlife, including moose, bear, caribou, beaver, ducks, and geese.

In the summer of 1951 a station was established by W.D. Forrester at the intersection of the 60th parallel with the Beaver River and another by G.A. Corcoran about 30 miles northeast of Smith River airport. On this project Mr. Corcoran used a pack-horse train for transportation. As there were no trails leading to the desired destination, it was necessary to employ a gang of axemen to open a path through the dense forest cover.

The 1951 precise levelling operation involved the projection of a line of levels from the Whitehorse area along the new motor road to Mayo and thence northward to the power development dam at Mayo Lake which is required to impound water for power development for the Keno Hill mining area. Permanent bench marks were established at intervals of about two miles along the Whitehorse-Mayo road, thus providing easily accessible points of known elevation above sea level for mapping and engineering purposes. The engineers connected with the levelling project were R.W. Serviss, N.H. Frost, and S. Fukuyama.

In addition to the northern projects carried out by personnel of the Geodetic Survey, G. Hattersley-Smith obtained astronomical fixations at four points in the Beaufort Sea on the 1951 Defence Research Board Expedition in the Cancolim II.

The Seismic Observatory at Resolute Bay. By P.C. Bremner[1].

In 1948 a survey made at Resolute Bay by the Dominion Observatory gave a favourable report on the feasibility of establishing and operating a seismological observatory in the severe arctic climate. The most important prerequisite, bedrock, for receiving seismic radiation, was discovered near a small river one thousand feet south of the station. Plans were accordingly laid to bring the station into operation.

A rigorous field test of equipment was carried out on the Experimental Farm in Ottawa during the winter of 1949-50; in July of

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

1950 P.C. Bremner and R.E. Andrews, the latter a student at the University of Toronto, flew north to establish the station. The detecting seismometers were placed on bedrock and enclosed in a small building which was then banked with gravel to provide temperature control and reduce the effects of strong winds. The building can only be entered through a trap-door level with the ground, and two one-hundred watt light bulbs provide sufficient heat to keep the vault at a comfortable working temperature during the coldest season of the year. Several cables lead from the building housing the detecting seismometers to the recorder building located in the weather station. The recording apparatus is set up on steel tables which are anchored in the peranently frozen ground and housed in a specially designed double-walled prefabricated building made by the Tower Construction Company. Within two months after the seismic crew landed at Resolute important data on distant earthquakes were being radioed to the south. P.C. Bremner remained in charge of the Observatory during 1951 but R.E. Andrews recently returned to Resolute to operate the station during 1952.

While there has been little indication that the Eastern Arctic Islands are seismic, few days pass that an earthquake is not recorded at the Resolute Bay Observatory. Earth tremors from Alaska, the Aleutian Islands, and occasionally from northern Siberia will often shake the seismometers so violently that only the first shock wave is well recorded. The remainder of the record may be obscured as the result of the intense ground movement too small for detection by human senses but violent enough to destroy the usefulness of the seismometer. The arrival time of the first shock wave is of great importance and this information is radioed at once to Ottawa, then to Washington where data are collected from all over the world. The United States Coast and Geodetic Survey uses this information to determine the location, and depth in the earth, of the earthquake and sends its results to stations studying these phenomena.

Today, with the experimental stage of the installation almost over, Resolute is ranked as one of the leading stations in the world. It is located in such a position that seismologists may study, in conjunction with other observatories, the geological structure beneath the Arctic Ocean, the Bering Sea, and North America. It may prove valuable in solving the mystery of microseisms, a periodic ground disturbance associated with the passage of cold fronts and more spectacularly with the movement of storms at sea. Much work is needed to improve the instrumentation to carry out this research but the most difficult stage has been completed. There are few stations which today have the great opportunities offered to seismologists in charge of the Resolute Bay Observatory.

Permafrost drilling at Resolute Bay. By P.C. Bremner[1].

Since 1948 the Dominion Observatory has been cooperating with the Canadian Meteorological Service and the United States Weather Bureau in making a geothermal study of permafrost at Resolute Bay. The Dominion Observatory's participation in this project began as a consequence of the drilling necessary to determine the suitability of the site for a seismic observatory. In the spring of 1950 it was decided to drill deep holes for temperature investigations, and diamond drilling equipment was acquired. During the summers of 1950 and 1951 attempts were made to reach a depth of one thousand feet with a diamond drill which would bore a hole one and one half inches in diameter to accommodate the thermometer and also provide rock samples for analysis. The extremely cold ground temperatures made drilling so difficult that many hundred feet of drill rod were lost before a successful technique was developed.

By the end of the first summer the greatest depth obtained was one hundred feet; the need for both continuous operation as well as hot water to keep the rods from freezing, had been all too clearly demonstrated. Temperatures observed at a depth of one hundred feet were about 8°F. and are thought to be the coldest soil temperatures on record for this depth.

The reason for the great operating difficulties became obvious with the knowledge of rock temperature; consequently the apparatus was modified to meet the conditions. During the first season a small gravity-feed boiler was used to provide the hot water necessary to prevent the drill rods from freezing in the hole. It was found to have insufficient heat capacity for that purpose and during the winter of 1950-1 a wide search for a suitable boiler finally met with success. A large fire-tube boiler was flown from Montreal to Resolute to be used in series with the gravity-feed oil heater for heating water from temperatures near freezing to around the boiling point. Additional pumps, water lines, and control valves were installed in the drill shelter until it appeared to those watching the operation to be nothing more than a plumber's nightmare. Then for days at a time, working with scalding water and drilling at high pressures which often caused the hoses to burst, the drillers pushed the hole down to

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

four hundred and fifty feet. Breakdowns and mechanical failures were handled quickly with ingenuity that meant the difference between success and failure. Only shortage of time and material prevented a further attempt to reach greater depths and the fact that the final hole was completed without any permafrost complications is an indication that considerably greater depths could be reached if it were desirable to make the necessary expenditure of time and money.

While the fact remains that the one thousand-foot hole was not completed in the period of less than three months during which drilling operations were conducted, it is felt that a satisfactory method was finally developed. The analysis of rock samples and deep-hole temperatures will soon be published and should be of great interest. The experiment has shown that the diamond drill is still an economical and practical method of boring exploration holes where cost of equipment and transportation difficulties prohibit the use of heavier machinery.

Subscriptions for 1952

Members are reminded that their subscriptions for 1952 ($2.00 for Ottawa members, or $3.00 for combined membership for husband and wife, and $1.00 for out-of-town members, other than institutions) were due on January 1, and are payable to the Treasurer, Mr. James Cantley, 215 Gladstone Avenue, Apt. 11, Ottawa. It will be greatly appreciated if members would pay promptly.

Owing to currency regulations it is not always convenient for members of the Arctic Circle residing in Europe to pay their subscriptions to the club in Ottawa direct. Through the courtesy of the Director, the Scott Polar Research Institute will now receive the subscriptions of members from the United Kingdom and from the Continent of Europe and will transmit them to Canada from time to time. European members should forward their 1952 subscriptions (5/-) to the Director, Scott Polar Research Institute, Cambridge, England and mark them "Arctic Circle Subscription".

Change of Address

Members are earnestly requested to advise the Treasurer, Mr. James Cantley, 215 Gladstone Avenue, Apt. 11, Ottawa, promptly of any change of address.

Editorial Note

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

Mrs. Graham Rowley,
411 Echo Drive,
Ottawa, Ont.

Authorized as Second Class Mail, Post Office Department, Ottawa

THE ARCTIC CIRCULAR

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Thirty-second Meeting of the Arctic Circle

The thirty-second meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Wednesday February 13. The President, Inspector Henry Larsen, was in the Chair and introduced the speaker, Mr. George Jacobsen. Mr. Jacobsen showed a colour film on the building of the railway from Seven Islands to the Labrador iron ore development and discussed some of the construction and transportation problems both there and in the Ferguson Lake area north of Churchill.

Beaufort Sea Expedition, 1951. By G.F. Hattersley-Smith

A Defence Research Board expedition in the motor vessel Cancolim II was engaged in hydrographic, oceanographic, and other work in the Beaufort Sea region last summer. The members of the expedition were:

T.H. Manning, leader and zoologist
F.G. Barber, hydrographer
W.M. Cameron, oceanographer
A.J. Dodimead, assistant oceanographer
G.F. Hattersley-Smith, geologist and surveyor
A.H. Lawrie, marine biologist
A.H. Macpherson, assistant zoologist
C.R. McDonald, cook
C.L. Merrill, geographer and engineer

Cancolim II is a 45-ton (registered) 80-foot Diesel-driven yacht, built in 1940 and bought by the Defence Research Board early last year: she was specially fitted out at New Westminster, B.C., for work in the Beaufort Sea over a period of years.

Difficulty in installing the wheelhouse engine control caused a delay of several weeks and prevented the ship from sailing until July 27; three days later Prince Rupert was reached. There followed a stormy seven-day crossing of the Gulf of Alaska to Dutch Harbor,

Unalaska, where the ship took on oil fuel and where poor sailors, such as the writer, enjoyed a brief respite from the elements.

After the departure from Dutch Harbor on August 7 Cancolim had a calm passage into Bering Strait, passing within sight of King Island, the home of cliff-dwelling Eskimo. North of Cape Prince of Wales and the Diomede Islands the weather deteriorated and Cape Lisburne was rounded in heavy seas, fanned by strong winds from the north.

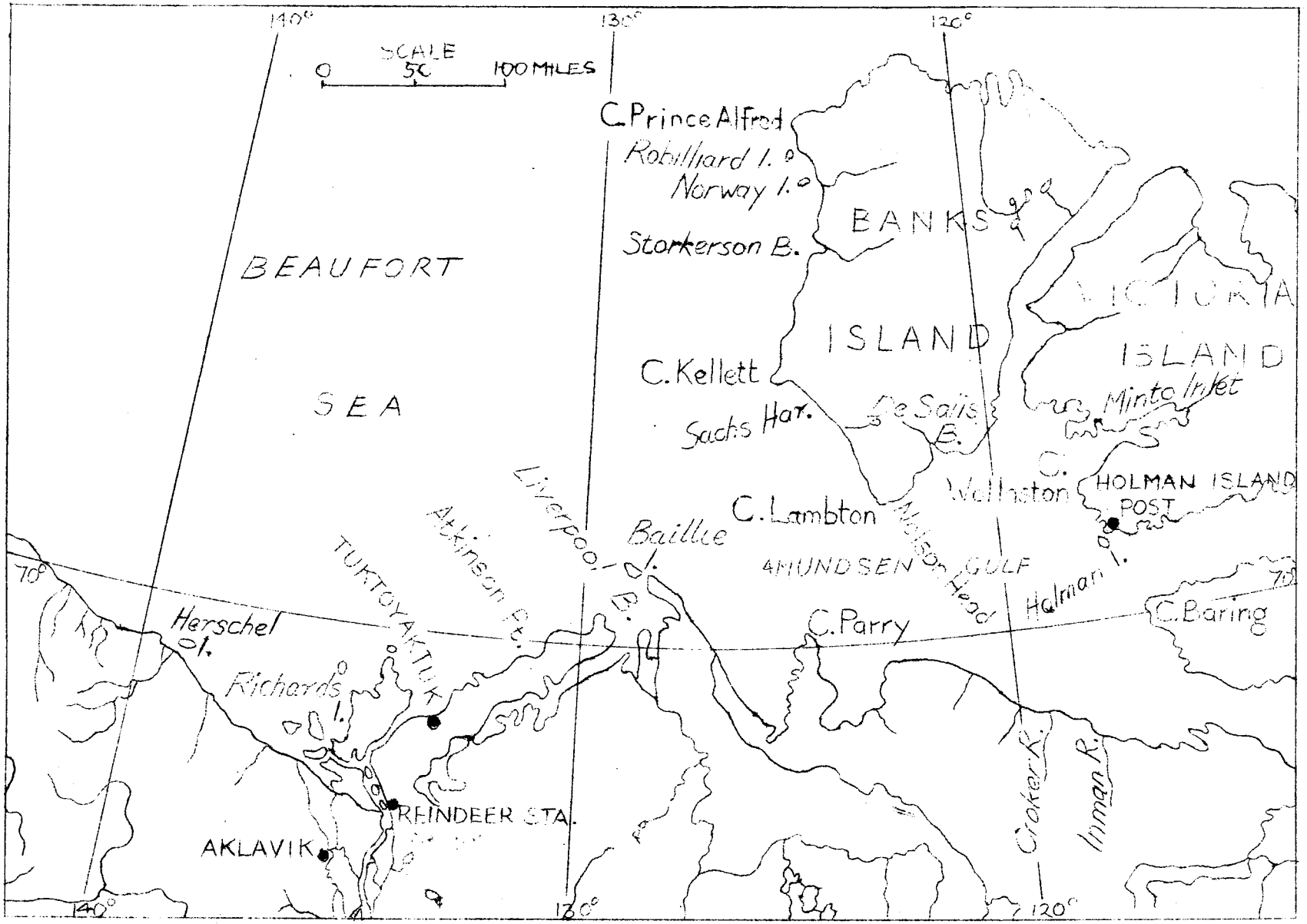
The expedition reached Point Barrow on August 13, where Cancolim, drawing about 8½ feet, was just able to enter the harbour behind the sand bar to take on oil fuel. Contact was made with the icebreaker U.S.S. Burton Island, at anchor off Point Barrow at this time.

After leaving Point Barrow on the evening of August 13 Cancolim passed through scattered ice floes west of Barter Island; this was the first ice to be sighted on the trip in a season which was one of the most ice-free in living memory in the Western Arctic.

Herschel Island was reached on August 16. For the next three days Lawrie, Macpherson, and Hattersley-Smith were in camp on the island working respectively on the fishes, birds and mammals, and geology, while the ship put in a series of sounding runs and oceanographic stations as far north as the hundred-fathom line. Eastward passage was resumed on the 19th; on this and subsequent passages continuous soundings and regular oceanographic stations were taken, except when weather or ice conditions were unfavourable.

On August 22 Cancolim reached Tuktoyaktuk where additional stores and fuel were embarked. Two Eskimo, Jim Cockney and John Edwards, were taken on as crew; they were to take turns at the wheel during daylight hours and to assist in work on deck and galley chores. This arrangement relieved the pressure of work on the ship's party, engaged in a twenty-four-hour schedule of oceanographic and hydrographic observations and often depleted by the sending of a party ashore.

Cancolim left Tuktoyaktuk on the 23rd, ran out to the hundred-fathom line, then headed for Baillie Island, and thence northward for Cape Kellett. A belt of loose pack (of one-year-old ice) lay close inshore near Cape Kellett with its northern edge extending westward at least 20 miles; another belt of pack lay north and south down the west coast of Banks Island 20 miles offshore. The ice did not, however, hinder navigation in the Sachs Harbour - Cape Kellett region. Following the edge of the coastal pack, the ship reached a position just south of Norway Island on the 26th, before turning south. On the way down the coast brief landings were made near Storkerson Bay, at Cape Kellett where an astronomical control position was established, and at Sachs Harbour where a few Eskimo families usually winter. Near Cape Lambton decayed, year-old ice was moderately tightly packed, and necessitated a wide detour to the south.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C. Kellett
Sachs Har.
de Salis B.
Minto Inlet
C. Wollaston
HOLMAN ISLAND
POST
C. Lambton
Liverpool
Baillie
Atkinson Pt.
TUKTOYAKTUK
Nelson Head
AMUNDSEN GULF
Holman I.
70°
Herschel I.
Richards I.
C. Parry
C. Baring
REINDEER STA.
AKLAVIK
Clarence R.
Inman R.
140°
130°
120°

Cape Parry was reached on August 28. The ship anchored in a small bay 5 miles south of the western headland of the cape, and, while Merrill carried out some necessary running repairs to the engine, a shore party established an astronomical control position.

From Cape Parry on August 30 Cancolim sailed to a landfall near Cape Baring, then southward again to Inman River, which, with its deeply incised, canyon-like valley, is a conspicuous feature from seaward.

After coasting westward as far as Croker River, the ship headed north for De Salis Bay which was reached early on September 2. Apart from some loose year-old ice in the bay and near the entrance, no ice was encountered in this crossing of Amundsen Gulf. Some of the party went ashore for a few hours on the east side of De Salis Bay, where there is a fairly level coastal plain rising gradually to 500-foot hills, 5 to 6 miles inland. A number of broad, boulder-strewn valleys descend to the coast, which carried very little water at the time of the visit.

From De Salis Bay Cancolim sailed eastwards, and arrived at Holman Island post early on the 3rd, after passing the Roman Catholic mission boat near Cape Wollaston, on her way to visit the Eskimo families in Minto Inlet. The ridge-and-valley topography of the Holman Island region is characteristic of the Precambrian trap-sedimentary sequence. The trap rock (basalt), which forms the ridges, shows signs of intense glaciation. Fuelling and watering ship occupied most of the day; the party sailed from Holman Island late in the evening after a memorable supper of arctic char with fresh lemons.

Early on the 4th Cancolim was off Nelson Head where a short time was spent ashore to collect specimens from the 1,100-foot cliffs. These cliffs of Precambrian rocks were the most spectacular sight of the whole summer's trip - the quartzites below, striped pink, maroon and buff, and the dark columns of the basalt at the top, partly shrouded in mist.

From Nelson Head course was set south-southwest for Cape Parry, but about 20 miles north of the cape course was altered towards Baillie Island owing to a heavy beam sea. Macpherson and Hattersley-Smith were landed on the west side of Liverpool Bay to take an astronomical fix and to do some collecting. Cancolim headed north on the 5th and up the west coast of Banks Island; she was in sight of Cape Prince Alfred before turning south. The edge of the pack appeared to lie at least 20 miles off the cape. A small island, not shown on the latest 8-mile map, was located north of Robilliard Island.

Cancolim arrived back at Liverpool Bay on September 9, and, after picking up the shore party, ran lines of soundings as far west as the 130th meridian. The ship then headed west to Atkinson Point, where an overnight stop was made to take another astronomical fix.

The expedition continued westward to Richards Island where the usual shore party was landed, while the ship carried out sounding runs to the north and went into Tuktoyaktuk to refuel. The shore party was picked up on the 14th, and the ship reached Herschel Island on the morning of the 16th after a day spent near the hundred-fathom line north and east of the island, where Lawrie made a series of plankton hauls.

Constables C.R. Mains and D.C. McDougall of the R.C.M.P. post on Herschel Island had been busy since the last visit of the ship, and a number of seal skulls awaited collection. A party was sent ashore to pick these up while the ship made a sounding run along the coast, returning to the harbour to anchor for the night.

Cancolim left Herschel Island early on the 17th, made a final run of soundings and oceanographic stations as far as Baillie Island, and returned to Tuktoyaktuk on the 19th where she was made ready and moored preparatory to being frozen-in for the winter. Mr. L.A.C.O. Hunt, Administrative Officer, Northwest Territories, and Mr. F. McCall, Wildlife Officer, were at Tuktoyaktuk at this time in the Wildlife Service motor-boat Caribou; they very kindly agreed to delay their departure a few days until the Cancolim party was ready to leave. After a further delay due to rough weather Caribou left Tuktoyaktuk early on the 25th with the whole party, personal baggage, and scientific records and collections aboard. The party reached Aklavik in the early afternoon of the 26th after having been hospitably housed for the night by Mr. and Mrs. L.E. Post at the Reindeer Station on the way up Mackenzie River. All members of the party had returned by air to their various destinations east and west by October 3.

The results of the expedition may be summarized as follows:-

Cameron and his assistants, Barber and Dodimead, established the rough limits of the continental shelf from sounding data: depths in the Amundsen Gulf region were in general found to be over 100 fathoms. Oceanographic data was obtained from 43 stations in the area traversed by the ship. The results of this work are being compiled at the University of British Columbia this winter under Cameron's direction.

Lawrie decided to take full advantage of the abnormally ice-free year by concentrating on work afloat, and he made plankton hauls whenever opportunity permitted. When in harbour at Herschel Island, Holman Island, and Tuktoyaktuk he made fish collections, in which a total of 16 species were represented.

During the course of the summer 85 skins of birds, representing 30 species, and 190 skins and skulls of mammals, representing 22 species, were collected for the National Museum by Manning and Macpherson.

Four new astronomical control positions were established for the Geodetic Survey: at Cape Kellett, Cape Parry, Liverpool Bay (west side), and Atkinson Point by Hattersley-Smith, who was assisted by Macpherson and McDonald in this work.

A report has been prepared on certain harbours and on the topography and geology along the coastlines visited. A Kodachrome film and numerous Kodachrome slides and photographs were taken during the summer.

Grateful acknowledgement is made for assistance and courtesies received during the course of the expedition from the following: - Mr. W.R. Hall (Manager, H.B.C. Post, Holman Island), Mr. L.A.C.O. Hunt, Mr. W. King (Manager, H.B.C. Post, Tuktoyaktuk), Constable C.R. Mains, Mr. F. McCall, Constable D.C. McDougall, and Mr. and Mrs. L.E. Post.

The Brown Lemming in captivity in Alaska. By Sally Carrighar

Although the Brown Lemming, Lemmus trimucronatus alascensis Merriam, is reputed to be harder to keep alive in captivity than the Varying Lemming, Dicrostonyx groenlandicus, a small colony of them survived for more than a year at Nome, Alaska. The following are a few details as to their care.

Six Brown Lemmings were captured near Barrow in July 1950, one being released within a few days because of its pugnacious disposition; the other five were transported by plane to Nome. Before leaving Barrow I had them caged there for eighteen days and experimented with their preferences in natural foods. Since later they lived on a quite different diet, their choices were not significant in regard to survival, except possibly for two preferences: they liked to gnaw driftwood, and they ate most of a sizable clump of earth that surrounded the roots of sod. Thereafter they always had small pieces of (salty) driftwood in their enclosures, and always some soil. I never observed them eating soil that was not adhering to roots, but they burrowed in it extensively, and may have sharpened their teeth on its grit. There was never a day when they did not gnaw on the driftwood.

During the fall I collected a large stack of the grasses, mosses, and lichens native to the Nome area, and during the winter the lemmings' civilized diet was supplemented with these. They also "ate" snow, which from time to time I put on top of their earthy burrowings, for the purpose of keeping the soil workable, as the melting snow moistened it. The lemmings were given raw potato frequently, raisins

and carrots less often, and a little lettuce about once a week. For the most part they subsisted on rolled oats. When one developed a scabby skin ailment, with loss of hair, I treated it locally with sulphur ointment and added cod-liver oil to the rolled oats, in the proportions of 1 to 30. The skin healed, but a few weeks later, in March 1951, two of the lemmings died. In discussing the project with Dr. Cosmo Mackenzie of the University of Colorado, Department of Biochemistry, I learned of work he had done proving that cod-liver oil can induce a Vitamin E deficiency, which is cured or prevented when Vitamin E is added to the diet. After that I included wheat germ in the lemmings' daily rations of cereal.

The original group were captured between July 9 and 12, 1950. On July 31 one of the females gave birth to eight young. Due to her urgent efforts to form a nest, I had moved her to a cage alone, therefore all of the young survived. On August 2 another female gave birth to young, how many I do not know as I only discovered her litter as a result of cage-mates' attacks. None of these lived. The colony after July 31 numbered 13, all of which lived until March. One that I had assumed to be old, because of its slow, heavy movements, died in its nest. Another became lethargic and died a day or two later. In April another was lost in the same way, and the mother of the eight died in May. These were the only ones that succumbed from "natural causes". Through a series of mishaps several were lost and two were killed by their fellows. Two were still alive sixteen months after the first group was captured. At that time, leaving Nome for a year, I had to abandon the project.

None of the lemmings that died was eaten, except for the litter of newborn, although the head of one that died in combat was chewed.

Besides the importance of finding the right diet for lemmings, it is necessary to watch for the periodical rise in their nervousness, and to work out ways to keep them relaxed. They are so high strung that they become fairly hysterical from time to time, and if not relieved, they would be likely to engage in fatal fights or perhaps die from some physiological aspect of the tension, I believe. There are certain Brown Lemmings that are too belligerent to be put with others, but on the average, I found, up to four can be kept together in a cage 30 inches by 16 inches providing each cage has, as mine did, an activity wheel attached. I thought that the wheel was the most essential single factor in keeping the lemmings alive. They ran it almost constantly during the night and often during the day, sometimes fighting over it, but also devising little routines whereby they shared it. This activity may have helped to keep down the level of their intensity; nevertheless they needed other aids at times. Then I gave them some diversion -- new cage materials, new earth to burrow in, new arrangements of the pieces of driftwood: these seemed to furnish them with a harmless release of energy. A different food for a day or two may have

helped, or a pan of water large enough for them to sit in. They crouched in a pan of water, especially one containing moss, as if it gave them satisfaction. A few times I took out the most disturbed lemming and let it swim in a tub of water for a few minutes, after which it seemed to return to a normal temper.

All this may seem like more elaborate care than the average observer would wish to devote to a group of lemmings, but it does not require much time if the cages are placed in a room where other work is being done, so that the emergencies can be discovered incidentally, as they arise, without the necessity of checking the lemmings frequently.

The 1951 Eastern Arctic Patrol. By Alex Stevenson

On June 27 the Department of Transport's vessel, the C.G.S. C.D. Howe sailed from Montreal on the 29th annual Eastern Arctic Patrol, carrying supplies and government officials to the northern posts (for an account of the 1950 Patrol see Circular, Vol. 3 (1950) pp. 70-2). Much of the following account is based on the log kept by Captain C.A.A. Chouinard, who was again master of the vessel for her second trip north. The administrative work was carried out by members of the Arctic Services, Department of Resources and Development, who also studied the Eskimo economy to report on possible improvements in conditions. The Officer in Charge of the Patrol from Montreal to Churchill was Mr. J. Cantley, and for the northern half of the Patrol, Mr. A. Stevenson. Their responsibilities included those of a Justice of the Peace, Game Officer, and Officer for Citizenship matters. Mr. R.G. Johnston was responsible for family allowances, relief, old age pensions, and collecting the 1951 census returns.

At each settlement medical work was carried out by a team from the Department of National Health and Welfare under Dr. Harvey Campbell, and an eye survey was made among the Eskimo, working in conjunction with the Canadian National Institute for the Blind; Dr. R.S. Robertson was responsible for the dental work. Mr. W. Hannaford and Mr. W. Litwin of the Dominion Observatory took magnetic readings; Mr. S.J. Murphy and Mr. W.C.G. Pett of the Hydrographic Service carried out hydrographic work in a small launch taken for the purpose; Mr. R.A. Hadden of the Post Office Department dealt with the mail deliveries; and Mr. W.M. Doucette of the National Film Board was the official photographer.

The helicopter carried aboard the ship was employed for ice reconnaissance, transporting government officials, and air photography of the settlements. Mr. L.C. Charleson of the Civil Aviation Division, Department of Transport, piloted the helicopter during the first half of the trip and F/O R.H. Ritchie of the R.C.A.F. during the second half.

On the way north the vessel put in to Tuchialic Bay (Cape Harrison) in Labrador on July 1. Thick fog and icebergs delayed the ship, but Resolution Island was reached on the 5th, and a judicial party was put ashore to investigate a fatal shooting (see Circular, Vol. 4 (1951) pp. 72-3). The trial was held later in the dining saloon of the C.D. Howe -- probably the only trial of this kind to be held on board a Canadian vessel in modern times. During this period the helicopter surveyed the ice conditions in Ungava Bay for the run to Fort Chimo.

The C.D. Howe anchored in the Koksoak River on July 7 after following leads through heavy ice. From July 8 to 14 supplies were unloaded for the air base, and the settlement at Fort Chimo. The new scow proved very satisfactory, and could carry up to 50 tons in one load.

Leaving Chimo on the 15th the vessel put in to Sugluk two days later, and the usual unloading and administration routine was carried out; on the 18th Ivugivik was reached, and the following day, Cape Smith. From July 20 to 24 the C.D. Howe was unloading at Port Harrison, and arrived at Churchill on the 26th after avoiding a heavy field of ice in Hudson Bay. As the C.D. Howe was to be berthed alongside the grain elevator where there would be no place for take-off, the helicopter left the ship for the air base. Unloading and loading at Churchill were completed by August 9 and the vessel sailed for Coral Harbour, arriving on the 11th and departing the same day for Cape Dorset.

At Cape Dorset Mr. and Mrs. J.A. Houston, representatives of the Canadian Handicrafts Guild, joined the C.D. Howe (see Circular, Vol. 4 (1951) p. 12). Working under a grant from the Department of Resources and Development, they had flown to Frobisher in February 1951 and had travelled to Lake Harbour and Cape Dorset by dog team, collecting Eskimo handicrafts and giving instruction to the Eskimo. They continued north with the ship and visited all the settlements on the northern and eastern coasts of Baffin Island. At each settlement they showed a handicraft exhibit to stimulate Eskimo interest in making work which would be saleable and bought any finished pieces of work.

Lake Harbour was reached on August 15 and the C.D. Howe left for Pangnirtung on the 18th. A message was received to proceed to Cape Hopes Advance to take a seriously ill man on board; however, it was found that the patient required an immediate operation, and he was landed at Frobisher to be flown to hospital outside. The vessel then proceeded on her course and Pangnirtung was reached on the 20th after encountering fairly heavy ice in Cumberland Sound. It was snowing heavily after leaving Pangnirtung so the vessel continued to Clyde without putting in at Padloping Island. On August 25 the ship left for Pond Inlet, arriving the following day. Here a National Film Board production unit, consisting of Mr. and Mrs. D. Wilkinson and Mr. Jean Roy, who had spent fifteen months in the Arctic (see Circular, Vol. 3 (1950) p. 56)

joined the ship. On the 27th the C.D. Howe left for Arctic Bay with no ice in sight. At Arctic Bay the officers of the Patrol visited a cairn on King George V Mountain, which contained records left by Captain J.E. Bernier in 1911, while wintering at Arctic Bay. Members of the Patrol took a transcription of the Bernier documents and left a record of their visit in the cairn.

On August 29 the vessel sailed for Dundas Harbour, encountering an ice field which made landing difficult. Here the R.C.M.P. post was closed and the two R.C.M.P. constables and two Eskimo families were taken north to Craig Harbour. Craig Harbour, which was reached the following day, was found to be three-quarters full of ice. Despite ice conditions and high tides, the landing was accomplished safely. A special ceremony was held and the R.C.M.P. post, which had been closed since 1940, was reopened by Inspector Henry Larsen. The ceremony was recorded by the Film Board unit. Members of the Patrol going ashore on the first barge startled a small herd of seven to eight caribou grazing in front of the R.C.M.P. huts. With the return of man to the area these animals naturally took to the hills. Captain Chouinard describes how ice started to drift into the harbour with great pressure while they were waiting for the landing barge to return. "One large sheet came across our bows, dragging the anchor and pushing the ship ashore. The engines were then put full ahead and we managed to weigh anchor and keep the large pieces of ice in such a position to facilitate the barge to return... After considerable manoeuvering through narrow passages, the barge reached the ship in dense fog."

The C.D. Howe returned to Pond Inlet on September 2 on the way south, and, after putting in at Padloping, entered Frobisher Bay on the 6th. On the 9th a message was received to leave for Sugluk to take on cargo from the N.B. McLean for Lake Harbour and Frobisher. The C.D. Howe arrived at Sugluk on the 11th, and was ordered to take the disabled R.C. Mission ship Regina Polaris in tow. She left for Lake Harbour on the 12th to unload and continued to Frobisher on the 14th to repair a broken manifold, which however proved impossible. The C.D. Howe then sailed south with the Regina Polaris in tow, and reached Quebec safely on September 25, having successfully completed the Eastern Arctic Patrol and having salvaged the M/V Regina Polaris.

U.S. Navy Icebreaker

It was announced in January 1952 that the U.S. Navy has recently awarded a contract for the construction of the first new icebreaker it has had built since the end of the Second World War. The icebreaker, which will be a prototype for any to be built in the future, will be 310 feet long, with a beam of 74 feet and a displacement of 8,300 tons. This is considerably larger than the Wind class icebreakers which are 269 feet long, with a beam of 63 feet and a displacement of 5,040 tons. The new vessel will be built by the Ingalls Shipbuilding Corporation, Pascagoula, Mississippi.

Exercise "Eager Beaver"

"Eager Beaver", a combined exercise of U.S. and Canadian army engineers, based near Kluane Lake in the Yukon Territory, got under way in late January. The exercise will continue until July and will test equipment and capabilities of personnel while carrying out an airfield construction programme, snow compaction studies, the construction of field defences, and demolition projects. Approximately 450 all ranks from the two countries will take part in the exercise which is under the command of Lt. Col. H.D. Brown, U.S. Army Engineer Corps. Major E.D. Taylor, Royal Canadian Engineers is second in command.

The Stefansson Library

In December 1951 Dr. Vilhjalmur Stefansson, who is Arctic Consultant at the Dartmouth College Museum, moved to Hanover, N.H., from New York, and placed his library in the Baker Library at Dartmouth College. The Stefansson Library contains some 25,000 volumes, and 20,000 pamphlets and manuscripts, dealing with arctic, antarctic, and permafrost regions. The library is housed in a separate part of the Baker Library stacks and is already available to the Dartmouth students and staff and, on application, to other research workers.

Banded Canada Geese

The U.S. Fish and Wildlife Service has marked a group of 250 Canada Geese which wintered at the Pea Island National Wildlife Refuge in North Carolina with plastic neck bands. These geese have now started their northward flight up the Atlantic Coast and across the Eastern States to nest in the region from James Bay eastward through the Province of Quebec into the Labrador.

All persons who see any of these marked geese are urged to report the place and date of observation immediately to the Bird Banding Office, Fish and Wildlife Service, Patuxent Research Refuge, Laurel, Md., U.S.A. The bands, which may be red, green, yellow, or white, can be seen at about 100 yards with the naked eye, or a quarter of a mile with binoculars. They are believed to be harmless to the bird and to drop off within six weeks to two months.

Endeavour Prizes

As a contribution to the meeting of the British Association for the Advancement of Science to be held in Belfast on 3 - 10 September 1952, Imperial Chemical Industries Limited, publishers of the quarterly scientific review Endeavour, have offered the sum of 100 guineas to be awarded as prizes for essays submitted on a scientific subject. The

competition is restricted to those whose twenty-fifth birthday falls on or after 2 June 1952. The subjects for the essays are as follows: Scientific research in polar regions; Oceanography; The influence of climate on technology; The origin of life; Sulphur in medicine, science, and technology; and Gas discharge tubes.

The essays, which must be in English and typewritten, should not exceed 4,000 words in length and must be received by 2 June 1952. Only one entry is permitted from each competitor. All entries must be marked "Endeavour Prize Essay" and addressed to The Assistant Secretary, British Association for the Advancement of Science, Burlington House, Picadilly, London W.1., England. The essays should be submitted without signature; the competitor's name and address and date of birth should be given in a sealed covering letter attached to the essay.

In judging the results special attention will be paid to the originality of the approach to the subject, and great importance will be attached to literary style. The competitor's age will also be taken into account.

The successful competitors will be invited to attend the whole of the Belfast meeting, at which the prizes will be presented, and their expenses within the United Kingdom will be paid.

Subscriptions for 1952

Members are reminded that their subscriptions for 1952 ($2.00 for Ottawa members, or $3.00 for combined membership for husband and wife, and $1.00 for out-of-town members, other than institutions) were due on January 1, and are payable to the Treasurer, Mr. James Cantley, 215 Gladstone Avenue, Apt. 11, Ottawa. It will be greatly appreciated if members would pay promptly.

Owing to currency regulations it is not always convenient for members of the Arctic Circle residing in Europe to pay their subscriptions to the club in Ottawa direct. Through the courtesy of the Director, the Scott Polar Research Institute will now receive the subscriptions of members from the United Kingdom and from the Continent of Europe and will transmit them to Canada from time to time. European members should forward their 1952 subscriptions (5/-) to the Director, Scott Polar Research Institute, Cambridge, England and mark them "Arctic Circle Subscription".

Change of Address

Members are earnestly requested to advise the Treasurer, Mr. James Cantley, 215 Gladstone Avenue, Apt. 11, Ottawa, promptly of any change of address.

Editorial Note

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

Mrs. Graham Rowley,
411 Echo Drive,
Ottawa, Ont.

Authorized as Second Class Mail, Post Office Department, Ottawa

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Thirty-fourth Meeting of the Arctic Circle

The thirty-fourth meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Wednesday March 12. The President, Inspector Henry Larsen, was in the Chair and introduced the speaker, Dr. M.J. Dunbar. Dr. Dunbar spoke on the "Work and results of the 1950-1 northern expeditions on the Department of Fisheries Research Vessel Calanus", and showed a film taken by the expeditions.

Special Meeting of the Arctic Circle

On Wednesday March 26 a special meeting of the Circle was held in the 1st. Corps Troops Mess, 278 Sparks Street. The President, Inspector Henry Larsen, was in the Chair and introduced the speaker, Dr. Vilhjalmur Stefansson. Dr. Stefansson described some of his experiences as the leader of the Canadian Arctic Expedition of 1913-8 and discussed northern "ice islands" and their relation to the palaeocrystic ice found off the Western Arctic islands, particularly Banks and Prince Patrick islands.

The "Calanus" Expedition 1951, and plans for 1952. By M.J. Dunbar

The Fisheries Research Board ketch Calanus was launched at Chimo on 18 June 1951, and made a preliminary cruise to Abloviak* Fiord, on the eastern shore of Ungava Bay, between George River and Port Burwell. Abloviak had been found to show exceptional hydrographic conditions in the fall of 1950, and the 1951 visit was to establish the conditions found during the early part of the summer season. Abloviak is a narrow fiord with a shallow threshold at the mouth, but the deeper water inside the fiord is considerably warmer than the water at similar depths outside the threshold; this is the reverse of the normal and expected temperature distribution in northern fiords.

Returning to Chimo, the Calanus party spent some time completing the preparation of heavy equipment for shipment by the C.D. Howe to Frobisher Bay. Chimo will no longer be used as a base of operations,

* Called by the natives Adlorilik

at least not for a number of years, although it is planned to keep a winch and cradle there as an emergency beaching point. The expedition left Chimo finally in the third week in July, for George River, and left the mouth of George River for Akpatok Island on July 23, making a hydrographic section of four stations on the way. This section filled in a gap left open from former seasons' work.

The Eskimo pilot, Mark Suppa, was dropped at Cape Hopes Advance, to be returned home to Chimo by Peterhead boat, and the Calanus crossed to Lake Harbour. Here another pilot, Anawak, came aboard, together with Moonie as deck-hand, who were to stay with the party until the vessel was beached in September in Frobisher Bay. The Calanus reached Frobisher Bay on the morning of July 31, pausing on the way only to do some plankton work at the mouth of Lake Harbour.

The whole of August was spent working in Frobisher Bay, from the mouth of the bay to the airfield. Four hydrographic sections were made across the bay at different levels, observations of salinity, temperature, oxygen, and inorganic phosphate being made at each station at the usual standard depths from the surface to the bottom. The deepest point at which observations were made was 600 metres, close to the southwest shore of the bay. Similar measurements were made inside three inlets - Victoria Bay, Ney Harbour, and Jackman Sound, and in Jackman Sound a continuous study of the plankton distribution was undertaken overnight, from 5 p.m. to 5 a.m. Plankton was collected throughout the bay.

With few exceptions sounding runs were made whenever the Calanus moved from one point to another. The present soundings (before 1951) are very sparse, especially in the middle and outer parts of the bay. The bathymetry shown by the 1951 soundings was interesting - a very deep (over 600 metres) trough along the southwest coast, where the increase in depth is very sudden, bounded along its northeast side by a more gradual shelving. In the outer third of the bay, the hundred-metre line is not far from the mid-line of the bay, and from this point to the northeast shore there is a flat shelf, called for present purposes the "Calanus Shelf", which offers good trawling grounds. Trawling with a light 8-foot beam trawl produced only a few shrimp, sculpins, sea-lilies, and crabs. The bottom is apparently fairly hard, with small pebbles and shells.

A few long-line trawls were laid on the shelf, with no results, and fishing by hand-line was tried in all parts of the bay. There was no sign of Atlantic cod during August. Further fishing experiments will be tried in the coming (1952) season in September. According to native accounts, codfish do not visit Frobisher Bay at all, with the single and remarkable exception of Ogac Lake at the head of Ney Harbour, where they appear to be resident the whole year round. The codfish of Ogac Lake have been known as long as the Eskimo can remember, but they have not been studied before this. The dinghy of the Calanus was taken

over the threshold to the lake at high tide on the morning of August 4, and used to do certain limnological studies and to catch some of the cod. The lake is fresh at the surface, with a river entering at the head, and there is evidently an access by salt water from the harbour at high spring tides. Salinities at 10, 25, and 50 metres were 22.32, 26.10, and 26.95 o/oo respectively, and temperatures were very high - 7.31, 8.12, and 4.52°C at the same depths. The 50-metre water was stagnant, devoid of oxygen. There is a fairly scanty marine planktonic population, and the cod, which grow to a great size (largest measured was 128 cm.), are highly cannibalistic. They also eat sea-weed and sea-urchins. They belong to the Atlantic species (Gadus callarias), and the present evidence points to their having been isolated for some time. It is hoped that a small party from McGill will study this lake more thoroughly in the coming summer.

During the whole 1951 season, from mid-June to early September, E.H. Grainger, of McGill University, was at work on the Sylvia Grinnell River at Frobisher Bay, making an intensive study of the arctic char. From this field work, and from earlier work at the same place in 1948 and 1950, Grainger is in process of preparing a paper on the growth rate, age and sex composition, migration and reproductive capacity of this char population. It will be the first study of its kind.

The Calanus party consisted of: M.J. Dunbar, John Lewis, Ian McLaren (zoologists), Bill Wilson and Tommy Wilson (Engineers). Bill Wilson left the expedition in the middle of August, and his younger brother took over the engine-room on his own. Ice conditions were very mild, and the weather was good.

For the 1952 season, the writer will not be in the field. E.H. Grainger will be in charge of the scientific work, accompanied by Ian McLaren and (probably) W.E. Black (all of McGill University). Tom Wilson will again be engineer, and Jack Martin will join the party at the end of August. The 1952 plan can be briefly stated as follows: (1) Hydrographic work, line fishing and plankton studies between Frobisher Bay and Cumberland Sound, and in Cumberland Sound itself, during August. There is a fuel reserve laid down at Pangnirtung. (2) Trawling on any suitable bottoms found in this area. (3) Line fishing and trawling on the "Calanus Shelf" in early September, and (4) Collecting of Atlantic cod and shrimp at Acadia Cove, Resolution Island. The vessel will come in to Frobisher Bay at the end of August, put the native crew ashore and leave for Resolution Island. From there she will go direct to Churchill, via Cape Hopes Advance and Wolstenholme, where fuel caches will be laid down. She will be brought on shore at Churchill for the winter.

Archaeological investigations on Mill Island, 1951. By Deric O'Bryan

In 1927 the Putnam-Bartlett Baffin Island Expedition visited Mill Island briefly, in order to repair the damaged propellor of its vessel, the Effie M. Morrissey. Laurence Guould, the expedition geologist, took advantage of the unexpected opportunity by making a preliminary map of the harbour where the vessel was anchored (subsequently named Morrissey Harbour) and by circumnavigating the island and sketching its outline. Meanwhile Junius Bird and I, two other members of the expedition, found an old Eskimo winter house, a "tunit ruin", in a cove of Morrissey Harbour. Several hours of excavation yielded about thirty artifacts, all of which proved to be representative of the Cape Dorset Eskimo culture. The artifacts were deposited in the Museum of the American Indian in New York.

Although by 1950 much research had been accomplished on the characteristics and range of the Cape Dorset Eskimo culture, the Mill Island ruin remained the only reported house site apparently not complicated by the alterations and refuse of more recent Eskimo occupants. It seemed, therefore, that much interesting archaeological information could be secured by completing the excavation of the dwelling in Morrissey Harbour, and in 1951 I was able to return to the area for further archaeological work, having been given a research grant from the Arctic Institute of North America.

Daniel von H. Rogers and I left Montgomery, Alabama by air for Coral Harbour on July 2 via Ottawa, Winnipeg, and Churchill. On July 15 weather conditions permitted us to say farewell to Mr. Bert Swaffield at Southampton, and to leave for Mill Island on board John Ell's Akva. A strong wind necessitated a day's stop at Seahorse Point, and it was early on July 17 when we reached Mill Island. Ben Ell, one of John Ell's sons, stayed with us while we were on Mill Island.

From July 17 to September 1 our base camp was in Morrissey Harbour. Much of the time was spent in the excavation of the "tunit" ruin, and in an archaeological survey of Mill Island. A number of days were devoted to exploring the coasts and interior of the island, to collecting botanical and geological specimens, and to checking existing maps with air photographs. August 9 through 15 were spent on the north end of Salisbury Island in ruin location and coastal survey work. The trips over and back were made when the weather was calm and clear as sometimes it was all our small skiff and outboard motor could do to hold their own against the tide rips.

West Hudson Strait was remarkably free of ice until August 23, the day before John Ell was due to take us back to Southampton Island, when heavy ice moved in and prevented his reaching us. Thanks to the Hudson's Bay Company's inter-post radio schedules, Mr. Robert Griffiths,

the post manager at Cape Dorset, took us to Cape Dorset on September 1. The Rupertsland picked us up there on September 9 and we reached Churchill on September 15, having been delayed by ice and high winds. We travelled south from there by R.C.A.F. and U.S.A.F. aircraft, reaching Montgomery, Alabama on September 25.

Our archaeological and other collections are now being studied. We brought back over 350 archaeological specimens. These, a mass of food bones, and other waste materials, appear to be a two- or three-year accumulation of two Cape Dorset Eskimo families (a storage area separated two living areas in the dwelling). The collection includes a good representation of such characteristic Dorset artifacts as harpoon heads of ivory or bone (late types with closed rectangular sockets), "whittling" knife handles of ivory or bone, sledge runners of ivory, and toys or ornaments depicting animals and birds carved from ivory or antler. The many stone implements include chipped scrapers, knife blades, and projectile points; ground burins (also called "boot creasers") of chert or chalcedony or nephrite, adze blades of nephrite, and a few slate knife blades, projectile points, and whetstones. The permafrost preserved two throwing boards and a fire drill of wood, a rag of leather, and even a few ptarmigan feathers. Five specimens in the collection are not true Dorset: two ivory ulu handles have drilled holes for blade attachment and fall within the range of Thule types; one heavy knife handle of bone has drilled perforations and can also be called a Thule type artifact; two specimens have both drilled and gouged holes -- the head of an ivory skewer and a bone base of a harpoon (with the broken tang of an ivory fore-shaft still wedged in the rectangular socket). As the dwelling showed no signs of reoccupation, it apparently was constructed and inhabited by late Dorset people -- Dorset Eskimo who had some contact with the advancing Thule Eskimo.

Our corrections to the maps of Seahorse Point, Mill Island, and the northern third of Salisbury Island are at present being worked up.

Throughout our stay on Mill Island we were dogged by weather which Eskimo Ben aptly summarized as "Lotsa no good bad days".

A new method for heating buildings in the north. By F.C. Hooper

The scarcity of available native fuels in the arctic and subarctic regions of Canada and the high transportation costs on fuels imported from the south make heating an expensive necessity in the Canadian north. This economic burden hampers the development of the north. Therefore when Dr. Misener, now head of the Physics Department at the University of Western Ontario, suggested that a device called a "heat pump" might reduce heating costs in the north, the Defence Research Board sponsored a scientific investigation which was carried out at the University of Toronto.

This investigation has led to the building of a heating machine which has been tested at Churchill, Manitoba, and has demonstrated its ability to cut fuel-oil consumption to less than half of that required by conventional heating devices. The machine is not yet on the market, but it promises to become practical in the not too distant future.

The heat pump is not an entirely new machine. Several are already in use in southern Canada, but until this investigation was started it had not been thought possible to apply the system in very cold climates. By incorporating several new ideas and special devices the investigators have found ways of using the machine in cold climates.

To understand how this heat pump works requires a knowledge of some basic engineering ideas. The explanation is a little complicated, but the possibilities of the machine are so interesting it is well worth learning about.

When any fuel burns completely it releases a definite amount of energy as heat. For instance, one pound of fuel oil will release about 20,000 units of heat energy as it burns up. If it is burned in a good stove or furnace about 15,000 units of heat will be supplied to the room and 5,000 units will be lost up the chimney in the hot gases. Thus we would say that the stove is 75 per cent efficient, since 75 per cent of the heat energy released by burning is actually used for heating.

Now if the same pound of fuel oil is used in a diesel engine and burns inside the cylinders, about 6,000 heat units, or 30 per cent of the energy units, are converted by the expansion of the hot gases into mechanical power, while the balance of 70 per cent or 14,000 heat units leaves as heat in the exhaust gases and cooling water. Since the useful effect in an engine is power, we say that the engine is 30 per cent efficient.

Next, consider how a refrigerator operates. It requires mechanical power (or mechanical energy) to operate, and it will absorb heat from a low temperature place and deliver it to a higher temperature place. That is, it pumps heat from a lower to a higher temperature in much the same way as a water pump will raise water from a lower to a higher level. A refrigerator might take 6,000 units of mechanical power and use it to pump 24,000 units of heat from a cold room to a warmer room. Because the 6,000 units of mechanical energy are converted to heat in the process a total of 30,000 units of heat would be delivered to the warm room.

The new heat pump combines all these ideas in one machine. First, one pound, say, of fuel oil is supplied to a diesel engine, which delivers 6,000 units of mechanical energy to a shaft connected

to a refrigerator, and 14,000 heat units go to the exhaust gas and cooling water. Now the refrigerator uses the 6,000 units of mechanical energy to pump 24,000 units of heat from a cold place, the outside air for instance, and delivers 30,000 heat units to a warmer place such as the indoor air. The 14,000 heat units in the diesel exhaust and cooling water need not be wasted but can also be used in suitable radiators to help heat the indoor air.

Thus, using only one pound of fuel oil, a total of 30,000 plus 14,000, or 44,000 heat units can be delivered to the inside of a building using this combination of an engine and refrigerator while the same pound of fuel, if burned directly in a stove could at best supply only 20,000 heat units to the building. The extra 24,000 units of heat were actually pumped into the building from the outside, and hence the device is called a heat pump.

There is one more important factor which influences the operation of a heat pump. Just as it takes twice as much power to pump water through 140 feet as to raise it 70 feet, it takes twice as much mechanical power to pump heat from minus 40°F to 100°F as to pump the same amount of heat from plus 30°F to 100°F. Therefore, in order to make a heat pump effective the temperature difference between the outside heat source and the place to which the heat is delivered must be the smallest obtainable.

The warmest possible source of heat in the north in winter is the unfrozen water under the surface of ice on the lakes and deep rivers. This water is of course not below freezing temperature of 32°F, while the air may drop in temperature below minus 50°F. In order to take heat from this water it must be frozen, and in freezing it gives up 144 heat units per pound of ice formed. Thus it is an excellent heat source, providing a way can be found to dispose of the ice in a convenient manner.

The arctic heat pump which was built in Toronto combines in a working unit the principles that have been outlined above. The machine is mounted on a single steel skid frame 15 feet long and 5 feet wide, and weighs about $3\frac{1}{2}$ tons. A fifteen horsepower, two cylinder diesel engine is used to drive a refrigeration machine. The heat from the exhaust gas and the cooling water is collected by heat exchangers for use in heating. Water is drawn from the most convenient source and frozen in a continuous ice making machine which consists of a rotating drum, cooled internally by the refrigerator and submerged in a tank of water. The ice forms on the drum surface as it rotates and is chipped away in flakes about a tenth of an inch in thickness. This ice is carried by a screw conveyor to a high speed centrifugal fan which pulverizes the flakes to a sugar-like size and blows this outside to be dispersed by the wind.

The unit can be fitted with an electrical generator and additional pumps driven by the same diesel, and thus supply not only the heat but also the electricity and water required by a small camp. The machine can supply about 125,000 heat units per hour, which is enough to heat about twelve average rooms. It uses less than half as much fuel as does a furnace or stove of the same heating capacity, and it makes and disposes of about 400 pounds of ice per hour.

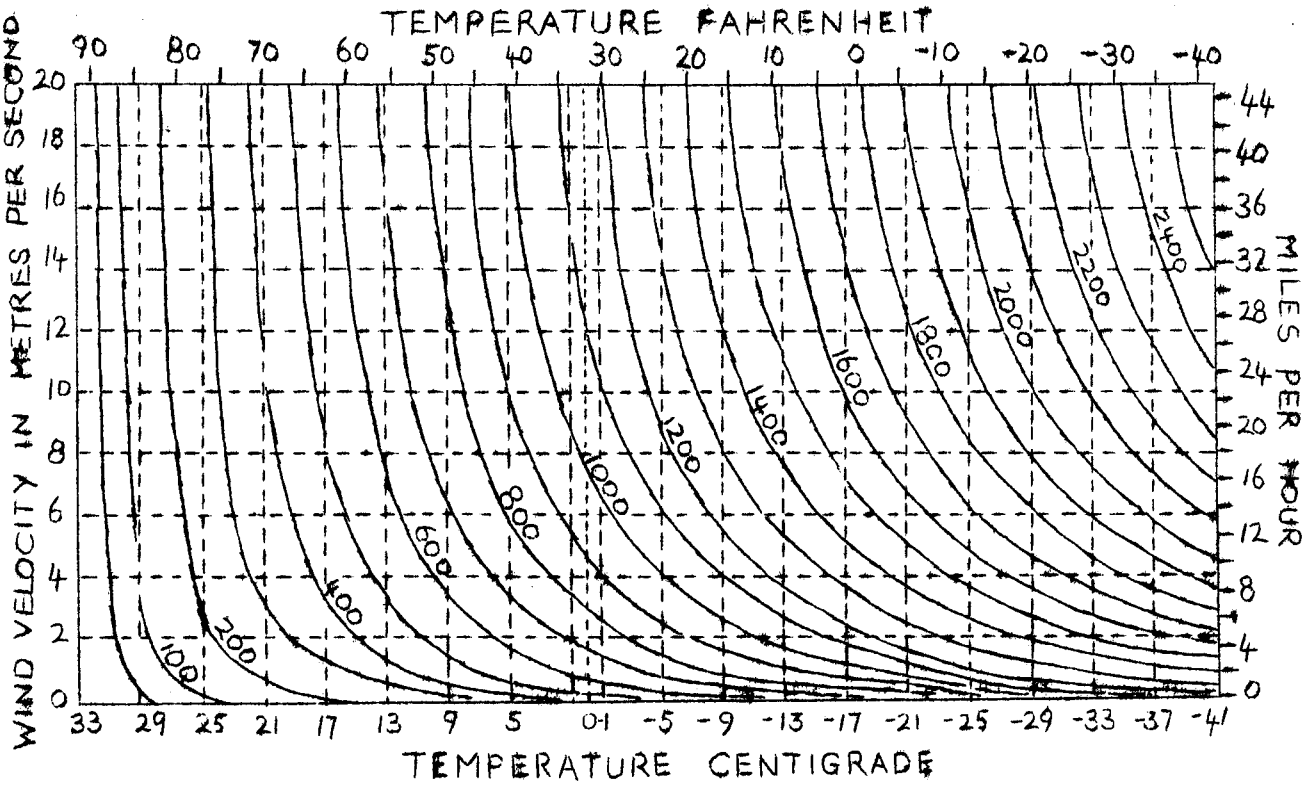
An additional advantage of the new machine is the greatly reduced fire hazard, since except inside the cylinders of the engine there are no high temperatures to cause fires. This is extremely important in the north, where the dwellings are wooden and very dry, where it is often windy, and where in winter there is no water for fire-fighting and shelter is essential.

The first pilot model has been tested for three winter seasons at Churchill. Many of the "bugs", which are always present in new machines, have been overcome and information has been obtained which will assist in the design of a production model.

The heat pump will no doubt be expensive at first, and perhaps not too dependable mechanically, but when more experience is obtained it may very well contribute greatly to the solution of one of the eternal problems of the north, that of heating.

Wind-chill

In reports of activities in the north, the term "wind-chill" is frequently used. Common experience shows that, when temperatures are low, it feels much colder if there is a wind than if it is calm. Temperature alone therefore does not give a true indication of the relative comfort of outdoor activities. Some scale has to be used based on both temperature and wind. The most common scale for this purpose is called the "wind-chill scale". In its present form it was originated by Dr. Paul A. Siple, the well-known antarctic explorer. He carried out a series of experiments in the Antarctic, in which he determined the times taken for a small cylinder of water to freeze in different conditions of wind and temperature. From his results he derived an empirical formula giving the rate at which heat was lost for any combination of wind speed and temperature. Human comfort depends on the rate at which heat is lost from the human body; the wind-chill factor caused by any combination of wind and cold was therefore defined as the number of calories that would be lost under these conditions during one hour from a square metre of a surface kept at 91.4°F, which was used to represent skin temperature. A nomogram can be drawn to show this value for any wind speed and temperature. From this it can be seen for example that a temperature of 20°F above with a wind of 40 miles per hour has the same cooling effect as 20 below with a 5-mile per hour wind; both would result in a loss of about



Wind-chill nomogram

This nomogram[1] gives the wind-chill values for different conditions of wind and temperature in the shade. In bright sunshine the values should be reduced by about 200.

The following table indicates the degree of comfort or discomfort felt by an inactive person with different wind-chill values.

Wind-chill value	Sensation
50	hot
100	warm
200	pleasant
400	cool
600	very cool
800	cold
1000	very cold
1200	bitterly cold
1400	exposed flesh liable to freeze

1. Taken from P.A. Siple, "General principles governing selection of clothing for cold climates", Proc. Amer. Phil. Soc. Vol. 89 (1945) p. 209.

1,400 calories in an hour and both are therefore said to have a wind-chill factor of about 1,400. With a wind-chill factor of 100, sun bathing is possible; average conditions in January on the airfields at Vancouver, Ottawa, and Winnipeg give values of about 780, 1,200, and 1,450 respectively; at Fort Churchill, where temperatures below -30°F can be accompanied by strong winds, the figure is frequently well above 2,000.

This scale is not strictly applicable as a measure of human comfort as it does not take into account many important factors such as humidity, loss of heat in the breath, radiation from the sun, and the effect of a lowered skin temperature. It is however a simple and practical guide and shows the conditions under which arctic travel is most pleasant, when exposed flesh is liable to freeze, and when special precautions must be taken against the cold.

Equipment which, unlike the human body or a running engine, does not contain a source of heat, will cool to the prevailing temperatures. In these cases the wind-chill figure can only indicate how quickly this will take place.

Exercises Sun Dog II and Sun Dog III

Exercise Sun Dog I was carried out in the winter of 1950 and a brief account appeared in the Circular (Vol. 3 (1950) pp. 32-5).

The second exercise of the Sun Dog series, Sun Dog II, was held during the second half of February and the first week of March 1951. Its objects were to test the effects of arctic conditions on men and equipment and to train service staffs to meet the problems of airborne winter operations. Personnel from the 1st Battalion Royal 22nd Regiment represented a small enemy force in the barrens north of Churchill. After air and ground reconnaissance, their positions were attacked by a company of the Royal Canadian Regiment carried in R.C.A.F. Dakota aircraft and dropped by parachute in the vicinity.

Exercise Sun Dog III was a joint training exercise carried out by the Canadian Army and the R.C.A.F. in the Labrador-Ungava area during the period 4-14 February 1952. A small enemy force, this time represented by elements of the 1st Battalion RCR, was assumed to have captured the Chimo airfield. The R.C.A.F. carried out reconnaissance flights, and Mitchell aircraft of 406 (Saskatoon) and 418 (Edmonton) Auxiliary Squadrons bombed with 500-lb. bombs and strafed with machine gun fire a dummy target area laid out some distance from the airfield to represent the runways and buildings. This was followed by a parachute drop of a force from the 1st Battalion R 22 R, flown from Goose Bay by 412 and 435 Transport Squadrons. The assaulting force attacked and captured the airfield. Throughout the exercise arctic winter conditions prevailed ensuring realistic training.

Subscriptions for 1952

Members are reminded that their subscriptions for 1952 ($2.00 for Ottawa members, or $3.00 for combined membership for husband and wife, and $1.00 for out-of-town members, other than institutions) were due on January 1, and are payable to the Treasurer, Mr. James Cantley, 215 Gladstone Avenue, Apt. 11, Ottawa. Members whose 1952 subscription is still in arrears will receive no further numbers of the Circular until their subscriptions are received.

Owing to currency regulations it is not always convenient for members of the Arctic Circle residing in Europe to pay their subscriptions to the club in Ottawa direct. Through the courtesy of the Director, the Scott Polar Research Institute will now receive the subscriptions of members from the United Kingdom and from the Continent of Europe and will transmit them to Canada from time to time. European members should forward their 1952 subscriptions (5/-) to the Director, Scott Polar Research Institute, Cambridge, England and mark them "Arctic Circle Subscription".

Change of Address

Members are earnestly requested to advise the Treasurer, Mr. James Cantley, 215 Gladstone Avenue, Apt. 11, Ottawa, promptly of any change of address.

Editorial Note

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

Mrs. Graham Rowley,
411 Echo Drive,
Ottawa, Ont.

Authorized as Second Class Mail, Post Office Department, Ottawa

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Thirty-fifth Meeting of the Arctic Circle

The thirty-fifth meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Wednesday April 9. The Vice-President, Mr. Frank Davies, was in the Chair and introduced the speaker, Mr. Doug Wilkinson. Mr. Wilkinson described his work making films of Eskimo life in the Eastern Arctic during 1950-1. He illustrated his talk with a number of colour slides.

Thirty-sixth Meeting of the Arctic Circle

The thirty-sixth meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Wednesday May 14. The President, Inspector Henry Larsen, was in the Chair. It had been planned that Mr. J.S. Tener would speak on "A summer at Slidre Fiord", but he was called out of town, and Dr. V.E. Solman, also of the Canadian Wildlife Service, very kindly took his place. Dr. Solman described the annual waterfowl breeding ground survey carried out in northern Alberta, Northwest Territories, and Yukon Territory during June and July 1951.

National Film Board Arctic Project. By Doug Wilkinson

On 7 July 1950 the crew of the National Film Board Arctic Project left Montreal aboard the M.V. Regina Polaris to spend fifteen months in the Eastern Arctic photographing Eskimo life and the north country (for a preliminary note on this project see Arctic Circular, Vol. 3 (1950) pp. 56-7). The production crew consisted of Doug Wilkinson, director, Mrs. Wilkinson, cook-business manager, and Jean Roy, cameraman.

Because of heavy ice in Hudson Strait the ten-day trip from Montreal to Chesterfield took twenty-six days, and it was August 2 before the crew, stores, and equipment were put ashore. Seven days were spent in uncrating and testing cameras, and in renovating the old doctor's residence which was to be our headquarters for the next eight months. On August 10 Roy and I left for Baker Lake by R.C.M.P. Peterhead boat hoping to photograph the large herds of caribou reported to be in that

district. Unfortunately, because of engine trouble, the trip to Baker Lake took five days and in that time the caribou had moved on. In spite of an intensive search on foot, by canoe, and then by air, only a few scattered animals were seen where a few days before there had been thousands.

Although we were disappointed in the caribou, good footage was obtained of a herd of muskox in the area south of Beverly Lake. Three barren-ground grizzlies were also photographed in the same area, as well as a number of wolves. Additional background material on the country, plus shooting of the local flora and small mammals, made up the balance of the footage exposed in this area.

We returned to Chesterfield at the end of August where we were faced with a new problem as our supplies of food had not arrived with the Fort Severn. The one month's supply we had brought in with us was finished and it was only through the generosity of the R.C.M.P., the Hudson's Bay Company, and in particular the Department of Transport radio station that we were provided with sufficient food. Our supplies finally arrived on the Rupertsland three weeks later.

In September Roy and I left Chesterfield in the R.C.M.P. Peterhead to accompany the annual walrus hunt to the White Island area in Frozen Strait. One month was spent on the trip. Bad weather and engine breakdowns continued to plague the expedition. It seemed that every time a camera was put aboard a vessel something went wrong. However walrus were found in large numbers. On the return trip on October 2 a nice movie sequence was obtained of the chase and shooting of a polar bear as it tried to escape among the swift moving ice floes.

October and November were spent shooting the freeze-up in the vicinity of Chesterfield. Detailed scripting and casting for the main film on the life of an Eskimo child were completed. In late November and early December an Eskimo guide, Singeetuk, and I journeyed by komatik to Baker Lake to pick up caribou skins required for winter clothing and as props for the film as there were no caribou in the Chesterfield area that year. Meanwhile, Jean Roy supervized the building of the special igloo studio in which all interior igloo shooting was to be done. A large family igloo was first built, then four extra porches, which were attached to the outer walls, were built around it. By cutting out the intervening snow walls as required, these porches could be used as camera ports for long shots of the interior.

By December 15 all was in readiness to start shooting. However, a mild spell caused the roof of the igloo studio to sag until it touched the sleeping platform. As soon as the weather turned cold the studio was rebuilt but it was not until after Christmas that filming could really begin. January, February, and March were spent in shooting the material for the film, the story of an Eskimo boy from

birth to marriage and to the time he goes off on his own. The highlight of this work was the photographing of the birth of a baby in an igloo.

On 14 April 1951 the party left Chesterfield and flew north to Pond Inlet. The flight was made in an Arctic Wings Norseman in one long day with short refuelling stops at Repulse Bay and Igloolik. At Pond Inlet temporary headquarters were set up in the R.C.M.P. carpentry shed and later the whole crew moved out to the camp of an Eskimo, Idlouk, some sixty miles from the settlement at the end of Eclipse Sound.

Over a four-month period, from May to August, working out from this camp, we shot a film story on the Eskimo of this area. Weather and ice conditions were bad for almost the entire period but fortunately when our luck was in it was in with plenty to spare and the necessary footage was obtained. During this time we made trips to the floe edge off Button Point, to the bird cliffs on the east coast of Bylot Island, and to the snow goose nesting grounds on the southern plains of Bylot Island. Break-up came suddenly and early and many Eskimo, as well as ourselves, were caught away from the summer camps. Coming back from a sled trip to the bird cliffs at the end of June our crew and accompanying Eskimo had to leave the dogs and sleds and walk the last few miles in to the settlement on the shore. The ice was badly broken up, and for three weeks we cooled our heels at the settlement while the loose ice moved back and forth with wind and tide. It was the third week in July before we managed to get back to the camp and our cameras in a borrowed boat.

In August much time was spent in photographing the Eskimo hunting narwhal from their kayaks. The weather was very bad and heavy ice from Navy Board Inlet kept moving down through Eclipse Sound jamming against the shore round the camp. Once again, however, when things improved the cameras were in the right place at the right time. On one occasion over two hundred narwhal were cornered in the shallow water at the end of Koluktoo Bay and much good footage was obtained.

On August 20 we returned to the settlement and six days later boarded the government vessel, C.D. Howe, for the journey outside. By September 26 we were back in Ottawa, having shot more than twenty-five thousand feet of 16 mm. kodachrome film and having taken a large number of colour stills. Two colour sound films have now been produced and are ready for distribution: "Angotee - story of an Eskimo boy", which was filmed at Chesterfield Inlet, and "Land of the Long day", which shows the life of the Eskimo camp near Pond Inlet. Each film lasts for approximately half an hour.

Annual waterfowl breeding ground survey, northern Alberta, Northwest Territories, and Yukon Territory. By V.E.F. Solman

During June and July 1951 the fourth aerial survey of waterfowl populations was made in northern Alberta, the Northwest Territories, and the Yukon. As in the previous surveys an amphibious aircraft of the United States Fish and Wildlife Service transported the observers. The aircraft was piloted by Robert H. Smith, Pacific Flyway Biologist of that Service.

The northern waterfowl surveys are part of the annual studies of the continental waterfowl supply on which are based the regulations governing waterfowl hunting in Canada and the United States. Because of the international nature of the waterfowl resources and their great importance, the studies are carried out as a cooperative project by the federal agencies of Canada and the United States, the provincial agencies, and Ducks Unlimited (Canada).

Selected northern waterfowl breeding areas are flown over twice each year - in June to secure data on numbers and species of nesting waterfowl and again in July to secure information on broods.

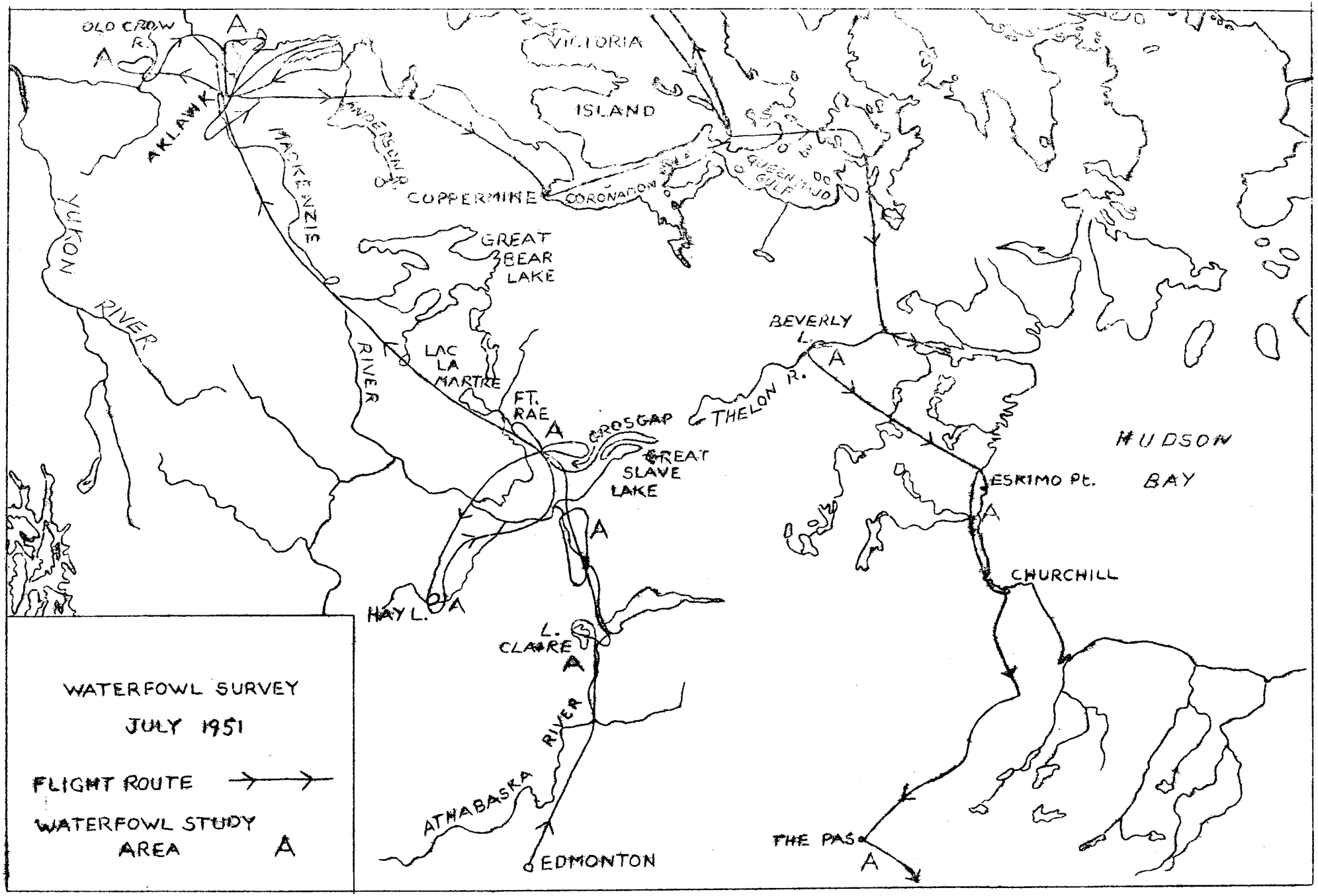
Random headings are flown over the breeding areas at an altitude of 100 feet and at a speed of about 130 miles per hour. This speed is necessary for safe operating with the heavily laden aircraft. A simple calculation involving air speed, wind speed and direction, ground speed, time, and width of transect permits the data to be expressed in terms of waterfowl or broods per square mile. This allows easy comparison with data from other areas or from the same area for previous years.

On the June survey the pilot and observer count all ducks visible in an area one eighth of a mile wide on each side of the line of flight. On the July survey they count all broods visible in an area one sixteenth of a mile wide on each side of the line of flight.

After the surveys made for comparative purposes have been completed for the year exploratory flights are carried out so that the knowledge of waterfowl habitats may be increased each year.

I was fortunate in being able to accompany the 1951 July flight as observer. This flight began from Edmonton on July 5 and terminated at Delta, Manitoba, on July 27. The route flown and the waterfowl study areas covered are shown on the attached map.

Waterfowl brood counts were made on the Lake Claire, Athabaska delta, and Hay Lakes areas of Alberta; the Slave River parklands, Lac la Martre - Willow Lake, Fort Rae - Gros Cap, and Precambrian areas near Great Slave Lake; upland and coastal tundra, wooded and treeless delta,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VICTORIA
ISLAND
COPPERMINE
CORONATION GULF
QUEEN MAUD GULF
GREAT BEAR LAKE
LAC LA MARTRE
FT. RAE
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GROSGAP
GREAT SLAVE LAKE
THELON R.
BEVERLY L.
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HAY L.
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L. CLARE
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ATHABASKA RIVER
EDMONTON
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HUDSON BAY
CHURCHILL
THE PAS
A
WATERFOWL SURVEY
JULY 1951
FLIGHT ROUTE
WATERFOWL STUDY AREA
A

and transition areas between the mouth of the Mackenzie and Anderson rivers, N.W.T.; and the Old Crow area in the Yukon Territory. These studies were completed on July 18.

Beginning on July 20 exploratory flights were made over some areas not previously visited. Waterfowl were scarce on the mainland between Aklavik and Coppermine but were present in some numbers in Coronation and Queen Maud gulfs. The north coast of Victoria Island, which appeared to be devoid of wildlife, provided some striking scenery with peaks exceeding 2,300 feet according to the altimeter, although not so indicated on our flight maps. Canada Geese were encountered along the Thelon River in the Beverly Lake area. Along the Hudson Bay coast, between Eskimo Point and Churchill, numerous Snow Geese were present. The Saskatchewan River delta, near The Pas, is a waterfowl paradise, but as it had been surveyed by another crew it was merely noted in passing.

Angling for Arctic grayling in Kelly Lake near Norman Wells and for Arctic char at Cambridge Bay provided a welcome change from waterfowl counting.

Conference on Eskimo affairs

A round table conference on Eskimo affairs was held in Ottawa on May 19-20. Major-General H.A. Young, Commissioner of the Northwest Territories, was in the Chair and eight federal government departments and agencies, the Roman Catholic and Anglican missions, and the Hudson's Bay Company were represented. Economic conditions, Eskimo morale, health, and education were the main subjects discussed.

The difficult economic problems caused by the periodic fluctuations both in white fox population and the value of white fox fur have been intensified by the decline in value of white fox pelts to less than $5.00 in 1951 and the general marked rise in the cost of trade goods. Government aid, such as family allowances and old age and blind pensions, has made the Eskimo aware of the fact that they now have two sources of income and are not solely dependent on trapping. Their independence is being weakened in some areas by the knowledge that government agencies will come to their assistance. As a result less effort is being devoted to trapping and the Eskimo are concentrating at settlements, resulting in a rapid depletion of the accessible country produce. This in turn has led to decline in vitality and resistance to disease. In the seven years 1945-51 Eskimo relief costs totalled $405,000 and other aid such as family allowances brought the figure from government sources during that period to $1,687,000. In the Baffin Island-Ungava area 53 per cent of the Eskimo's income came from government sources, while in the Western Arctic the figure was about 25 per cent. It was agreed that Eskimo should be encouraged and helped to live off the land and to follow their traditional way of life.

The conference was very concerned with the deterioration of health among the Eskimo. It was admitted that the present health organization is far from adequate in so large an area and among so scattered a people. Nevertheless the bare maintenance cost of the current services is $355,000 a year and if all related costs are added the total would be about $1,000,000. Reports indicate that the spread of tuberculosis among the Eskimo is increasing seriously. Dependence on supplies of white man's food and poor game conditions in some areas, and the delay in the isolation and removal to hospital of active cases are contributing causes. An effective programme for the treatment and removal of active cases and for the rehabilitation of arrested cases is necessary. It was agreed that the possibility of using discharged patients in the Great Slave Lake fisheries and similar occupations less arduous than the normal Eskimo existence should be studied.

The curricula at present provided in the seven territorial schools operated by the Government and the twelve Roman Catholic and six Anglican day schools were discussed at length and the general feeling was that there is room for improvement. New types of text books were suggested and greater emphasis on practical training was recommended. The employment of the older Eskimo at certain settlements is depriving the younger generation of the training which they would normally have received from their parents and many children are unfitted to follow the traditional mode of life. An effort to provide some of this training should be made in the schools. The conference was in agreement with a proposal to employ Eskimo teachers when available and wherever possible to encourage and help Eskimo children of demonstrated ability to become teachers. Whether teaching should be conducted in English or in the Eskimo dialect is a question for further study. It was the view of the missionaries that no real progress could be made in bringing Christian and formal education to the Eskimo unless their economy could be stabilized. The only place in the Northwest Territories that is not seriously affected by the deteriorating influences is Aklavik where the Eskimo, owing to the availability of muskrats and furs other than fox, have living conditions almost on a par with white men. The majority have reasonably clean, well-kept homes, maintain an adequate economy as trappers, and are making definite progress in adapting themselves to civilized conditions.

The Royal Canadian Mounted Police reported that the Eskimo is a law-abiding citizen when his actions are considered in the light of his situation and his view of the law. There are fewer cases of murder as white men know it than there are in what is referred to as the civilized parts of Canada. The force has found it difficult during and since the war to attract and retain personnel for northern duty but the situation is now improving.

The conference also heard suggestions for increases in the number of R.C.M.P. posts and personnel as a means of extending supervision over Eskimo affairs; for establishing government stores or

subsidizing the Hudson's Bay Company to operate posts in areas where they were uneconomical at present; for helping Eskimo to regulate their income by establishing a trust fund; and of the possibility of placing a "floor" under fur prices. The conference also discussed the adequacy of fur and food resources to maintain a larger Eskimo population, and the fate of other primitive peoples as a result of contact with modern civilization.

The conference appointed a continuing committee, with General Young as Chairman, to study the reports and suggestions presented at the conference. Other members of this committee are: Most Rev. J. Trocellier, Roman Catholic Bishop of Mackenzie; Rt. Rev. D.B. Marsh, Anglican Bishop of the Arctic; R.H. Chesshire, General Manager of the Hudson's Bay Company's Fur Trade Department; Commissioner L.H. Nicholson of the R.C.M.P.; Dr. P.E. Moore, Director of Indian Health Service, National Health and Welfare Department; and Mr. J.G. Wright, Chief of the Northern Administration Division of the Department of Resources and Development. The committee will meet in the fall to consider and recommend action. A sub-committee, under the chairmanship of Mr. J.G. Wright and with representatives from various government agencies and both missions, was also appointed to deal with matters concerning Eskimo education.

Second report on the Barren-ground Caribou Investigation. By A.W.F. Banfield

The Barren-ground Caribou Investigation, undertaken by the Canadian Wildlife Service with the cooperation of the Game Departments of the provinces of Alberta, Manitoba, and Saskatchewan, was begun in 1947. Accounts of the preliminary phases of the work have been published in the Circular for November 1948 (Vol. 1, pp. 77-8), and further details of aerial surveys in the vicinity of Yellowknife during April 1949 were described in the Canadian Geographical Journal for January 1950 (Vol. 40, pp. 48-52). The following information on the work of the two parties in the summer of 1949 completes the investigation record.

During the winter of 1948-9 D. Peterson, of Winnipeg, became a member of the field staff and joined A.H. Lawrie's party. After a short stay at Churchill, Lawrie and Peterson proceeded north by air to Baker Lake on 16 May 1949. On June 1 they were transported west to Beverly Lake, where they established a camp and observed caribou on their summer range. On August 2 the party was flown south to Nueltin Lake, where range studies and observation of utilization by the Eskimo were completed. The field studies were concluded at Churchill on 1 September 1949.

On 18 June 1949 A.L. Wilk and I arrived at Fort Smith. We spent the period June 25 to July 11 carrying out vegetation studies on the winter range in the vicinity of Fort Reliance and the Lockhart River.

On July 11 we were transported north by air to Bathurst Inlet, where we obtained much valuable information about caribou on their breeding ground and about Eskimo utilization. In the latter part of July the United States Fish and Wildlife Service provided me with an opportunity to observe caribou concentrations on a flight north to Arctic Sound, as well as on a flight east to Perry River. Wilk and I spent the period August 1 to 20 at Contwoyto Lake, where we collected data dealing with Eskimo hunting techniques and caribou utilization during the summer migration. The field investigation was concluded at Fort Smith on 23 August 1949.

A preliminary draft report was prepared early in 1950 and an abbreviated popular report, 'The Barren-ground Caribou', chiefly for distribution to northern residents, was issued by the Department of Resources and Development in September 1951.

The findings of the report may be summarized as follows: Preliminary aerial survey has indicated an estimated population of 670,000 continental barren-ground caribou between Hudson Bay and the Slave-Mackenzie river system. The annual increment is estimated to be approximately 141,000 calves. The annual human kill is estimated to be 100,000 animals; this may be broken down as 50,000 by Indians, 30,000 by Eskimo, and 20,000 by whites and half-breeds. The annual loss from predation is thought to be about 34,000 caribou. Disease and accidents may take a similar toll. Much information on life history, ranges, migrations, ecological relationships, and native utilization was also obtained.

The Department of Resources and Development has decided to continue the caribou investigation to provide up-to-date information on the status of the herds as an essential part of the basis for wise management policies, and has appointed John P. Kelsall of the Canadian Wildlife Service as permanent caribou mammalogist, with headquarters at Yellowknife. Thus with the termination of the initial preliminary investigation, the second stage has now been begun - a continuing study of the status of the barren-ground caribou in the districts of Mackenzie and Keewatin as part of the programme of the Canadian Wildlife Service of the Department of Resources and Development.

Maps of the Northwest Territories

The two maps of the Northwest Territories showing "Settlements and Trading Posts" and "Transportation and Communications", which are included with this number of the Circular, were prepared by the Geographical Branch of the Department of Mines and Technical Surveys for the Northern Administration and Lands Branch of the Department of Resources and Development. It was felt that these maps would be of great value to anyone interested in the Canadian North and Major-General H.A. Young, Deputy Minister of Resources and Development, has very kindly made them available to us for distribution to the members of the Arctic Circle.

Spring airlift supply of far northern weather stations

Resupply operations to the joint Canadian/United States weather stations at Mould Bay, Isachsen, Alert, and Eureka were carried out in April by the R.C.A.F. and U.S.A.F. The R.C.A.F. aircraft, two North Stars of 426 Squadron, were based at Resolute Bay and flew the supplies of mail, food, and equipment to the stations at Mould Bay and Isachsen. Four C 54 aircraft of the U.S.A.F., based at Pepperrell Air Force Base, Newfoundland, flew more than 230,000 pounds of cargo to the stations at Alert and Eureka.

Reindeer breeding experiment in Scotland

The Reindeer Council of the United Kingdom has received permission to import a small number of reindeer into Scotland for the purpose of a limited breeding experiment. Mr. Mikel Utsi, Technical Adviser to the Council, has arranged for the reindeer to be brought in from Sweden, and the first consignment, to consist of eight animals, was expected to reach Glasgow in mid-April. The first phase of the experiment will be carried out on 300 acres of land offered by Lieut. Col. J.P. Grant, Younger of Rothiemurchus.

Subscriptions to the Arctic Circle

Subscriptions to the Arctic Circle ($2.00 for Ottawa members, or $3.00 for combined membership for husband and wife, and $1.00 for out-of-town members, other than institutions) are payable to the Treasurer, Mr. James Cantley, 215 Gladstone Avenue, Apt. 11, Ottawa.

Owing to currency regulations it is not always convenient for members of the Arctic Circle residing in Europe to pay their subscriptions to the club in Ottawa direct. Through the courtesy of the Director, the Scott Polar Research Institute will now receive the subscriptions of members from the United Kingdom and from the Continent of Europe and will transmit them to Canada from time to time. European members should forward their 1952 subscriptions (5/-) to the Director, Scott Polar Research Institute, Cambridge, England and mark them "Arctic Circle Subscription".

Editorial Note

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

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411 Echo Drive,
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Authorized as Second Class Mail, Post Office Department, Ottawa

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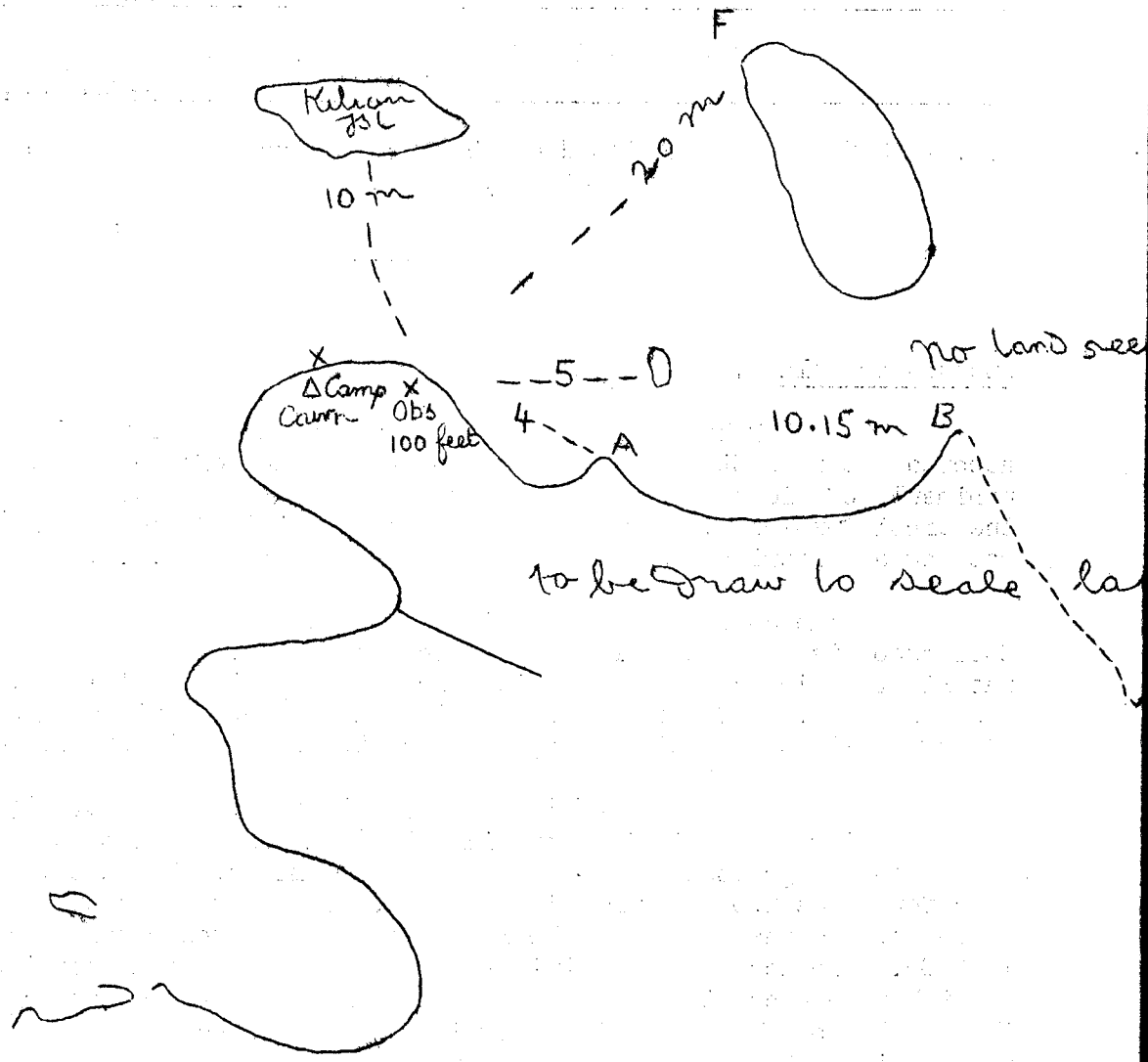
Stefansson Island. By Diana Rowley

On 6 February 1952 the Canadian Board on Geographical Names adopted the name Stefansson Island for the island off the northeast peninsula of Victoria Island, in honour of Dr. Vilhjalmur Stefansson, the arctic explorer. The strait between this island and the mainland was named Goldsmith Channel for F/L J.E. Goldsmith R.C.A.F.

The announcement that there is now an island named for Dr. Stefansson is very welcome. The northeast peninsula of Victoria Island was first explored on the Canadian Arctic Expedition of 1913-18, which was led by Dr. Stefansson, and this island has not previously appeared on any published map of Canada, to which it forms an important addition.

Stefansson Island is roughly triangular in shape, with the apex pointing south; it is approximately 65 miles long from north to south and the greatest east-west width is 55 miles. The total area is therefore some 2,000 square miles, not 8,000 as has appeared in some accounts, and the centre of the island lies at approximately 73°10N., 105°00W. The accompanying sketch-map must be regarded as preliminary as it has been compiled from air photographs without adequate control. The outline of the island is unlikely to need correction, but from an astronomical observation made on a recent flight it appeared that the northwest corner was probably plotted about 3 miles too far to the northeast. This observation gave the position of a small hill or rise near the coast as 73°40N., 106°41W.

Present knowledge of the extent of Stefansson Island has been derived from air photographs. Following an R.C.A.F. flight in 1946 it was suggested that the northeast peninsula of Victoria Island was cut across from west to east by a channel, making the tip of the peninsula a separate island. Later, from photographs taken on an R.C.A.F. flight in July 1947, it was shown that a channel, containing numerous islands connected Hadley Bay with M'Clintock Channel at 73°05N. and that land lay to the north. These reports were checked by photographs taken on a U.S.A.F. flight in July 1948, on which the land mass was proved to



Tracing of the sketch showing the islands off northeast Victoria Island from Storkerson's diary for 14 July 1917.

Sketch-map of Stefansson Island. Note the names of the smaller islands are those given by Storkerson and have not as yet been approved by the Board on Geographical Names.

be another island. From these photographs it is apparent that Stefansson Island is a "new" island, and that the northeastern peninsula of Victoria Island remains substantially unaltered from the earlier maps, though the gap between the farthest explored points, marked as 'Storkerson's farthest' and 'Hansen's farthest', has now been closed.

The north coast of Victoria Island was first explored from the west. On 9 May 1851 a sledge party led by Robert Wynniatt left the Investigator, Captain R.C. M'Clure, which had spent the winter ice-bound near the Princess Royal Islands. On 24 May 1851 Wynniatt reached as far east as Glenelg Bay. The following year Captain R. Collinson, captain of the Enterprise, which was in winter quarters at Walker Bay, followed much the same route as Wynniatt to Glenelg Bay. The next attempt to extend Wynniatt's work was in 1905 when Lieut. Godfred Hansen and Per Ristvedt left Gjöa Havn, Amundsen's base on King William Island, hoping to reach Glenelg Bay. On 26 May 1905, fifty-four years after Wynniatt had turned back, Hansen reached his farthest point at Cape Nansen[1], 72°02N. The gap between Wynniatt's farthest and Hansen's farthest was still considerable. In 1915 Storker T. Storkerson[2], as a member of the Canadian Arctic Expedition, made his first journey along the coast of north Victoria Island from 10 October to 4 December 1915, and discovered the Shaler Mountains and shortened this gap. In the spring of 1917 Storkerson made a second journey along this coast to extend this work. Both journeys are briefly described in 'The friendly Arctic' (Stefansson, 1921).

On comparing the map showing the track of Storkerson's 1917 journey in 'The friendly Arctic' (facing p. 594) with the sketch-map of Stefansson Island it was surprising to note that Storkerson appeared to have travelled the entire length of the strait between the mainland and the island without seeing the island. Even allowing for the fog and rain with which he was contending and his need for speed, it seemed inconceivable that he could really have made this journey and failed to have discovered the island, which, although low lying and admittedly separated from the mainland by a channel filled with islands at its southern end, is still a large and extensive area of land. The problem seemed worth further investigation.

[1] Incorrectly named Cape Hansen on the 80 mile to the inch map, an error which Dr. Stefansson has already pointed out and which the Topographical Survey plan to correct at the first opportunity.

[2] The Norwegian form is correctly "Storkersen", but in North America he is best known by the anglicized version of his name, which he himself used throughout his stay in Alaska.

Storkerson, a Norwegian sailor, had been First Officer on the Leffingwell-Mikkelsen Expedition of 1906-7, of which Stefansson was a member, and had lived in the Arctic for seven years before the Canadian Arctic Expedition. Stefansson frequently praises his excellent spirit throughout the latter expedition, his desire to do what had been planned, no matter how great the difficulties, and his careful conscientious work. That a man of his experience and character could have missed the island or falsified his results seems unthinkable. The only reasonable conclusions are that the published track of his 1917 journey is in error or that he did see the island. Fortunately Storkerson's original diary of 1917, including several sketch-maps, and a copy of an unpublished report he made to the Department of Naval Service are stored in the Canadian Archives, and were kindly made available. These accounts describe a very remarkable journey, greatly hindered by lack of time.

Shortly before Storkerson planned to leave the winter quarters of the Polar Bear at Walker Bay, west Victoria Island, H. Gonzales, captain of the ship, stated that he would sail after midnight on 29 July 1917 whether the travelling party had returned or not. Most of the men were therefore reluctant to accompany Storkerson for fear of having to winter in Victoria Island. However, Second Engineer Martin Kilian, a brother of Herman Kilian who had been with Storkerson in 1915, and Seaman Adelbert Gumaer volunteered for the journey.

On 7 June 1917 the party of three left Walker Bay to survey the northeast coast of Victoria Island, and if possible to extend Storkerson's work of 1915 to join with that of Hansen in 1905. Storkerson promised his companions that he would return on June 28, but subsequently both offered to stay with him for as long as necessary to complete the work. Gumaer however, announced his decision to return on June 26 and on the following day left the party. This necessitated dividing stores and parting with a sledge and dogs. Although Gumaer travelled overland against Storkerson's advice he succeeded in reaching the ship safely, though he lost his dog team crossing a river.

On June 28 Storkerson and Kilian continued eastward beyond Glenelg Bay. They followed the coast until they reached Mikkelsen Island (first called Gonzales Island) where Hadley Bay narrows. On July 6, realizing that they were in an inlet, Storkerson crossed to the east coast and continued north up the western side of the peninsula. The following day he reached Elsa Hill (called for Kilian's cousin) where he left a monument in the form of the letter S and was able to get a good view of the country. He noted from here that Mikkelsen Island was in reality three separate islands and that two more islands lay to the east of the group. Storkerson's sketch-maps in his diary of the coast north from this point to his farthest, reached on July 14, are remarkably accurate when compared with the sketch-map made from the

air photographs. Moreover his observations were hindered by fog and rain and he records that his longitude observations are approximate only as the second-hand fell off and stopped one of his watches on July 1.

Off the northern tip of the northeast peninsula of Victoria Island Storkerson records seeing three islands. In his report to the Department of Naval Service, he writes for July 13: "Island A appears to be a fairly large Island about ten miles distant. The East end of it appears to bear about North Northeast the West end about North one-quarters East. As this Island appeared to be the Northernmost and so the most prominent of the land we had discovered that trip, I named it after my companion, Martin Kilian's family, as a token of appreciation of what he had done for me and the Canadian Arctic Expedition when he refused to return with Gumaer according to Captain Gonzales' wishes." On July 14: "Fog, snow and rain with a strong breeze from the South Southeast prevailed ... Before starting to return I decided to take a walk to the Eastward to have a look at the coastline, so leaving Martin at camp to build a cairn where I intended to leave my record, I walked to a point two miles East of camp from where I saw an Island about fifteen or twenty miles between the directions of Northeast and East by North. To the East by South about ten, or at the most, fifteen miles distant the farthest point of land (Point B) was visible beyond which the coastline seemed to turn more to the South. The distance estimated, I judged by the light blue color of the land at fifteen or twenty miles and dark blue at ten or fifteen miles. This way of estimating distance had proved in the past, to be fairly reliable in the clear atmosphere existing in the Arctic region. To the East about five miles and a little beyond Point A, a small Island was visible. This Island I named Elvina[1] Island while Island B to the Northeast was named Leffingwell Island after my former commander on the Anglo-American Arctic /Polar/ Expedition. Point B the farthest point visible to us was named by Mr. Stefansson after the Honorable G.J. Desbarats, Deputy Minister of the Naval Service; while the Point F of July 13th., was named after

[1] The name "Elvira Island" was later adopted for this island. In 1921 Dr. R.M. Anderson sent the Canadian Board on Geographical Names a list of probable meanings of the places named on the Canadian Arctic Expedition. In this he noted: Elvira Island "probably for Schr. 'Elvira', Capt. C.T. Pedersen ...". In Storkerson's account however he referred to the island as "Elvina Island" and had deleted the word "for my" after "Island". I asked Dr. Stefansson's opinion on this point and he replied that he felt confident that Storkerson had named the island for a member of his family, perhaps one of his daughters and gave me the information that they had attended Hay River Anglican School. By good fortune I was able to get in touch with Canon A.J. Vale, who had been in charge of the school, and learned that Mrs. Storkerson's name was "Elvina".

Sir Robert Borden, Premier of Canada. These two Points are, in reality, Capes for the coastline turns abruptly at both places. When I returned to camp, Martin had the cairn ready so I took a photograph of him alongside it after which Martin commenced to get our camping gear together in preparation for our return..." The record left in this cairn sums up the results of Storkerson's journey and ends with the following sentences: "If we have had a little longer time at our disposal we could easily have finished the rest of the coast line to Hansens farthest. This season is late and going is fair but we have orders to be back at the Expeditions winter quarters July 29th 12 p.m. at the latest. We have 350 miles to Walker bay and only 16 days to make it in.

"The blame for this work not being completed this year must rest with H. Gonzales Master of the Polar Bear as he has stubornly refused to wait for us longer than July 29th. Our provisions have long been exhausted are depending on game for grub and fuel for ourselves and our dogs.

"Have sufficient ammunition.

"Men in good health. Dogs sorefooted, leave here for Walker bay tonight will probably go overland from Collinsons Inlet." (quoted from Storkerson's report)[1].

It must have been a bitter blow to Storkerson to have to return when his goal was so near, a decision made to honour his promise to Kilian to get him back to the ship in time if at all possible. In spite of a remarkably rapid journey Storkerson and Kilian did not reach Walker Bay until July 31, two days after Gonzales had said he would leave, and found the Polar Bear still there.

From this account it becomes evident that Storkerson's farthest was erroneously placed on the published map[2], and that in fact he did

[1] As the only available copy of the report is an uncorrected carbon copy the spelling mistakes have not been perpetuated.

[2] In a collection of maps of the expedition stored in the Topographical Survey in Ottawa, there are two identical base maps. On one, Storkerson's farthest is shown roughly correctly with a solid line extending south along the eastern side of the peninsula, probably indicating the direction of the coastline as Storkerson had seen it from the hill two miles beyond his cairn. The other map shows a cross for Storkerson's farthest placed at the end of the strong line and this appears to be the published version. The change was, presumably, a simple error in draughting.

see the northwest corner of Stefansson Island, which he named for Leffingwell. Storkerson did not realize the extent of the island he had discovered, a very understandable mistake as he only saw it from a distance. Moreover the drainage suggests that the northwestern part of the island is higher ground than that immediately inland and recent air observers refer to a slight hill or rise on the northwestern point, which might have cut off his view.

One sketch-map, illustrating a paper by Dr. Stefansson in the Geographical Review for 1918 (Pl. XVIa, Vol. 6, facing p. 368), may perhaps show Stefansson Island. An island is drawn in roughly the correct position relative to the northeastern peninsula of Victoria Island, but the outline of the peninsula is somewhat inaccurate. Dr. Stefansson was writing from hospital at Fort Yukon before he had received full reports from Storkerson, which explains why he mentions that Storkerson "did not know at the time of his turning back from the survey trip that his turning point was a few miles short of Cape Nansen", while Storkerson's record left in his cairn shows that he was sadly aware of this fact. Stefansson continues: "An additional reason for his turning back was the discovery of an island apparently considerably more than twenty miles in length lying north of the northeastern corner of Victoria Island .... the strait separating Victoria Island from the new island to the northeast is Hansen Strait". It appears likely that the island referred to is the Leffingwell Island (Stefansson Island) of Storkerson, not his Kilian Island in view of the position shown on the accompanying sketch-map.

Few of the place names mentioned in Storkerson's report have appeared on the official maps of the region. If Storkerson were alive today he would probably be happy to see the large island named for Dr. Stefansson and to see Kilian Island and Elvina Island reinstated. The latter names appear to have been dropped from the map and they have been grouped together as the Elvira Islands. In 1921 the names Cape Desbarats and Cape Borden were rejected because larger features had been named for both men farther north, and Cape Storkerson was accepted for Cape Desbarats. Now that Cape Storkerson is no longer a prominent feature, it would seem appropriate if the northwestern point of Stefansson Island or the northwestern point of the peninsula were named for Storkerson. It would also be very suitable if Leffingwell's name were given to some other major feature on the island. Stefansson originally proposed that the channel between the large island discovered by Storkerson and the mainland, now known as Goldsmith Channel, should be called "Hansen Strait", but this name was not adopted. Perhaps the name "Hansen Strait" would have caused confusion because of Storkerson's use of "Hansen Inlet" for what is now Hadley Bay.

That such a large island as Stefansson Island was unknown to the Eskimo, who formerly travelled in northern Victoria Island, would have been very unlikely. According to Inspector Henry Larsen there

were several Eskimo at Cambridge Bay and Perry River who spoke of a large island off Victoria Island, "Umingmalik" (Place of Muskox), where their ancestors had hunted muskox. Among those who knew of this island were Angulalik, the trader at Perry River, and the late Patsy Klengenberg. Neither of these had been to the island and Inspector Larsen had not heard of any Eskimo who had travelled there. High winds and various superstitions were given as reasons for not visiting northeast Victoria Island. Storkerson records that Kilian found recent muskox wool near Elsa Hill in northeast Victoria Island in 1917, and it is possible that there are muskoxen on Stefansson Island today. If this correlation of "Umingmalik" and Stefansson Island is correct it will make the naming of the island for the ardent supporter of muskox domestication a happy coincidence.

The rediscovery of Stefansson Island from the air and its subsequent naming parallels the case of Prince Charles Island in Foxe Basin. It shows that the records of early travellers in the region should be checked with care before sightings from the air are claimed as first discoveries.

The beluga fishery at Churchill

From 1948 to 1950 scientists from the Central Fisheries Research Station of the Fisheries Research Board spent several weeks each year studying the beluga in Hudson Bay. The following account is written from notes very kindly sent to us by Dr. K.H. Doan, who was in charge of the observations.

The beluga, Delphinapterus leucas, a member of the porpoise family, is blue at birth, grey as it grows older, and white when adult, hence it is popularly known as the White Whale. Beluga are widespread in Canadian arctic waters. Commercial fisheries are primarily interested in the oil which can be obtained from the substantial layer of blubber which protects the beluga from the cold. The Eskimo and other northern residents catch beluga for dog food as well as for oil, and the outer layer of the skin, the muktuk, is considered a delicacy.

The mouth of the Churchill River is a good place for catching beluga. The beluga enter the river in abundance as soon as the ice goes out. During the summer they come in on the rising tide, proceed to head of tide, turn around, and most leave the river on the falling tide. Their daily numbers are much affected by cold weather or winds, and on a fine day as many as 162 "spouts" have been counted in one mile of river. Most beluga leave the Churchill area by the end of August and they are believed to be a transient population. Their main food is the capelin, but jaws of the sandworm (Nereis), beaks of squids, and occasionally other fish are also found in their stomachs.

The first attempt at a commercial fishery of the beluga in the Churchill area was made during the summers of 1929 and 1930 by the Hudson's Bay Company, which has also operated a fishery at Pangnirtung. The fishery was on a small scale and the blubber was simply rendered in open kettles. After a first good season the catch of beluga declined and a very poor season in 1931 resulted in the fishery being closed. Between 1931 and 1949 beluga hunting was confined to local residents and the missions, and it is estimated that fewer than 50 were taken each year.

In 1949 commercial hunting started on a considerable scale and a reduction plant was built by the Adanac Whale and Fish Products Company. The plant overlooks the Churchill River and stands on an extended spur of the railway a short distance from Churchill station. It consists of frame buildings containing a cookhouse, bunkhouse, coal-fired steam boiler, refrigerated storage (about 50 tons), oil storage tanks, and a meat grinder. In addition to the plant manager and accountant about six men were employed to operate the plant during the busy season in 1951.

The beluga are taken by harpoon and by net. They are then brought to the plant where they are hauled up a ramp and flensed on a low table. The blubber is cooked in the retort and the oil is then drained into a settling tank where it is centrifuged and stored in closed outside tanks. The oil is used in industry and in the manufacture of edible products such as margarine. The liver and steak are separated from the rest of the meat; the former is used for animal food, the latter is on sale in some Winnipeg stores for human consumption. The remainder of the carcass, bones and all, is passed through the grinder and packed in 50 lb. cartons for animal food, particularly for dog food and for fur farms.

The following table shows the total catch and processed products in lbs. of the beluga fishery for the three years for which figures are available.

	1949	1950	1951
Number processed	206	326	584
Oil	45,000	101,935	172,735
Ground meat	85,000	78,300	133,100
Liver		2,050	4,750
Steak			3,200
Total production, lbs.	130,000	182,285	313,785

The beluga hunting season lasts approximately from June 10 to September 10. In 1951 39 fishermen were licensed and took 584 fish, of which 385 were males. The hunters, or fishermen, worked part-time only and were paid $1.00 per foot of beluga. Payments totalling nearly $6,000 were made to the group which consisted of 4 Eskimo, 6 half-breed Eskimo, 8 Chipewyans, 5 half-breed Chipewyans, 6 half-breed Crees, and 10 whites. Of these the Eskimo, half-breed Eskimo, and one family of half-breed Crees were the best hunters.

Between 1947 and 1951 1,077 beluga were measured in the Churchill area and the largest was 14 feet 8 inches long. The females averaged 10 inches shorter than males of the same age. In the 1951 commercial fishery the lengths ranged from 5 to 14 feet. No facilities were available for weighing individuals in the "round", but the rule-of-thumb method of slightly less than 100 lbs. per foot in length is generally accepted.

The beluga fishery in the areas of Hudson Bay, Hudson Strait, James Bay, and Ungava has been controlled since 1949 by the Department of Fisheries. Licenses to take beluga have to be obtained from the Department of Fisheries and cost $1.00. Indians, Eskimo, half-breed Indians or Eskimo, and members of the R.C.M.P. are permitted to take beluga for their own domestic use and for feeding to their dogs. Licensees must avoid, insofar as possible, killing females with sucklings or taking sucklings, and weekly reports have to be made to the Department of Fisheries.

In the Churchill area a district quota of 600 beluga has been in force, but up to the end of 1951 the catch has always been well below this figure. In 1949 and 1950 beluga had to be taken by harpoon and rifle only, but in 1951 the use of gill nets was permitted. An objection to nets is that smaller animals are caught: in 1951 55 per cent of those taken by net averaged less than 10 feet, as compared with only 28 per cent by harpoon.

Eight observation flights were made along the coast from Churchill in the summer seasons of 1948, 1950, and 1951 to count the beluga. Each flight was about 300 miles and an average of 275 beluga were seen. The fishing does not appear to have fallen off in the three years the commercial fishery has been operating and so far it seems that the present quota is sufficient protection. The number observed on the flights was highest in mid-summer, when as many as 1,600 beluga were counted in 100 miles.

In addition to studying the beluga in Hudson Bay to determine whether the exploitation there may affect supplies for the Eskimo farther north, the Fisheries Research Station has been investigating the biology of this interesting mammal. To assist in tracing their movements a few

beluga have been marked: the barbed head of a harpoon was replaced by a flat plate bearing needles arranged in a design and dipped in tattoo ink and the harpoon was then fired at the animal. However only 4 beluga were marked in 1949 and 7 in 1950 and up to date there have been no recoveries. Much scientific information has been obtained about the beluga and it is hoped that the problem of where they winter will soon be solved.

Canadian Ice Distribution Survey. By J. Keith Fraser

In 1947 the Geographical Bureau of the Department of Mines and Resources (now the Geographical Branch of the Department of Mines and Technical Surveys) made plans for a long-range study of the condition and distribution of ice in northern Canadian waters. The general purpose of the project was to extend the geographical knowledge of the formation, disintegration, extent, and movement of the different types of floating ice in Canadian waters and the accompanying navigational difficulties. The project includes information on floating ice only, upland or continental glacier ice being excluded except where such glaciers supply ice to the sea as bergs or ice shelves. Originally the area under survey included the Beaufort Sea, the waters of the Canadian Arctic Archipelago, the Hudson Bay-James Bay area, Baffin Bay, Davis Strait, and the Labrador coast. Recently, at the suggestion of the Fisheries Research Board and the Fisheries Division of the Nova Scotia Department of Trade and Industry, the Gulf of St. Lawrence and eastern Canadian maritime waters have also been included. It is intended later to cover all Canadian inland waters.

The project was begun during the summer of 1948 by extracting data on ice conditions from reports published prior to 1905. This work was continued during 1949 and 1950, in which year help in the form of a staff for extraction and editing was contributed by the Defence Research Board, and the information gathered has been filed according to region. As a result of this joint effort, some 2,700 references had been tabulated in the form of cards by 1 September 1952, and these have been sent by the Geographical Branch to certain agencies and organizations interested in ice conditions. Additional references will be distributed as they become available. It is hoped that those receiving the information will contribute to the project by bringing additional references to the attention of the Branch and by sending in authoritative unpublished ice observations.

The information collected will possibly be of most immediate use in estimating ice conditions for specific areas and times. When more information is assembled it should assist navigation, the study of the relationships between ice conditions and meteorological and oceanographic phenomena, and forecasting dates for break-up and freeze-up.

An outbreak of rabies in northwest Canada, 1951-2. By V.E.F. Solman

Since 1947, when rabies was first proved to exist in both the Eastern and Western Canadian Arctic,[1] the Division of Animal Pathology, Animal Disease Research Institute, Hull, Que., has confirmed the diagnosis of rabies in a number of cases from the Western Arctic.

The 1951-2 outbreak was first reported on 6 December 1951, when word was received that the head of an infected dog was being forwarded from the Reindeer Station near Aklavik. The brain was found to contain Negri bodies in large numbers, confirming the diagnosis of rabies. To 1 May 1952, laboratory examinations have demonstrated rabies in 5 dogs, 4 wolves, and 15 foxes, all from within a radius of one hundred miles of Aklavik. During May one infected fox was found in the Yellowknife area, and during June another was found in the Fort Fitzgerald area.

Rabies vaccine was provided to officers at Aklavik and neighbouring centres in December 1951, and at latest report 832 doses had been used or issued for dog vaccination.

Although rabid animals are reported almost annually from the Western Arctic, the 1951-2 outbreak already appears to have involved more animals and to have covered a wider geographical region than previous outbreaks for which we have information. This may of course, be due to improved facilities for diagnosis as a result of the increased scientific staff in the area, better transportation, and better facilities for obtaining such information.

Ian McTaggart Cowan (J.Mammal. Vol. 30 (1949) pp. 396-8) describes some details of attacks by rabid animals in the Aklavik area in 1947 and suggests that rabies may be of importance in fluctuations in animal numbers in this area.

Hudson Bay Insurance

It was reported in The Times for June 27 that on the recommendation of the Joint Hull Committee underwriters and insurance companies have made the following changes in the additional premiums required for Hudson Bay.

The rate for vessels fitted with gyro-compass is to be reduced by 25 per cent in all columns. In the current schedule, the commencement date for passing Cape Chidley is altered from July 26 to July 23. No

[1] See Circular, Vol. 1 (1948) pp. 37-8 and 55-6; and Vol. 4 (1951) pp. 47-9.

vessel, however, may pass Cape Chidley before August 10 until the captain has been advised by the Canadian Government patrol ship that it is safe to do so. The closing date remains unchanged, with October 10 rating in the scale. For extensions up to October 15 the rates are to be increased by 25 per cent.

Correction

Our attention has been drawn to an error which appeared in the first paragraph of the article "The coming of representative government to the Northwest Territories" in the Circular for December, 1951 (Vol. 4, No. 6, pp. 79-83). In the phrase "acting under instructions from the Governor in Council, the Minister of Resources and Development" the comma should be replaced by the word "or". The Governor in Council is, of course, not the same as the Minister of Resources and Development and is in effect the Cabinet. Under the Northwest Territories Act the Governor in Council or the Minister have the authority to instruct the Commissioner concerning the administration of the Territories.

Subscriptions to the Arctic Circle

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Owing to currency regulations it is not always convenient for members of the Arctic Circle residing in Europe to pay their subscriptions to the club in Ottawa direct. Through the courtesy of the Director, the Scott Polar Research Institute will now receive the subscriptions of members from the United Kingdom and from the Continent of Europe and will transmit them to Canada from time to time. European members should forward their 1952 subscriptions (5/-) to the Director, Scott Polar Research Institute, Cambridge, England and mark them "Arctic Circle Subscription".

Change of Address

Members are earnestly requested to advise the Treasurer, Mr. James Cantley, 215 Gladstone Avenue, Apt. 11, Ottawa, promptly of any change of address.

Editorial Note

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

Mrs. Graham Rowley,
411 Echo Drive,
Ottawa, Ont.

Authorized as Second Class Mail, Post Office Department, Ottawa

THE ARCTIC CIRCULAR

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Thirty-seventh Meeting of the Arctic Circle

The thirty-seventh meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Wednesday October 1. The President, Inspector Henry Larsen, was in the Chair and introduced the speaker, Mr. N.O. Christensen. Mr. Christensen, who is Kontorchef (Deputy Governor) in Greenland, spoke on the "Greenland Administration".

Thirty-eighth Meeting of the Arctic Circle

The thirty-eighth meeting of the Arctic Circle was held in the 1st. Corps Troops R.C.A.S.C. Mess, 278 Sparks Street, on Wednesday November 5. The President, Inspector Henry Larsen, was in the Chair and introduced the speaker, Mr. Doug Wilkinson. Mr. Wilkinson showed the colour sound film "Angotee - story of an Eskimo boy" and described the shooting of the film at Chesterfield Inlet during the months of October, November, and December 1951 by a National Film Board party. (For an account of the work of the National Film Board Arctic Project see Arctic Circular, Vol. 5 (1952) pp. 36-8).

First Meeting of the newly constituted Greenland National Council.

By N.O. Christensen

The first annual meeting of the newly constituted Greenland National Council (Landsraad) opened in Godthaab on 25 September 1951. The Council is composed of thirteen members, one from each of the electoral districts of West Greenland, who serve for four years. An account of the first national election held on 29 June 1951 was published in the Arctic Circular for 1951 (Vol. 4, pp. 83-5). Danes and Greenlanders were eligible but no Danes were elected. The Council met daily over a period of four weeks, adjourning on 23 October 1951, and dealt with an agenda of over eighty items. Governor Paul H. Lundsteen presided over the meetings.

The Council is a national body in the sense that it represents over ninety per cent of the total population of Greenland. It is not directly concerned with the affairs of East and North Greenland, (North Greenland = Thule district) although certain items on the agenda touched

upon developments in those areas. The Council has no legislative authority and its administrative decisions are subject to review by the Danish Greenland Department in Copenhagen. None the less the Council will exert considerable influence in shaping policies and legislation affecting Greenland. It does have direct authority over certain matters of domestic finance.

In the opening ceremonies, Governor Lundsteen delivered an address of welcome to the delegates and messages of greetings were exchanged with the King and Queen of Denmark, the Danish Parliament, and the Danish Prime Minister. Augo Lynge, the member for Godthaab, replied to the Governor's address on behalf of the Council. He reaffirmed Greenland's loyalty to the Mother Country and said he looked forward to continued close cooperation with Denmark in developing Greenland in the best interests of the native population. He said he desired the ties with Denmark strengthened and he also expressed the hope that Greenlanders would eventually be granted full parliamentary representation in the Danish Rigsdag similar to that enjoyed by the Faroe Islanders. Mr. Lynge stated that he believed the younger generation of Greenlanders should be trained, with the assistance of the Danes, to take positions of greater responsibility in all phases of the development of the country, and that they should assume, in time, a greater degree of control over local affairs, particularly in the field of finance.

Some of the most interesting items on the agenda are mentioned below.

In the course of its deliberations the Council selected Frederik Nielsen of Julianehaab and Augo Lynge of Godthaab to be delegates to the Permanent Greenland Committee of the Danish Parliament, and Frederik Lynge of Egedesminde was chosen as delegate on the Board of Directors for the Royal Greenland Trading Company.

The New Development Programme in Greenland was considered by the Council. Frederik Nielsen of Julianehaab expressed the opinion that greater emphasis should be placed first upon the housing programme, in order to combat tuberculosis among the Greenland population, and secondly upon fisheries and manufacturing establishments to promote trade and commerce. He thought these two phases of the programme should take precedence over administrative development. The Council, however, made no formal proposals on the matter.

The question of control of sales of alcoholic liquors occasioned lengthy discussion. After considering various proposals ranging from complete prohibition to the removal of all restrictions, the Council voted in favour of a rationing plan whereby each householder would be permitted to buy not more than ten litres of hard liquor, twenty litres of wine, two hundred bottles of beer, and forty-eight kilograms of malt annually. Larger rations would be allowed for certain officials.

In considering problems relating to fishing activities in Greenland waters, several Council members expressed concern over the operating methods of Danish and Faroese ships. A law passed in 1950 gave all Danish nationals, which includes Faroe Islanders, the right to fish in the fjords and territorial waters of Greenland. This regulation had been approved by the two former Greenland Provincial Councils. As a consequence, many Faroese and a lesser number of Danish ships came to Greenland to fish the rich cod and halibut banks of the inshore waters. They aroused considerable local resentment by intensive fishing without due regard for the Greenlanders whose less effective methods and equipment made it impossible for them to compete with the visiting ships. The Council condemned this practice and asked that corrective measures be taken. This problem will be further considered in Copenhagen.

On 1 October 1951 the Chairman explained the implications of the new Greenland Defence Pact which was signed on 27 April 1951, between Denmark and the United States. The Council expressed unanimous satisfaction with the Pact.

A Royal Decree outlining administrative procedures for the Greenland District Councils (kommunalbestyrelser) was presented to and approved by the Council.

The Council formally requested that the Danish Government life insurance programme be extended to include Greenlanders.

Following discussions of various cultural affairs in Greenland, the Council decided to arrange for the publication of a new bi-weekly periodical to be printed in both Danish and Greenlandic to replace Grønlandsposten and Atuagagdliutit. Public funds were also voted to purchase new library books in Greenlandic.

A Danish law of 1951 which established for the first time a schedule of import duties for certain goods entering Greenland, such as sugar, chocolate, tobacco, and alcoholic beverages, was approved by the Council. The proceeds are deposited with the National Council Treasury and are used preferably to finance social welfare projects, administered by the District Councils, such as old-age pensions, homes for the aged, relief, child welfare, public wells, and roads. The National Council may also authorize loans from this fund to persons in the lower income groups for building homes or buying hunting and fishing gear.

A plan to import domesticated reindeer into Greenland from Norway was studied and approved. The Council in its present session designated an experimental area in southern Greenland where the first herds will be introduced.

In 1950 the Greenland Department in Copenhagen drafted a new penal code for Greenland. The Council reviewed it and agreed upon its adoption.

An official report of the Council proceedings has been printed in Danish and Greenlandic. It may be purchased from the Governor of Greenland, Godthaab, or from the Greenland Administration, Copenhagen, Denmark.*

Northern activities of the Geodetic Survey, 1951-2. By J.E.R. Ross

During 1952 two types of geodetic projects were continued in the subarctic areas of Canada - shoran trilateration mainly in the east and precise astronomical work in the west. (For an account of the geodetic work during 1950-1, see Circular, Vol. 5 (1952) pp. 5-8).

With the cooperation of the Royal Canadian Air Force, shoran line-measurement operations were carried on in the Dubawnt Lake-Coronation Gulf area easterly across the northern part of Hudson Bay to the westerly limits of Hudson Strait and the Ungava Peninsula. Altogether 53 new lines were measured in the shoran network in which the average and maximum length of line are 239 and 362 miles respectively. Both Air Force and Geodetic Survey personnel were based at Yellowknife during the first part of the season and at Churchill during July and August.

In advance of the line-measurement operations, reconnaissance and station preparation work was carried on for several hundred miles both northward and southward from Hudson Strait. New stations selected and prepared during 1952 include points adjacent to Gillian, Basin, and Amadjuak lakes, Cape Dorchester, Lake Harbour, and two unnamed lakes at 68°31N., 71°22W. and 64°12N., 66°51W. in central and southern Baffin Island; an unnamed lake on Resolution Island; Tasiat and McGill lakes, the Kovik River, and George River in Ungava, and Clearwater Lake and an unnamed lake (56°24N., 69°58W.) near Lac Châteauguay farther south in Quebec province; and an unnamed lake (55°43N., 63°12W.) near Lake Mistastin in Labrador.

In general, the 1952 summer season was very favourable for field work in the east. Freshwater lakes in southern Baffin Island were practically clear of ice by the middle of July. One violent wind storm, however, occurred in this area on July 28 and several tents at the Amadjuak Lake base camp were blown down and in some cases badly torn.

* Day by day summaries of the Council's activities appeared in the new Godthaab daily news sheet Godthaab Avis, published in Danish under the direction of Helge Christensen.

The scarcity of animal life was remarkable. During the entire season, the shoran reconnaissance party observed from the air only three or four caribou. However, just south of the Koukdjuak River on Baffin Island, great flocks of several thousand birds, presumably geese, were seen flying between the small lakes and ponds which cover a large part of that area.

On the first trip to the lake at 64°12N., 66°51W. on Baffin Island, the crew and geodetic personnel of the Canso could see great masses of boulders and rocks which appeared to reach almost to the surface of the water. Since the landing hazard was considered too great for a Canso, which requires 5 or 6 feet of water for a safe landing, the aircraft returned to base. The next day a successful landing was made in a Norseman pontoon-equipped aircraft drawing only 1½ feet of water. It was found that the water was so crystal clear that rocks and stones which appeared to be barely covered by water were in reality 30 or 40 feet below the surface.

Geodetic Survey personnel engaged on the 1952 shoran project were: W.J. MacLean, A.C. Hamilton, A.S. Grant, W.D. Forrester, S.A. Yaskowich, Dr. R.K. Johns, C.D. McLellan, F.H. Hawkins, and P. Williamson.

Along the southerly limits of the Northwest Territories an astronomical party established four precise stations on the 60th parallel. Two of these points, near small lakes 90 miles north of Fort Nelson, were required for the demarcation of the British Columbia-Northwest Territories boundary. On this project, the geodetic survey party and a dog team were flown in to the lakes from Fort Nelson early in March in a ski-equipped plane. The dog team was used to provide transportation from the lakes to the locale of the 60th parallel. The aircraft-dog team combination proved to be an efficient and satisfactory solution of the winter transportation problem.

In June, two more precise astronomical stations were established on the 60th parallel: one on Donovan Lake, 20 miles east of Fort Smith, and the other on Charles Lake, 20 miles farther east. A Norseman aircraft was used for transportation on this work. On the winter project, W.D. Forrester and G.A. Corcoran carried out the observational programme. Mr. Forrester was accompanied by Paul Williamson for the summer work. On the completion of the boundary project, Forrester and Williamson moved to the Baffin Island-Ungava Peninsula area where they made preliminary astronomical fixes in connection with the selection of new shoran stations.

First meeting of the committee appointed at the Eskimo Conference

At the round table conference on Eskimo affairs held in Ottawa on May 19-20 a continuing committee was appointed to study the reports and suggestions presented (see Circular, Vol. 5 (1952) pp. 41-3). The members of this committee, which met for the first time in Ottawa on October 16, are: Major General H.A. Young, chairman, His Excellency J. Troecellier,

Rt. Rev. Donald B. Marsh, R.H. Chesshire, Commissioner L.H. Nicholson, R.C.M.P., Dr. P.E. Moore, and J.G. Wright.

The Hon. Robert Winters, Minister of Resources and Development, addressed the committee and stressed the need for a practical approach to education to prepare the Eskimo for the changing times in the Arctic. There are at present seven schools for Eskimo in Canada and arrangements have already been made by the federal government to build an eight-room school at Aklavik.

The committee agreed that besides extending facilities for elementary education to all Eskimo children and setting up camp hostels at schools for those children who live away from the settlements, provision would have to be made for higher education and for technical training for those who showed particular aptitude. Eskimo who give evidence of possessing the necessary qualifications will be enabled to prepare themselves to work as teachers, nurses, or artisans, either among their own people or outside.

Consideration was also given to the problems involved in extending the medical care at present given to Eskimo, and particularly to the programme which has been in effect during recent years for the detection and treatment of tuberculosis. One of the more pressing problems is to provide convalescent or rehabilitation centres for Eskimo who have been discharged from hospital, but are not capable of returning to the rigorous northern life they have known before. Two such centres will be established in 1953: one at Frobisher Bay, southern Baffin Island, for Eskimo from the Eastern Arctic, and the other at Driftpile, Alberta, for the Western Arctic.

At the Frobisher Bay centre convalescent Eskimo will learn to take up their normal activities again. The Driftpile centre will be something of an experiment where it will be seen if those Eskimo who are unlikely ever to be fit enough to return to the north can adjust themselves to different occupations in areas other than the Arctic.

With the opening up of the North, which has followed the development of air travel, there have been a number of epidemics such as measles, scarlet fever, and whooping cough. Because Eskimo have little or no resistance to these diseases, formerly unknown among them, special medical measures are necessary. Ordinary health and medical problems are being met by frequent medical patrols, local hospitals, and nursing stations and by the voluntary work of missionaries, traders, and police throughout the country. Cases requiring specialized surgery or treatment are brought out by aircraft or boat to hospitals in the south.

The committee agreed that, under the direction of the Canadian Handicraft Guild, the development of handicrafts as a source of Eskimo income has shown good results. Government assistance will be continued. Other small industries such as boat building, fishing for local markets, and the collection of eiderdown are to be encouraged.

Eskimo Research Unit

On November 24 the Hon. Robert Winters, Minister for Resources and Development, announced that an Eskimo Research Unit had been created in the Northern Administration and Lands Branch of the Department. Mr. J.G. Wright, former chief of the Northern Administration Division, has taken over the new unit, which will probably consist of four persons. Mr. Wright, who joined the Department of the Interior in 1918, has been closely associated with the problems of the Eskimo and of the north country since 1941. His wide knowledge and sympathetic understanding of these problems should go far towards making the formation of the Eskimo Research Unit one of the more important steps towards stabilizing the economy of the Eskimo.

The functions of the unit are as follows:

1) To conduct field researches into the best means of adapting the Eskimo to changing economic conditions.

2) To develop specific projects to this end with particular regard to:

   a) The improvement of hunting and fishing techniques.

   b) The greater utilization of local food resources.

   c) Handicraft industry.

   d) Small industries such as whaling, codfishing, eider-down collecting, and boat building, and home industries.

3) The transfer of Eskimo from over-populated or depleted areas to under-populated areas or favourable areas or to areas where employment, seasonal or otherwise, may be obtained.

4) To recommend specific loans to groups of Eskimo or to individual Eskimo and specific investments in particular projects.

5) The study of relations between Eskimo and traders.

6) The development of educational techniques for the better instruction of Eskimo in occupations suitable to their local environment.

1951 supply mission to the joint arctic weather stations

Unfortunately we were not able to publish an account of the supply mission to the joint arctic weather stations in 1951. We have included notes about all previous missions (see Circular, Vol. 1 (1948) pp. 2 and 90; Vol. 2 (1949) pp. 70-1; Vol. 3 (1950) pp. 46-7) and therefore consider it worth while publishing the following brief account about the 1951 season to complete the record.

In 1951 the annual supply mission managed to reach three stations: Resolute and Eureka, both joint Canadian/United States stations, and Thule, a joint Danish/United States station, and to land supplies at Bridport Inlet, Melville Island, which could be used for a future station.

The naval force, commanded by Captain Walter C. Ford, U.S.N., was the largest so far sent north on the joint weather station programme, and included a tanker. It consisted of five ships: two icebreakers, the U.S.S. Atka and the U.S.C.G.C. Eastwind; two cargo vessels, the U.S.S. Wyandot and the U.S.S. Achernar; and a tanker, the U.S.S. Nespelen. The U.S.S. Atka was making her first trip into heavy ice since her return by the Russians in October 1950.

The mission left Boston on July 16 and, with the exception of the Eastwind, returned to Newport, R.I. on August 27.

In spite of heavy ice in Lancaster Sound and Barrow Strait Resolute was reached on August 7, an earlier date than any previous mission. Incoming ice forced the ships to leave the harbour once during their stay, but unloading was later completed successfully.

The Eastwind managed to reach Eureka on August 24, rather late in the season as she had been taken off on other work.

Long-range ice reconnaissance was provided by R.C.A.F. aircraft of 405 Maritime Squadron, based at Greenwood, N.S. Short-range ice reconnaissance was flown by helicopters from the icebreakers.

The senior Canadian representative was Mr. J.C. Jackson of the Department of Resources and Development. Lieutenant-Colonel R.B. Sykes, Chief of Arctic Projects, United States Weather Bureau, assisted by Mr. J.G. Dyer, supervised operations for the United States Weather Bureau.

Captain Walter C. Ford, U.S.N. was embarked in the Atka, commanded by Commander R.B. Kelly, U.S.N.; the U.S.C.G.C. Eastwind was commanded by Captain O.A. Peterson, U.S.C.G., the U.S.S. Wyandot by Captain F.W. Laing, U.S.N., the U.S.S. Achernar by Captain Crutchfield Adair, U.S.N., and the U.S.S. Nespelen by Lieutenant W.F. Harris, U.S.N.

1952 supply mission to the joint arctic weather stations

During the summer the annual supply mission was successful in reaching four of the joint arctic weather stations: Resolute, Eureka, and Alert, all joint Canadian/United States stations, and Thule, a joint Danish/United States station. The United States naval task force, known as Nanook 52, was the sixth supply mission to these stations. (For references to accounts of previous missions see p. 65).

The naval force, commanded by Captain J.W. Callahan, U.S.N., consisted of four ships: two icebreakers, the U.S.S. Edisto and the U.S.C.G.C. Eastwind, the cargo ship U.S.S. Wyandot, and the tanker Nespelen. All these vessels had seen service on previous arctic missions.

On July 21 the Wyandot and the Nespelen sailed from Boston. After loading supplies at Halifax they reached Thule on August 2, where they joined the Edisto and the Eastwind. Here the force divided, the Eastwind sailed north on August 6 in an attempt to resupply Alert, and the other ships sailed west for Resolute Bay on August 5, where the bulk of the supplies was to be left.

After negotiating heavy ice in Lancaster Sound the Resolute group reached the station on August 7, the same date as in 1951. The Edisto then reconnoitred to the westward, while the Wyandot and the Nespelen were unloading, and reached Melville Island, where she examined sites for further weather stations, including Bridport Inlet, where stores had been left in 1951.

On her return to Resolute on August 13, the Edisto took on board the cargo for Eureka and then escorted the supply ships clear of heavy ice on their return run. She reached Eureka on August 16, where off-loading was completed the following day, and then returned to Thule, arriving on August 20. On the whole, the Resolute group encountered very favourable ice conditions.

The Eastwind had a more adventurous passage. The station at Alert, in Dumbbell Bay, northeast Ellesmere Island, is the most northerly of the stations, and was established in the spring of 1950 by air. Up to date the supply missions have succeeded in reaching Alert in alternate years only - 1948 (on reconnaissance), 1950, 1952. Ice conditions in this area in 1952 were exceptionally severe and the Eastwind had to work her way through floes of heavy polar ice up to 10 miles in diameter with pressure ridges 50 feet high.

The transfer of cargo at Alert was completed in only eighteen hours, and the Eastwind was underway on August 13. However, the ice closed in and she remained within sight of the station for several days. Helicopter reconnaissance showed that the best leads lay to the north and east, and in taking advantage of this information, the Eastwind reached 82°38'20N., 61°51W. slightly less than 442 miles from the north pole, and eight miles farther north than her farthest in 1950, thus establishing a new record for a vessel under its own power in this sector of the Arctic. She reached Thule on August 24.

The ships of the task force regrouped at Thule, where scientific and meteorological projects were carried out before sailing for Boston.

As in previous years long-range reconnaissance was provided by R.C.A.F. Lancaster aircraft of 405 Maritime Squadron, based at Greenwood, N.S., and short-range reconnaissance was flown by helicopters from the icebreakers.

The senior Canadian representative on the force was Mr. A. Stevenson from the Department of Resources and Development, who was aboard the Eastwind. Captain O.C.S. Robertson, R.C.N., who is to take command of the Canadian Navy icebreaker H.M.C.S. Labrador, now under construction, was senior Canadian observer aboard the Edisto. Lieutenant Colonel R.B. Sykes, U.S.A.F., assisted by Mr. E.E. Goodale and Mr. H.P. Rabbitt, supervised operations for the United States Weather Bureau. Civilian and military observers from the United States and Canada were aboard the vessels, and personnel of the U.S. Naval Research Cosmic Ray Project accompanied the mission. In the next number of the Circular we hope to include a short account of the cosmic ray work in which huge plastic balloons carrying automatically firing rockets were launched.

Captain J.W. Callahan, U.S.N. was embarked in the U.S.S. Edisto, commanded by Commander J.M. Leroy, U.S.N.; the U.S.C.G.C. Eastwind was commanded by Captain O.A. Peterson, U.S.C.G., the U.S.S. Wyandot by Captain D.W. Olney, U.S.N., and the Nespelen by Lieutenant W.F. Harris, U.S.N.

Hydro-electric plant on the Mayo River

The hydro-electric plant near Mayo, Yukon Territory, went into service early in November. It is operated by the Northwest Territories Power Commission and is to supply power to lead-zinc-silver mines and communities of the Keno Hill and Galena Hill districts.

The power-house and main dam are located on the Mayo River, five miles north of Mayo Landing and 215 air miles north of Whitehorse. The main dam is an earthfill structure having a total volume of 300,000 cubic yards, of which 112,000 cubic yards is an impervious core. The main dam is 360 feet in length and 115 feet high. The tunnel between the main dam and the power-house is 1,865 feet long and is concrete lined. The average tunnel section is approximately 10 feet wide and 10 feet 6 inches high before lining. The finished tunnel section is horseshoe shaped having a maximum width of 8 feet by 7 feet 4 inches high. Power is generated at the power-house at a head of 120 feet. The capacity is 3,000 horsepower, and can be expanded to 6,000 horsepower.

Water storage has been provided in Mayo Lake by constructing a timber crib rock-filled structure 320 feet in length and 15 feet high. This dam will raise the level of the lake about 10 feet and will provide 250,000 acre feet of storage, approximately equal to three years' natural run-off at this point.

Power is delivered to consumers in the Mayo Landing area by means of a 6,900-volt transmission line which is six miles in length running south from the power plant. The Galena and Keno Hill mining areas to the north will be serviced by a 69,000-volt transmission line, thirty-three miles in length.

North Atlantic harp seal fishery

During the past year there have been discussions among scientists, members of the Canadian sealing industry, and representatives of Norway, Denmark, and France regarding the need for regulation of the harp seal fishery of the North Atlantic. As a result an exchange of information has been arranged between the Fisheries Research Board and Norwegian and Danish investigations, and the Board's Newfoundland Fisheries Research Station at St. John's has assisted in sampling and tagging seal stocks.

In 1951 it was estimated that the 27 vessels participating in the sealing took 440,000 seals from an estimated total population of 2,150,000. This showed a marked increase over the period 1912 to 1940 when the annual take was about 160,000. The total population figure was based on air photography of the breeding concentrations on the ice of the area east of Newfoundland, known as "The Front". Fortunately, in 1952 the take was reduced as a result of less activity in the sealing fields, and the fear of overexploitation has now been eased, at least temporarily.

Appointments in Department of Resources and Development

Mr. Frank J.G. Cunningham has recently been appointed Director of the Northern Administration and Lands Branch of the Department of Resources and Development, succeeding Mr. G.E.B. Sinclair who retired in June 1952, because of ill health. Mr. Cunningham was appointed a stipendiary magistrate at Yellowknife in April 1946, and later came to Ottawa to assume senior administrative duties. Since November 1950 he has been Deputy Commissioner of the Northwest Territories and a member of the Northwest Territories Council.

Another recent appointment is that of Mr. W.G. Brown as Commissioner of the Yukon Territory. Mr. Brown succeeds Mr. Fred Fraser who has been transferred to Ottawa to become Chief of the Northern Administration Division of the Northern Administration and Lands Branch, following Mr. J.G. Wright's appointment to the Eskimo Research Unit (see p. 65). For the past two years Mr. Brown has been Administrator of the District of Mackenzie. This position has now been taken over by Mr. L.A.C.O. Hunt who has been Sub-District Administrator at Aklavik.

Mr. Leo Manning, one of the very few white men in Canada who have a really good command of the Eskimo language, is now interpreter and translator in Eskimo for the Northern Administration Division. Mr. Manning joined the Hudson's Bay Company in 1918. He was posted to Cartwright, Labrador, in

1919 and moved from there to Lake Harbour in 1920. Subsequently he was at the following Company posts: Frobisher Bay, Coats Island, Blacklead Island, Port Harrison, Povungnituk, Wakeham Bay, Sugluk, Aklavik, Bathurst Inlet, and Coppermine. He retired from the Company in 1952, just prior to his appointment to the Department of Resources and Development.

Reindeer experiment in Scotland

In October 1952 Mr. Mikel Utsi brought ten Rödingsträsk "forest" reindeer to Scotland to join the mountain reindeer previously established in the Rothiemurchus Forest (see Circular, Vol. 5, No. 4 (1952) p. 45) as an experiment under the supervision of the Reindeer Council of the United Kingdom. Of the first consignment of eight reindeer, one calf died in quarantine and the only female in calf soon afterwards, apparently as a result of the long journey and close confinement. A third died from an unknown cause in June. Since then all has gone well on the Reserve; the full-grown ox, two bulls, and two young females are in good condition and adapting themselves to their new surroundings.

Subscriptions for 1953

Members are reminded that their subscriptions for 1953 ($2.00 for Ottawa members, or $3,00 for combined membership for husband and wife, and $1.00 for out-of-town members, other than institutions) are payable to the Treasurer, Mrs. A.G. Sangster, 504 Golden Avenue, Ottawa.

Owing to currency regulations it is not always convenient for members of the Arctic Circle residing in Europe to pay their subscriptions to the club in Ottawa direct. Through the courtesy of the Director, the Scott Polar Research Institute will now receive the subscriptions of members from the United Kingdom and from the Continent of Europe and will transmit them to Canada from time to time. European members should forward their 1952 subscriptions (5/-) to the Director, Scott Polar Research Institute, Cambridge, England and mark them "Arctic Circle Subscription".

Note from the Committee

The Committee would like to express its thanks to Mr. H.V. Serson, Mr. E.L. Hagg, Mr. J.A. Warwick, and Mr. R. Thane 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 Margaret Murray for her 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:

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