# 1949

# NEWS on the DOT

# "Finger-Tip" Controls For Worlds Most Powerful Icebreaker

The Prince Edward Car Ferry "ABEGWEIT", said to be the most powerful ice-breaker ever built, has completed two years of service between the main land and Prince Edward Island.

Four propellers, two astern and two in the bow, are driven by electric motors from a 12000 horsepower diesel electric power plant.

That diesel electric propulsion was selected does not in itself represent a novelty in icebreaker design. However, the manner in which it is used is an innovation and results in very fast response to any requirement of the Vessel's Master.

There are four 1500 H.P. diesel electric engines in each of two engine rooms. Each propeller is driven by a 3850 horsepower motor. These motors are the largest of their type ever built in Canada.

The electric circuits between the generators and the propulsion motors enable the full output of one, two, or three generators to be connected to any propeller, without any interruption whatsoever. This feature, in itself, enables the ship to buck through heavy ice which might otherwise stop it dead.

Under normal conditions only six of the eight engines are used, two each being connected to each aft propeller and one to each forward propeller. If a failure occurs on one engine, a spare can quickly be brought into service. If very heavy ice is encountered, it is a matter of seconds to get all engines in service.

Before the ship leaves the dock, the Master signals to the control room for a certain combination of engines on each propeller. This signal sets a pointer on a dial to the number of engines required. The control room operator then instructs the engineers on watch in the engine rooms to start up the required units.

When the Master is ready to leave he operates a conventional ships telegraph to signal the deck crew to remove the ship's lines. When the lines are clear he receives a signal on his telegraph to that effect. He then manipulates the four controllers, one for each propeller, to obtain the desired propeller speeds. The response of the engines to his command is instantaneous as his orders are electrically signalled direct to the engine instead of an engineer as on a conventional ship.

All the electrical controls are adjusted to match the characteristics of the generators and propulsion motors against the diesel engines with the result that no matter how fast the Master manipulates any of the controllers the rate of speed change will follow the engines' ability to handle the rate of load change.

Normally he cannot overload the engines but if an abnormal condition does exist it is quickly observed by the operator on instruments located in the control room. By means of small rheostats with knobs no larger than a conventional radio dial he can raise or lower the load on any propeller motor at will, and thus keep the engines in service until the abnormal condition can be cleared.

When the ship is bucking ice, all engines are in service, normally two on each propeller circuit. If very heavy ice is encountered it is sometimes an advantage to switch engines from the aft to the forward propeller circuits or vice versa. When the Master wishes an engine switched he signals the control room, and within twenty seconds 1500 horsepower has been transferred from one propeller to another.

Sometimes when bucking heavy ice, the propellers, particularly the forward ones, will slow down considerably and may even stall. The electric controls automatically compose the volts and amperes to normally hold full power on the engine regardless of the speed of the propeller. However, should the propeller motor actually stall or overheat the power will be automatically reduced to prevent a burnout.

Three 500 H.P. diesel electric sets provide power for lighting, cooking, air conditioning and other ships services for which some 135 motors are required. The ship is also equipped with all the latest fire fighting devices and navigational aids such as Gyro compass, echo sounder, radiophone and radar.

It was built by Marine Industries Ltd., Sorel, P.Q. for the Department and is operated by the C.N.R. on the run across the Northumberland Straits between Cape Tormentine, N.B. and Borden, P.E.I.

# "Met" Awards

Seventeen officers on 12 Canadian ships have been presented with an award by the Department of Transport Meteorological Division for excellent weather observations, carried out at sea during 1948. As a member of the International Meteorological Organization, Canada co-operates in providing weather reports from the Merchant Marine.

The ships' officers work on a voluntary basis and several times each day report weather conditions while they are on the high seas. Reports are transmitted free to the nearest nation and collected ship reports are exchanged between National Meteorological Services. These reports are essential for the preparation of weather forecasts for areas of the sea and contribute to the accuracy of forecasts for land areas.

The list of ships and Merchant Marine officers taking part in this Service is being expanded in conformity with the agreements of the International Meteorological Organization.

This year's award was a book "Wind Waves at Sea, Breakers & Surf" by H.B. Bigellow and W.E. Edmondson. In each copy was an illuminated book plate bearing the Coat of Arms of Canada and signed by Andrew Thomson, Controller of Meteorological Services.

# 1950

# NEWS on the DOT

Jan. 19, 1949.

Andrew Thomson, O.B.E., Controller of the Meteorological Service of Canada, will be Canada's representative in the meteorological section of the Pacific Science Congress to be held in New Zealand early in February. Canada's top weatherman leaves today and on his arrival in Auckland, N.Z., will lead the discussion in the Congress on the problem of trade winds in the Pacific.

# WORLD'S WEATHER MEN MEET IN PARIS

Trees budded and flowers bloomed several weeks early in Paris this year. The phenomena can be explained perhaps by the presence in the city of representatives from twenty-nine nations attending a joint meeting of the International Meteorological Organization and the Meteorological Division of the International Civil Aviation Organization. Among the members attending was Mr. H. H. Bindon, Superintendent of Oceanic Aviation with the Canadian Meteorological Division.

During the six weeks of meetings, much was accomplished in the standardization of aviation meteorological procedures throughout the world. At all times the use of jet-propelled aircraft for commercial use was borne in mind in the drafting of recommendations and procedures. Mr. Bindon was impressed by the spirit of co-operation and friendliness that pervaded the meetings. The truly international nature of weather provided a common ground for discussion and understanding. Although Mr. Bindon was enthusiastic about the hospitality extended by the French Hosts to the conference, he declined to elaborate on the famed Parisian night life, maintaining that the gathering of world weathermen stuck strictly to business. (Ed. note---Even after midnight?)

HOYT S. VANDENBERG
Chief of Staff, United States Air Force

## OPERATION ICECAPADE

The days of pioneering in Canada are not over, at least not as far as the Arctic is concerned. Recently Percy Saltzman, representing the Meteorological Division, accompanied members of the Joint Intelligence Board, the Defence Research Board and McGill University on a two-day reconnaissance flight over Hudson Bay. Contrary to the information included in most text-books and charts, Mr. Saltzman reported that, with the exception of a few minor shore leads Hudson Bay was entirely frozen over. Similar flights during the past year have also found the Bay ice-covered, in contradiction to the old belief that the Bay did not freeze over. It now appears that the Bay is ice-covered from January to April each year.

In a highly entertaining address to the Royal Meteorological Society, Mr. Saltzman recounted his personal experiences in connection with this scientific flight. Despite the discomfort of a crowded aircraft monotonous hours of painstkaing observations, and cold blasts of Artic air, these investigations are filling in a blank space in our knowledge of the Canadian North. All flights have been made by the R. C. A. F.

# WAGNER, ALBERTA

## WAGNER MET. STATION

Perhaps many employees of the D. O. T. have never even heard of such a place. Well it is by no means a brand new station nor an out of the way station. It is situated on the south shore of the east end of Lesser Slave Lake, latitude 55° 21′ N., longtitude 114° 59′ W., and is only a stone's throw from the railroad and highway. This highway is the only one linking Edmonton with the Alaska Highway and although it is not a modern one it is a very important one.

The Meteorological Office along with a Repeater station was built by the Americans during the year 1943, and was manned by their Army Air Corps and Army Signal Corps, respectively. The Weather Office gets its electric power and running water from the Repeater Building.

The Meteorological Office was officially transferred to the D. O. T. on 1700M January 15th, 1946. It has since then been staffed by four Meteorological assistants, Grade 2.

The Repeater Building eventually was turned over, in 1947, to the Canadian National Telegraph Company, which still operates it.

Our weather transmissions are sent out directly on circuit 103. To all stations having a map of the Meteorological teletype Communication System our location will seem quite prominent.

The two main local occupations are lumbering and mink ranching.

For the enthusiastic hunters this district offers its share of deer, moose, and black bears. Needless to say, the lake forms a summer's fun in boating, swimming and fishing.

The picture shows Wagner as it appeared in February, 1946. The lake can be seen in the background, with its north shore forming the horizon. The railroad and road are a few yards from the front of the Meteorological Office.

If plans do not fail, a picture taken in February, 1950, will show Wagner Meteorological Office as a brand new building.

# WATSON LAKE MET MEN ENJOY(?)-62° WEATHER

From Watson Lake in northern B.C. comes a frozen piece of prose to warm the hearts of all who live in the deep south of Canada. Wilbur Hockin, Meteorological Assistant, reports:

"We are not living in an ice box."

In the darkness between 7 and 9 a.m., Friday, the official reading of our thermometer dropped to 62° below zero. In that kind of cold, we find we must accustom ourselves to a new, different way of living. Even the simple act of breathing is done, not automatically, but with extreme caution. One's life may depend on the way he moves. One breathes by inhaling through the nose a short time and then exhaling through the mouth so membranes of the nose will not be iced and frozen. To continue this, however, would be to allow the nose to freeze, so one must change to inhaling through the mouth and exhaling through the nose from time to time. Teeth soon ache with the cold, no matter how one breathes.

Oil tanks for stoves must have pipes leading from outdoors at least one and one-quarter inches in diameter; otherwise the fuel oil will congeal and cease flowing.

Cold penetrates log walls eight inches thick, and frost on nailheads on the interior of cabins stands out three-quarters of an inch.

When the temperature is lower than 50° below, the Air Lines operate only during emergencies, so mail and transportation ceases. If aircraft motors are turned off, the oil congeals rapidly.

Despite the fantastic cold, work continues almost as usual here.

# 1951

# NEWS on the DOT

1. Capt. Sleight checking navigation radar.
2. Tom Morrison-Marine Agent at Victoria, operational base of Weatherships.
3. Recording information from radiosonde instruments in flight.
4. Radio officers checking flight of radiosonde reflector by radar.
5. Andy Thomson - 'Mr. Weather', himself.
6. Releasing balloon for upper air data.

## TRI-SERVICE BOYS ON DOT'S WEATHERSHIPS GAIN SEA-LEGS AT STORMY "P" FOR PETER

"It was a quiet and lonely job, but I am pleased with the performance of the ship and we accomplished what we set out to do". So said Captain J.H. Sleight on board the Department of Transport's new Weathership, CGS "St. Catharines." It was the last day at Ocean Weather Station "P" for Peter, a spot in the North Pacific, 900 miles west of Vancouver Island. The last weather diagram had been plotted and coded, the last radio report had been transmitted, the "Stonetown", the relief weathership was in sight, and the men were looking homeward.

The Weathership, "St. Catharines", arrived at Station "P" for Peter on December first, to begin Canada's ocean weather service in the Pacific. For six weeks, she had patrolled this 10-mile square of tossing Pacific water, only sighting a ship or plane in the distance. The only life seen were several whales, some seals and dozens of friendly seagulls. The scenery out there at Station "P" for Peter in the grey Pacific never changes, the sky and endless ocean are its boundaries.

The men became used to the fifty knot winds, and storms which became almost continuous during this mid-winter season. It was a real testing period for the sturdy vessel, a former frigate, chosen by the Department of Transport for this new Met. service, and her performance was good in the rolling and pitching caused by the heavy seas. And in the wind, with the rain slopping around the deck, the weather men were out, several times daily, sending up their balloons to get the vital upper air information on wind, barometric pressure, temperatures and humidity, to send by radio to ships, aircraft and coast stations. On their first tour of duty in the North Pacific, the weathermen had seen "weather".

Why choose this particular spot on the map, so stormy and so remote? First of all, Station "P" is designated as the centre of a meteorological "grid". It lies directly in the path of most of the storms that sweep the west coast of Canada and the U.S.A. It is a key location for maintaining a close watch on the pulse of the weather, particularly with respect to upper air currents at the 40,000 to 50,000 foot levels, and such weather forecast information is needed for more accurate forecasting in western Canada and the U.S. It also lies directly in the track of air routes from the U.S.A. and Canada to Japan. It is also on the Great Circle Route for surface shipping between the Pacific Coast of North American and the Orient.

For the Korean airlift this was a very timely service, (operated for awhile, before Canada took over, by the U.S. Coast Guard Service). Weather forecasts made from information on both surface and upper air temperatures, wind direction and velocity as well as other weather data are available to both the commercial and service planes flying in the "airlift". Canadian Pacific Airlines, Bri-

(Cont'd on page 8)

Canada's Three Weatherships for "P" for Peter.

## WEATHERSHIPS

(Cont'd from page 1)

tish Commonwealth Pacific Airlines and U.S. Airlines also need these weather reports in planning their flights to Tokyo, Honolulu, Hong-Kong and Australia, to enable them to operate at minimum fuel consumption and maximum payload. As time goes on, a network of ocean stations will be operated across the Pacific.

Mariners and pilots all know the position, call sign and radio frequency of the weatherships. They know if they call Station "P" for Peter, they can be given their bearing and, if in distress the weathership can come to their rescue, or guide other ships to their position. The weatherships, themselves, are well equipped for air-sea rescue, with towing bollards, one-ton cranes and four steel engine-driven lifeboats. A constant air-sea rescue watch is kept and continuous aids to navigation for aircraft and surface shipping are maintained. The Department of Transport has issued notices to all mariners and air pilots on the communication signals and facilities of her weatherships.

While the location of "P" for Peter may be far from the scenes of "life", the men on board report that time does not hang on their hands, neither have they time to be lonely. When day's duties are over, the men have a comfortable lounge to go to. Perhaps there will be a movie to see, some records to play or a book from the library, play cards, work at some hobby, or just sit-talk-grow beards. And so time passed on the "St. Catharines", nothing exciting happened from day to day but everyone is alerted from any eventuality.

But now the "St. Catharines" has completed her first tour of duty. The sister ship, the CGS "Stonetown" has arrived to relieve her, so it's full speed ahead for the "St. Catharines" to her shore base at Esquimalt for servicing. The personnel aboard her will make up for their Christmas and New Years spent at sea and the "Stonetown" will start her six- week patrol under Captain J.W. McMunagle.

The "Stonetown" is the same type of ship as the "St. Catharines", a former world war II frigate acquired by the Department of Transport. Both these vessels have been completely converted to fit them as weatherships. The hull of each was reinforced and the decks strengthened to support the special equipment for the particular type of work required on the weatherships. Standing by at Esquimalt is an emergency weathership, the "St. Stephen" which was formerly stationed at Weather Station "B" for Baker in the North Atlantic which Canada operated jointly with the U.S.A. Now Canada has relinquished her responsibility there, in order to concentrate on "P" for Peter.

Three separate branches of the Department of Transport, Marine, Meteorology and Telecommunications, have combined their respective facilities to provide at Station "P" for Peter an efficient and reliable year-round weather service which will be of immeasurable benefit to all Canadians.

CYRIL BROMLEY, naval veteran of the First World War, joined the Meteorological Service at Calgary when the Prairie airmail service was inaugurated in 1930. The Meteorological Service expanded rapidly to meet the needs of the airmail and air-passenger service from Winnipeg to Lethbridge but the depression arrived and the government disbanded it as part of its economy measure. Most of the personnel were laid off, although a few key men, such as Mr. Bromley, were retained and they formed the nucleus of the Meteorological Service required when Trans-Canada Air-Lines was established in 1937. He remained Officer-in-Charge at Calgary until 1939 when he was called back to the Canadian Navy where he remained until the end of the war, rising to the rank of Lieut. Commander. He has been Naval Aide to two Lieut. Governors of British Columbia. Mr. Bromley returned to the Meteorological Service in 1945 at Vancouver and soon took over the post of Port Meteorological Officer, which position he ably filled until October 3rd when he began his Retirement Leave. His fellow workers at the Vancouver District Forecast Office presented him with a pipe lighter

# PRIVATE SECRETARY

H.D. Cameron, Executive Assistant to the Director of Air Services and one of the departmental graduates from the Defence College at Kingston, has been appointed Private Secretary to the Minister. He succeeded Miss Gougeon who went to the Maritime Commission as Secretary. "Don" Cameron's first position in the Department was with the Met. service in 1940. During the war years, he was in charge of meteorological work at the RCAF stations at Patricia Bay and Comox B.C., and Greenwood, N.S. Since the war he has been Liason Meteorologist at head office and later Executive Assistant to the Director of Air Services.

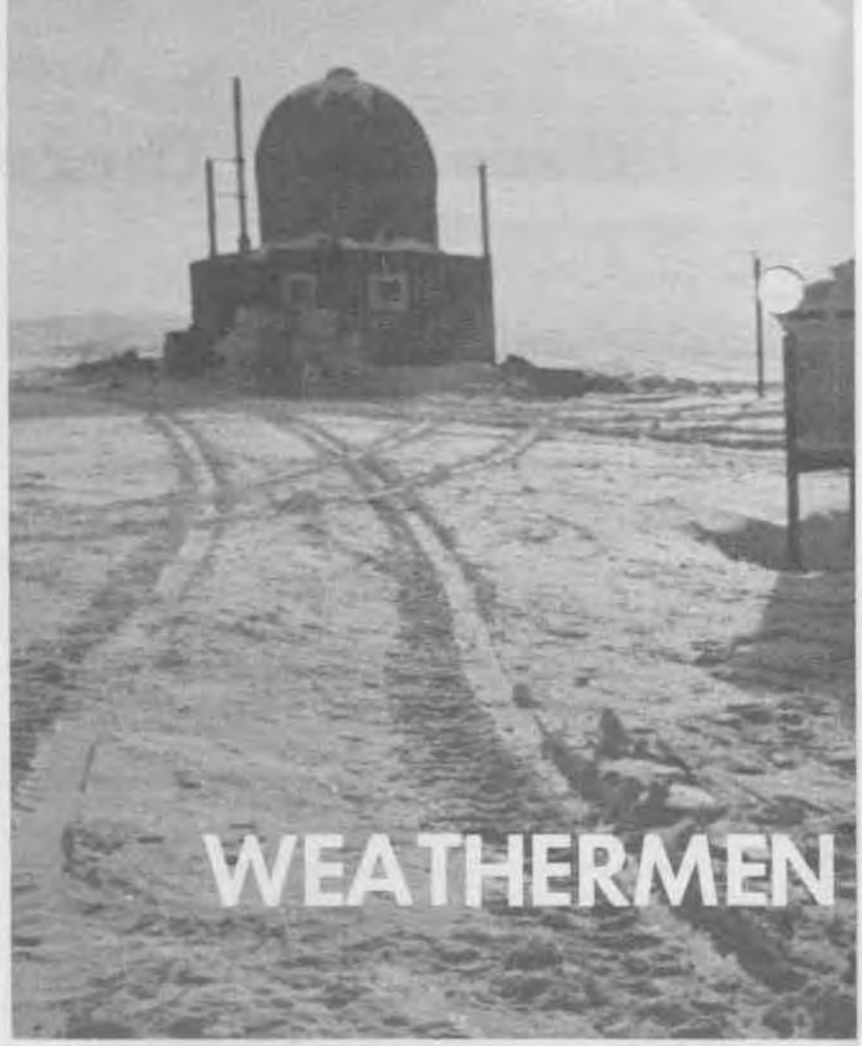
# 1952

# NEWS on the DOT


At Alert, 450 miles from the North Pole, the northernmost weather station in the world, Bob Miller, Toronto, takes a radiosonde base line check.

The weatherman releases the radiosonde balloon with its tiny radio transmitter. The fibreglass domed building contains the radar equipment which tracks the weather balloon and records upper air wind direction.

With the return of the sun in April, comes the annual "Operation Re-supply". For these Met men at Mould Bay it means hours of waiting for the plane and hard work, offset by the arrival of long awaited mail and supplies.



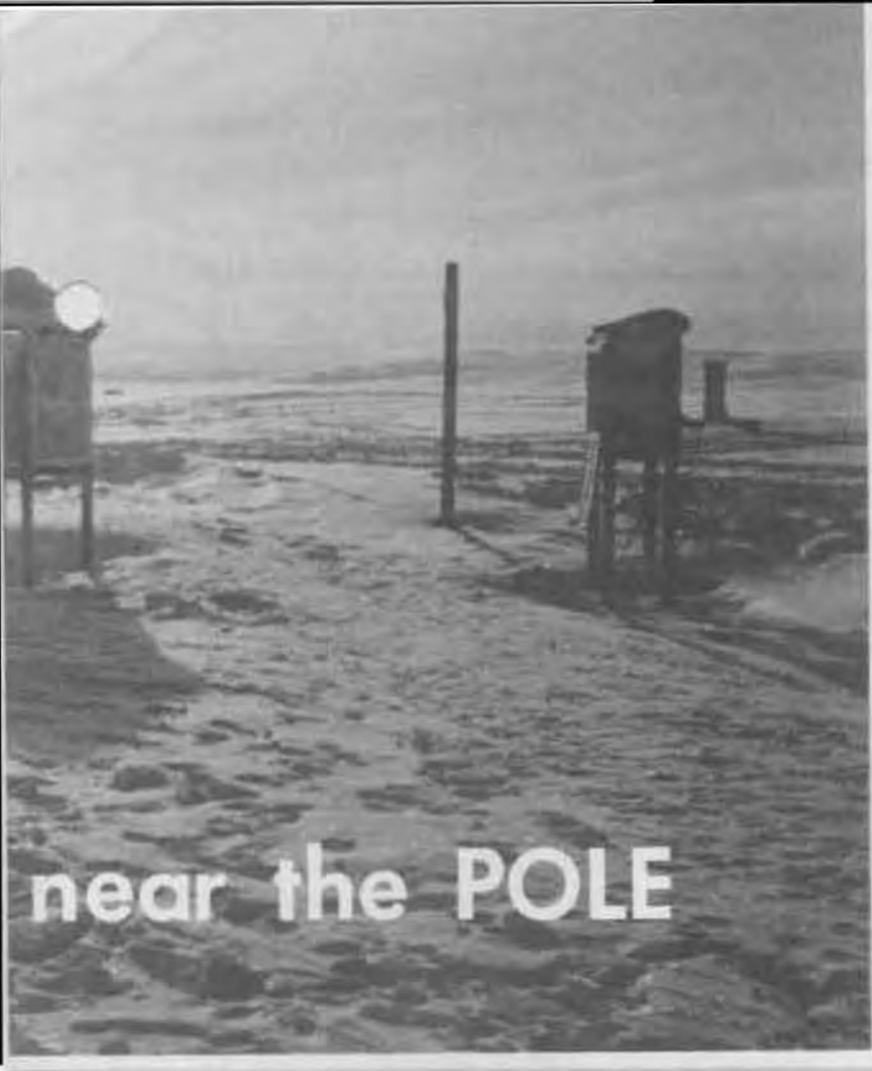
# WEATHERMEN

PHOTO-STORY BY WILF DOUCETTE

Weather is the business of a small core of men who live on top of the globe, harvesting information that affects the comfort of the entire world. Based in small clusters of international orange coloured buildings at Alert and Eureka on Ellesmere Island, Mould Bay, Isachsen and Resolute, Canadian and American ''met men'' are jointly engaged in exporting data on the Arctic's one natural product --- *weather*.

Twice a day they send up radiosonde or rawinsonde balloons, according to the nature of the station. With the former, tiny radio transmitters attached to the balloons send back signals on pressure, humidity and temperature of the upper atmosphere. The rawinsonde which can be tracked during their ascent by radio direction finder or radar, provide the additional information of the speed and direction of the upper winds. And through a high-powered telescopic device they follow the course of small pibal balloons across the bleak Arctic sky every twelve hours to record lower-level

Each station presents a different problem in obtaining its water winter. At Isachsen, the men cut snow blocks which are carried to th on sleds. The snow blocks are passed through a window into a room snow is melted and the water is then pumped to an overhead tank; thus running water for showers and for the washing machine on wash day; I Ingram of Winnipeg, brings a snow block to the kitchen where cook Jim New York says "Just one today". Other stations get water from th blocks of glacier ice.



# near the POLE

wind directions. Eight surface weather observations are made daily, noting clouds, ceiling, visibility, pressure and snow-ice conditions. The information gathered is radioed to Edmonton for relaying to weather bureaux throughout the world.

The bearded and parkaed weathermen who staff these lonely outposts are a strange collection of realists and romanticists. Sparked initially by the opportunity to save almost all their salaries in this remote corner of the world, many of them admit that something more than that draws them back year after year to face the intense cold and loneliness. The age-old challenge of the lonely and beautiful tundra that lured early trail-blazers north of the ''Circle'' seems to exert an influence on these modern weather explorers.

It is this strange combination of scientific precision and just plain courage that writes the script for the radio-announcer who casually drawls: ''The outlook for tomorrow is ....''

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Another weather operation - sending up a pibal balloon. In the hut shown here is the device the weathermen use to follow the course of the balloon in the lower atmosphere.

Bill May from Toronto, talks over problems with John Lewis, former OIC at Alert. (R) Wes Stanley, radiosonde operator from Vancouver, only DOT man staying over at Mould Bay for a second year. Mail from "outside" is an event.

Many weathermen become keenly interested in searching for old campsites, fossils, petrified wood, etc., in off hours while tramping the wind-swept Arctic wastes.

A.H. Matheson, from Lethbridge, Alta., at Resolute Bay Arctic Station tracks the course of the rawinsonde balloon. (R) Gerald Obell, from St. John, N.B., also at Resolute Bay, takes readings transmitted by radiosonde instruments aloft.

Resolute is base for Arctic weather stations. Here personnel and supplies are gathered for dispatch by "Operation Re-supply" to met posts further north.

Radio provides the year round link with the outside world as well as sending out weather data at station intervals. (R) Steve Kolin, from North Battleford, Sask., at Isachsen using a theodolite - a telescopic device used to follow the course of the pibal balloon.

# LIFE IN "AIR DROP VALLEY"

Oscar C. Grandy, O.I.C. Clyde River, who wrote this story.

For many months now, our station at Clyde River, N.W.T., situated on the barren shores of Baffin Bay, has been known as ''Air Drop Valley''. The station has had other names pinned to it such as ''The Garden Spot of Baffin Island'' and ''Your Top of the World Station'', the latter being discontinued since another station claimed the honour. It was not until two parachute airdrops within weeks of each other, that Clyde River received its now famous name. One of these ''drops'' was drugs to combat an epidemic. Since the first drop in November, up to May 19, there have been seven airdrops, and on three occasions a plane has landed on the Bay in order to evacuate or replace personnel.

The Bay upon which most of the dropped bundles should land is seven miles long and two miles wide. On the far side we lay out an air strip to guide any planes landing. In the last drop, witnessed by all but the one radio operator on duty, four of the fifteen bundles landed in the drop zone, the rest within a radius of three miles. One landed among the Eskimo tents and Komo, an elderly native, never moved as fast in his life, dodging a falling crate. Another landed on a roof, some in between the radio masts, and one chose the one puddle of water for miles around to find a resting place. The ''watchers'' later verified the fact that one didn't quite know where to point ones camera in order to get the best pictures of the proceedings. It is a pleasant sight to see these red, yellow, blue and green parachutes descend upon us, carrying mail, bundles of fresh meat and other supplies. Thanks to the Post Office Department, our mail has always been forwarded to another somewhat northerly station often referred to as being in ''the Banana Belt'' from where it has been placed aboard the plane coming to ''Air Drop Valley.''

The majority of the buildings at the station are strung out in almost a straight line running north and south. The five nearest to the shore of the Bay, about fifty feet above the tide mark and forty to fifty feet apart, belong to the Hudson Bay Company. The next five above these and about one hundred feet from the beach are owned and operated under the watchful eye of DOT as are the remaining six buildings. Two of these are above the OIC's house, the last in the second group. The Rawinsonde Tower, tallest of the buildings, and the Hydrogen building occupy a spot about two hundred and fifty yards from the beach and on the crest of a slope away from all the buildings where it is very easy to release the large balloon used for taking the Rawinsonde flights twice a day.

Continued on Page 8

Many of the members of ''Air Drop Valley'' will be leaving when the DOT's annual supply ship, ''C.D.Howe'' comes into our Bay (about September 12) and discharges the year's supply of food and fuel as well as hundreds of radiosonde instruments that will enable next year's staff to carry on the upper air observations. At present, the staff are as follows: John (the dark one) Brisbois, radio operator; David G. (the bearded one, also Dagmar) McMillan, radio operator; S/sgts ''Jim Lindsay and ''Bob Clark, U.S. Airforce radio operators; Michael (little Mike or the small bearded one) Morgan, Met Assistant; Donald (a way with the women) Downey, Met Assistant; Fred (imitation of the one who was here before) Rossy, Met Assistant; Ray (cookaluk) Plourde, Air Drop Valley's happy chef. The last staff member is myself Ozzie (the little boss ) Grandy. The representative of the Hudson Bay Company, Peter Murdock, makes up the total population of ''Air Drop Valley''. There are no RCMP at this station, although David van Norman spent two weeks here in February, while making his annual patrol, but returned to his post some three hundred miles up the coast. The only other white visitors have been the missionaries, Reverend Mr. Tom Daulby, the Anglician Missionary, in March, and Reverend Father Danielo, O.M.I., the Roman Catholic missionary in May.

There have been very few complaints about the weather at ''Air Drop Valley''. Many people think that it is always cold (fifty and sixty below) but such is not the case. Naturally during the cold months, parkas and mitts are worn outdoors. On the 13th of January, when the RCAF made a drop of fresh meat and mail, most of us stayed outdoors for more than an hour even though the temperature was forty-two below zero. Looking back over the months it would be safe to say that we have had only seven bad storms or ''blizzards'' when it means taking extra precaution in going from one building to another. The storms usually last from ten to twenty hours after which it will be perfectly calm. The ''daddy'' of them all was on the 6th and 7th of April. It lasted thirty-six hours but the winds were over ninety miles an hour. We have enjoyed endless days of clear calm and fine weather, the good days more than making up for the stormy ones. For those who like statistics, here are a few. The sun was lost to us about the middle of November. We saw it again on the 28th of January but the days previous to that were cloudy. It does not get totally dark--there are about two hours of twilight near noon between eleven and one, on or near the 22nd of December. The coldest temperature was recorded in mid January when it was 48.5 degrees below zero. The sun is visible for twenty-four hours beginning May 18th.

Such is life in the cold, desolate, mountainous, frozen but intriguing north here in ''Air Drop Valley'', otherwise known in official circles as Clyde River, N.W.T.

The weather station personnel at Mould Bay standing in front of the operations bldg. - Lynn Glass, Watonga, Oklahoma; Roy Hayward, Toronto, Ont. - new officer in charge; Robert Shakman, Brockton, Mass; Anton Hanchenkon, Toronto, Ont; Thomas T. Joines, Detroit; Wes Stanley, Vancouver, B.C; Jack Hart, Port Rowan, Ont; Frank Wojtalewski, Syracuse, N.Y. (missing when picture was taken was E.L. Storey, U.S. Executive Officer).


Staff at Isachsen station (at spring change; new arrivals have haircuts.) Front: Steve Kalin, North Battleford, Sask.; John Lessard, Killaloe, Ont.; Art Moron, Toronto, Ont.; James C. Perry, West Chazy, N.Y.; Mike Young, Cape Breton, N.S.; Charles Dow, Wiarton, Ont.; Paul Coree, Portland, Ore. ; Gordon Meacher, Toronto, Ont.; George R. Toney, Pigeon Cove, Mass.

# MET REPORTS

## GLEANINGS FROM GANDER

Bob Stark

All members of the Met staff were saddened at the death of Mrs. Lenahan, wife of the OIC. All who ever met Mrs. Lenahan remember her happy smile and cheerful disposition.

Sincerest condolances to Mr. Lenahan and his three boys.

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During the past summer we have said ''goodbye'' to many friends at this station, posted elsewhere, and 'hello'' and welcome to Gander to others from many other parts of Canada.

The postings were mainly the results of competitions. Forecasters who left include Roy Lee to Research and Training at Head Office; Paul Benison to Central Analysis at Montreal. ''Mac'' Elsley went to the TCA Liaison position at Montreal, and Moe Kestenberg went to California to study for a doctor's degree.

Out of the Assistant's ranks, Charlie James went to CAO Montreal, and Frank Healy to Torbay.

Five left Met Office for ATC, being Bill Banfield, Ed Moore, Don Blackmore, George Smith and Brian O'Rourke.

*Recent Arrivals*

Newcomers to the staff included Miss Angela Chafe, Steno, St. John's; Al Evenson, Forecaster from Edmonton; Don Day, Forecaster, Moncton; Tom Rissesco, Assistant Met, Parrsboro, N.S.; Steve Nikleva, Forecaster, Toronto; John Chafe, Teletypist from CNT; Fred Hoskins, Assistant Met from Goose Bay; Lorne Elms, Assistant Met from Bay Roberts; Max Thistle, a former school teacher at Gander, from Burlington, Notre Dame Bay, was at Gander a few weeks before going to Toronto for a radiosonde course and then headed for the north; Alex Chisholm, forecaster from Malton; Bill Abbott from St. John's; Max McKinnon from Liverpool, N.S.; and Leo Byrne from Tilton, Conception Bay, Nfld.

*Other Recent Arrivals (to the Staff)*

Dianne Jacqueline Greene, Karl Joseph Simla and David Francis Denison. Forecast notice.--- Stuart Stark arrived September 19 to Bob and Margaret Stark. This makes the third boy born to Gander forecasters this year. For three years past there have been born each year to the forecasters three boys and one girl. Looks like we can expect a girl in December. *(Looks as if the weather boys are forecasting other facts besides the weather).*

The Gander Met. Office has taken on a modern appearance with the installation of metal forecast desks, and a smart counter which separates air crews, dispatchers and other customers from the general office. Now, the most onerous duty of forecasters is walking back and forth to the teletype room to collect and file data. Over a mile is walked each day in this task. However, soon there will be an aerial runway to carry this traffic. The device, consisting of a metal basket, pulleys and clothesline wire, has been built by Norm Powe, with suggestions from several members of the staff. Norm has been experimenting in his garage for a few weeks perfecting this runway.

At a farewell party held for Washburn, Lee and Johns: Fr. Row: J. Simla, R. Simla, S. McKay, F. Sutherland, F. Johns M. Cake, M. Stark, Sec. Row: R. Wright, F. Washburn, J. Lee P. Kestenberg, J. Elsley, B. Gilbert: Back: P. Johns, C. Sutherland R. Lee, G. Washburn, M. Kestenberg, M. Elsley, G. Gilbert.

*Sports*

Salmon and trout stories are over for this year with the close of the fishing season in mid-September. This date, however, opened the shooting season but bags to date have been light as there seems to be more hunters than ducks. Only the second season from December 15th on is open for moose and caribou in areas accessible by road and rail, so any who want them before that date have to travel by boat or plane into the wilderness. None of the Met staff plan on doing this.

Bowling is Gander's latest sport. Forecaster Don Day, was elected president of the newly formed bowling association. The league, which got underway in late October, consists of a 16-team men's league and a 16-team mixed league. Met has three teams in each league. Captain's in the men's team are Teletype, Ron Chafe; Observers, Cecil Saunders; Forecasters, Don Day. Captains in the mixed league are Harry Carter, Norm Powe and Al Evenson.

GANDER CHILDREN PLAY WITH BABY MOOSE. Many famillies went to Glenwood to see the baby Moose that was there for a few weeks before being sent to Bowrings Park in St. John's. Seen here are: Barbara Ellen, Ann, and Ricky Gilbert, and John Sutherland. Looking on from the rear is Conn Sutherland.

*On the Lighter Side*

A few month's ago Teletype sent this out as part of the Marine Forecast for Belle Isle Area: ''Visibility 6 miles, lowering to 1 mile in fluffies''. Rather descriptive!

What is Canada's foremost Arctic Supply Ship ''C.D.Howe'' doing off the southeastern coast of U.S.A.? Yes, the name ''Howe was marked beside a weather report from a ship plotted at 36 N.70 W. However, it was only ''Weather Ship H'' with an ''E''added by the plotter. This error will not likely occur again as in the phonetic alphabet the weather ship becomes ''HOTEL''

Forecaster Norm Powe has a bright two-year old son, Gregory. Greg has long known that c-a-n-d-y spells candy, but the other day he surprised Norm by asking ''Please Daddy, can I have some D-O-T?

Sex has now appeared in a weather forecast! This word which is used so often in current publications, occurred when a forecaster referred to ''sextions of the islands'' in the synopsis.

# Across Canada with D.O.T. Reporters

## SUMMERSIDE

''Now Summerside will take her spot
Within the pages of the DOT.''

Hal Robertson, posted to Penhold, Alta., spent a couple of weeks on temporary duty at Winnipeg while enroute. Jack Evans has been accepted for the MA Meteorology course and left in September for Toronto. We welcome Clarke Tingley and his wife to our staff from Winnipeg.

Before Hal left we called the clan together and presented him with a pen and pencil set. Just before he departed he arranged a bang-up meteorological display for Air Force Day here at SU.

Art and Lois Lamont turn dramatic on the local stage each year. This year their play ran on and off for about two and a half months. Performances were staged in about twelve different halls scattered across the ''Island''.

''Now that we've told you what is what,
And this, right now, is all we've got,
Best wishes from this eastern reach,
Yours very truly, James A. Peach.''

## HALIFAX

E.A. Croucher

This is to send greetings from the Meteorological Office at Halifax and also Pieter de Groot and the boys at the Weather Observing Station at Lucasville, who during the past summer, have been raising prize-winning vegetables on the site of Halifax's future airport (?).

The Weather Office varies slightly from most offices in the Federal Building here at Halifax in that we are accustomed to entertaining many of the interested public. Groups of Naval Officers, Merchant Navy, high school students, yachtsmen and ''Meet Your Weatherman'' radio fans are usual, and I was not a bit surprised yesterday to enter the teletype room and find a chubby Boy Scout holding forth at a perforator. We also receive many more letters than most offices, but a description of the humour, etc., in these would fill many issues of the D.O.T. news.

Incidentally, this 14-storey Federal Building is receiving plenty of shaking these days by the explosions taking place in Halifax Harbour where a wrecking crew is trying to remove a shipload of ammunition which burned and was sunk by R.C.N. gunfire one hectic night during the war.

We have had an excellent summer in the Maritimes: Yarmouth had its usual average of 25 foggy days per month, but in most places plenty of suntan oil was used. It was a fine summer for Burpee Mason (who went to Tangier in time to help with haymaking) and Stan (DiMaggio) Westhaver who have left for Resolute, N.W.T. These Met Assistants have volunteered for the ooportunity to study conditions in the North. We have also lost Doug O'Reilly to the R.C.A.F. All these departures make for good office parties, but the boys will be sadly missed -- especially by Matt Dolan who trains the new recruits.

In between studying for barrier exams and doing research, the staff took part in a CSC softball league this past summer and have planned the usual bowling leagues this winter: Met and Radio Branch combined, Ladies' only, and the Male CSC league (consisting of teams from DVA, Customs, Family Allowance, Treasury and Admin, Immigration, National Harbours Board, Unemployment and Telecommunications and Met).

Our teletype room has recently been improved by a large picture of the newly proposed Met. Division badge done by John Fox, who is also famous for his last Christmas (Kiss) greeting on teletype. John has also designed and made an improved inkwell for plotters working on sloping plotting desks, and we see in the boy a budding Edison.

## MONCTON

Barrie Miller

The main social event of the summer season for the Moncton District Office was the staff picnic held on a beautiful August afternoon at Fundy Park, Canada's newest National Park, fifty miles from Moncton. Swimming in the salt water pool was the main attraction. Tracy MacFarlane, Bill Coles, Johnnie Saphir, Pat Ascroft, Yoland Goguen, Barrie Miller as well as others displayed their aquatic ability for the benefit of the less timid souls. Many just explored the beautiful spacious park.

After lunch came the soft ball game with both teams ending the same, 14-14. Ray Branscombe, Irvine Long, Len Fitton, Florence Le Blanc and Frances O'Blenis presented several extraordinary inovations to the game and Allan MacKendrick specialized in several long hits.

The social committee consisting of Edna Foran, Bernice Leger, Betty Carmie, Ev Armour and Ches Bateman deserves the thanks of all for a fine picnic.

During the past months, presentations were made to several of the staff on the occasion of their leaving their positions. Dolores Melanson on the occasion of her marriage; Mrs. Geneva Wilson who went to Moncton Aeradio Station; Yolande Goguen who left to accept a position as telephone operator at Goose Bay; and Miss P.M. Ascroft who went to Airport Manager's office at the Moncton Airport.

## MONTREAL

C.H. Skelton

Paul Johns of Meteorological Services was transferred in September from Gander back to the main met office at Dorval where he had been posted prior to his term to Gander in 1950.

R.R. Dodds, Met Service was transferred to CAO from DPWO. M. Hall departed for California in September where he will take up permanent residence.

Ross Hague, also met, made a familiarization flight to Kingston, Jamaica on October 20. These trips are taken by the forecasters to acquaint them with weather conditions encountered on various air line routes.

See also page 6

Continued from Page 5

## TORONTO

A number of head office meteorologists were delegates to the Buffalo convention of the American Meteorological Society and played an active part in the deliberations. This meeting was noted for the large number of Canadian contributions. Among the speeches and papers delivered were: ''The Canadian Experiment'' by P.D. McTaggart-Cowan; ''Energy in the Atmosphere'', D.P. McIntyre; ''Training of Meteorologists in Canada'', C.M. Penner; ''Low Temperature Fog in Canada'', W.L. Godson; ''Three Dimensional Frontal Analyses'', C.M. Penner and A.M. Crocker.

The Controller, Andrew Thomson, was on extended business trips to Trinidad for meetings of the Eastern Carribbean Hurricane Committee, and to Europe for meetings of Executive Committee of the World Meteorological Organization in Geneva.

K.T. McLeod, Superintendent of Public Weather, flew to England to take part in meetings of the Maritime Commission of the World Meteorological Organization. He chaired many of the business sessions and managed a side-trip to Paris.

Recent arrivals to staff here include Joe Clodman from Montreal to head office Research and Training Services; C.L. Mateer from Malton to the same place; Gil Fozard from Edmonton to Head office as District Teletype Supervisor; R.Lee from Gander to Head office Research.

Two conferences of Officers-in-Charge of field forecast offices were held with great success--one for District Officers, the other for Department of National Defence Weather Officers.

The Toronto Star annual puzzle threw most of us for a loss but among the prizewinners were Alec Chisholm (Malton), Bill Rae (Arctic section) Isobel Bagnall (Arctic section) and Fred Albert Page (Verification.) Prizes were nominal.

P. Saltzman

# Christmas Cruise in Mid Pacific

Marine, Met and Radio up to bat

The forecast is in the cards

Christmas this year aboard the C.G.S. St. Catherines at lonely Ocean Station "P" will be made as pleasant as possible for its staff of Department of Transport personnel. Special Yuletide fare, Christmas mail, and even a Christmas tree were taken aboard prior to departure. On December 19, the C.G.S. St. Catherines relieved her sister ship in time to allow the personnel of the C.G.S. Stonetown to reach their homes for Yuletide festivities.

The two weather ships share the endless vigil at Ocean Weather Station "P" and alternate on the six-week round of duty. The men assigned to these ships are carrying out one of Canada's chief responsibilities to the International Civil Aviation Organization in gathering data for weather forecasts as well as rendering assistance to aircraft and shipping as required.

Canada's weather ships are "Happy Ships". Staffed by 41 officers and seamen, five meteorologists and nine radio technicians - all members of the large D.O.T. family, - they spend their working hours and their leisure moments together and get along remarkably well. Needless to say the end of the six-week patrol finds them happy to set foot ashore again and see their respective families as well as the bright lights of Victoria and Vancouver.

In keeping with the best traditions of the sea all personnel are on hand when the time comes around again to proceed to Station "P" to relieve the sister ship with its complement of D.O.T. personnel. The reason that the Canadian weather ships are such happy ships is due mainly to the kindly attitude taken by the Department of Transport towards its staff in their mid-ocean vigil. This dates back to when the ships were being reconditioned. Special attention was then given to provide roomier living quarters and to allow more privacy than is enjoyed on most ships. In addition an extra large, well equipped recreation room was built in the aft deck.

The Department has equipped each ship with a projector and sufficient movie films for a six-week period are supplied for each trip. Other entertainment is supplied by the Department and the men themselves contribute additional facilities through their canteen service. When off-duty, the men spend their time at the twice-weekly movies, join in the sing songs around the piano, play games such as ping-pong, cards, etc., read books from the well stocked library or listen to the radio-phonograph.

The Christmas crews and a carol

Yarning..........

Off Hours...........

...Dreaming of a White Christmas

## HONOUR "ANDY" THOMSON

Andrew Thomson, Canada's No. 1 Meteorologist and Controller of the Meteorological Division of the Department of Transport, was signally honoured on March 22 last when he was presented with the 1952 Gold Medal of the Professional Institute of the Public Service of Canada. The presentation took place at the luncheon which featured the 32nd. annual meeting of the Institute.

In making the presentation, Institute President Harold McLeod quoted from the report of the Board of Award Judges which stated that ''Mr. Andrew Thomson has acquired for himself an enviable position in world meteorological council. He carries high the banner of Canadian science. The Medal of the Professional Institute of the Public Service of Canada is a fitting tribute.''

The judges' report further said that ''One of the most striking developments in the meteorological service under Mr. Andrew Thomson's direction has been the work in the polar areas. With the rapid development of aerial service in the far north, and with the increasing importance of that area from the standpoint of defence, the need for meteorological knowledge, day by day, has become urgent.''

''Mr. Thomson has shown foresight and vigour in developing this important service. The scientific progress in meteorology both in ground level and upper air altitudes, for which Canadian meteorological officers have been responsible, is being widely recognized.''

In responding, Mr. Thomson said that ''the credit for winning the medal should go to the members of the Meteorological Staff,'' which he said, was a very large team with some 1500 players serving in some 1100 stations. ''The medal is awarded to a team, extraordinarily scattered, but who, thanks to communications, play together with unbelievable smoothness.''

In his kindly manner, Mr. Thomson likened the Meteorological Service to a village cricket team he had seen many times in his nine years' stay in Robert Louis Stevenson's island of Samoa in the southwest Pacific. ''It wasn't a regular cricket team with a captain and ten men on a side, but the whole village - men and women, boys and girls - played as one team against the team from a neighbouring village. When a team won, it was through the combined efforts of the entire village.''

Continued on Page 6

Andrew Thomson Receives Gold Medal. Left to right, Dr. O.M. Solandt, J. Stuart McGiffin, Mr. Thomson, President Harold McLeod, Hon. P. Martin, Min. of Nat. Health and Welfare, Hon. L.B. Pearson, Min. of External Affairs.

Thanking the President of the Professional Institute for the Gold Medal which had been presented to him, Mr. Thomson referred to the fact that this medal had been awarded to a group of distinguished civil servants over the years. ''It is a great honour indeed to be included in such a roster of men who have added honour and distinction to the Civil Service although I must confess my own work seems very small indeed compared with theirs.''

The presentation of the Institute Gold Medal to Mr. Thomson took place before a large assembly of members of the Institute, Cabinet Ministers, Diplomats, Deputy Ministers and honoured guests. Included among these were Sir Robert Watson Watt, father of radar, vice-president of the Institute of Professional Civil Servants of Great Britain and a personal acquaintance of Mr. Thomson of some 30 years standing; Dr. O.M. Solandt, Director of Defence Research Board; and Dr. M.M. MacOdrum, President of Carleton College, one of the three Medal Award Judges. The other two eminent educationalists who adjudged the submission, Dr. R.C. Wallace, former Principal of Queen's University, and Very Reverend J.C. Laframboise, Rector of Ottawa University, were unable to attend.

Canada's Controller of Meteorological Services was nominated for the highly prized Gold Medal of the Professional Institute of the Public Service of Canada by his own Deputy Minister, J-C. Lessard, by Dr. C.J. Mackenzie, President of the National Research Council, and by Professor T.R. Loudon of the University of Toronto. In their nomination they stated that Andrew Thomson ''has brought credit and distinction to himself, the Meteorological Division and the professional Civil Service in Canada. He has also earned for himself and the Division a position of esteem and respect in international meteorological circles.''

Andrew Thomson has had a highly interesting and varied scientific career. After joining the Department of Terrestrial Magnetism at the Carnegie Institution of Washington he enlisted in the United States army but was seconded to serve as personal aide to Thomas A. Edison on defence projects. In 1919 he was physicist on a solar eclipse expedition to the interior of Brazil. This was followed by being placed in charge of investigations on atmospheric electricity on a 26-month round the world cruise aboard the research ship ''Carnegie''. In 1922 he was appointed scientific advisor to the Apia Observatory, in Samoa, and the following year was appointed its Director. In 1929 he was appointed Aerologist for the Dominion of New Zealand. This was followed by a year in advanced studies in Meteorology at leading European Research Institutions.

Returning to Canada in 1931, Andrew Thomson was appointed Chief of the Research Division of the Meteorological Service of Canada, followed by his promotion to Assistant Controller in 1939, and Controller in 1946.

# NEW WEATHER OBSERVING STATION

Road maps of British Columbia show a route northward from the central interior town of Vanderhoof, on the C.N.R. west of Prince George. A fairly busy gravelled highway for the first forty miles, it carries freight and tourists to and from Fort St. James, a bustling lumbering community on Stuart Lake, where the Hudson's Bay Company established its trading post over a century ago.

During the recent war, the next twenty-odd miles saw special traffic connected with a valuable mercury mine at Pinchi Lake. Now for the most part only tourist cars venture beyond Fort St. James. Licence plates from as far as Texas, and from most States between, are seen each summer and fall, as visitors laden with camping, fishing and hunting gear point their radiators toward the Arctic Divide. Across this flat ridge, only about 75 miles north of Vanderhoof, they are in the vast drainage basin of the Peace River, and in these north-flowing waters are the Arctic grayling which tempt anglers to return year after year.

This is the country of the Nation River, and beyond are lakes and streams and mountains where gold has been panned and sluiced, and other rich minerals dug, where prospector, trapper and hunter are in their own element. The road, a rough track past the Nation, continues for 65 miles until, past Manson Creek of mining and Hudson's Bay fame, it comes to an end at the Omineca River. There lies tiny Germansen Landing, now one of Canada's newest weather observing stations.

The location was chosen as one of great value in the network of observing points, to fill, in part, the large gap between Prince George and Smithers to the south, Fort St. John to the east, and Fort Nelson, Dease Lake and Telegraph Creek to north and west. Here it gives warning of the southward flow of Arctic air, and marks the passage eastward of Pacific moisture toward Alberta.

Instruments were installed by E.D.M. Williams, Meteorological Inspector, Vancouver District. In charge of this station is Weather Observer Fred E. Brumblay, local postmaster, storekeeper, and host to tourists. Three times daily his report on local weather goes out over his radiophone to Dease Lake, where a Radio Division operator relays it to Watson Lake to be placed on the Meteorological Division's northwest teletype circuit. It thus becomes incorporated in the mass of weather data required by the forecast offices at Vancouver, Edmonton, Winnipeg, Regina, Calgary, Victoria, as well as Seattle, Billings, Salt Lake, San Francisco -- and perhaps more. So each observation of wind, cloud, temperature, humidity and precipitation has international significance.

# Sunny, Fair with Showers

## CALGARY C.B. Cooper

A very successful staff party was held recently at the home of Miss Marion Peterson, one of the observers in the Met Service.

Most of the members who were not on duty and their wives attended. The evening was spent in dancing and games and a very good time was had by all. It was generally felt that this should be done more frequently in the future.

During the evening several pictures were taken by A.F. McQuarrie, Officer in Charge.

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Allan McQuarrie was a delegate from the Alberta district at the annual meeting of the Professional Institute of Canada, held in Ottawa, March 21-22.

CALGARY MET STAFF ENJOY A PARTY - STANDING (LEFT TO RIGHT) N. ZAMOLSKY, BOB VERGE, BOYD WILSON, BERT HARTWELL, GEORGE BUSCHE, MRS. HARTWELL, MRS. M. MASON, MRS. BUSCHE - CENTRE ROW - NICK ZAMOLSKY, MRS. VERGE, MARION PETERSON, MURRAY MASON, MRS. N. GASKARTH, MRS. WILSON - SEATED - TOMMY DAVIDSON, MRS. DAVIDSON, MRS. C. COOPER, CED COOPER, PART OF NORMAN KILBACK'S HEAD, MARY KRIGOVSKY. (ALLAN MCQUARRIE IS NOT SHOWN - HE TOOK THE PICTURE.)

## HEAD OFFICE

The Controller of the Meteorological Division, Andrew Thomson, was honoured recently by the award of the 1952 Gold Medal of the Professional Institute of the Public Service of Canada (see story elsewhere in this issue).

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A very successful annual meeting of the Air Services Civil Service Association was held in Toronto on March 25. Mr. K.B. Fox presided at the function which took the form of a combined dinner-dance-business affair. About sixty guests and members were present. Officers elected for the coming year are: K.T. McLeod, President; F.W. Rayfield, Vice-President; Isobel Bagnell, Secretary; Fred Page, Treasurer; F. Hughes, C. Brint and Eva Omoto, district council delegates. The outgoing executive were accorded a hearty vote of thanks, and honoraria were voted L.T. O'Neill, John Laraway and Bernice Hall.

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The following item appeared in the consolidated progress report of the Edmonton Air Services District: ''A press release was made consisting of a story on the effects of the coal wave in January at Snag as applied to living conditions. The story was prepared by L.E. Mann, Met. Assistant at Snag.'' We can only suggest that the caption for this release should read: Snag Solves Fuel Problem; perhaps we should all go to the Yukon for low cost fuel.

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Bob Graham, erstwhile OIC, Main Meteorological Office, Dorval, has arrived at HQ to take up his new duties as Superintendent, Trans-Oceanic Aviation (or as John Wingfield would say, trans-o-scenic).

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Fred Page, verification expert on aviation forecasts, got off Toronto Island in the nick of time, bought a new home in Islington, just as 10-foot waves were breaking over Ongiara Avenue, his old-time hangout.

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Only a few Meteorological Offices have responded to HQ appeal for items for ''News on the DOT''. On the honours list are: F.M. McCallum (Watson Lake, Yukon); W.A. Craigie (Kapuskasing); C.B. Cooper (Calgary); Tommy Davidson (Calgary). How about it, all the rest of you: pictures, cartoons, poems and prose of your comings and doings. Send it to HQ as soon as you get it; don't let it pile up. We'll print it - if suitable.

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Mac (R.M.) Clelland, radiosonde expert, newly wedded on March 25th. His bride and he will occupy the departmental house on Toronto Island, headquarters for radiosonde trainees. This home, by the way, is the only floating radiosonde station in the world, now that the island is underwater. Mac's house, sitting a scant six-feet above high tide, has the only dry basement on the island.

## KAPUSKASING KAPERS Jerry Craigie

As old Sol begins to set later each day, the staff at Kap. are anxiously looking towards the Spring and its warmer weather with various motives. Jim Dunlop and ''Shorty'' Upton, our two ardent gardeners, are busy leafing through their various seed catalogues, while Jerry Craigie plans for the building of his Summer cottage at Remi Lake. A considerable portion of Norm Seguss's time is spent polishing and oiling his golf clubs and fishing tackle.

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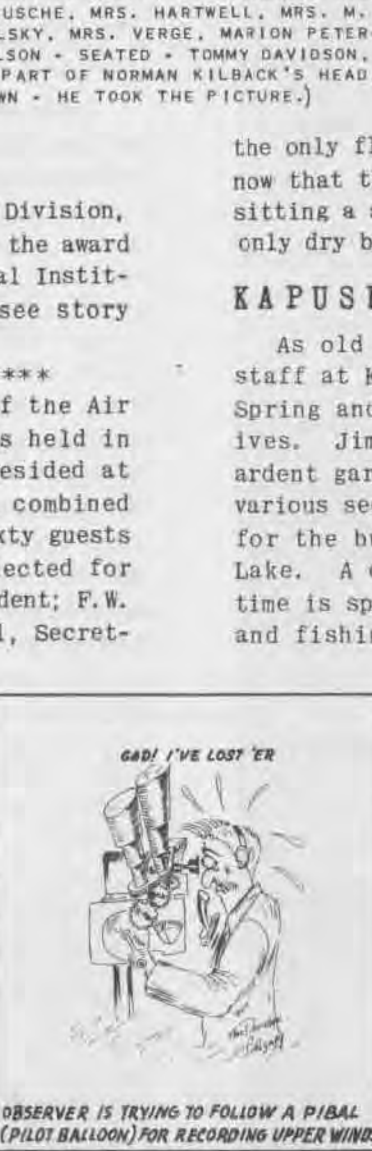
''For He's A Jolly Good Fellow'', is the theme in order for Eric Gillies who will be reporting to Sudbury in the near future. Eric arrived at Kap. shortly before Christmas to act as relief man while the remainder of the Kap. staff took their Annual leave.

Congratulations are in order for Jim Dunlop on the successful results obtained on his Barrier Examination. What, no cigars Jim?




OBSERVER IS TRYING TO FOLLOW A PIBAL (PILOT BALLOON) FOR RECORDING UPPER WINDS

Continued on Page - 6

## OCCUPATIONAL HAZARD

I went out to send a Pibal up,
Quite cheerful and light of heart.
Tramping bravely into the cold,
Willing to do my part.

I opened the door of the hydrogen shack;
(How else was I to get in?)
Mounted balloon and turned on the valve,
The gas began to seep in.

As the balloon was slowly filling,
My thoughts flitted thither and yon
Of worries I have but they're private,
And not to be written upon.

When the Pibal was fully inflated
I tied it and fastened the lamp;
Picked up the board and the flashlight;
For up on the roof I must tramp.

I removed the theodolite cover,
The balloon in the other hand.
The flashlight was up on the railing,
Everything perfectly planned.

I tried to lower the theodolite,
But it seemed quite tightly stuck.
Normally the process is easy,
But I have the darndest luck.

So I took a hold of it firmly;
Good grief but that thing was jammed.
I gave one good heave and it loosened,
And came crashing down on my hand.

Did you hear a scream? Well you should have;
For it pained like the fires of hell.
The blood spewed out like a fountain,
My thumb had been punctured quite well.

A bolt had gone through my mitten,
Piercing the thumb nail and meat.
By gad but it ached, and the numbness!
I felt I was pretty well beat.

But I struggled to light the lantern,
Released the balloon to observe;
But after I'd taken eight readings
The pain caused my sight to be blurred.

So, nuts to the whole blooming business
I decided, and ran down the stairs,
And into the warm cozy office,
With someone my sorrow to share.

So that's how my hand got mangled,
And I swear it's the truth, not a yarn.
I'm glad I could tell it to someone,
Even though you may not give a darn.

F.M. McCallum,
Watson Lake, Yukon Terr.

# 1953

# NEWS on the DOT

TROPHY WINNER

When it comes to sports, the Met. Section at the R.C.A.F. Station, Trenton, feels it has one of the top athletes in the DOT. He is 32-year old Dick Bridgman, one of the old timers on the Trenton weather forecasting staff with nearly six years of service at Trenton.

With the Met Service since graduating from the University of Toronto in 1943, Dick is a native of Rockwood, Ont.

Interested in sports since an early age, Dick has been playing hockey and baseball of either senior or intermediate calibre throughout various parts of Canada since 1938.

In baseball, Dick has played 10 years of senior ball and four years of intermediate class since he started playing organized ball with Simcoe Red Sox in 1938. Equally at home in the shortstop spot or in the outfield, he has always been a potent batter, hitting ..300 or better ten of these 14 seasons. Besides playing for Simcoe, he has played for Acton, Caledonia, Fort Erie, Kirkland Lake, Toronto, Yorkton, Regina, Timmins, Guelph, Trenton and Batawa. For the past four years Dick has been a member of the Batawa Shoemen of the Central Ontario Senior Baseball League. Highlights in his baseball career are two .400 or better batting averages; in 1943 when he hit .423 to finish with the highest average in Toronto's two senior leagues; and in 1945 when he won the Temiskaming Senior Baseball League batting crown with a .400 average while playing for Hollinger Gold Mines.

About the same time as Dick began playing baseball, he also started his goal tending career in hockey. Starting in the University of Toronto inter-faculty ranks, he moved on to play in Hamilton, Toronto, Yorkton, Timmins, Springhill and Trenton. While at Timmins, he was a member of the Timmins Combines, Northern Ontario Senior finalists. This season he appeared only briefly in the nets, concentrating on coaching the RCAF Trenton Flyers. His first season's coaching efforts were rewarded with the lads in blue winning the championship of the Trent Valley Hockey League, an eleven-team intermediate calibre loop.

TROPHY WINNER Continued on Page 4

TROPHY WINNER Continued from Page 2

Married to the former Mary Watt of Vancouver, Dick is the father of two children, Mary Ann, aged four and Dickie, born early in 1952. With the arrival of the Bridgman male heir Dad has high hopes that young Dickie will go on to dwarf his Dad's athletic prowness and, if coaching will help, the youngster should do just that, because he can be assured of plenty of individual inst - ruction.

As coach of the Trenton RCAF Flyers DOT'S Dick Bridgman directed the local team to the championship of the league, receiving the Fran Follwell Trophy. Ja[illegible] Devine, radio sportcaster is shown presenting t[illegible] trophy to Dick Bridgman.(L).

# TELEVISING THE WEATHER

Percy Saltzman stars on daily Video Programme

To the ''Met'' Service goes the honour of having had its weather report included in the first programme of C.B.C.'s Toronto TV station, CBLT, on its opening night, September 8 last. Each night since then, at 7:15 p.m., the weather report presented by Percy Saltzman of the Head Office Public Weather staff, has occupied a prominent part of the opening 15-minute telecast.

Included in the programme ''Let's See'', the weather report is presented by Mr. Saltzman in a casual, conversational style. Despite the confusion and cramped quarters on set, Mr. Saltzman has succeeded in achieving a relaxed and informal atmosphere. Present at each broadcast are from ten to fifteen technicians with cameras, sound producers, and other equipment. Often rehearsals for other programmes are going on simultaneously.

Sharing the ''Let's See'' programme with the weatherman are three puppets called Uncle Chickimus, Pompey and Hollyhock, whose primary job is to announce the shows for that evening. The weather boys feared the possibilities of sharing a programme with the antics of three puppets. This was a new departure for professional meteorologists, who approached its possibilities with much wariness. But experience so far seems to show that the mixture is not an unhappy one.

Arranging the weather programme requires the co-operation of many people. The Dominion Public Weather Office at Malton supplies the latest information and the success of the programme is in a large measure due to the co-operation of W.E. Turnbull and his staff. The official Toronto weather observers, J. McGowan and H. Funston, have been helpful in keeping the records straight.

The plotting staff at Head Office phone the current temperature to the studio just before air time. B.S.V. Cudbird and M.K. Thomas of the Climatology Section have supplied many leads on interesting information. The network of precipitation observers in Toronto has proven a fruitful source of local detail. Many members of the staff at Malton and Head Office have assisted with critical comment.

''Let's See'' reaches a potential of 75,000 sets in an area roughly 100 miles in all directions from Toronto. Major centers such as Buffalo, Hamilton, Oshawa, Peterborough, Barrie, Guelph, and Kitchener are within the receiving zone. Merchants in American cities south of Lake Ontario are advertising their sets as capable of receiving Toronto Television.

# FORMER WEATHER CHIEF HONOURED ON 81 ST BIRTHDAY

Dr. John Patterson, former Controller of Meteorological Services, is now president of the Technical Commission on Instruments and Methods of Observation of the World Meteorological Organization (W.M.O.) despite his 81 years. On the occasion of celebrating his birthday on January 3, 1953, the staff of Meteorological Headquarters, Toronto, presented him with 81 chrysanthemums to mark the occasion. At the same time a vase of roses and carnations was presented to Mrs. Patterson.

Capping his long years of service in the cause of meteorology, both domestic and international, Dr. Patterson is currently making preparations for the forthcoming meeting of his W.M.O. Commission in Toronto next summer.

# PORT WEATHERMAN "King of Commuters"

(By Jim Fairley, Marine Editor, Vancouver Province, October 29, 1952.)

The thriving community of Gibsons on west Howe Sound, B.C., not so long ago considered a nice day's excursion by steamer from Port of Vancouver, today serves as Vancouver's newest ''residential district'' ...at least for one Vancouver man.

He's F.R. ''Dick'' Kennet, port meteorological officer for Vancouver, whose desire for a bit of elbow room at the end of a busy day at the office brings him some sort of record as a city commuter.

The port weatherman at Gibsons, travels to and from work each and every day like thousands of city workers who attend jobs in the down-town area and disperse to their homes at night.

Four hours traveling time every day...but it's worth it, says Mr. Kennet, and far from wasted.

Regular schedules of the new Black Ball Ferry Line's auto ferry between Horseshoe Bay and Gibsons make the long-distance daily ride to the office possible.

Mr. Kennet leaves his home in Gibsons each morning in time to catch the first east-bound ferry sailing at 7 a.m., lands at Horseshoe Bay an hour later and catches a bus which gets him in to his desk in Vancouver... 10 minutes ahead of time.

Going home at night, he leaves at 5 o'clock and is home at Gibsons in time for dinner at 7. The cost of the bus and sea voyage across Howe Sound twice a day the port weatherman balances off in several ways, among them the healthful advantages for Mrs. Kennet and their four youngsters.

Meanwhile, his enthusiasm as a weather observer has infected the regular truck drivers whom he meets daily on that early morning ferry start, plus the skippers.

''The truck drivers are getting quite interested in weather and now we've got Capt. John Bunyan making daily water temperature readings for us on the way across the sound,'' he smiles.

As a port weather officer, Mr. Kennet visits deep-sea ships to check government weather instruments on the regular liners who radio weather information back to Vancouver and enlist the aid of others who make casual calls here.

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A.F. McQuarrie of the Calgary Forecast Office received the following letter from the Watson Construction Co. Ltd. The letter is a recent sample of many received at both head office and field offices testifying to the valuable service provided by the Met Division to the economy of the country.

WATSON CONSTRUCTION CO LTD
Engineers and General Contractors

Mr. A.F. McQuarrie,
Meteorologist-in-Charge,
Aviation Forecast Office,
Calgary, Alberta.

Dear Sir:

The writer would like to record his appreciation of the telephoned warning from your office, advising of the pending 75 mph wind on Thursday of last week.

Acting on your information, which gave us nearly two hours grace, we were able to contact our various jobs and protect ourselves against the high winds which turned up as forecast. But for your timely warning, we would have incurred extensive damage. As it was, we securely fastened down just about every movable object.

Your service is invaluable, and we, for one take full advantage of same.

WATSON CONSTRUCTION CO. LTD.
per "H. AVERY"

# GLEANINGS FROM GANDER

## NORM POWE - DESIGNS AN AERIAL RUNWAY

Norm Powe working on a new gadget in his workshop -- a cupboard in the bathroom. Norm also has a workshop in his garage, but this is too cold for winter use.

Norm Powe, forecaster at Gander Met office, has designed an aerial runway to carry traffic from teletypes to forecast office. It is figured it will save about a mile a day of walking back and forth from teletypes to forecast office. This clever aerial runway designed in his own workshop with suggestions from several members of the staff is working out very well.

Shown here (1) is teletypist Cal. Abbott placing traffic in the metal and perspex basket. By pulleys he then raises the wire which the basket runs on, and the basket travels down the wire until it reaches an obstruction above the forecaster's files. The obstruction causes the basket to open up, emptying its contents into a wire container

(2) and (3). The teletypist makes the return to him by lowering the wire at his end and and raising it at the other end (all by pulleys and cables). By lowering the bumper in front of the basket, it misses the obstacle on the wire at the forecaster's position, and the basket travels on to the aerologist's desk to deliver data to the upper air plotters.

Gladstone Lester of the Met. office was co-ordinator of the 7th series of Canada Savings Bonds for the D.O.T. in Gander. Glad reports that the $100,000 objective was exceeded by $15,000, which, he has been informed, is a record among comparable sections of the Department throughout the country.

The Met. hockey team lost all games except the last one. Star of the season, goalie Tom Rissesco, made many remarkable saves -- the most marked one was the one that broke his nose! Next baseball.

Senior Observer John Greene is instructing some Scouts of St. Martin's Troop in the Weatherman's Badge.

Met. Assistant Ed. Cooper is resting up on a three months' sick leave. We all hope you return to work in full health, Ed.

Bob Stark

SKATING AT DEADMAN'S POND was popular at Gander most of the winter, especially before Gander Gardens had an ice surface. Seen in the foreground of the picture: Bob Cake, Johnny Cake, Rhody Powe, Greg Powe, Mary Cake, Margaret Stark, and Donny Stark.

# SUMMERSIDE

Here in Summerside we have had a few additions to the staff, one way or another. Early in January we welcomed Ernie Brandon, with his wife and two children, from Dartmouth, NS., to work with us.

We have been visited in the past few months by two forecasters from the Moncton DAFO, Norm Glenesk in November, and Elmer Caborn in January. We appreciate their working on shift with us and enjoy describing to them the special services we are giving the RCAF Navigation School in forecasting and in Met. Instruction.

A class of approximately thirty navigators, training under the NATO training plan, graduates from our school every three weeks. We find it very interesting and consider ourselves fortunate to be able to meet and teach members of the British, Danish, French and Belgian Air Forces.

James A. Peach

# GLEANINGS FROM GANDER

Two Met bowling teams did well in the winter season with Forecasters finishing at the top of the men's league with 50 points, and the Meteos No. 3 making the first division in the mixed league. Individual awards went to Al Evenson with the second highest triple of the year, 781, in the men's league, and to Mel Day with the ladies' second highest triple, 634, in the mixed league. The only casualty was in the final game when Cliff Crozier, aiming for a strike, struck his hand on the score stand to receive a compound fracture of a finger.

The Vital Statistics Department records the marriage of our Steno. Angela Chafe to Met. Assistant Harold Kinden, and the birth of a second son to Sam White.

Postings for Meteorologists have just been announced: Paul Denison to the CAO, Montreal in July; Bob Stark to Montreal in August; Bob Cake to Montreal in September; Norm Powe to Moncton in January; and Gordie McKay to Winnipeg in May, 1954.

Ed Cooper reports from the West Coast Sanatorium that he should be back home soon as he is taking 900 pills a month. The Office staff send Ed fruit, candy, and reading material each month.

For several years now, the wives of Gander Forecasters have met fortnightly to roll bandages for the Sir Frederick Banting Memorial Hospital. The girls take it in turn to provide refreshments. As well as the work done, the latest gossip is exchanged.

Bob Stark

WEATHERFAX - At the inauguration of the world's first automatic weather map transmission service, Hon. Lionel Chevrier placed the weather map on the transmitting drum while (to the right) G.C.W. Browne and Andrew Thomson, DOT officials, look on. Others in the photo from l. to r. M. Metcalf (CN), C.R. Slemon (RCAF), D.F. Bowie (COTC) and A. Lyle (CP).

Staff of Central Analysis Weather Office who compile Weatherfax maps, sent out four times daily.

# WEATHER MAPS BY WIRE

At 2.00 p.m. on August 28 last, the Central Analysis Weather Office at the airport, Dorval, Que., played hosts to visiting officials from the RCAF, CPR, CNR, and DOT, who came to see a new weather telecommunication service put into operation - transmitting weather maps by wire. Hon. Lionel Chevrier placed a weather map on a transmitting drum, Air Marshall C.R. Slemon, Chief of Staff, RCAF, turned a switch, in a few minutes identical copies of this map were available in the main meteorological forecast centres and many RCAF training centres in Canada. This was the opening of the world's first fully automatic weather map facsimile transmission service, which the Department of Transport has called WEATHERFAX.

Weatherfax was developed to provide a faster and more economical means of getting weather information to Air Force stations, to meet the demands of their rapidly expanding operations and training commitments. The national transmission maps, which are prepared in the Central Analysis Weather Office, under direction of J.M. Leaver, consists of a series of charts that plot the weather in the form of pressure patterns and fronts for altitudes all the way from sea level to 50,000 feet. They also indicate such information as temperature, wind velocity and direction, precipitation and dew points. This master chart is transmitted four times daily.

The high altitude plot is valuable to jet flying. With a master chart transmitted over the network, showing weather picture from the Aleutians to Iceland, the Air Force demand for trained meteorologist required for such a complete analysis of the upper air will be greatly reduced. Now, with the basic maps available at the stations, the forecaster can spend a greater portion of his time in the detailed weather conditions over the area, and in combined operations the Unit Commander knows he has a weather map identical to that of his colleagues.

The maps reproduced exactly as drawn come to the recorders fully printed and do not require any laboratory processing there. The receiving stations are only required to keep power supplied to the recorders and rolls of electrolytic paper on the machines. Facsimile is the only form of communication that can never make a mistake.

The ceremony at Dorval was the culmination of many months work by the Telecommunications Division under Controller G.C.W. Browne and his staff of engineers which carried out the negotiations with the line companies for the rental of lines and equipment on behalf of the Meteorological Service. H.E. Walsh is senior aviation Radio Aids Engineer and D.S. Robertson is land line engineer. The Telecommunications Division of DOT are also arranging for the transmission to and reception of these maps at points in the far north depending entirely on radio for communication. Radio Engineer F.L. Bentley is in charge of this technical operation. The weather map which is sent along the land line, will, electronically, go straight on to the powerful transmitter in Montreal, for transmission to Goose Bay, Labrador and again electronically without human aid or action of any sort, will be transposed and put on another transmitter at Goose, where it will be relayed on the circuit already established at an Arctic station. This Arctic station will receive the charts the same time as Vancouver, Winnipeg or Moncton. Each map transmitted travels over 4,000 miles by cable and 1500 by radio. The radio facsimile circuit to the Arctic is technically another first for DOT telecommunications engineers and WEATHERFAX is establishing another improved meteorological service for Canada.

The Minister of Transport signs the first weatner map facsimile as J.M. Leaver watches.

## GANDER

Reports from the San say that Ed Cooper is getting along fine and has gained 30 pounds. The Met. staff at Gander indirectly are making a substantial contribution to his recovery by relieving him of some financial worries. ''Give the united way'', the red feather slogan in Community Chest campaign, could easily be applied here. Since Ed's salary stopped in July, the Met staff have been making a contribution from each pay cheque to pay the rent on his apartment for his wife and three children. Met.

assistant Ed. Cooper has been a patient in the West Coast Tuberculosis Sanatorium for several months. Another money raising idea of the office - collecting postage stamps which are then sold to a stamp dealer (Gander - ''Crossroads of the World'').

Recent appointments to the forecast staff are G.W. Gee from Toronto; R.J. Duquet from Montreal; and Rudolf Treidl. Mr. Treidl, who has a doctor's degree from a European University, gives an international tone to the forecast office.

Houses are now available for rent in the Gander Townsite but with high rents, not so many of the Met. Staff are interested. Many of the permanent employees at Gander have lots of land about 5 miles from the Airport, and hope to build on these.

The Met. Office is well represented in the Bowling League, with Al Evenson as President and Bob Duquet as Vice-President. There are 20 teams in both the men's and the mixed leagues. Met. Captains are: Observers, Austin Hollett; Teletype, Rom Rissesco; and Forecasters, Al Evenson. In the Mixed League, Max Warren, Al Evenson, Don Day.

From a Marine Forecast for the Grand Banks: Visibility 5 miles seduced at night to near zero in fog patches. Bob Stark

# CLYDE RIVER N.W.T.

Our year started off with the arrival of the "C.D. Howe" on September 1, 1953, bringing with her such notables as R.A. McConnel, D. McIver, A. Goltz and G. Gely. These men were the new additions to the DOT staff. With V. Lundin, G. Wood and S. Steinhor, who were staying for a second year, the crew was at full strength of seven men. As members of the staff also, are four USAF personnel, who maintain a radio beacon and keep a twenty-four-hour radio watch on the airways frequency.

# 1954

## NEWS on the DOT

# GLEANINGS FROM GANDER

Gander's townsite is developing rapidly. Over a quarter of a million dollars has been pledged by Gander's residents in sacrificial church building campaigns by Gander's three main churches. Some stores will move to the townsite this year, and it will not be long before plans are made to raise money for schools.

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The new "cry" in the met. office is "No more ditto." The newly acquired automatic duplicating machine does a much nicer job for the 1500 copies of forecast documents required each day, and easier on the hands and clothing.

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Forecaster Bob Duquet is a "Ham" operator and almost daily chats around the world with CW over his station VO2G. Not long ago Bob got several fellows to help him put up a 60 foot mast on top of his apartment building. Everything went well until Bob got up on the roof and discovered he suffers from acrophobia. Happily he was aided in his descent by a rope tied to the roof ventilator.

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Several forecasters were able to make familiarization flights this spring. Fam flights are generally a wonderful experience, but they do have hazards. Conn Sutherland arrived in London, and came down with pneumonia. This meant three weeks in London, but in bed. Conn says all he saw of London was a couple of chimneys and the view from a taxi.

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Recent staff transfers include Alfred Moakler from Goose, and in the near future Cec Saunders is going to Sydney.

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Fly fishing started with the Easter holiday as Bert Peddle, Austin Hollett and Clarence Bowring hiked the long way along Burnt Brook to Soulies Pond. Bert landed fourteen beauties.

Bob Stark

For the first time in the three years that a trophy has been awarded in the Gander B (for "bush") Hockey League, it has been won by the Met team. Captain Ade Lenahan is shown here holding the trophy. President of the Gander Hockey Association, Tom Godden, is presenting Gord McKay with an individual award. Others shown in the picture are Don Blackmore, Steve Nikleva and Al Evenson.

Photo by Des Wright

# Weather Observers

Forty-one officers on board certain Canadian merchant ships have received awards from the Meteorological Division of the Department of Transport for providing voluntary weather observations during 1953. The book "Image of Canada," a photographic Canadiana extracted from the picture files of the Canadian Geographic Journal and edited by Malvina Bolus, was the award given "as a token of appreciation for the excellence of the meteorological observing provided by officers of selected and supplementary Observing Ships in 1953" according to the citation.

These Canadian ships are part of a 2,000 international marine weather observing network which, by reporting weather conditions at specified times, contributes to the weather forecasts and warnings so necessary for the safety of life at sea and also for aviation and public weather forecasting.

While the Master, assisting officers and radio officer each contribute to the weather observing programme on designated ship, the principal observer is usually the Second Officer and in such cases he is the recipient of this year's award.

The ship's weather observer is required to report the position of his ship at the time of observation, give cloud conditions, wind direction and speed, visibility, present weather, any change of sky, haze, fog, rain, snow, drizzle and weather for the last six hours. He is also required to give the barometer reading, temperature, direction and speed of ship, barometer changes in the last three hours, dew point and period and height of waves.

The report from each ship is sent out four times daily by radio to "Weather Halifax" or Washington or Rigby, according to the ship's position and the coded messages consist of as many as 19 groups of five figures each. On the other hand, the Meteorological Service broadcasts weather reports to ships at sea at set times each day in both plain language and code (up to 200 groups of five figures each) which enables the weather officer on a ship to make his own weather map analysis.

# PERCY SALTZMAN TV WEATHERMAN

Percy Saltzman, who gives the weather on the CBC-TV network, was presented with a television award by an American magazine. TV Guide, published in Rochester and Philadelphia, ran a popularity poll among its readers in the Lake Ontario region. Persons appearing on the four stations in this area, Rochester, Buffalo, Syracuse and Toronto, were eligible as candidates. The viewers were asked to send in their ballots for "the local TV personality most worthy of network recognition". Among the 32 winners were two from the CBC: a singer, and a meteorologist.

# OUR FLOATING WEATHERMEN

One thousand miles out on the vast Pacific DOT weatherships keep watch on Ocean Station 'P'. The weather is their business. Here are a few excerpts from a rough log of Patrol 14, made by G.M. Robertson, OIC Radio.

(The photos show the met and radio officers at work on board the 40 day vigil.)

Here we are ten days at sea, and I've just remembered I agreed to keep a rough log of the trip. Well, here's a brief resume of the trip so far.

We were supposed to sail around noon on Tuesday, December 29th, but it was suddenly discovered the movie projector hadn't come aboard. Well, we just couldn't sail without that.

Had a good run out the Straits, but next day we ran into head winds which gradually increased to gale force. We had gale force winds, varying between west and south all the way out to the edge of the grid, where we relieved the St. Catharines at 2 p.m. Friday.

We started Radar runs on taking over from the St. Catharines -- in fact, we took their noon Rawin on Friday, as they were short of hydrogen. Well, it was no joke getting to the Radar shack during that storm. Spray was flying all the time and solid water coming over the gun deck every time her bows went down. Another thing we radar operators do not like is having to open that watertight door when the ship is rolling and pitching. One morning at five a.m. on my way to the radar office, I got as far as the wheelhouse when I heard the wind howling and saw, or rather felt, the seas coming over. I said, "To hell with it, there will be no radar run this morning."

The weather moderated about three days ago and the last two days have been quite nice: just a light swell. One of the new operators, de Montezuma, (Monty) has been quite seasick, and is still feeling rather woozy. However, he has always kept his watch, and I think he will be OK in a day or two.

12th Day - Nice weather again - moderate breeze and light swell. Monty is feeling very much better the last two days. Think he will be OK now.

16th Day - A third of the trip in today and the day operators change watches, so Condon and I stood the 8 to noon watch.

After a 40 day vigil at Ocean Station "P" the relieving weathership "St. Catharines" is a welcome sight.

UPPER AIR-LEVEL OPERATIONS. On deck releasing a rawinsonde balloon twice daily, average ascent, 55,000 ft. Radar office where course of rawin balloon is tracked by radar for upper wind information. Radio Officers W.M. Granger and G.M. Robertson at work.

SURFACE OBSERVATIONS. Eight times daily then coded and radioed ashore. Bob Porter getting psychometer to measure humidity.

RADIO AIDS. Weather ships also provide navigational aids to Pacific vessels and aircraft with direction finding, radar and beacon services. (Left) Radio Officers Cringan and Chuck Robertson. (Right) Radio Officer E. Woody and Bill Baxter.

27th Day - Another week gone by. Half the trip over now. Things have been comparatively quiet during the week, and the weather not too bad. Gales only about three quarters of the time. Our lowest temperature for the season was Thursday morning when it was 31 degrees. Much milder than it was ashore.

33rd Day - Blowing a whole gale with rough seas all day. Loran working fine.

42nd Day, Friday, Feb. 12th - We were relieved by the St. Catharines at 2 p.m. PST today and now we are on our way home. The wind and sea are just abaft the beam, and we are rolling quite a bit.

Sunday night - Weather much improved today -- wind practically astern helping us along. We expect to dock about ten a.m. tomorrow morning. Have to box this typewriter in preparation for sending ashore, so this is all for this trip.

# PATTERSON MEDAL

Dr. John Patterson was Controller of Meteorological Services, Department of Transport, during the period 1929-46. At the time of his retirement a fund was established for the purpose of the periodic awarding of a medal to be known as the Patterson Medal for Distinguished Service to Meteorology to the resident of Canada deemed most worthy. This medal was made possible through contributions by colleagues within the Department and in scientific organization as well as by members of the staff of the Meteorological Division.

Plans are being made for the first award to be made early next year. The recipient may be chosen by those engaged in any field of meteorological endeavour including instrument design, weather observing, communications, administration, research, training, radiosonde technology, climatology, forecasting and public relations. In addition, any person who has made an outstanding contribution to Meteorology in Canada is eligible.

The award may be made at any time during the life of the recipient for distinguished service for a protracted period of time as well as for recent outstanding achievement.

Bulletins will shortly be distributed giving further details with regard to nominations for the award.

# GLEANINGS FROM GANDER

Glad Lester, our Admin. Asst., is used to doing things in duplicate, and so his wife, not to be outdone, presented him with twin boys. Others on the staff whose families have had recent additions, all boys, are Ken Lee, Ruddy Treidl and Al Parry.

Another Teletypist will soon leave Met. for ATC. This time it is Pat Hickey. In the Assistant ranks, John Porter has arrived from Change Islands and the Department of National Defence, and A.H. Baldwin is expected from Halifax in September. Forecasters being posted in September are - Bob Stark going to Edmonton, and Elmer Caborn coming from Moncton.

We regret that in our last report we omitted the fact that the star of the champion Met. hockey team was Des Wright, who in one game scored 8 goals.

Summer missed Gander this year with very damp and dull weather. With so much rain all the rivers are high, and the salmon fishing has been poor, although Austin Hollett's luck has been exceptional with over 30 catches.

Gander, "Cross-Roads of the World", now has an information officer, Miss Joan Morton. The Met. Office provides her with the temperatures at the European and American Terminals.

One of the largest Boy Scout Camps in Newfoundland was held at Gleneagles some 15 miles from Gander, in July. This camp obtained and found most useful the daily weather forecast from the Gander Weather Office.

Everyone is pleased to hear that Ed Cooper, who has been in the San for 18 months, is now on his feet and will soon be back at work.

The Met. ball team is battling for its life in a six-team group. The prospects appear bright if such oldsters as Day, McKay and Wright continue to steady the promising rookies Evenson, Gee, Lee, McKinnon, Moakler, Nikleva, Parry, Rissesco and Withers.

Bob Stark

# VANCOUVER — SANDSPIT

## DOT OFFICIAL GREETS PRINCE PHILIP

H.R.H. chats briefly with G. Fyfe, superintendent of a local logging firm who presented the Duke with a hand carved, slate totem. - L. to R. - Cmdr. N. Parker, RN; I. S. Macaskill, DOT airport maintenance foreman; H.R.H. the Duke of Edinburgh; G. Fyfe.

His Royal Highness, the Duke of Edinburgh, made a brief but impressive stop-over at the Sandspit airport when he exchanged the Canso aircraft, used to visit the huge Kitimat project in Northern B.C., for the more comfortable and luxurious "C5" used on his transcontinental flight.

On his arrival he was met by the airport maintenance foreman, I.S. Macaskill, and officials of a local logging camp who were on hand to make a presentation. After the introductions, the Duke was presented with a slate-rock totem. This hand-carved, jet black totem, was made by a group of Haida Indians of Skidigate, located a short distance from here.

A relatively large crowd turned out to see His Highness, many of them travelling a great distance by automobile and boat. As the Prince and presentation committee walked from the Canso to the C5 aircraft, some 100 yards away, the people began cheering and waving flags. The Duke returned their cheers with a bright smile and a friendly wave and again added a few hundred more friends to his already gigantic list.

Stopping under the wing of the huge C5 aircraft, His Royal Highness spoke again with those he had met. Soon it was time to leave. He shook hands and ascended the steps into the plane. Before stepping inside, he turned, smiled and waved goodbye. Members of his party followed and minutes later the Royal flight moved slowly off the ramp. As it did, the Duke was at the window waving a last farewell to his friends in Sandspit, who will long remember the visit of the casual, informal, friendly Duke of Edinburgh.

W.R. (Reg.) Hamilton, (above), supervising forecaster at the Vancouver D.F.W.O. was at Sandspit to supply special forecasts for the Royal Flight. "Reg" did a very fine job and "arranged" for excellent weather during the event.

H.D. Cameron, D.C.A.S., was there for the occasion. Other members present from the District Office included D.J. Dewar, P. Ryan, A.H. Wilson, and E. Loos.

W.R. Hamilton, supervising forecaster of the Vancouver Forecast Office, was also at Sandspit to supply special route forecasts for the Royal flight.

D. Staryk, Radio Opr.

I.S. Macaskill chats with Prince and party. Seen in photo - Inspector F. Kelly (with dark glasses); His Royal Highness; Group Captain McNab; Rear Admiral Hibbard.

# 1955

## NEWS on the DOT

# MEN BEHIND THE WEATHER

Behind the scenes drama of your TV or radio weather broadcasts is enacted in little remote weather observing, radiosonde and rawinsonde stations in Canada. In all degrees of temperature, the men at these stations obtain data, vital for the forecasts. Just as in the familiar saying "The mail must go through" similarily the "weatherman must carry on."

One of the most recently completed rawinsonde stations is at Maniwaki, Quebec, in the Gatineau hills 80 miles north of Ottawa. Regularly, every twelve hours, in all kinds of weather, one of the duties of the Met. personnel there as well as in the other 31 radiosonde and rawinsonde stations in DOT., is to inflate and release balloons, to which are attached radiosonde instruments which transmit weather conditions in the

In the dome of the weather station, radiosonde technician J.L. LaFranchise, tracks down balloon and radiosonde transmitter by radio direction finder, thus recording direction and velocity of wind at upper air levels. The direction finder and its grill (left) swings around and tilts as required.

J.L. LaFranchise plots out and codes wind direction and velocity from recordings made by means of radio director finder.

The building shown houses the special instrument used to record level and upper air weather information. The dome houses radio direction finder which tracks radiosonde balloon. Radiosonde technician L. G. Leslie is shown (inside) getting equipment ready, and about to release the balloon while H.J. McCabe, OIC of station holds attached radiosonde equipment.

Intricate radio recording instrument takes down radio signals sent by radiosonde technician on three different frequency pitches, each in turn recording the humidity, temperature and barometric pressure. H.J. McCabe records and codes the information.

upper strata of the atmosphere up and even beyond the 65,000' level. A 24 hour watch is also maintained on ground level observations.

Before the radiosonde technician sends the weather balloon aloft, he synchronizes the small transmitter with the receiver in the weather station. As the balloon ascends the compact little instrument transmits humidity, temperature, and barometric pressure at the different levels on a different frequency pitch for each. This information is automatically recorded on a chart by special equipment. Wind velocity and direction at the different levels is obtained by the rawinsonde stations by tracking the balloon and equipment

continued on page 11

When all recordings have been completed and the result coded down to a few meaningless words, Mr. McCabe teletypes information to Montreal and Toronto from which it is relayed to the Met. centres of the world.

 continued from page 4
with a radio direction finder, located in the dome of the station building. From observations taken, the position of the jet stream is located and velocity recorded. When recordings are completed, the radiosonde technicians compute the information, code it and relay it to main centres.The forecaster carries on from there.

The Maniwaki rawinsonde station is staffed by three radiosonde technicians who live in a nearby housing development, located on the banks of the Gatineau river. They are:-

Harry J. McCabe, Officer in Charge, a native of Cork, Ireland, whose home town is St. Catharines, Ont. He has had wide experience in Arctic stations and his tour of duties include Frobisher, Clyde River, Fort Smith and Gander as well as the more populated centres of Toronto, Ottawa and Edmonton.

J.L. LaFranchise of Montreal. He has helped to establish the joint Canada-United States Arctic weather stations at Alert and Isachsen and has seen duty at weather stations located at Frobisher, Resolute, Great White River, Baker Lake and The Pas.

J.L. Leslie, a native of Paisley, near Lindsay, Ont., has not had any Arctic experience. His tour of duty has taken him to Whitehorse, Ottawa and Toronto.

## Patterson Honoured

# Wins His Own Medal

Dr. John Patterson, O.B.E., 83, who retired from the position of Controller of the Canadian Meteorological Service in 1946, received the award of the first Patterson medal at a presentation dinner in Hart House March 1 attended by more than fifty of his former staff and colleagues. The medal was specially designed and cast in silver by the Royal Canadian Mint. It will be given annually to the Canadian resident who is judged to have made the most outstanding contribution through distinguished service to meteorology.

Dr. Patterson is internationally known for his many improvements in meteorological instruments, but he is best known in Canada for his long record of effective and untiring service as Canada's leading Weatherman.

Doctor Patterson became Controller of the Canadian Meteorological Service in 1929; and, when he retired in 1946 at 74, he had guided Canada's Weather Service through an unprecedented period of growth and strain. The British Commonwealth Air Training Plan placed heavy demands on Canada's Weather Service, forcing the number of

Andrew Thomson ( L ) presenting medal to Dr. Patterson.

AT THE BANQUET TO HONOUR DR. PATTERSON

Head Table-Standing-L. to R.
Dr. L. Gilchrist, Dr. John Patterson, Andrew Thomson, Mrs. J. Patterson Dr. John Satterley

Seated by rows L.toR.
1. Dr. A.E.R. Westman
P.D. McTaggart-Cowan
Dr J.T. Wilson
Dr. H.J.C.Ireton
Mrs. E.M. Walker

2. K.A. Hignell
D.G. McCormick
D.G. Black
A.H. Lamont
F.T. Upton
F.W. Benum
H.H. Bindon

3. Miss M.D. Stephens
Miss E.M. Kelly
Miss M.M. Skinner
E.B. Chilcott
K.B. Fox
G.A. Fozard
A.J. Childs
C.C. Boughner
T.B. Elliott
J.R.H. Noble

4. J.G. Potter
G.R. Kendall
B.V.S. Cudbird
M.K. Thomas
F. Turnbull
C.M. Penner
K.T. McLeod
Mrs. A. Thomson
Dr. E. M. Walker

Dr. Patterson reminiscing about his experiences in meteorology in Canada and India. Mrs. (Dr.) Patterson wears the "Kaiser-e-Hind" medal awarded to her by India for her splendid work in fighting the plague in that country.

forecasting meteorologists up from fifty in 1939 to over three hundred by the end of the war, while the number of forecast offices grew from six to almost fifty.

In presenting the medal, Andrew Thomson, who succeeded Dr. Patterson as Controller of the Canadian Meteorological Service, spoke of his active membership in many international and Canadian societies, and of his keen, personal interest and leadership in the World Meteorological Organization.

The award is given, Mr. Thomson said, for work done at any time during the life of the recipient in any field of meteorology, such as instrument design, communications, research, forecasting or public relations. He told his listeners how Doctor Patterson had made contributions in each of these fields, and that his work had been internationally recognized by the granting of life fellowships in both the Royal Meteorological Society and the American Meteorology Society.

Doctor Patterson joined the Canadian Weather Service in 1910, where his inventive genuis and organizing ability led to the design of a series of instruments able to perform under rugged Canadian weather conditions. His Patterson barometer became the Canadian standard; the four-cup anemometer formerly used has been replaced by the present three-cup type largely as a result of his studies, and instruments for measuring and recording the weather aloft were designed and developed for attachment to kites and balloons.

# HALIFAX MET.

Into the peaceful, salty atmosphere of peacetime (?) Halifax, there entered, on December 20, television programs on CBC's Halifax station CBHT, challenging the overwhelming roars of the hitherto undefeated foghorns and ships in our harbour. At 7:10 each evening weather comes over CBHT, in the program "Gazette" and our OIC, Rube Hornstein, gives an excellent continental weather coverage before dwelling nostalgically on the fogs and drizzles of the Maritimes. Weather is followed by an interview of some schooner-sailing salt or other newsworthy citizen by Max Ferguson ("Rawhide"), with Rube joining in during the course of the interview to link in the weather. This program has evoked some rather wonderful suggestions from the public regarding things they like to see on the map, and has included in its scope an ancestor of Admiral Nelson, an 84-year old step-dancing mariner, a birthday cake being presented by Rube, Cmdr. Finch-Noyes' collection of shrunken heads and native spears acquired during a round-the-world cruise, a live horse just arrived on a boat from England, a taxi-driving Dorothy Dix, Rube issuing the April 1 forecast while hanging inverted from the ceiling and attempts by Max to scuttle the forecasts.

Our forecasters have been at Halifax so long now it is suspected they have acquired barnacles. With no transfers to report, nothing is left but to mention new honours acquired, such as the awarding of the President's Prize for 1954 by the Royal Meteorological Society to our statist, Ted Munn. This is a prize awarded each year for the best paper received. Forecasters, like Ted Munn, and other members of the R.M.S. send in written articles on their research projects. There is still much to learn in the meteorological field and these men are constantly carrying on research in an effort to solve some of the problems and enable us to issue better forecasts. Ted Munn has been studying different ways of dealing with meteorological problems by the use of statistics.

The prize, a book, was presented to Ted in February when he made a trip to Toronto to present a paper on statistics.

News reached us from the outside world when K.T. McLeod visited us in April (and was storm-bound for a week) and when our new Maritimes D.C.A.S. R. Goodwin, visited us near the end of April.

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It was not necessary to leave the office to watch the construction of the Angus L. Bridge, spanning the Narrows from Dartmouth to the north end of Halifax. A spyglass was in the office for watching, from the north windows of the forecast and teletype rooms, the pitching and tossing of the catwalks. Whenever a man fell into the harbour, 33 fathoms below, it was judged to be breezy and work on the bridge was discontinued for the rest of the day. In spite of such delays, the bridge was finished and the first ox-teams, hospital-bound taxis and Bengal Lancers were seen crossing it on April 2 after Mrs. Angus L. MacDonald had, with due ceremony, smashed a bottle of champagne over its bow --- that is cut the white ribbon barrier.

Max Ferguson (R) and Rube Hornstein (L) featured on "Gazette" CBHT's program of public interviews and weather forecast.

## RUBE HORNSTEIN

Rube Hornstein has been on the C.B.C. Trans-Canada since May 19, 1952, when he began his "Ask the Weatherman" series. Since that time Canadians have been "asking the weatherman" at the rate of several hundred letters a month.

He is also heard on the Maritime Network - at 2.15 p.m. - "Meet your Weatherman" series. He emphasizes the "whys and wherefores" - rather than the weather situation of the moment - and this may partly explain his popularity.

Through his programs the weather service has gained several volunteer weather observers in communities not served by weather stations. With an interest in weather conditions and with instruments supplied to them, observers provide information on a monthly basis which is put to use in Climatological reports.

Rube Hornstein was born in London, Ontario. Although he had no idea at the time that he would eventually become a meteorologist, he learned the importance of the weather during 10 years of the early part of his life, which he spent living and working on a farm in Caradoc Township, about 16 miles from London.

After completing high school he won a two-year scholarship and entered the University of Western Ontario. With part-time work and another scholarship he completed his course in 1934 - a B.A.

During his post-graduate years he served as a demonstrator of physics at Western, and for a short period filled in for a professor of biology, mathematics and physics at Waterloo College. He confesses now that since his last contact with biology had been in high school, he had to give his biology course by keeping one lesson ahead of his class.

Rube received his M.A. in physics from the University of Western Ontario in 1936. It was about this time that he first became aware that he wanted to become a meteorologist. He attended the University of Toronto and in 1938 graduated with another master-of-arts degree, but this time in meteorology. He joined the Canadian Meteorological Service and was sent to St. Hubert, Quebec, as an aviation forecaster.

He first went to the Maritimes in 1940. He was transferred to Halifax as meteorologist-in-charge at Eastern Air Command, and continued as such until 1946 when he assumed charge of the newly-organized Dominion Weather Office in Halifax. In the fall of that year he began his MEET YOUR WEATHERMAN broadcasts on the Maritime network of the C.B.C.

One of the strangest requests in Rube's mail-bag came from an 83-year-old gentleman in New Brunswick. He pointed out that, since Rube's voice "sounded so kind", he must be a "very nice man". Would he, therefore, be kind enough to grant a favour? Could he find a maid for the old gentleman? She had to be a good cook, and assurance was given that she would receive only the best of treatment.

Everyone who receives a great deal of mail gets the odd letter with a trick address. Rube recalls a box of fudge mailed from Pictou County and addressed simply: "Intermittent Drizzle". He received it.

In the great number of letters addressed to "Gazette", his T.V. program, one of the most prevalent questions is, "How does Rube remember all the different places and temperatures he uses on the continental weather map?" Rube assures us that it's straight memory work and no gimmicks are used. Once, when he was away ill, the replacement forecaster hinted that the trick was in the piece of chalk used to mark the map. He intimated that Rube's notes were written on the end of the chalk. Since that time requests have been coming in for autographed sticks of chalk.

In summing up his work, Rube quotes a little poem:

*In Retrospect*

*And now among the fading embers,*
*These in the main are my regrets,*
*When I am right, no one*
*remembers-*
*When I am wrong, no one forgets.*

(From C.B.C. Times)

# EDMONTON DISTRICT

## CALGARY

The year 1955 has already provided many changes in the Calgary Weather office and still others are promised.

Sam Shimizu, Meteorologist, decided to forego the dubious pleasures of mid-night shifts and went home to Toronto where, at last reports, he was happily settled in the routine at Head Office. His replacement, Dan Buss, a native of Winnipeg, was assigned to Calgary off course at Trenton.

Two Meteorological Assistants have left Calgary for greener fields. Bernard Anderson is now under training at Edmonton for a future in Air Traffic Control. Earl Hawthorne is assigned to Radiosonde and, he hopes, an ultimate northern posting. As replacements we have welcomed Gil Smith from Beatton River and Tom Donnelly from Teslin.

However, the most striking change, forecast for this fall has nothing to do with staff. The Calgary airport is finally getting its long awaited terminal building. This building will be one of the most modern in Canada and will house T.C.A. and C.P.A. staffs, the Tower, Radio Range and Weather Office all in one building after a separation of nearly eight years. A.F. McQuarrie

# MONCTON

On June 6, Department of Transport employees at Moncton and throughout the District were saddened by the sudden death of A.S. (Nick) Nicholson, Meteorological Assistant at Moncton DAFO. Nick had worked his regular shift on Friday, but became ill shortly after going home and passed away at Moncton Hospital early Monday morning. He is missed especially by those with whom he was associated at Moncton Airport and our deepest sympathy goes to Mrs. Nicholson.

# 1956

## NEWS on the DOT

(L) Governor General Massey, on his recent Northern tour, visited the Meteorological Station at Great Whale River in the Eastern Arctic. Here he is shown the radio room by OIC Fred Woodrow of Picton, Ont., a veteran of 14 years in the Arctic.

(R) AT RESOLUTE, N.W.T. - Governor General Massey watches the releasing of a weather balloon at the Joint Arctic Weather Station. S. Steiner of Toronto holds the balloon; the radiosonde transmitter is held by V. Boynton, USA.

## *WAS MY FACE RED*

Montreal's 'face', which has undergone many changes in recent years, has a little more color - weatherwise. April 12 was the date for the opening of a new weather forecasting service in colors. A beacon has been erected atop Dorchester Towers, 505 Dorchester Street, West, for the Canada Life Assurance Company. Colored lights flash forecasts some 12 miles across the sky. Data is based on information from the Dominion Public Weather Office at Montreal Airport at Dorval. A green light atop the beacon indicates clear weather ahead, red for cloudy, flashing red, rain, and flashing white, when it calls for snow. Lights running up the tower indicate warmer weather coming; running down, cooler weather. Steady lights will indicate no change. There are adjustments in the forecasts every six hours. The prediction during the daytime is good for the balance of the day. Night time lights indicate the weather for the following day.

(Montreal Star, March 28)

## *DIAL WEA*

For more than twenty years Britons have been able to dial TIM on their phones to get the time. A recorded woman's voice announces it continuously. Now the Post Office has started a new service. Dial WEA any hour of the day or night and a recorded voice gives you the official Met. weather forecast, brought up to date every few hours. About 1,000,000 calls a month are expected.

(Toronto Star and Telegram, March 5 and 20)

## *LETTER TO R.A. HORNSTEIN*

From St. John's, Nfld. - W.J. Robinson. "I was very glad to get your script of last Sunday evening's broadcast -- the first which I have missed for two or three years. Incidentally my wife hauled me off to hear a Sermon. But I am afraid I must confess that I find your broadcasts more interesting than Sermons."

# DOT Officials at World Conferences

The Department of Transport's importance in world affairs is indicated by the many international conferences attended by senior officials. To mention a few in the last several months:

Dr. W.L. Godson, superintendent of atmospheric research for the Weather Service of D.O.T., represented Canada at two international conferences. At Ravensburg, Germany, he attended a symposium on atmospheric ozone held by the Ozone Committee of International Association of Meteorology. There he delivered a paper "The Determination of Vertical Distribution of Ozone from Infra-Red Observation", and was named to serve on an international panel investigating this field.

The second conference attended by Dr. Godson was at Oslo, Norway. This was with NATO countries. It was a week's symposium on the atmosphere in the Arctic regions arranged by NATO's advisory group for aeronautical research and development. Dr. Godson presented a paper there also "Canadian Studies of the High-Latitude Stratosphere Jet Stream in Winter".

Keith McLeod, Superintendent of Public Weather in the Met Service, is representing Canada at the World Meteorological Organization Meeting at Geneva, October 16.

TRAINING CONFERENCE FOR MET INSTRUCTORS F.W. Benum, Met Headquarters; A. Thomson, Controller; D.E. DeBow, Training and Welfare. Second row: W.R. Richard, Montreal; C.F. Warren, Malton; R.H. Harley, Moncton; H.J. Green, Gander; J.A. Lachapelle, Montreal. Third row: E.L. Barclay, Goose; H.A. Matthison, Vancouver; C.H. James, Montreal; M.F. Dolan, Halifax. Back row: W.A. Turner, Winnipeg.

# Training Conferences for Instructors

The halls of the University of Toronto were the scenes of hot discussions during the last two weeks of June when personnel of Meteorological Headquarters, Toronto, and Training and Welfare, Ottawa, met for a conference with instructors in the Met Service. Organization of the meeting was under Frank Benum and Don McCormick of Met Headquarters and staff training officers Denis Wood and Darrel DeBow.

The group was welcomed to Head Office and to the training conference by A. Thomson, Controller of the Meteorological Service, who emphasized the responsibilities of the Met Service and the importance of giving the employees the best possible training.

The instructors called together for this conference are responsible for the training of new or semi-skilled observers and plotters and for Met training of radio operators and other personnel. They were drawn from across Canada, from Vancouver to Gander.

Instruction was on a two-phase basis. Key Head Office staff with F. Benum, M.N. Monsinger, J.G. Potter, E.B. Humphrey, G.L. Johnson, A.A. Mason, J.M. Wingfield and F.A. Page, acting as conference and syndicate leaders, led discussions in all facets of Met operation. The other phase, discussion on instructional techniques and supervisory problems, was led by Training and Welfare personnel.

The group also toured the various sections of the Meteorological Service and inspected all functions at Head Office.

A side-light of the project was the opportunity for the participants to become acquainted with the operation of "Toastmasters, Inc.", an organization whose function is one of mutual self-help in the art of public speaking. One of their meetings was attended by the group in a body, and was thoroughly enjoyed.

The conference gave the members an opportunity to exchange ideas for improvement in the service as a whole. Old acquaintances were renewed, and warm new friendships were formed. The whole two weeks was extremely interesting and, as one of the group commented, "The rafters of various establishments are still ringing ................"

HALIFAX -MET E.A. Croucher

The biggest news to report from the Halifax Dominion Public Weather Office --- and the biggest surprise --- was the unannounced early morning wedding of our O.I.C. Rube Hornstein, to Helen MacDonald. The staff members sent a gift of table silver with many heartfelt wishes for their future happiness.

A short time after the marriage, Rube departed for Cuidad Trujillo to represent Canada at the WMO Hurricane Seminar, at the request of our Controller, Mr. Thomson, who was attending conferences in Peru and Mexico City. The hospitality of the Dominican Republic in providing tours of the Island (at breakneck speeds) and the many interesting sights there provided stories to which we northerners were glad to listen.

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In the middle of May, Ted Munn, National president, and "Flash" Walsh, President in the Halifax office of the Civil Air Services Association, attended their national convention at Toronto when discussions were held with the Controller and many comprehensive plans made for the future of the Association.

The Radio-Met Bowling League concluded its activities with a banquet and dance at the Riverside presided over by Doug Holland. Prize-winners were: Ladies' high single, Dot McCarron; Ladies' high double, E. Gallagher (Radio); Men's high double, S. Spencer (Radio); Men's high single, O. Grandy; Men's high average, Joe Burke; Ladies' high average, Jackie Bailey. The Cleve Trophy was won this year by the Met Team of Joe Burke, Stan Westhaver, Oscar Grandy, Lou Quigley, Benny Bourque and Burpee Mason.

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The very popular TV program, "Gazette", closed at the end of June for the two summer months, but not before Rube Hornstein and Max Ferguson had been presented with membership passes to the Lily Lake Powerboat Club and the Dartmouth Fish and Game Association, tickets to the Colour Photographers' show. Rube had been presented with seven Haitian bowties and Max a straw hat by Murray Olin, representing the Petty Officers' mess of the "Magnificent" on the program.

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One June 3 Rube and Max spent a very enjoyable Sunday M.C.-ing at the Lily Lake Apple Blossom Regatta, where Rube was asked to open the festivities by riding surfboard.

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Joy Keeler, teletypist, showed a high degree of discrimination several months ago when she traded in a Buick for a Volkswagen. Since then she has given it such ardent praise that three other staff members have invested in the toy cars, with Jerry O'Neil and then Grace Hayes becoming Volkswagen enthusiasts.

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We felt very fortunate in adding Earl Ripley to our forecaster staff on June 15. Earl had worked in the Halifax office last summer, and returned again as soon as he had finished the M.A. (Met) course. To the Assistant ranks we have welcomed Theo Okonkwo, of Nigeria, who returned to the University of Fredericton in September, and Gus Shaw.

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The Cirrus Social Club, of which Burpee Mason is President, had very enjoyable card parties at the new home of Grace Hayes, Teletypist, in Fairview, and at the Oscar Grandys.

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During the past few months we have enjoyed receiving visits from Bill Ganong, a former Halifax forecaster now working at Ottawa; from Lt.-Cmdr. Markham, forecaster on the aircraft carrier "Magnificent", from Capt. Coates, Capt. Boudreau and Mr. Jennex who maintain weather observations on Sambro Lightship at the mouth of Halifax Harbour; from Art Twohig and Reg Hody of the Moncton District Office; from Mr. McTaggart-Cowan, Assistant Controller, who conducted many discussions with staff members and also visited the weather offices at Maritime Group Air Force Headquarters and the Navy Air Station at Shearwater; Mr. Burns and Mr. Goodwin, D.C.A.S., of Moncton; from Lt.-Cmdr. Mel Hagglund of the "Labrador" who told many interesting stories of his travels; from Mr. Hicking of the powerful Navy transmitter base at Newport Corner, and many other Department officials who just dropped in for brief calls.

# Meteorological Exhibit at CNE


WEATHER EXHIBIT CNE: Left Front, Mrs. M. Townsend at the Electronic Punch Machine; T. Burling at the teletype, which was connected to the Malton Forecast Office; standing by is Percy Saltzman.

A peep into the future featured this year's exhibit by the Meteorological Service at the Toronto Ex when the Met boys dreamed up and produced in a most effective manner a preview of "The Earth's Satellite" which will be launched next year in connection with the International Geophysical Year.

The Toronto "Globe and Mail" aptly described this exhibit in the following terms: "A scale model of an earth satellite, science's first step toward manned space stations, is capturing the imagination of visitors to the Department of Transport meteorological display at the CNE". Indicative of the interest taken in the display, is the attendance at the Met exhibit this year has exceeded that of any previous year. Most interested were the teenagers and University students.

The main D.O.T. exhibit consisted of a miniature model of the satellite spinning around a slowly revolving replica of the earth; a scale model of the satellite encased in plastic so that the mass of instruments inside it could be seen; and murals illustrated how the earth would look to a visitor 4,000 miles away.

A model of the three-stage rocket which will carry the satellite 300 miles above the earth and kick it off at 18,000 miles an hour stood in the foreground of the exhibition booth, attracting attention to the display. A booklet that was in large demand, gave details of the satellite, its mission and salient facts of its mission.

Accountable for this striking display of "The Earth's Satellite" were the following Met personnel: P.D. McTaggart-Cowan and Keith McLeod, who dreamed up the idea; Percy Saltzman, Fred Page and Keith McGlening, who designed and set up the display and were in attendance to answer questions; and the Headquarters Instrument Shop boys consisting of Joe Deschesne, Bill Richardson, Lief Hansen, Frank Harris, Peter Monett and Ed Wheeler, who assisted in building the models and the display.

Also exhibited in the Met Service booth was an electronic card machine used for punching weather information on cards under the advertised slogan "The Weather has punched us long enough, now we're - punching the weather". A teletype machine brought in weather reports from everywhere in North America; a lighted telescreen gave out current weather forecasts,

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and a large panel gave out information as to actual temperature, wind and humidity at the C.N.E.

Tommy Burling and Paul Simpson from Malton Weather Office were in attendance to supervise the teletype and answer general questions. Supervising the punch card machine and answering questions were Mrs. Margaret Perkins, Mrs. Lou Ellen Smith and Mrs. Margaret Townsend from the Climatological Section at Head Office.

# 1958

# NEWS on the DOT

Trips were recently made to Universities across Canada to recruit meteorologists. In addition to interviews and consultations, numerous seminars and talks were given to University groups. Several television and radio interviews were accorded the Meteorological representatives who were: Dr. D.P. McIntyre, Chief, Research & Training; Dr. W.L. Godson, Superintendent, Atmospheric Research; C.L. Mateer, Radiation Unit; T.L. Richards, Malton Forecast Office; A. Ouellet, Montreal Forecast Office.

# SOME WEATHER REPORTS

## NEW ICE SERVICE FOR EAST COAST

Plans for establishing an Ice Central at the Shearwater AFO at Halifax are proceeding steadily. The RCN is co-operating in the first year by providing the trained ice forecasters and it is expected that the Met. Branch will have its own men by next year. A special course in Sea Ice observing is being held at Meteorological Headquarters.

## J. CLODMAN AWARDED DARTON PRIZE

The Royal Meteorological Society, Canadian Branch, has recommended that the Darton Prize be awarded to, among others, J. Clodman of Head Office for his paper on "High Level Turbulence" (published in Quarterly Journal, Royal Meteorological Society, January, 1957).

## WEATHERMEN ATTEND CONFERENCES AT NEW DELHI, INDIA

The Deputy Director, P.D. McTaggart-Cowan and F.W. Benum, Superintendent of Continental Aviation Weather Services, were in New Delhi, India, attending the Second Session of the Commission for Synoptic Meteorology of the World Meteorological Organization. This commission recommends and organizes uniform worldwide codes, networks of observing stations, times of observations, and many other phases of meteorology which are so important on an international scale.

## AT BANGKOK, SIAM

The Director, Andrew Thomson, attended the Pacific Science Congress at Bangkok, Siam, where he represented not only Meteorological Branch but also the World Meteorological Organization. More than 500 scientists were in attendance.

## K.T. MCLEOD AT CIVIL DEFENCE COLLEGE

K.T. McLeod, Superintendent of Public Weather Services, attended the Department of National Defence Orientation Course at Civil Defence College in mid-January. He was very much impressed by the well-run and informative nature of the Course, which gave facts and demonstrated solutions to the many problems which may arise with national disasters. The training course was well organized and the staff able and conscientious.

## BUSINESS FIRMS SEEK STATISTICS FROM CLIMATOLOGY

The Climatological Division's Machine Section has carried out statistical analysis work to meet a constant flow of enquiries from a wide range of organizations including Imperial Oil Ltd., Travelers Insurance Co., and the British Meteorological Office.

## RADIOSONDE SCHOOL IN OPERATION

Eleven trainees are enrolled at present in the three-month-long Radiosonde Training School. In charge is A.M. Micelli, assisted by Instructors E.C. Bourdon, S. Dodds and R. McFadden. The course in upper-air observations is given four times a year and graduates are posted to radiosonde stations across Canada.

## MANY VISITORS SEE FORECAST OFFICE DISPLAY AT TORONTO MUSEUM

The Royal Ontario Museum in Toronto held Open House recently and one of the features was a small-scale forecast office on the spot. Manned by K.T. McLeod, A.G. MacVicar, L.K. McGlening and J. Overs, the feature was a pronounced success, with over 500 museum visitors dropping in to see the exhibit, ask questions, and pass a comment.

## Mrs. Riggs, Longest in Met. Service

nsp.

Mrs. Mary Riggs got a big sendoff from Toronto Weather Office on the occasion of her retirement in her 70th year. With over forty years of weather work behind her, Mrs. Riggs was the employee with the longest service on the staff. Born in Toronto, she resides near her two sons and her seven grandchildren.

# EDMONTON

EDMONTON, JUNE 26 - Ground Observer Corps wings and scroll were presented to Anthony Smith (right) a radiosonde technician with D.O.T. at Sachs Harbour. Sachs Harbour thus becomes the most northerly manned G Ob C post. It is more than 300 miles north of the Arctic circle, and is on Banks Island facing the Beaufort Sea. Here, Flying Officer Norm Dick, 20 Det. operations officer congratulates Mr. Smith.

Ground Observer Corps personnel are civilian volunteers, situated in every part of Canada, who stand ready to report all intruding aircraft or to assist in locating lost or downed pilots.

In September, Mr. Smith moves to Resolute Bay - more than 500 miles north of the Arctic circle - to continue as a D.O.T. radiosonde technician and as a G Ob C observer. (RCAF Photo)

# SUGGESTION AWARD REPORTS

## MONTREAL

C.H. James, Central Analysis Office, won $300 for a time-saving device for use in Ozalid machines, which reproduce charts in the 35 Met. offices in Canada. Mr. James developed a gauge which permits proper adjustments in speed and exposure for each chart. Formerly, adjustment in speed and exposure was done by trial and error. The cost of paper and time of operator is saved. Service is also improved, being better equipped to ment deadlines.

Miss M.G. Reeve won the second largest amount, $108, for developing a manual used in training personnel in communications. Using the manual saves not only time but also provides a uniform training.

## MONTREAL REGION EMPLOYEES, C.H. JAMES AND MISS M.G. REEVE, MET. BRANCH WIN TWO HIGHEST CHEQUES IN SUGGESTION AWARD PLAN


Miss M.G. Reeve and J.L. Blondeau


C.H. James and J.L. Blondeau


Joseph Omer Roy and J.L. Blondeau

## U.S.A.F. HONOURS C. ELMER STEVENS, GOOSE BAY

C. Elmer Stevens, O.I.C. Goose Main Meteorological Office was the recipient of honour from the Strategic Air Command of the U.S.A.F. On Armed Forces Day May 17, a plaque was presented to him in recognition of the meritorious service he and his department had rendered to the United States Armed Services.

In a letter to Dr. A. Thomson, Director of Met. Branch, informing him of this honour, Colonel A.J. Beck of U.S.A.F. writes "Mr. Stevens and his Meteorological Office personnel have repeatedly handled large scale exercises of near saturation capacity in a calm, efficient and expeditious manner. It is largely through his efforts that the harmonious relationship that presently exists between our meteorological services was attained."

## DIRECTOR PRAISED

Meteorological staff at Goose are warm in their praise for the prompt and efficient manner the Regional Director of Montreal, J.L. Blondeau and his staff responded to a radio message in the emergency situation of Mrs. T. Bourque, wife of technician Terence Bourque, who was too critically ill to travel. The message was received over a week-end but within a very short time Mr. Blondeau was able to expedite an aircraft, a pilot and a specialist doctor, possibly saving the life of a mother and a child. The pilot of the aircraft was D.O.T. pilot A. Guyot.

# 1960

**News on the DOT**

DEPARTMENT OF TRANSPORT STAFF PUBLICATION

# Mariner's Language in Marine Forecasts

Beginning March 1, the Canadian Weather Service and the United States Weather Bureau attuned their marine weather forecasts to the language of the mariner. Knots instead of miles per hour will be used for weather terminology in forecasts and bulletins. Forecasts for land areas will continue to use the landlubber's terms, miles per hour.

The knot has long been a part of marine vocabulary and is used as a unit of speed by sailors around the world. One knot equals 1.15 miles per hour, so that a speed of 10 knots is comparable to about 11½ miles per hour.

The Meteorological Branch of the Department provides marine weather forecasts several times each day for both the Atlantic and Pacific coastal waters, the St. Lawrence, Great Lakes and Churchill shipping route through Hudson Strait and Hudson Bay, and other inland waterways. Even the areas off the southwest coast of Greenland are taken care of in the marine forecasts issued by the Canadian forecast offices.

The marine forecasts, broadcast by the Government Marine Radio Stations and by the CBC and many commercial stations broadcasting at scheduled times, are used extensively by mariners in planning their operations. Special attention is given in the forecasts to the weather elements most critical to marine operations—wind speed, wind direction, fog and icing conditions. Gale and storm warnings are also issued when severe weather conditions are expected.

**Important to Fishermen**

The Northumberland Strait disaster last June, when 37 fishermen lost their lives, led to a recent conference of fishermen in the north shore area of New Brunswick, with E. A. Barks, Regional Forecast Officer for Moncton. The weather service is encouraging inshore fishermen to install radios on their boats, since, unfortunately, warnings of quick-sweeping gales may not be issued until the boats have cleared ports. Ship radio, and also ship-to-shore units, have long been standard equipment on fishing vessels which venture farther from home. Such disasters provide proof that the use of ship radio is also vital to the security of inshore fishermen.

The great increase in small boating that has recently developed across Canada and is expected to expand rapidly is focussing attention on the need for more knowledge by these boaters and more weather service for them.

## Weather Forecast Office For Fredericton, N.B.

A new forecast office will be opened in Fredericton early in April. The opening, originally scheduled for last summer, was postponed due to the shortage of forecasters in the Canadian Weather Service. To be located in the Customs Building on Queen Street, the office is being established to provide improved weather service to such agencies as the New Brunswick Electric Power Commission, the forest service, other public utilities, local industry, agriculture and the general public. While it will not be staffed sufficiently to prepare its own forecasts for the St. John River Valley area, it will in many cases be able to improve locally on the general forecasts issued by the weather office in Halifax. The staff will consist of one forecaster, R. B. B. Dickison, officer-in-charge of the forecast office at RCAF station, Chatham, and one assistant. Mr. Dickison, a native of Doaktown, N.B., will be assisted by J. S. Worth, at present employed at the Fredericton airport weather station.

*CANADA'S GIFT TO W.M.O.—Canadian crafts and products are expressed in the decor for the President's Office in the new home of the World Meteorological Organization.*

# Canada Furnishes Room in New Home World Meteorological Organization

A bit of Canada will be embodied in the first home of the World Meteorological Organization being erected in Geneva, Switzerland. Canada, a member nation of WMO, chose as her contribution the furnishing of the President's office. A combination of Canadian products, skill and ingenuity has produced an excellent display of Canadian artistry and handiwork.

Of oiled Canadian walnut are the President's desk, a three-door cabinet, telephone stand, end-tables and coffee table. A carving of Canadian butternut, following closely the meteorological symbolism on the postage stamp issued by the Swiss Government and WMO, is mounted on the front of the desk. Of Canadian butternut, also, are the carved meteorological motifs mounted on the doors of the cabinet.

Highlight of the gift is the wooden panelling behind the President's desk. Of native butternut, sixteen feet by more than eight feet, it is hand-carved to show in relief North America and parts of other continents, significant of the universal character of WMO. Motifs characteristic of the areas shown have been carved across the face of the map.

The four chairs and settee are upholstered in top-grain cowhide dyed a soft rust. They are an exact replica of the chairs used by Queen Elizabeth and Vice-President Nixon when they opened the St. Lawrence Seaway power plant at Cornwall, Ontario, last year. Drapes of Canadian design and weave, in tones of egg-shell and beige to deep tan, are a Canadian design award winner.

A Georgian Bay scene by the well-known Canadian artist, A. J. Casson, a former President of the Royal Canadian Academy of Arts, will hang on the wall and three table lamps of turned Canadian wood are painted silver grey to match the frame of the picture.

Both Dr. Andrew Thomson, who retired last year as Director of Canada's Meteorological Services, and his successor, P. D. McTaggart-Cowan, took a very personal and active interest in the designing and manufacturing of this distinctive Canadian gift to WMO.

## W. R. LAVERY NAMED TO AIR REGS POST

William R. Lavery, Air Regulations Inspector, Vancouver, took up his duties as Superintendent of Air Regulations, in January. He takes over the post formerly held by the late "Des" Murphy.

## Met. Experiments with Radar To Guide Cloud-Seeding Plane

J. Dickson, Meteorologist, Toronto, was in Port Hardy, B.C. to conduct a unique cloud-seeding experiment with aircraft guided by a portable radar set.

The radar is being used to track and guide cloud-seeding aircraft to establish their position relative to pre-established points within a control area.

No actual cloud seeding was done, but scientists hope that by using radar to position and track aircraft, they can make cloud-seeding operations more controllable and effective within pre-determined areas.

Cloud seeding is generally done by dumping of dry ice into clouds to stimulate rainfall by artificial means. The measure has met with varying success.

The experiments being conducted at the northern tip of Vancouver Island are an extension of similar experiments carried out over the past two years in Quebec.

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## First Time Two Canadians on Council of A.M.S.

For the first time in history, two Canadian Meteorologists are on the Council of the American Meteorological Society. P. D. McTaggart-Cowan, Director of the Canadian Weather Service, was elected vice-president for a two-year term and Dr. D. P. McIntyre, Chief of the Research and Training Division, continues to serve on the Council in the Society for a three-year period.

Many of Canada's professional meteorologists are members of the American Meteorological Society which has an enrollment of 7,000 including a number of interested laymen.

[illegible]
suggested portable audio alarm to warn personnel working on a runway which is to be used for an emergency landing. It is operated from the control tower.

### KNOB LAKE TO BE IN SCHEDULED WEATHER BROADCASTS

W. R. GILLESPIE, radio operator, Seven Island Marine Aeradio Station suggested that Knob Lake Weather be included in the Seven Island scheduled weather broadcasts. He received a barometer for the suggestion.

### SUGGESTION SAVES TIME IN MARKING EXAMS

C. H. JAMES, Meteorological technician, Montreal, suggested that when a master copy of correctly plotted meteorological data, etched on a clear sheet of cellulose, is placed over examination sheet of meteorological technician the examiner can see at a glance whether student's plotting is correct. This eliminates the tedious job of measuring each plotting mark of students paper. He received a barometer for his suggestion.

Mr. James had previously received an award of $300 for another suggestion.

T. Foley
Empress, Alta.

W. R. Gillespie
Seven Islands, P.Q.

C. H. James
Montreal, P.Q.

W. A. Clavet
Winnipeg

A. B. Perry
Fort St. John

S. M. Nield
Fort St. John

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## A. E. Lewis, Met Technician Awarded Bravery Medal

The Queen awarded the British Empire medal for gallantry, civil division, to Arthur Ernest Lewis, a meteorological technician of Dease Lake, B.C., who was one of five men in a boat which capsized on the lake. Dressed in heavy bush clothing, he swam 200 yards to the shore in freezing water and stumbled three-quarters of a mile to get help for his companions, who were hanging onto the boat.

# Torbay Weatherman Trapped by Blizzard Remains on the Job for 54 Rugged Hours

The Department of Transport's weathermen take a back seat to no man when it comes to standing fast in the line of duty.

Working at Torbay Airport, St. John's, Newfoundland, Meteorological Technician Cyril M. Dyke stayed at his post without replacement for 54 storm-battered hours while the winter's worst gales and snowfall pounded the area.

He went on duty at the airport at 4 p.m. Sunday, March 13, just when the storm was beginning to build up. Before he was through his shift, it was apparent that he was in for a bit of overtime. Drifting snow had blocked the roads and conditions generally had stalled traffic to a point where his relief man could not reach the weather station.

He stayed on...... and on...... and on. The storm raged with increasing fury, March 13 became March 14, then March 15. By this time the entire area was at a standstill and the wind was ripping the tops off snowdrifts up to 20 feet high near the airport.

By this time Mr. Dyke was almost exhausted, yet he stuck to his post and carried out his duties, recording and reporting the weather.

At around 10.30 p.m., still busy with the extra work load brought about by the storm, he wearily welcomed "Met" technician P. M. Roach, who had struggled on foot over three miles of unplowed, drifted-in roads to take over the weather job. At some points he had found it almost impossible to proceed and it had taken him hours to cover the distance.

The entire episode was brought to the attention of P. D. McTaggart-Cowan, Director, Meteorological Branch, who heartily commended both Mr. Dyke and Mr. Roach for "exemplary devotion to duty".

# WEATHERMEN MAY PLAY PART IN AIR POLLUTION STUDIES

Canadian scientists are attempting to combine the techniques of weather forecasting with information on air pollution in major cities to map the extent and degree of pollution in Canada. So far they have had considerable success in one area in forecasting pollution levels and now are extending their network for collecting information to other centres.

A national air-sampling network, a co-operative effort by federal, provincial and municipal government agencies, is in operation covering Sydney, N.S.; Toronto, Hamilton, Windsor, Winnipeg and Vancouver. Steps are being taken to fill the gaps by adding Montreal and Edmonton, through the co-operation of the provincial health departments. The aim is to add other centres and perhaps extend the network to cover less-settled areas. Information now sent to the air-pollution services of the Federal Health Department's Occupational Health Division is being used to prepare maps of air pollution climatology in collaboration with the meteorological service.

Behind this movement is the possibility that as cities grow and industrialization increases, the effects of air pollution may endanger health and damage buildings, exposed materials and crops. A knowledge of the pollution levels therefore may lead to better city planning and industrial site selection.

# WIN AWARDS FOR SUGGESTIONS

R. G. Stark,
Meteorologist,
Edmonton

## WINS SIXTH AWARD

R. G. Stark won his sixth suggestion award for an idea that eases the work of the weather-map plotter. He suggested that a flagged symbol be placed before a corrected group in a coded meteorological message so that a map-plotter could make correction without reviewing the entire message. He was awarded $55.

## "Met" Gets Research Ship For Great Lakes Study

The diesel-powered ship *Porte Dauphine,* formerly a Royal Canadian Navy gate vessel and on loan to the Department of Mines and Technical Surveys as a Great Lakes marine research ship, has been taken over by the Department.

She will be used by the Department's Meteorological Branch and other scientific bodies in the study of the Lakes, their bearing upon weather conditions and other natural factors that affect navigation or otherwise are of national concern. Temperatures on and in the water, currents, ice conditions and other physical aspects of the lakes will be under study.

CMS *Porte Dauphine* is 125 feet long and normally is manned by a crew of 12. She is being put into drydock at Toronto for refitting to make her comply with Steamship Inspection requirements for civilian-operated vessels.

# Stanley Bane Retires

## He was Founder Of Weather Workshop

Stanley Bane, Superintendent of the Meteorological Service's instrument workshop, retired on March 11, after 32 years of distinguished service. His many friends on the staff at Met Headquarters, Toronto, gathered to do him honour at a banquet chaired by H. G. Bindon, Chief of the Instrument Division. Speakers included Dr. A. Thomson, former Director of the Weather Service; and P. D. McTaggart-Cowan, present Director. Mr. and Mrs. Bane were presented with a Rolleiflex camera, a Bell-Howell slide projector, light-meter, viewing screen and accessories, by A. Burnside.

Mr. Bane joined the weather workshop in 1928 and practically built it to its present importance in the Meteorological Branch. It has manufactured almost every type of meteorological instrument used.

During World War II, when the government was experiencing difficulty in getting some component parts properly made by commercial firms, it offered Mr. Bane another position. He did not accept it, however, the work was eventually brought to his own instrument workshop. This led to considerable expansion in the accommodation in the shop and an increase in staff. It has kept on growing ever since until now it has twenty-five workers. Last year it produced around 1,600 instruments or major instrument components.

Mr. Bane received a technical school

eral years as apprentice with Negretti and Zambra, a large British instrument company. He saw service in World War I and was wounded in France.

Mr. and Mrs. Bane plan to visit Florida and then Australia for an extended period, following which they will return to Toronto.

***AT RETIREMENT BANQUET FOR STANLEY BANE—Shown here at head table (Left to right) A. Burnside, J. R. Fowler, M. J. Watson, Mrs. Bane, H. Bindon, Stanley Bane, P. D. McTaggart-Cowan, Dr. A. Thomson, J. R. Noble and F. W. Benum.***

### Minimizes Errors

Harold W. Carson, a met. technician on the Seven Islands radiosonde staff, was awarded a travel alarm clock for his suggestion that true north and south points be permanently marked on the inside of rawinsonde towers. This will enable operators to make an extra check on antenna orientation and tend to prevent errors in computing upper wind directions.

### Removes Hazard

Riley J. Workman, a met. technician at Fort Nelson, B.C., was presented with an electric alarm clock for his suggestion to remove a potential short circuit hazard by making certain changes in ceiling projector switch boxes.

# 1961

# News on the DOT

DEPARTMENT OF TRANSPORT STAFF PUBLICATION

Faithfully recording weather data
twice a day without pay,
1350 men and women across the country
help the department as

# CANADA'S VOLUNTARY WEATHER OBSERVERS

**By M. K. Thomas**
***Climatological Division***

PERHAPS that neighbor of yours with the white box in his backyard is not a beekeeper at all. He may be a volunteer weather observer co-operating with the meteorological branch in our own Department of Transport.

His beehive or bird cage is actually a thermometer shelter. It has louvred sides so that the air can circulate through the box but no direct sunshine or rain can fall on the thermometers. The shelter and a small copper raingauge sitting on the ground nearby identify him as one of Canada's 1350 co-operative weather observers.

Farmers, doctors, ranchers, bankers, school-teachers, editors, pensioners—in fact, people from all walks of life are represented among them.

These men and women send in monthly reports from such places as Horsefly Lake, Seven Persons, Yellow Grass, Dog River and Rattling Brook Depot as well as from better known localities such as Chatham, Cornwall and Nanaimo.

The co-operative observation stations are spread across the settled portions of the country and in fact are most densely located in a few of the large urban areas. In cities like Victoria, Vancouver, Regina, Winnipeg, Toronto and Ottawa, meteorological branch employees have volunteered their services for the establishment of quite extensive networks to measure precipitation and temperature.

On a provincial basis, Ontario leads with 290 co-operative stations followed by British Columbia with 228.

Co-operative observers receive no pay from the department for taking their twice daily observations and sending in a monthly report. However, all instruments, report forms, envelopes and postage are paid for by the meteorological branch, while the observer agrees to take twice daily observations.

*Opposite page: A weather observer checks his rain gauge. Above: A typical co-operative observing station at Brownfield, Alberta.*

During periods of sickness or absence on holidays, the observer is usually able to arrange for a replacement so that his record will be complete.

Compared to those taken by professional observers at air, marine and northern weather observing stations, the actual observations taken at co-operative stations are relatively simple.

Most co-operative observers take an observation at 7 a.m. and a second about 6 p.m. At each observation they read and re-set both the maximum and minimum thermometers, measure any rain or snow that has fallen since the last observation, measure the depth of snow on the ground and usually make a few notes regarding the character of the weather during the day.

Most observers also record the times of beginning and ending of precipitation and some also observe and record cloud amounts, humidity and wind information. At the end of each month, the observer completes a monthly report form and mails it as soon as possible to a regional processing centre.

Such centres are located at Victoria, Edmonton, Regina, Saint John and Torbay. In Quebec, all forms are first routed to a Montreal office of the Quebec Department of Hydraulic Resources, while in Ontario and Manitoba all co-operative observation forms are sent directly to meteorological headquarters in Toronto.

Since 1953, the meteorological branch has made annual awards to twenty co-operative observers for outstanding work. Accuracy and completeness of report, along with the length of service are the main factors taken into consideration when making these awards, and the prizes are usually books.

The Canadian Oxford Atlas has been given for the past three years, and after being suitably inscribed, is a token of our gratitude to these men and women.

There were co-operative weather observers in Canada before the formation of the meteorological service, and even before Confederation.

The earliest weather journal in Canada extending over the period of a year is one from Quebec City in 1765-1766, while the earliest long period records which we have on file are those taken by the Rev. C. Dade in Toronto during the 1830's and Dr. Smallwood at Montreal in the 1850's.

The first meteorological observatory with professional observers was established at Toronto early in 1840 and by Confederation in 1867 there were approximately 100 co-operative observers in action in Canada under the leadership of the Toronto office which was then sponsored by the Government of Upper Canada.

Since then the number of co-operative observers has grown

*Continued on page 15*

## WEATHER OBSERVERS

*Continued from page 5*

steadily until at the beginning of the present fiscal year out of 1900 stations of all kinds 1350 were manned by volunteers.

Although these observations are not usable in the regular weather forecasting program, the climatic data built up over the years from these volunteer stations have provided the basic knowledge of the climate of Canada upon which the different forecast regions have been based.

Using information obtained from these stations, thousands of requests for climatic data are handled annually, and the basic data behind such articles as the one on the climate of Canada which appeared in the 1959 *Canada Year Book* are only made possible by the observations taken and reported by these volunteers.

Most co-operative observers obtain no material gain from their activities but find weather observing an interesting hobby. However, there are many who take observations, or have them taken by their employees, on their farms or in their company because they find weather information of value to their business.

Many weather observers enjoy a certain amount of notoriety as the local weatherman and local newspapers often carry weather stories from information provided by these observers. On occasion, weather observers go into court to give evidence regarding the weather on certain days in the past.

Meteorological branch officers administering the co-operative network occasionally come across interesting notes and letters from co-operative observers. Such notes as "raingauge attacked by grizzly bear—please send replacement" and "thermometers taken inside because of the cold" —are perhaps extreme examples of the notes received from these people.

Most meteorological inspectors enjoy visiting these co-operative stations, but one veteran inspector, while expressing appreciation to the co-operative observers for their generous hospitality and the provision of slices of pie and cups of tea, does admit that he has been chased and even bitten by more dogs than he cares to remember.


*Above: Three-dimensional map of radiosonde network and actual instruments form DOT display. Below: Equipment and models in piston-engine section.*

Conical chairs and bar stools are feature of cocktail lounge on second floor.

Above: Small waiting rooms like this one are located at each of terminal's 23 gates. Left: Weather office in new building is Canada's largest, makes marine and aviation forecasts and provides all weather services for province of Quebec.

*terminal's 33 gates. Left: Weather office in new building is Canada's largest, makes marine and aviation forecasts and provides all weather services for province of Quebec.*

## MET BRANCH ON TV

The Canadian weather service was the subject of a weekly series on 7-0-1, an early-evening television program seen five nights a week over CBC stations in Kenora, Toronto, Ottawa, Montreal and Quebec City.

The program originates in the CBC studios in Toronto and Percy Saltzman of the meteorological branch is the show's regular weatherman.

The director of the branch, P. D. McTaggart-Cowan, was interviewed on October 31 and the series featured hydrometeorology, weather instruments, satellites, radiosonde observations of the upper air, professional staff training, research in ozone and radiation, communications, meteorological data processing, weather forecasting and other facets of the branch's work once a week.

The presentation was mostly on film and through interviews with meteorological staff.

### Wins Two Awards, Including $25

Officer-in Charge JAMES O. MARTIN of the Clear Creek, Ont., aeradio station won two awards. He received $25 for his suggestion that a standard method of determining barometer pressure be circulated to radio and TV stations to ensure the broadcast of accurate information, and chose an electric alarm clock as his award for suggesting that more publicity be given to the availability of technical texts through the departmental library.

### Simple Idea Saves Money—Wins $25

Meteorological Technician R.J. GRAUMAN of Edmonton won $25 for his suggestion that a line be painted on the floor of radiosonde balloon inflation buildings to mark the centre of the doorway, and guide the man carrying a balloon, thus reducing the danger of a balloon bursting against the door jamb.

# Floating Laboratory

by U. Sporns

*Meteorological Branch (Hydrometeorology Section)*

THE Great Lakes cover an area equal to twice the size of Nova Scotia, but we have never been able to obtain more than scattered weather observations from this region in summer and none at all in winter.

Questions of many years standing have gone unanswered. How much snow and rain fall directly into the Lakes and how much water evaporates? Why does ice form or accumulate only in certain areas? To what extent is the weather of the surrounding area changed as air flows over the Lakes? How can a valid forecast for the water levels of the Lakes best be made? It looks like at last we may be in a position to answer these puzzlers from observations made by the department's recently-acquired research vessel.

The *Porte Dauphine*, a 400-ton, 125-gate vessel, is North America's largest Great Lakes research ship. She was purchased from the navy early in 1960 and is now being operated by D.O.T. for the Great Lakes Institute of the University of Toronto.

Equipped with three fully-instrumented laboratories, it is difficult to estimate what far-reaching benefits will be realized by year-round operation of the *Porte Dauphine*. When she is on cruise complete weather observations are provided every three hours. This information is of great value to forecasters in analyzing the weather in surrounding areas.

The meteorological branch is one of a number of agencies collaborating with the university on this program. Specifically, the hydrometeorological section is responsible for meteorological and climatological research, which means they are studying the effect the weather has on the Lakes and the effect the Lakes have on the weather.

Top: *An instrument head*, containing temperature, humidity and wind sensing units, is installed on the movable boom mounted at the bow of the *Porte Dauphine*.

Centre: Ozone count is taken by U. G. Lama, a student employed by the met. branch in summer. The ozone sampler, along with many other instruments, is installed on a former gun-mount.

Bottom: *The author* studies thermometers in a screen located on the forward deck. Some of the other instruments seen in this photo are a gimbal-mounted Eppleypyrheliometer (top centre) and two standard rain-gauges (mounted on each end of a vertical bar at top of tower).

*Eliminates Costly Calls—Gets $26*

WILLIAM G. LEWIS, a meteorologist at Trenton, Ont., won $26.00 for his idea to eliminate daily long distance phone calls from the Uplands (Ottawa) RCAF Station DAFO to Atomic Energy of Canada at Chalk River. He recommended that 36-hour area weather forecasts can be obtained by phoning Petawawa, which receives same information from Malton F.O.

## MET. DIRECTOR ON WHIRLWIND TOUR

Canada's no. 1 weatherman went on a whirlwind tour of 30 stations across Canada to tell weather personnel of their sunny future under a new career plan. The plan has been designed to enable met. professionals to specialize and get further faster.

P. D. McTaggart-Cowan, director of the meteorological branch, left Toronto February 13 on a trip that took him as far west as Whitehorse, as far north as Frobisher Bay and as far east as Gander. He returned to his Toronto office March 27.

The hurricane tour called for meetings with each and every meteorologist, meteorological officer and met. technician at each station visited. He was at each station for an average of 24 hours only and scheduled meetings for every available minute of every available day.

A typical day (March 23) called for getting up at Halifax around 4.00 a.m. to catch the 5.10 a.m. flight to Gander. Arriving at Gander at 10.15 a.m., the director held discussions with the staff right through till 10 o'clock that night.

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## NEW WEATHER OFFICE OPENED

The Truro weather office went into operation on November 8. The 28-foot square building, a modern bungalow structure (see cut) located at 9 Vimy Road, replaces the old Debert weather station.

Explaining the change in location, D. C. Archibald, chief of the basic weather division, Toronto, said that the office could better serve the interests of agriculture, transportation, forestry, fishing, utilities and the general public by being located at Truro. This was particularly so in view of the limited flying activity at Debert.

The new office is connected to one of the special weather teletype circuits which carry traffic between Montreal and the Maritime provinces. Its staff includes Ron Graham, weather officer-in-charge and Rupert Troop and Ron MacKenzie, met. technicians.

# An Open Door To N

*(Editor's Note: This article was originally written for* Canadian High News, *a publication read by high school students from coast to coast. Its purpose was to tell students, particularly 1961 graduates, of the job opportunities that await them with the Department of Transport.*

News On The DOT *felt that many of its own readers would be interested in learning about these opportunities and passing the information along to young people of their acquaintance, who are on the threshold of careers.)*

CANADIAN youth, born in the Air Age and standing at the threshold of the Space Age, have career opportunities in fields their fathers never knew.

The gigantic advances made by aviation in the past few years have been accompanied, and largely made possible, by the forward march of science. It is this fact, with its resulting demand for bright and ambitious young men and women, that is causing many high school graduates to seek their future in the broad field of aviation.

It is not so long since youth thought of jobs in the realm of flying in terms of piloting or in mechanical engineering and aircraft maintenance. Today's career openings, however, lie in vast measure in the closely-integrated spheres of air traffic control, meteorology and telecommunications.

Work in these fields calls for development of special skills through expert training. The Department of Transport, which is responsible for these necessary aviation services, has established a school at Ottawa Airport at which to train these badly needed specialists.

The Air Services School is divided into four main teaching sectors, training air traffic controllers, meteorological technicians, communicators and radio operators.

## Open Competitions

The openings for air traffic controllers, meteorological technicians and communicators are advertised as open competitions by the Civil Service Commission and candidates must have a junior matriculation standing.

Those who are accepted are then sent to the Air Services School, each trainee being given a living allowance of $175 a month during his training period. Those who successfully pass the course are taken on the departmental staff on a monthly salary basis.

In the case of radio operators, candidates must already hold an operator's certificate. However, they are taken on as departmental staff at the beginning, with a salary of $312 per month.

(continued on page 16)

Opposite: Student meteorological technicians study weather observing methods during their training at the school. Two instructors holding the balloon (at left and centre) demonstrate the use of the weather balloon.

Lower left: Young radio operators learn communications procedures while training with the school's modern equipment.

Lower right: Student communicators learn to use teletype equipment.

# ew Careers

## Meteorological Training

The course for meteorological technicians also calls for a junior matriculation entry standard. Successful candidates take a 12-week training course, satisfactory completion of which gives them a rating of meteorological technician, Grade 1. They are then hired as either surface weather observers or radiosonde observers.

In the former instance, they go as surface weather observers to a meteorological observing station, one of the many forecast offices, or to the Central Analysis Office at Montreal. They can work their way up to a Grade 8 rating, with a salary up to $7,500 a year.

Those entering the radiosonde field are sent to a special school at Scarborough, Ontario. After taking a 12-week training course, they are posted to one of the radiosonde weather stations for duty. They can progress up to a Grade 4 rating.

In these fields, there will be opportunities for work with a touch of adventure. Some of the new men will be able to "go north" and serve an interesting and rewarding tour of duty at one of the department's weather stations in the High Arctic.

## CHOOSES BAROMETER AS AWARD

After approval had been given to his suggestion, RONALD B. GILLIS, clerk, meteorological branch, chose a walnut-mounted barometer as his award.

Mr. Gillis had noticed that many of the monthly recorded cards sent in to the Toronto data processing centre from the field stations arrived in damaged condition. He, therefore, suggested that self-sealing, corrugated outside wrappers be provided for such shipments.

## MET EMPLOYEE RECEIVES $90

A. M. W. SAMUELS, a clerk in the meteorological branch, received $90 for saving the department approximately $900 a year.

His suggestion was that certain meteorological forms be microfilmed in a way that would save film.

*Steinhaur by Steinhaur*

## NEWS ON THE DOT CONTRIBUTOR

The sketches which illustrate the article "Weather and Why" on pages 11 to 13 are the handiwork of Norman Steinhaur, a technical illustrator with the met. branch. A D.O.T. employee since 1949, he has been a frequent contributor to our pages.

# Weather and Why

**highlights from several articles written**

**by R. A. Hornstein,**
***Meteorologist, Halifax***

EVEN if your favorite almanac does caution you to plant potatoes by the dark of the moon; even if your grandmother did swear that thunder turned the milk sour—when a D.O.T. met. authority like Halifax Meteorologist R.A. Hornstein explains away these beliefs in logical fashion, perhaps you will agree that such weather lore is really pretty far-fetched.

Weather lore—the curious signs, beliefs, fancies and legends which man uses to assist him in explaining and forecasting the weather—has a 2,000-year history. The origins of much of it have been lost in the dim mists of antiquity, but over the centuries thousands of people have been firmly convinced that supernatural phenomena do indeed play a part in the weather. And even today, with greater scientific knowledge of weather whys and wherefores available than ever before, many continue to hold fast to these beliefs.

Such lore adds color to our lives, but it is untrue; that is, most of it is. But the odd saying does make sense and may be highly accurate.

For example, it is true that a close connection exists between the temperature and the tempo of a cricket's chirp. Count the number of chirps in 14 seconds, add 40 and nine times out of 10 you will know the temperature to within a couple of degrees.

However, such accuracy in weather lore is rare indeed.

*(continued on next page)*

## WEATHER AND WHY

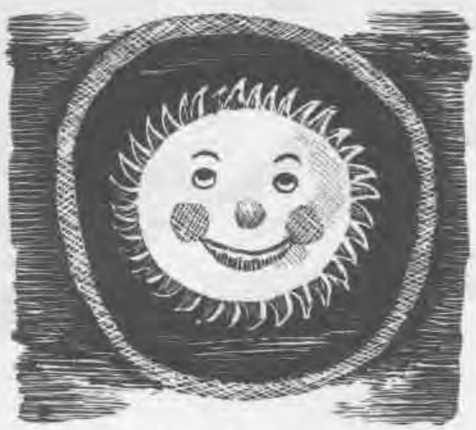
*(continued from previous page)*

### "It's Greek to Me......."

Ancient Greeks were faithful followers of complete teachings of lore. If you happen to subscribe to the saying, "a red sky in the morning, sailors take warning", it may be of interest to know that it dates back to Theophrates, a Greek gentleman who made a hobby of studying weather.

Moving on a few centuries to the Roman era, we find they considered the Greek studies to be so excellent that very little was added, except the fact that the pig was included among those animals accredited with foresight regarding the weather.

During the medieval period in European history scientists of the day added a few items by playing with the calendar and coming up with such beliefs as, "if Candlemas Day be fair and bright, winter will have another flight. But if Candlemas Day brings clouds and rain, winter is gone and won't come again." This later evolved into our present day belief that if friend groundhog comes out of his comfortable burrow on February 2nd (Candlemas Day) and sees his shadow then we are in for another six weeks of winter. Most of us have been able to prove for ourselves without doubt that this is not so.



### Old Man Moon

Getting down to cases, let's cast a thought to the moon, which is attributed with having many powers over the weather. Meteorological evidence is all against it.

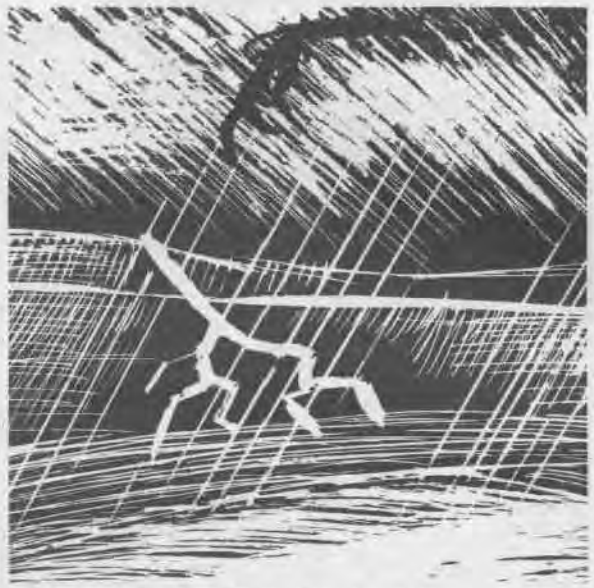
Although the moon is responsible for the earth's tides, it has been found that there's no connection between tides and weather.

People in Halifax and Vancouver enjoy the same moon, but rainfall figures for the two cities vary greatly.

"Reading" the moon differs according to the beliefs of the individual. Some follow the saying, "if the bonny moon is on its back, mend your shoes and sort your thack"—meaning it will rain. Others believe, "it is sure to be a dry moon if it lies on its back, so you can hang your hat on its horns." So one group thinks the moon on its back foretells rain, and another that it foretells dry weather. That leaves us in the position of being ready for anything, but you do not need the moon for that.

As for the advice to plant by the dark of the moon to avoid frost damage, it is poor insurance.

In one region, 31 years of records show 266 cases of frost during the bright half of the moon and 289 during the dark half. In another region, 37 years of records show 119 frosts during the bright half and 125 during the dark half. And in yet another, 36 years of records list 432 frosts during the bright half and 410 during the dark. All told, this is 817 cases of frost during the bright half of the moon and 825 during the dark half—just about as equal a distribution as one could possibly get.



### Rain, Rain Go Away . . .

Many people have a fear of thunder and lightning far out of proportion to the actual danger. Lightning can smash a huge tree to bits, but more often the current only follows the grain of the wood along a narrow strip just under the bark and the damage is slight.

Lightning is not considered a major hazard and the chances of losing your life by being struck by it are 350,000 to 1.

Maybe you believe that "lightning never strikes twice in the same place". If you do, we hope you won't find out otherwise through actual experience.

The fact is that it probably *will* strike twice in the same place—the Empire State Building has been struck so often that new strikes no longer make news. During one storm the building was struck 15 times in 15 minutes.


### All-Weather Dress

The popular belief that animals or birds have an amazing degree of perceptiveness when it comes to predicting the weather gives rise to a whole host of incorrect ideas.

There are those who insist that animals can foretell the severity of an entire season and grow coats accordingly. If this is true, then it is surprising to hear of deer and other wild animals that have failed to grow this extra thick coat and, as a result, have perished.

Birds are accredited with being able to anticipate storms during migration, thus being able to fly safely over distances of thousands of miles. The facts are, though, that all too often birds are caught in severe storms and whole migrating flocks have been known to perish.

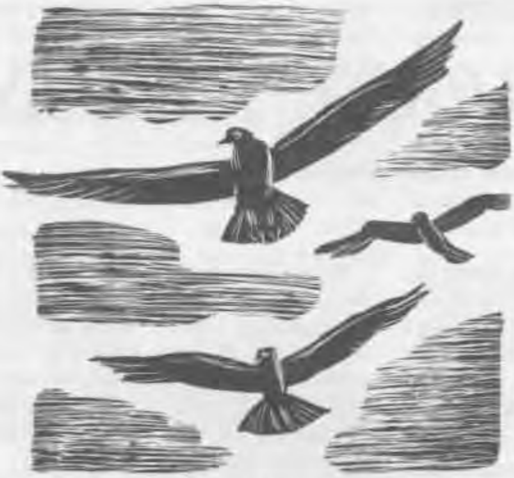
As for squirrels tucking away huge reserves of nuts in anticipation of a long hard winter, it would seem rather that their storage depends on how great the nut harvest is in a particular year.

Some folks have the idea that fish possess this weather forecasting instinct as well. While fishing enthusiasts do have a good case for the theory that fish are susceptible to atmospheric pressure changes, there is no foundation to the theory that they have the instinct to forecast these changes.

## Survives the Test of Time

In some cases forecasting the weather ahead by signs does have authentic basis in fact. In the Bible we read that Christ said, when asked for a sign from heaven; "When it is evening, ye say, it will be fair weather: for the sky is red. And in the morning, it will be foul weather today: for the sky is red and lowering." Some 20 centuries later meteorologists know through studies that due to atmospheric conditions the chances are very much in favor of this happening.

Our old friend the couplet, "Red sky in the morning, sailors take warning; red sky at night, sailor's delight", is a paraphrasing of this biblical weather note.



## Storm Warnings

Haloes around the moon or sun are said to herald a storm and this is usually so. "When the sun is in his house, it will rain soon", "the bigger the ring, the nearer the wet" are both Indian proverbs which take account of this weather phenomenon.

A halo is caused by the refraction of light through high ice crystals in clouds which usually are the forerunners of a major storm. So when you see such a halo it is of considerable value in knowing what weather lies ahead.

## Do-It-Yourself Weather-Scientifically

With rhymes couplets and ditties destroyed by "ruthless" weathermen, perhaps you are wondering if there are any reliable weather signs to which you can subscribe when planning ahead for picnics or holiday outings. Well, here are a few:

***Look for cloudy unsettled weather when***

*The barometer is falling.*

*The temperature at night is higher than usual.*

*The clouds move in different directions at different levels.*

*High thin white clouds increase. A large ring appears around the sun or moon and stays there until the overcast clouds thicken and obscure the sun or moon.*

*Summer afternoon clouds darken.*

### Look for clearing weather when

*The barometer rises.*

*The wind shifts into the west or northwest.*

*The temperature falls.*

### Look for higher temperatures when

*The barometer falls. In summer a falling barometer may indicate cloudy weather which will be cooler than clear weather.*

*The wind swings away from the north or the west.*

*When the morning sky is clear, except when the barometer is high or is rising in wintertime, or if the wind is strong from the north or west.*

### Look for lower temperatures when

*The wind swings from the southwest into the west, or from the west into the northwest or north.*

*When skies are clearing—although clearing skies in the morning will likely mean warmer weather by afternoon, particularly in the summer.*

*In the winter, the barometer rises.*

*Snowflurries occur with a west or north wind.*

*Pressure is low and falling rapidly, wind east or northeast and backing slowly into north. (The fall in temperature will be gradual.)*

And, of course, most important, listen to the daily weather reports on radio and television or read them in the newspapers—they have been prepared by our department's experts—the weathermen.

## AWARDED DARTON PRIZE FOR MET. PAPER

Dr. Warren L. Godson, superintendent of atmospheric research, met. branch, has been awarded the 1960 Darton Prize by the Canadian branch of the Royal Meteorological Society for his paper, "Total Ozone and the Middle Strathosphere over Arctic and Sub-Arctic Areas in Winter and Summer."

Dr. Godson has achieved enviable international recognition as a research meteorologist and is active in an executive capacity in several scientific societies and organizations.

# News on the DOT

DEPARTMENT OF TRANSPORT STAFF PUBLICATION - SEPTEMBER—OCTOBER 1961

# EDITOR'S PAGE


## ABOUT OUR COVER

Our feature article this month tells the fascinating story of Canada's first weatherman, who, unfortunately, was of an age B.C.—before camera. Since Peter Fidler's picture could hardly be conjured up to grace our cover, petite Pat Grossmith makes an eye-pleasing substitute. As one of a very rare species—a *weatherwoman*—she deserves front page coverage in her own right.

Born in Shanghai, China, Pat came to Canada—Vancouver, to be exact—as a child. Her early years paralleled those of most active girls, what with school, piano lessons (she retired from this, she says, in her dotage at 12 years of age) and ballet. Today her artistry is confined to "plucking desultorily on a guitar and bleating out the occasional folksong."

A keen interest—not to mention ability—in mathematics and physics led to the University of British Columbia and its Arts course. She graduated with honours in both in 1959 and then decided to enter the world of meteorology. For equipment to weather the job she donned an M. A. in meteorology from the University of Toronto in 1960 and from there it was only a hop and a skip to 315 Bloor Street West where she joined the staff of the Department of Transport's met branch.

After an initiation period at headquarters, Pat was posted to Edmonton in June, 1960 and has since been forecasting in the lee of the mighty Rockies.

Her biggest challenge came this past June when she filled in for vacationing Whitehorse meteorologist Herb Wahl. Says she, "Although it probably takes more like eight years to become an accomplished (that means getting used to being continually amazed) forecaster for mountainous terrain, the eight days I spent at Whitehorse were invaluable. I only hope the pleasant, friendly townspeople weren't thrown for a loop by my forecasting."

Of her chosen profession, this comely 24-year-old meteorologist says, "To me forecasting is both interesting and amusing. It's rather like trying to solve a diophantine equation—there are many possible solutions, but often the exact nature of the problem is somewhat obscure. And that's how it is when you set out to find what is causing the prevailing weather. Meteorologists are supposed to pick the most likely class of solution—sometimes I'm lucky."

She suggests that if her interpretation of forecasting seems somewhat oversimplified it could be because she has only been "on the job" for little more than a year. She still finds it a strain predicting future weather moods while being a little uncertain of her interpretation of prevailing conditions. Summing it all up beautifully, if not too simply, Pat says, "If one is endowed with a phlegmatic nature and an enormous sense of humor, it seems to me that the strain of forecasting would be reduced to a mere bagatelle."

There's only one drawback to being a weatherwoman. Watching the weather is a round-the-clock job—shift work and meteorology are blood brothers—and the graveyard shift plays havoc with a gal's social life. Pat hastens to point out, though, that some friends are not too loath to switch dinner dates of roast beef to breakfast dates of ham and eggs.

Although she doesn't see herself as unusual or different from other young women her age, we say playing chess and driving loaded logging trucks down mountainous roads near Hope, B.C., among other things, are unusual. The case of the Editor versus Pat Grossmith rests!

## CONTENTS




**News on the DOT**

Staff magazine for the
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Published under the authority
of the Minister,
Hon. LEON BALCER, Q.C.
by the Information Services Division,
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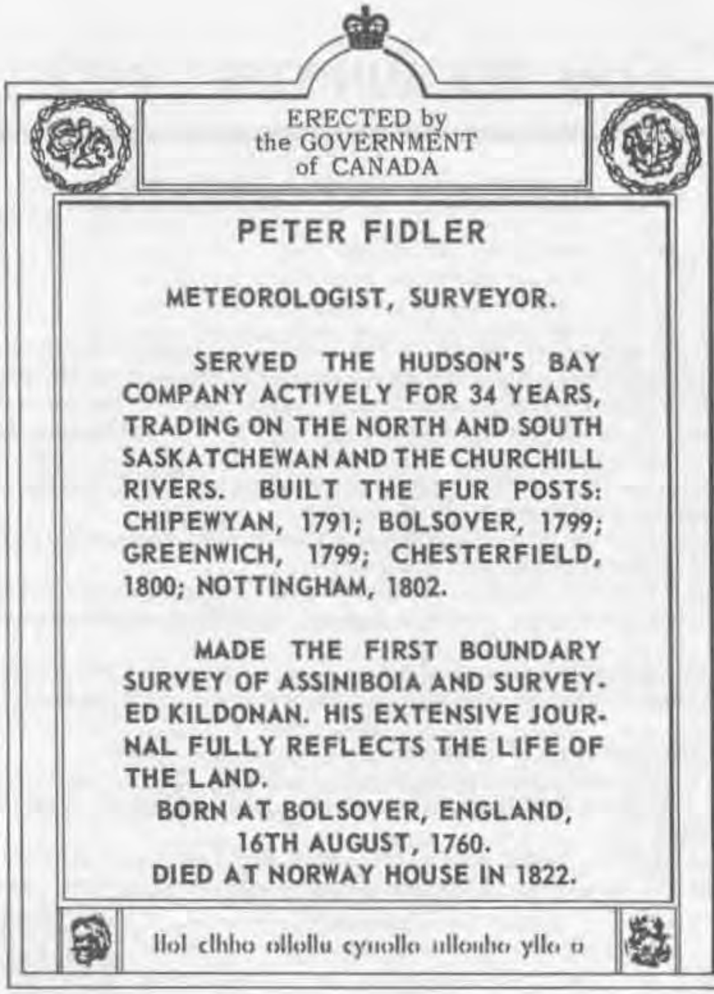
Editor: Yvonne McWilliam
Vol. XII No. 5
September-October 1961

## "Canada's First Weatherman" reprinted from The Beaver

Through an oversight, the excellent article on Peter Fidler, "Canada's First Weatherman," by A. Burnett Lowe in the September-October issue of News on the DOT appeared without credit to the magazine from which it was reprinted.

The article first appeared in *The Beaver*, published by the Hudson's Bay Company, Winnipeg.

News on the DOT reprinted it with the kind permission of *The Beaver's* editor, while the company's librarian kindly furnished the accompanying illustrations.




# Canada's First Weatherman

**by A. Burnett Lowe,**
**Meteorologist**

IN the town of Meadow Lake in Northern Saskatchewan there stands a stone cairn to the memory of Peter Fidler. Peter Fidler lived close to 200 years ago and was an employee of the Hudson's Bay Company. During the years from 1788 to 1822, he made his way up the rivers and across the plains of Western Canada, trading for furs, drawing maps, and building forts. And so, in his memory, this stone cairn at Meadow Lake was erected, and the inscription on it is this:

### PETER FIDLER

***Meteorologist, Surveyor***

I was most surprised when I read this inscription. The surveyor part was all right; I knew that Fidler had surveyed a great deal of land in Canada, including, for instance, the Red River lots of the Selkirk Settlers. But the meteorologist part was baffling. I thought that meteorology in Canada was a comparatively recent thing; but here was a man who lived in Western Canada over 150 years ago who, so the inscription said, was a meteorologist. If this was so, surely he must have been Canada's first weatherman.

To get to the bottom of this mystery I began searching through the old records of the Hudson's Bay Company and, sure enough, Peter Fidler had been a meteorologist. During the thirty odd years of his sojourn in Canada, he had been an ardent observer and recorder of the weather. As he moved about from one post to another, one of his first duties was to set up his meteorological equipment—his thermometer on the north side of the house where the sun could not get at it; his wind vane up on the roof; and his barometer in a sheltered room inside.

His records were kept faithfully, day after day, for some thirty years and recorded in a fine English hand in his ledger. Usually he read the instruments five times each day; the first reading was at daybreak and the last before going to bed at night; the others were equally spaced in between.

This regular reading of the instruments sometimes presented inconveniences but nothing was allowed to interfere. For instance, the entry for June 26, 1794, at York Factory reads: "House plundered by the Indians. Three men, one woman and two children murdered. Temperature 62. A smart breeze."

His records are full, too, of interesting comments about the changing seasons. He records the migration of the birds, the break-up of ice in the rivers and bays, the changing color of the leaves. Here, for instance, is how spring arrived at Cumberland House in the year 1798:

March 13 – A flock of snowbirds seen – the harbingers of spring.
March 18 – Large blue meat flies seen in numbers, being early in the season.
April 11 – A swan first seen.
April 14 – Saw the first goose.
April 23 – Frogs began to croak.
May 12 – Mosquitoes pretty plentiful, being rather early in the season.
May 17 – Trees in bud.
May 18 – Leaves came out.

During the cold winter of 1794–5 at York Factory, it occurred to Fidler that he should test the purity of the alcoholic beverages in his cellar; and so, in his register, intermingled with data about wind and temperature, the following information is imparted:

"December 31 – Holland gin freezes at 17 below." The weather turned colder and the entry for January 5 reads: "English brandy freezes solid at 25 below." The cold continued and grew more bitter so that on January 11 the entry is "Rum freezes at 31 below."

I discovered that there had been other weathermen in those days besides Peter Fidler. One was William Falconer, sloop master, who, during the years 1771 and 1772, took regular observations at Severn House on Hudson Bay. He, too, was very observant and carefully noted down the effect of the weather on the people and things around him. "Our people in the open marshes froze their faces for the first time. . . . . the beams of the house began to crack with the frost."

It was a severe winter on the shores of Hudson Bay and Falconer eagerly reported the signs of approaching spring:

March 28 – On Monday last the first snowbird was seen and several more since – also an eagle today. They are the first birds of passage that make their appearance on this coast in the spring.
April 5 – These five days past have been excessive warm and so clear that a speck has not been perceptible in the hemisphere.

But it was too good to last. During the second week of April he reports the air thick with snow occasionally mixed with "hearty showers of rain and sleet." On April 16 he says "The last two days we have had a constant strong gale of wind which has raised the snowdrifts much higher than they have hitherto been this winter." And even on May 3: "In the night was the most tempestuous gale of wind we have hitherto had this year attended with sharp frost and snow at intervals."

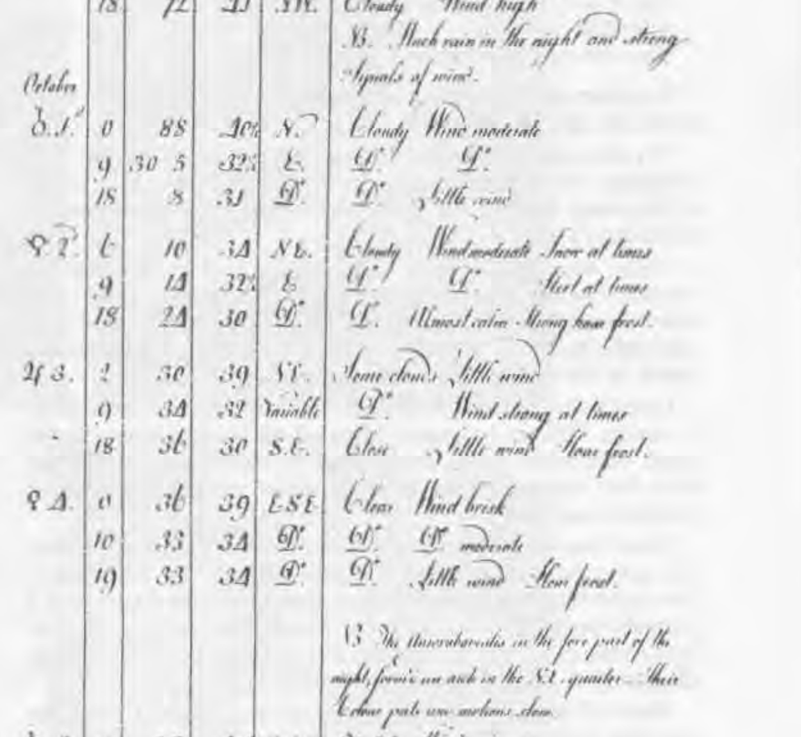
Some of the problems of observing the weather in the early days are noted in the record of Mr. Thomas Hutchins at York Factory in 1771. Mr. Hutchins had with great care brought over from the old Country a mercury barometer, installed it in a special room, and taken daily readings of the mercury level. Then, on October 2, the following comment appears in his record: "This day some Indian children accidentally cracked the tube of the barometer. I made two ligatures on it and did not perceive any air had gained admittance." On October 4, however, there is no entry in the barometer column and he makes the remark: "In the night the mercury all subsided into the cistern of the barometer, no doubt occasioned by the admission of air through the cracks."

So for the next day or two he sought ways and means of repairing his barometer. He finally wrapped up the injured part of the tube with bladder moistened in a solution of gum arabic and secured it with silk. For a time the barometer seemed as good as new but then on the 10th there is the entry – "At 21 hours the cistern of the barometer dropped off, the tenacity of the glue having been destroyed by the moisture of the air, an incident the natural consequence of so gross an inattention."

A new barometer was obtained from overseas but before long they were in trouble again for an entry says: "Please take note that the surgeon being in great need of quick-silver, we were obliged to borrow some from the barometer, consequently no observations can be taken from the instrument for some time.

The weather reports of those early weathermen were much more colorful than is the terminology of meteorologists today. We describe weather today in terms such as "sunny with cloudy intervals," "widely scattered showers," "not much change in temperature." There's not much color in language like that. But look at some of the descriptions of the weather given by the early weathermen:

The night was boisterous with much rain.
Gentle snow falling.
A great fog on the river.
A wet rime descended.



| 1771 Sept. | H. | Barom. | Therm. | Winds | Weather &c. 3 |
|---|---|---|---|---|---|
| ☽ 30 | 3 | 29 84 | + 44 | S.B.E. | Cloudy little wind |
| | 10 | 87 | 38 | ..... | Hazy very warm |
| | 18 | 72 | 41 | S.W. | Cloudy Wind high |
| | | | | | N.B. Much rain in the night and strong squalls of wind. |
| October ♂ 1. | 0 | 88 | 40½ | N. | Cloudy Wind moderate |
| | 9 | 30 5 | 32½ | E. | D° D° |
| | 18 | 8 | 31 | D° | D° little wind |
| ☿ 2. | 6 | 10 | 34 | N.E. | Cloudy Wind moderate Snow at times |
| | 9 | 14 | 32½ | E. | D° D° Sleet at times |
| | 18 | 24 | 30 | D° | D° Almost calm Strong hoar frost. |
| ♃ 3. | 2 | 30 | 39 | S.E. | Some clouds little wind |
| | 9 | 34 | 32 | Variable | D° Wind strong at times |
| | 18 | 36 | 30 | S.E. | Clear little wind Hoar frost. |
| ♀ 4. | 0 | 36 | 39 | E.S.E. | Clear Wind brisk |
| | 10 | 33 | 34 | D° | D° D° moderate |
| | 19 | 33 | 34 | D° | D° little wind Hoar frost. |
| | | | | | N.B. The Aurora borealis in the fore part of the night, proceeding from an arch in the S.E. quarter. Their colour pale, [illegible] motions slow. |
| ♄ 5. | 1 | 35 | 40½ | E.S.E. | Thick fog Wind moderate |

**William Falconer's beautifully kept ledger for Severn House, 1771, shows a day of missing rain.** Illustrations are from the H B C Archives.

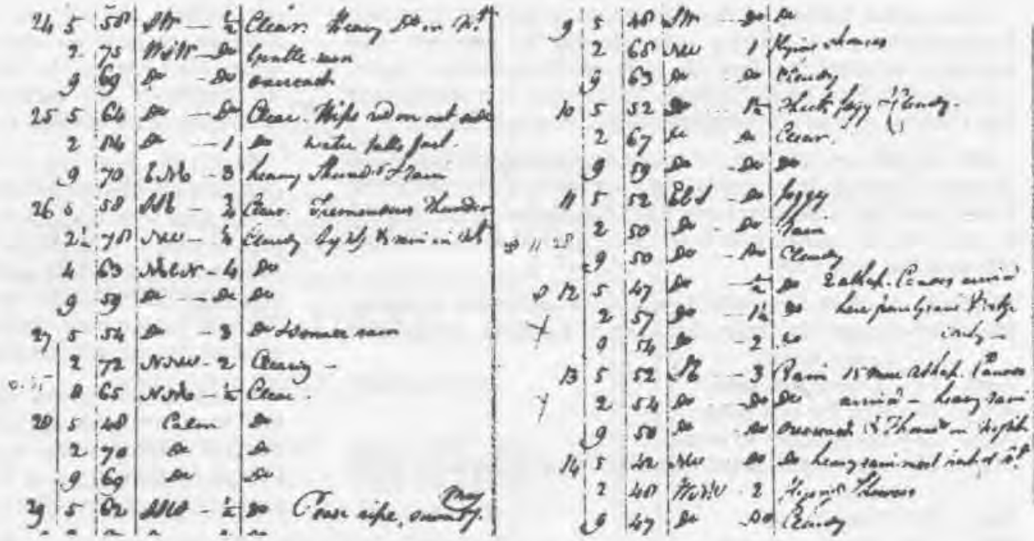
Remarks

At noon the Thermometer's mercury had sunk below the graduated line & remained about ¾ an inch above the Bulb. At 3 hours it was at the 35th and at 8 it was at 38 degrees below the cypher. We also observed an Halo round the Moon at Midnight: and a large bright Aurora Borealis which formed pendant from the skies like a curtain, direction NE&SW, radii shooting N. altitude 70. At 11 observed a Beautiful Appearance round the sun which I shall explain by a Diagram.



AB the visible Horizon. DDD Parhelia in an Halo round the Sun. EE Parhelia exterior, these were considerably higher the horizon than the internal, tho' the figure in this place does not show it so well as might be wished.

*In the York Factory meteorological journal for 1772, Thomas Hutchins begins the Remarks column for January 23rd "At noon the Thermometer's mercury had sunk below the graduated line . . ." He includes a diagram of parhelia round the sun observed the next day.*



*Extract from Peter Fidler's Cumberland House meteorological journal July 1790. In addition to weather observations such as "tremendous thunder" he notes on the 25th "Hips red on outside" and, on the 29th, "Pease ripe, sown May 17."*

Much rime which in the morning exhibited a beautiful scene with every tree and shrub encrusted and adorned with spangles.

A smart flash of lightning.
A copious dew descended.
Serene weather.
Damp and disagreeable.
A middle breeze.
The cold raw and piercing.

And here is a description given by Thomas Hutchins in 1771 of the changeable weather in Canada:

"In the evening the sky was clear, the stars numerous and refulgent. At midnight it was cloudy and snow fell. This is one of the many instances of the sudden vicissitudes of the weather in Hudson's Bay."

There were several old English words used to describe the weather—words which are no longer in common usage; the word "mizzle" for instance, which meant a combination of mist and light rain and the word "roak," to describe the steam fog rising in winter from the open leads of the bay.

Graphic descriptions were given of the Northern Lights. Here is one by William Falconer: "The aurora borealis shone in the night with great lustre. From East to North they formed an arch but otherwise they were in divers positions with their motions tremulous."

Other heavenly phenomena received similar attention. Here is a comment from Thomas Hutchins' register: "In the evening the moon bright and beautifully ornamented with a halo and 3 paraselenae, but being conscious of inability to convey an adequate idea in words, we beg leave to attempt by the following diagram." A detailed drawing followed.

Most of the early records which I have obtained are from northern Canada, from posts such as York Factory and Severn; but there are others from the prairie regions—Brandon House on the Assiniboine, Chesterfield House and Buckingham House on the Saskatchewan.

In the reports from these posts during the autumn there is frequent mention of the visibility being reduced by "smoak". In autumn, when all vegetation was dry, alarming fires often broke out, spreading for miles across the unbroken plains and lasting sometimes for weeks together. Peter Fidler, as he describes the prairie sky, often speaks of "fire clouds" as the smoke billows from distant fires rolled across overhead. When he was stationed at Brandon House he makes note on one occasion that the entire Moosehead Hills were on fire.

I was much impressed with the care which these pioneer weathermen took to ensure good observations. Thomas Hutchins, in an introduction to his weather records at York Factory in 1772, gives a detailed description of the location of his observatory, mentioning its elevation, distance from the sea and surrounding woods. These remarks, he says, "May be of some utility in indicating any uncommon phenomena which may appear."

Hutchins goes on to describe his instruments. Of his thermometers, he makes the comment: "We have great reason to think them both very good as Mr. Wales, the astronomer, (who remarked the last transit of Venus at Churchill) was commissioned to send them."

The number scale which was used to indicate wind speed was quite new to me. It varied from 0 to 4, with 0 apparently intended for calm conditions and 4 representing a strong gale. Nowadays we measure winds in miles per hour; before that, the Beaufort scale was in common usage, but Admiral Beaufort devised his scale in 1808 and these observations were made long before that.

Finally, a clue was found in some remarks by Thomas Hutchins. "In judging the force of the wind," he says, "we have endeavoured to follow the method proposed by Dr. Jacob Jurin in No. 379 of the Philosophical Transactions and lately made use of by a learned society at Edinburgh."

A letter to the Royal Society in London brought a copy of Dr. Jurin's paper, written in scholarly Latin. Speaking of his wind scalé, Dr. Jurin says "Force 1 signifies the gentlest motion of the wind, scarcely agitating the leaves of the trees; 4 the truly maximum violence of the wind; the numbers 2 and 3 describing the intermediate forces between these, and the cipher denoting a perfect calm."

Most of us are inclined to think that the weather in the early days of our country was more severe than it is now. We read in history books of the hardships suffered by the early settlers due to the extremities of the weather—like that incident in the early days of the Selkirk Settlers when a buffalo hunting party was caught on the open plains by a sudden blizzard and thirty-three perished before shelter could be reached.

In order to find out just how cold and stormy it was in the early days, I calculated the average temperatures and precipitations for all the years of record I had gathered together. I found, first of all, that the weather varied considerably from year to year then, just as it does now. There were wet seasons, when the rivers were as high in autumn as they were in spring, and there were other years when drought was widespread. There were cold winters and mild winters. Here, in Manitoba, we talk about the very cold winter of 1950. The natives of this part of Canada a century and a half ago must have similarly talked about the year 1797 when, as Fidler said, "this has been the most backward spring and cold winter ever known by any person in these parts."

But as far as the average temperatures are concerned over a period of years, here are the results. For the three winter months—December, January and February—the mean temperature at York Factory a century and a half or more ago was 14.1 below. Our present day records for the same place give a mean temperature of 13.3 below—just about the same. At Cumberland House, near The Pas, the figures are: in the old days 3.5 below; at present 3.3 below—almost identical. As a further check, I figured out the average of the daily minimum temperatures for January, the coldest month, for York Factory. In the old days it was 24 below and the figure which we have today for York Factory is exactly the same 24 below.

So when Peter Fidler travelled this way nigh 200 years ago, he had just about exactly the same weather to put up with as we have today.

## FORM REVISION

RONALD B. GILLIS, a clerk in the meteorological service, Toronto, felt that an economy in time and paper would result through standardization and redesign of two forms in current use.

After careful review it was decided that both tangible and intangible benefits will be realized and the suggestion was effected.

Mr. Gillis received a $50 cheque as his award.

## WINS POST OFFICE AWARD

A D.O.T. employee who saw a need won an award from the Post Office Department for his public-minded alertness.

R. G. STARK, an Edmonton meteorologist, suggested that a mailbox, located in the neighbourhood in which he resides, be moved from one corner to the opposite corner since, in its original location, persons mailing letters were required to walk on the road. Mr. Stark felt this might be dangerous for small children or older people, particularly during winter.

By submitting his suggestion to the Suggestion Award Board of the Public Service of Canada it resulted in an award-in-kind being made by the Post Office Department.

## ELECTRONIC WEATHER PREDICTIONS

MONTREAL—Automation has found yet another field in which to be of value. A million dollar computer is being installed at the Central Analysis Office at Montreal International Airport (Dorval) to assist in weather forecasting.

This will mark the first attempt to use a computer for weather predicting in Canada and one of the first in the world. The department's model, 75 times faster than the IBM 650 at McGill University, can do 100,000 additions per second. There is a faster one in use for weather forecasting in Washington and a slower one in Japan.

Meteorological equations and data fed into the machine will be of a nature which the weatherman ordinarily has no time to calculate. The physics of the atmosphere have been known to man for years, but the complications are so great it would take hundreds of man hours to equate the basic data.

While the new computer will improve present methods, it will not put men out of work—rather, it will free highly skilled meteorologists for more advanced work. In addition to meteorological computations, it may also be used for research in radiation and energy studies.

# SEA-GOING WEATHER OBSERVERS RECEIVE AWARDS

TORONTO—Thirty-nine awards were made in July to the masters and officers of some 20 ships trading into Canada. These men were honored for the valuable service they rendered to the department's meteorological branch by relaying reports of weather conditions during their voyages on the high seas, in coastal waters, and on the Great Lakes.

In all, 85 ships recorded the pressure, temperature, humidity, clouds, visibility, state of the sea, and other aspects of the weather four times a day. In 1960 these ships made approximately 13,000 reports for the benefit of Canada and any other country receiving them. Some ships, sailing from east and west coast ports, travel to the Far East, Australia, South Africa and the United Kingdom. About 25 send reports from eastern coastal waters and the Canadian Arctic, while several others send them from the Great Lakes.

P. D. McTaggart-Cowan, director of the met branch, pointed out when announcing the awards that ships' officers, by tradition, perform weather observing duties on a voluntary basis. However, they receive assistance from the branch in the form of weather bulletins, forecasts and maps by radio. Such weather advice is of vital importance in the safe passage of a ship through dangerous, stormy seas.

This year's awards—inscribed books—are the 30th of an annual series. Winners were selected on the basis of the number and accuracy of weather reports submitted by each. As in past years, a special award was made to the ship showing the greatest improvement over the previous year in the quantity and quality of its observations. Mr. McTaggart-Cowan announced that the Knutsen Lines M. V. ELLEN BAKKE, sailing out of Vancouver, is the recipient of the 1960 "Greatest Improvement Award".

On August 17, 1961 at 1500 GMT, automation came to the Canadian Arctic.

At that moment the world's first radioisotope-fuelled weather station on Axel Heiberg Island started transmitting weather data, fulfilling a dream meteorologists had dreamed for years.

The Canadian head of the party that put the unmanned station on the island was D. C. Archibald, chief of the basic weather division of the department's meteorological branch.

Here Mr. Archibald tells readers of News on the DOT of his historic mission to install a

# Weather Eye At Sherwood Head

by D. C. Archibald

ARCTIC WEATHER EYE—Volunteer workers from CMS John A. Macdonald help with installation of world's first isotope-powered automatic weather station. Steel cylinder (centre) containing electronic deck and isotope unit is partially buried in permafrost on Axel Heiberg Island in High Arctic. Icebreaker is seen in background.

Meteorologists had long dreamed of having unmanned weather stations operating automatically in remote or inaccessible areas from which reports were important. Their vision has now come into focus with the installation of a fully automatic station designed to operate unattended for two years.

Basically this station consists of meteorological instruments, electronic equipment, transmitters, antennae and towers, and a reliable power source. It reports dry bulb temperature, barometric pressure and wind direction and speed averaged for eight-minute and one-minute intervals.

The housing for the automatic weather station is a cylindrical shell eight feet long and 26 inches in diameter with a weather-proof flange bolted to the upper end.

The cylinder is set vertically five feet in the ground. A snorkel-like tube attached to the shell protects the cable connected to the meteorological instruments mounted on a 35-foot tower in the immediate vicinity.

A three-cup anemometer and wind vane top the tower. A radiation-shielded thermometer and junction box are attached to the side of the tower.

The electronic data processing and transmitting equipment, called the electronic deck, is located in the upper part of the cylinder. The barometer is mounted on the electronic deck.

The isotope power source is housed at very bottom of the steel shell with the nickel cadmium batteries above it. A precision mechanical chronometer, electrically rewound, activates the data processing system. The data are then automatically transmitted on two frequencies to the receiving station at Resolute.

The high speed transmission lasts approximately six seconds. The information picked up at the receiving station is converted into our regular synoptic meteorological code for transmission on the continental teletype network.

One unusual part of this equipment is the power unit. A radioisotope of strontium-90 securely locked in the compound strontium-titanate is used as the power source. The compound has been made into checker-like pieces approximately two inches in diameter and one inch thick. These are stacked in a special alloy cylinder capable of withstanding very high temperatures.

About three-quarters of a ton of lead is used for the major portion of the biological shielding. The heat energy of the decaying isotope flowing through the thermo-electric elements produces a direct current.

Five watts of electrical power is generated and recharges the nickel-cadmium batteries which power the transmitter. Each transmission—every three hours—uses about 1,000 watts.

Although the equipment had been developed and built in the United States, there was a desire to install it and try it out under rugged Arctic conditions, an opportunity welcomed by Canada.

For meteorological purposes a site on Graham Island in Norwegian Bay, about midway between Resolute and Eureka, was selected as first priority. However, we had learned from experience in siting the joint Arctic weather stations that one must have alternate plans. Three other possible locations were, therefore, selected in order of priority.

Mr. J. G. Dyer, chief of polar operations in the United States Weather Bureau, and technicians Al Sullivan and Ed Mills joined me on an RCAF flight from Edmonton to Resolute. The total installation party of 13 assembled in Resolute and boarded the D.O.T. icebreaker CMS *John A. Macdonald.*

Aboard ship a keen interest was displayed by captain, officers and crew and one could easily sense an air of urgency associated with this historic expedition.

All of the meteorological equipment, the isotope-powered unit, the test gear and ancillary equipment had been carefully loaded aboard the icebreaker in Montreal.

The isotope-fuelled unit particularly had to be handled very carefully and for this reason it had been transported by escorted truck from Baltimore to Montreal at a speed of about 30 m.p.h. In order to give it a softer ride the tires of the truck were only partially inflated.

Our careful preparations included high-powered rifles, sleeping bags, tents and food rations. Since ten holes had to be dug to a depth of four to five feet and we expected difficulties with the permanently frozen ground, a steam jenny to melt the permafrost was included in the installation gear.

With comparative ease the *John A. Macdonald* came abeam of Graham Island in the early morning of August 15.

About an hour before breakfast Mr. Dyer in one helicopter and I in the other went ashore to examine the possible installation site. Captain Cuthbert and his first officer, Mel Lever, came ashore to examine the approaches to the beach with respect to the possibility of landing the equipment.

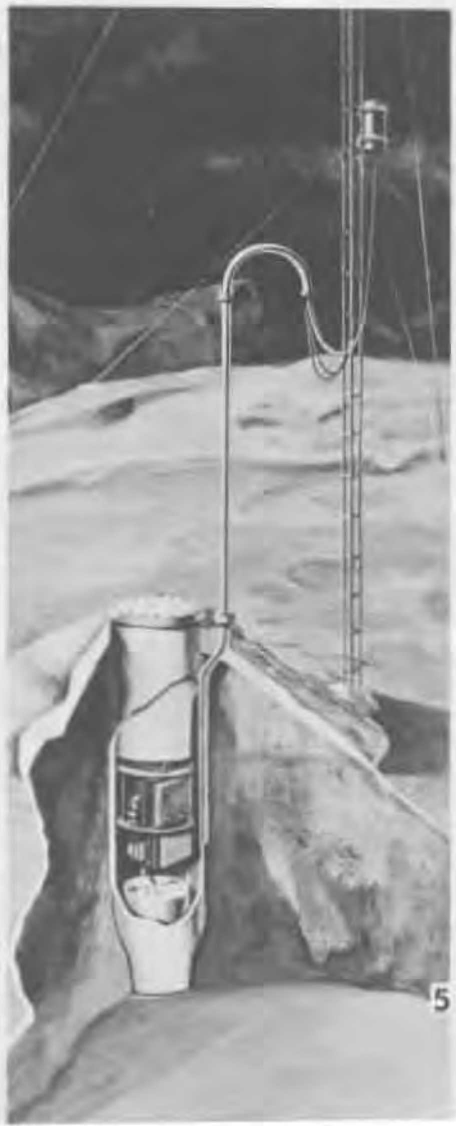
From a meteorological point of view Graham Island appeared an ideal site. Although the depth of the active layer of soil was only 11 inches, there were a couple of small streams which would provide adequate fresh water for the operation of the steam jenny.

Unfortunately there were shallow approaches to the shore where the water depth was approximately 2½ feet at a distance of 200 feet from shore. This, coupled with the fact that a considerable amount of ice blocked the direct access by barge from ship to shore, made it impossible to land the equipment.

(Continued on page 16)

**WHAT MAKES IT TICK**—Lead-shielded isotope-powered unit in its packing case. Note weight on crate: 1,895 lbs.

**ARCTIC ROBOT**—Cut-away drawing shows how cylinder containing isotope-powered unit (bottom) and electronic instruments (centre of cylinder) is half-buried in permafrost. Nearby tower contains meteorological instruments (top).



## WEATHER EYE

*(Continued from page 5)*

We reluctantly abandoned further consideration of this location, but once the decision had been made Captain Cuthbert proceeded without delay across Norwegian Bay toward our alternate at Sherwood Head.

We encountered some heavy ice during this passage. However, the helicopter with ice observer Geoff Meek aboard flew ahead of the ship, relaying ice information and making occasional landings on the ice as a target for the ship.

We eventually entered a lead in the ice which took us right to our destination. We arrived at Sherwood Head at 7.30 p.m.—almost a week ahead of schedule.

I went ashore in the first helicopter to make an aerial reconnaissance. Mr. Dyer followed immediately in the second 'copter.

We conferred and decided on the precise location of the station.

We conveyed our decision to Captain Cuthbert and immediately the helicopters started ferrying the work party and the equipment ashore.

The location selected was on a sort of saddle, 200′ above sea level and a mile inland. As soon as the position of the antenna towers and guy wires were staked out we selected a suitable route from the shore to the station site so that the tractor could haul a sled loaded with equipment.

The first officer supervised the unloading of all the equipment. This work went on simultaneously with the work of excavating the holes for the antenna towers and the instrument tower.

Voluntary work parties from the ship's crew worked around the clock and within 40 hours of the first landing ashore the automatic station was sending signals on schedule to Resolute. The equipment has performed faithfully ever since.

After we had cleared the area of the debris of packing cases and returned tractor, sled and equipment to the ship, we gazed across at the result of our labors for the past two days.

There it was, its modest appearance—just a tiny storage building and three towers—belying the fact that a blank spot on the Canadian weather map had just been filled in by the wonders of modern science.

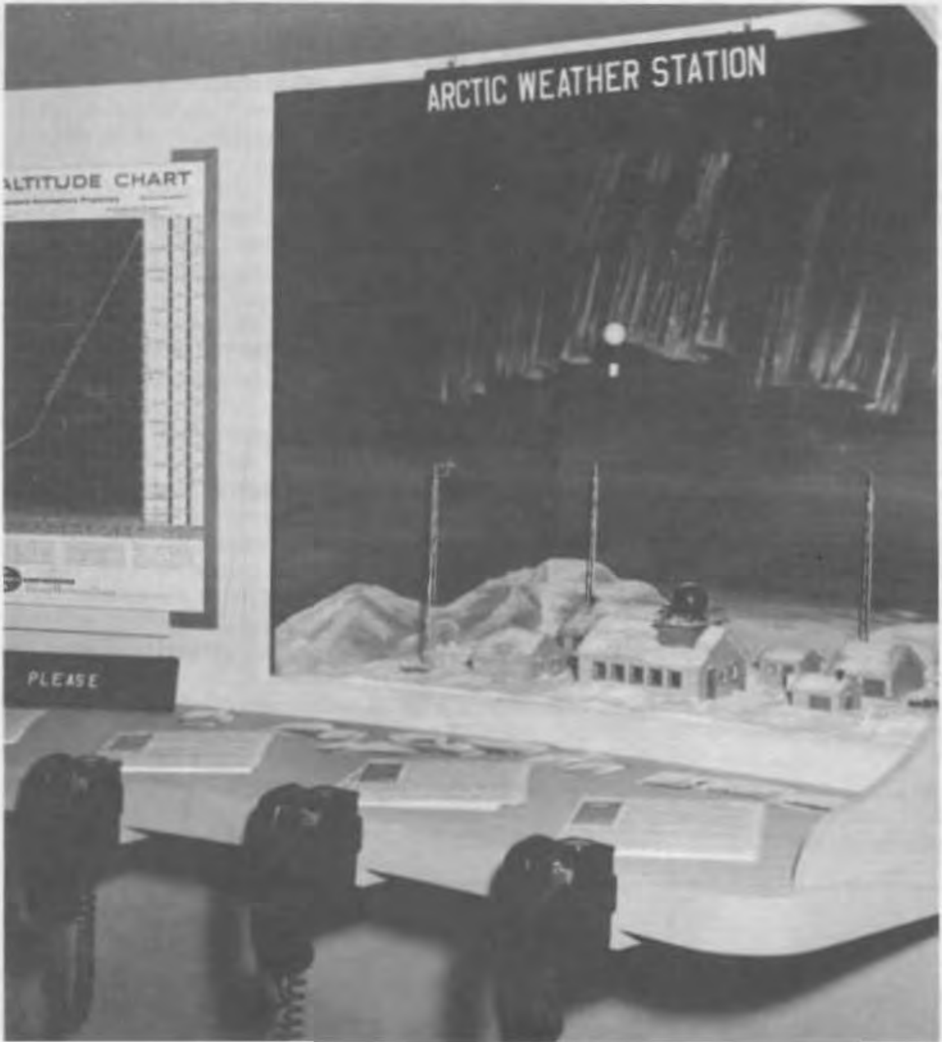
At TORONTO the meteorological branch had its weather display at the CNE for the 14th consecutive year.

The centre of the exhibit was a console with 36 switches corresponding to 36 questions on weather and climate. When a switch was pressed, the answer appeared on a board in front of the visitor.

Popular, too, was the model of an Arctic weather station (see photo), complete with a tiny balloon periodically rising above the station in simulation of a radiosonde release.

Other features of the Met display included Weatherfax and teletype machines and a current weather map.

*MET MINIATURE—Scale model of Arctic weather station, complete with northern lights and miniature radiosonde balloon was major attraction at CNE display designed, built and manned by met branch, Toronto.*



## Ideas Unlimited in Edmonton

There is probably no one in the department who has had more suggestions accepted than Edmonton meteorologist *R. G. Stark*. He just received his 10th and 11th awards.

One was a camera outfit for suggesting a revision in the blue coloring of cities on aeronautical charts, to avoid pilot confusion, the other a cash prize of $40 for proposing that form 9127 (Pilot's Report) henceforth include a box to indicate whether or not the temperatures observed aloft have been corrected for air speed and altitude.

VANCOUVER—Captain John Fagerland (with book) of the MV "Ellen Bakke" received the 1960 Greatest Improvement In Marine Weather Observing Award from Gordon E. McDowell, (second from left) acting regional director air services, Vancouver. Also shown on the wing of the Ellen Bakke's bridge in Vancouver harbor are Jack R. Hamilton (left), port meteorological officer, and A. R. McCauley, regional meteorologist.

## Prompts Action, Receives $30

*Robert A. Keenan*, a met. technician in the radiosonde office at Edmonton Municipal Airport, devised a new method of checking equipment and batteries before a radiosonde flight.

Although his system was not adopted in the form submitted, his suggestion did prompt a revision to basic procedures and for this Mr. Keenan was awarded $30.

## Urges Radiosonde Identification

Last year, a radiosonde instrument was picked up near Buckingham, Que. An Ottawa newspaper reporting the incident commented that it had probably been released somewhere in the U.S. because the case had U.S. markings.

*Roy T. Tsuda*, a met. technician at Maniwaki, didn't think so. Upper wind directions indicated it had probably been released from his station.

To publicize Canada's meteorological branch, why not put a sticker or stamp on each radiosonde indicating where it was released, Mr. Tsuda asked.

Dandy idea, the department found, and gave him $30.

**Dr. P. D. McTaggart-Cowan**

## DOCTORATE FOR "MR. WEATHER"

Canada's No. 1 weather man received an honorary degree the other day.

P. D. McTaggart-Cowan, 49, director of the meteorological branch, was honored October 26 when his Alma Mater, the University of British Columbia, conferred upon him the degree of Doctor of Science, Honoris Causa.

Dr. McTaggart-Cowan graduated from U.B.C. in 1933 with first class honors in mathematics and physics. A Rhodes scholar, he subsequently attended Oxford, where he received an honors degree in Natural Sciences in 1936.

He was responsible for the organization and development of meteorological services in Newfoundland for experimental transatlantic flights prior to World War II. During the period of hostilities he served as chief meteorologist at Gander, Newfoundland and Dorval, Quebec to provide transatlantic meteorological services for RAF Transport Command operations over the Atlantic. He won the respect of pilots with what the citation accompanying his new degree terms his "uncanny accuracy" in plotting the weather for transatlantic flights. His organizational abilities received the acclaim of the military authorities.

After World War II Dr. McTaggart-Cowan came to meteorological branch headquarters in Toronto as chief of the forecast services division and assistant director and subsequently, in 1959, he became director of the branch.

Recognition of his services to Canada was made when he was awarded the MBE and Coronation Medal and his part in aviation was recognized when he received the Robert M. Losey Award from the Institute of Aeronautical Sciences in the United States for his "outstanding contributions to the science of meteorology as applied to aeronautics".

Dr. McTaggart-Cowan is vice-president of the American Meteorological Society and serves as a member of the executive committee of the World Meteorological Organization, a United Nations agency located in Geneva, Switzerland.

The citation accompanying the awarding of the degree presented him as an undergraduate at the University, "a wartime legend and a dedicated public servant".

# 1962

## News on the DOT

DEPARTMENT OF TRANSPORT STAFF PUBLICATION

# Attend Satellite Workshop

PAUL Johns and J. A. W. (Jim) McCulloch of meteorological branch headquarters, along with meteorologists from some 28 other nations, attended the International Meteorological Satellite Workshop held in Washington in November.

Organized jointly by the (U.S.) National Aeronautics and Space Administration and the United States Weather Bureau, the workshop was the first meeting of its kind.

It presented directly to all weather services the results of the U.S. meteorological satellite activity to date—what data are available, how they are processed and what the possibilities are for the future.

Representation by both the forecast and research divisions of the met branch was indicative of Canada's interests in the operational as well as the research aspects of satellite meteorology.

### Weather Observing From Space

Meteorologists believe the entire world will benefit from satellite data. They point out that a means is now available of observing the atmosphere on a global scale from a platform outside the atmosphere. This, they all agree, will inevitably lead to improved understanding of atmospheric processes—a necessary prelude to improved weather services.

Canada has an additional interest in satellite data since it is not practical to maintain an adequate network of conventional weather reporting stations over Canada's Arctic and over adjacent oceans.

Also, satellites can depict marine ice as well as clouds—a fact of obvious economic importance to Canadians.

### Well-Run Workshop

"The United States has been most generous in inviting the entire meteorological community to participate in its meteorological space program," Meteorological Branch Director Dr. P. D. McTaggart-Cowan said in commenting on the meeting. "The workshop was well organized and well conducted."

The program included a number of technical sessions, two days of field trips to installations involved in control and read-out of the satellites, and several days of laboratory work in the techniques of rectifying and gridding photographs and infra-red radiation data, and in the interpretation of results.

## Even Dozen For Weatherman

One of the most consistent suggestion award winners in the department has done it again. He is R. G. STARK, an Edmonton meteorologist, who has just won his 12th award.

This time he urged the department to make a copy of the ICAO Notam Q code available in weather briefing offices for use in decoding Notams carried along with the weather sequences.

Printed cards containing the code have now been distributed to all units.

Mr. Stark received a heating pad.

## Karl B. Fox

Karl B. Fox, 62, officer-in-charge of the office services section of the administration division, meteorological branch headquarters, died suddenly on October 12.

Mr. Fox was born in Havelock, Ontario, joined the Canadian Army at the age of 15, lost an arm overseas, returned to Canada and joined the meteorological branch in December, 1917. He served as a telephone operator and clerk in the branch and in 1930 became a meteorologist engaged in weather forecasting duties. For the past ten years he was in the position he occupied at the time of his death.

Mr. Fox was a former president of the Toronto District Council of the Civil Service Federation and a member of the War Amputations Association of Canada.

He leaves his wife, the former Mary Anderson, and two daughters, Mrs. E. B. Bousche of Paris, France and Mrs. D. A. Etherington of Islington, Ontario.

## T. Braden Elliott

T. Braden Elliott, 50, accountant for the meteorological branch since February 1, 1961, died suddenly on November 7.

Prior to taking over his most recent position, Mr. Elliott served with the Departments of Trade and Commerce and National Revenue. He was in the Pay Corps of the Canadian Army during the second World War.

His period of continuous government service dated back to the summer of 1936.

He was born at Norwood, Ontario and leaves his wife, the former Vera Robertson, and one son, Douglas, 15.

Mr. Elliott was a member of Fairlawn United Church where he served on the Board of Stewards, taught Sunday School, served on the Sports Committee and coached a Pee Wee hockey team.

He was also an enthusiastic philatelist.

## CHANGE IN MEDICAL POLICY

*Leslie Martin*, a met technician at Winnipeg, pointed out that a delay in hiring qualified met technicians due to the lengthy inoculation period could result in the loss of good personnel.

He suggested that such candidates be employed after passing a physical examination and that vaccination and inoculations be given during the three month training period.

A check of all regions showed that most were following the recommended practice. Medical procedures at Winnipeg were revised accordingly. An award-in-kind, group "B", was made to Mr. Martin.

## TOOLS OF THE TRADE

*Francis C. Rowe*, a met technician at Torbay, Nfld., is the owner of a new barometer (who could use one to better advantage?) thanks to the acceptance of his suggestion. He felt that percentage and division tables to assist in calculating meteorological observations should be made available. This has now been done.

MONTREAL—Montreal International Airport (Dorval) boasts the most advanced weather radar in the world—a fully automatic system that gives a complete picture of conditions within 140 miles of Montreal.

The system is the first to provide a cross-section look at weather at constant altitude. It automatically photographs, develops and displays a new weather picture every three and a half minutes. Closed-circuit television carries the picture to air traffic controllers and pilots in another building. By the Spring of '63, a facsimile network will be able to transmit copies of the radar picture to other Montreal airfields, McGill University weather scientists, city snow removal officials and U.S. air bases in upper New York state.

The Montreal system, perfected by members of McGill University's famed "stormy weather group", requires only the part time services of a single meteorological technician.

WINNIPEG—A January weather forecast synopsis (in its entirety): "The weather has been cold. It is cold and will remain cold."

YARMOUTH—The Yarmouth Light, a weekly newspaper, printed the following tribute to R. A. (Rube) Hornstein, chief weather forecaster at Halifax.

*The Wind blew down across the bay,*
*Blew Hornstein's chalk-marks all away,*
*But we have this to say about him,*
*We could never wash our clothes without him.*
*By him we plan our work along,*
*And time has proved he's never wrong.*
*Whatever weather he predicts,*
*That's the kind that comes, and sticks.*
*One time his prophecy was snow,*
*Said drifts would form and winds would blow,*
*We did not take it in that night,*
*But morning proved that he was right.*
*The banks were piled outside our door,*
*We could open an inch, and nothing more,*
*That day we did not get about,*
*Till neighbors came and dug us out.*
*The rains may splash,*
*Or sun may shine,*
*Or cold winds whine,*
*Or our television blow a tube.*
*But you never, never fool old Rube.*

TORONTO—H. H. Bindon, chief of the instrument division, meteorological branch, represented Canada at the third session of the Commission for Instruments and Methods of Observation. A technical commission of the World Meteorological Organization, it was held in New Delhi, India, from January 29 to February 15. Experts from 31 countries attended.

The commission is responsible for standardizing methods of observation and types of instruments used. In taking meteorological observations it is essential that instruments be used in such a way that results may be compared regardless of where in the world they originate.

Mr. Bindon felt that the formation of a working group to consider required accuracy of measurement was of particular interest. He said that the lack of specifications for the accuracy of meteorological instruments has long been a matter of concern to instrument designers and users and this was the first time the problem was tackled on an international basis.

TORONTO—Dr. P. D. McTaggart-Cowan, director of the meteorological branch, has announced that 20 co-operative weather observers across Canada have received awards for excellent reporting over a period of at least five years. The 1961 awards—the new edition of the Canadian Oxford Atlas of the World—are the eighth in a series of such awards.

These 19 men and one woman are part of a corps of nearly 1,550 voluntary observers who take time each morning and evening to observe the weather and record the temperature and precipitation. Once a month they mail reports to the department to be used in the compilation of weather statistics in various publications.

Dr. McTaggart-Cowan pointed out that these people make a very worthwhile contribution to the general knowledge of the Canadian climate. Some are keenly interested in weather observing as a hobby, others make use of the observations in their business activities, and some take the observations as a public service.

—L. A. TRECARTEN, senior met officer at Summerside, P.E.I., a $30 award for suggesting Weatherfax recorders at RCAF stations St. Margarets, N.B. and Beaverbrook, N.S. be controlled by twin clock equipment. The need for continuous operation of this equipment has thus been eliminated.

—W. J. FRYMIRE, a met technician at Prince George, B.C., for his suggestion that in the interests of safety the use of candles and paper lanterns with nighttime pilot balloon observations be discontinued. Instructions have been issued to use electrical lighting units and parachutes (when available) in their place. Mr. Frymire chose an oil painting as his award.

—JOHN R. HAMILTON, a port meteorological officer at Vancouver, B.C., who asked that consideration be given to constructing a marine barograph tray to eliminate the possibility of damage when changing charts. He included pictures of a prototype.

Although the original design was considered incomplete, several different models were made and tested aboard various vessels. For suggesting the idea which led to this study, Mr. Hamilton received a $30 cash award.

# Mr. Guintu Goes To School

Although it isn't really unusual for Ciraco Guintu to be going to school—back home in the Philippines he is a part-time professor at Feati University in Manila—the type of school he is now enrolled in is unusual.

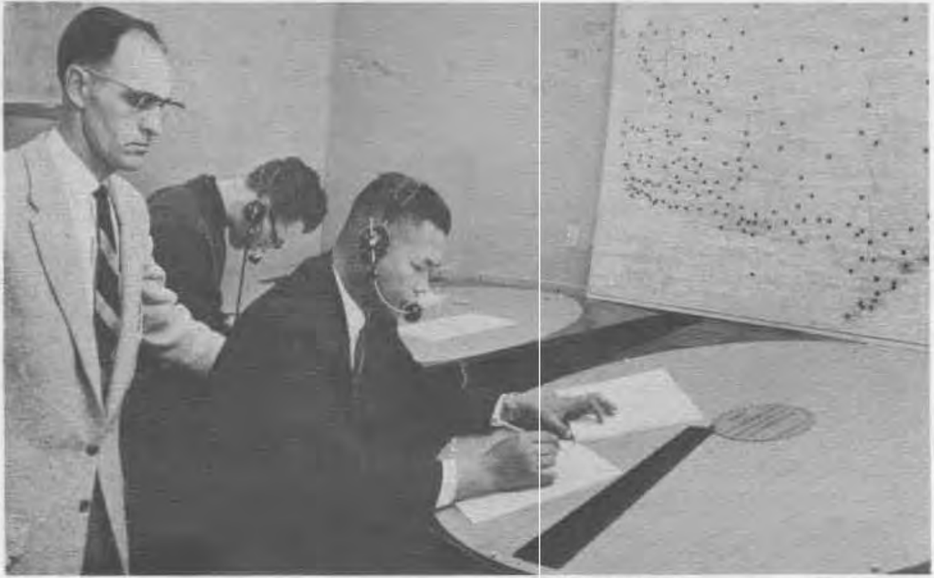
Mr. Guintu arrived in Canada early in January to study meteorology, air traffic control and other aspects of Canadian civil aviation under Colombo Plan auspices. The first six months of his year-long stay are being spent at the department's air services school at Ottawa International Airport, where he studies along with many other students. Early in the summer he will exchange the school's classroom for the labs and offices of the met branch in Toronto.

This year-long course of study will be very valuable to Mr. Guintu in his position as supervisor of the Philippine aeronautical information services.

A graduate electrical engineer, Mr. Guintu first came to this country in 1959 as chief Philippine delegate to an ICAO conference at Montreal. He liked what little he saw of Canada on that trip, so when the opportunity to return came he experienced no hesitancy in making up his mind.

*Below: Instructor of pilot balloon information, L. D. Lloyd, checks Mr. Guintu's calculations of asmath and elevation angles of a weather balloon.*

*The balloon, released a quarter of a mile away, is being followed by a fellow student who observes its movements and reports back over a walkie-talkie system. With these visual observations Mr. Guintu is able to determine upper wind speed and direction.*



# *My Brother is a Brute!*

**says Julian Kinisky,**

Chief Technician, Edmonton District Aviation Forecast Office

You probably know my brother—"Bulldog" Gene Kiniski the bad man of wrestling. He's a mean one all right. The fans hate him, that's obvious, but does he really hate his opponents as much as he says?

To quote brother Gene, "I'm in the business for one reason only—money. The winner makes the most money, so the guy who wants to keep the dollars out of my pocket is going to have to work hard to do it."

To be successful in wrestling requires the ability to wrestle well, coupled with the ability to make the sport exciting, brutal and entertaining. And this is what my "baby" brother does.

I am often asked what it's like to have a brother who is rough, rugged and mean. Well, it is what I would expect of a brother of mine.

You see, father was the toughest man in our hometown of Chipman (50 miles east of Edmonton), Alberta. His name is Nickolas and he came to this country from Poland as a young lad, all alone. He had little education, but more plain guts than you can imagine. It was enough to make him successful in Canada.

He was not really a big man, but he was widely feared for his physical prowess and no one for miles around entertained the thought of challenging him. I can well remember the first wrestling match I ever saw. It took place during a sports day and the contest was between my father and a professional wrestler, who had loudly proclaimed he would give $50.00 to any man who could survive five minutes in the ring with him.

My father beat him quite handily and further enhanced his own local reputation.

There are four of us Kinisky boys and each grew to be a good size. At 6′ 2″, weighing 235 pounds, I am the smallest. When we were young fellows we fought amongst ourselves as brothers will and father encouraged us to become proficient fighters.

Gene was the baby of the family and to this day father calls him "Baby" or "Babe". He was a sissy, slow to get started and not at all prone to doing his share of work around home. Then one day a gypsy family, complete with small son, came to town. The youngster set about terrorizing all the children—girls and boys alike. Then Gene got to him and that was that.

As we grew older Gene and I got into many scraps. To get out we had to fight. As I recall it, I had to do a lot of fighting for both of us. But by the time he was 12, he took up wrestling seriously. At an age when he was growing rapidly, he worked out daily at the YMCA and was trained by Leo Magrill, a really fine coach.

At 16 Gene won the provincial heavyweight title. His amazing strength, stamina and determination made him virtually impossible to beat. He was left unchallenged for several years and since he loved all sports involving violence, he turned to football with delight.

At 17 he was a first line tackle with the Edmonton Eskimos. With Annis Stukus as coach (and promoter) what Gene lacked in talent was made up for with fine publicity. What a team those two were! Both were superb at shooting a line and neither, despite their individual claims, could shoot a game of pool.

The Eskimos actually managed to win a few games that season, but with a salary of only $200 a year, Gene was easily persuaded to accept a football scholarship to the University of Arizona.

He was an immediate hit and quickly got All-American mention and was a candidate for All-American tackle. At this point he entered a few amateur wrestling wars and won the Southwest Conference title. He was the only amateur wrestler to hold international titles simultaneously. I remember when he beat his opponent for the title in Arizona he wired us that he had won in 31 seconds. My brothers and I replied asking why he had wasted 30 seconds!

It was just about this time that Gene got the idea no one could beat him and was tempted to disagree with father. This course of action was very foolish since father was and still is supreme commander of the family. Gene, in a moment of near insanity, talked back and the next second found himself sitting squarely on his other end. In case of any doubt, father announced loudly and clearly that *he* was still the champion.

Edmonton Eskimos, under the sly management of Al Anderson, decided they wanted Gene back and outbid the Los Angeles Rams for his services. During the training season he was a sensation. However, in the first game against Regina he received a leg injury which completely displaced the right knee joint.

The following year was one of great disappointment for the big boy. He was beginning to realize that the injury might be serious enough to keep him out of sports—no other life was possible for Gene and he was determined to make a comeback.

That year was hard on me. As Gene's leg improved he wanted to wrestle several times a week to get into shape. Promoter Al Oeming and I were on, and it was only then that I realized what a formidable wrestler Gene was. Al and I, both in good shape, would wrestle him for five minutes each never letting him rest. He easily beat both of us 10 to 20 times a night. By spring, Gene was able to make a good showing despite the knee that could only be bent 70 per cent.

Gene spent two more years with the Eskies, then married and moved back to Arizona to embark on a professional wrestling career. He was an immediate success.

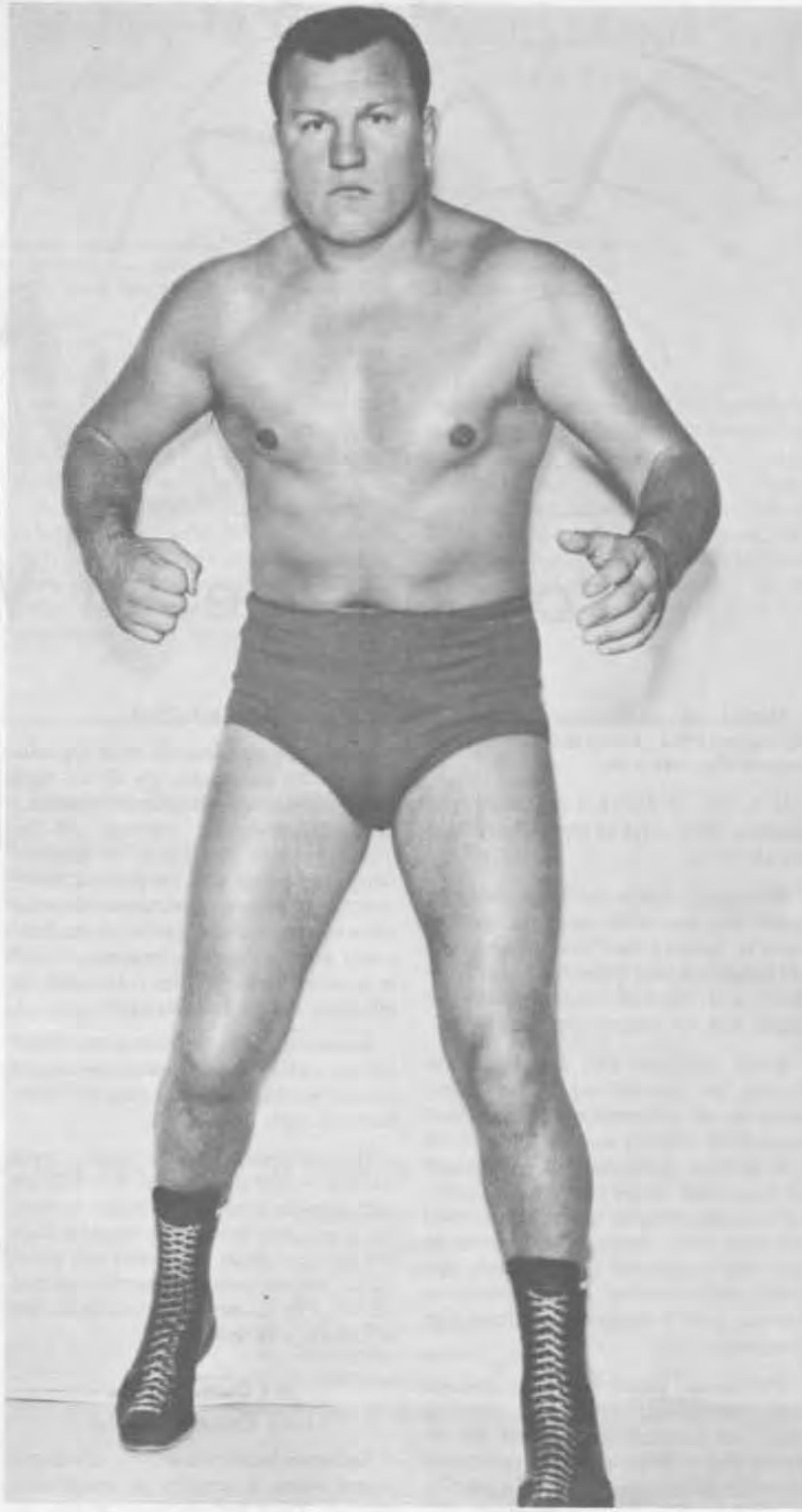
In the first year he defeated Jack Clayborne, the world's colored champion, and fought a brutal three-hour match with Danny Savitch. Gene decided winning was fine, but the price in injuries too high, so he took to the road in "anything goes" style. To this day some people believe his wrestling ability is limited. They should see this boy go when he wants to go straight out. Sure he is hated and criticized by fans and opponents alike, but he is also respected.

I've been a television weatherman since 1955 and am often asked if I am Gene's brother. I deny it—I say he is my brother. Neither of us is willing to take a back seat to the other. And that goes for the rest of the family as well.

Brother Fred is a railroader and union representative in Salinas, California; brother Rudolph runs a music school specializing in accordion in Toronto; and sisters Mary and Dorothy are happily married housewives.

Then there's mother, also Polish by birth, who has been a quiet, steadying influence on all her four sons. I've said before that father was and still is supreme commander of the family, but about 1940, I recall, in a subtle way much of the control slipped over to mother's side and I've never been able to quite understand how it happened.

So you see, the Kinisky's are really a typical small town family—and while it might seem to you that brother Gene is a brute—to us he's just our baby.



**"Bulldog" Gene Kiniski—Height 6'5"—Weight 275.**

*New course added to university's curriculum*

# McGILL FIRST TO HAVE DEPARTMENT OF METEOROLOGY

Look to McGill to provide an increasing number of the met specialists of the future.

The only university department of meteorology in Canada has just completed its first academic year. J. Stuart Marshall, who was awarded the coveted Patterson Medal for 1961 for distinguished service to Canadian meteorology (see page 13), heads up the unique department.

In the past dozen years two research groups at McGill, the Stormy Weather Group and the Arctic Meteorology Research Group, have won international reputations. According to Professor Marshall the department, which he organized and now chairs, has a two-fold purpose: to advance meteorology by research, and to increase the flow of soundly-trained young people into meteorological careers.

Nearly all of the graduate students are D.O.T. staffers working towards master's and doctor's degrees. Candidates for the M.Sc. degree (meteorology) spend seven months in classes and an additional seven months for research and work on a thesis. The two research groups offer special facilities for research leading to the Ph.D. degree.

Fittingly enough, 1962 is a centenary year for meteorology at McGill. Its famed observatory, slated for razing this year, was built in 1862.

*1. J. Stewart Marshall, who organized and now chairs the first Department of Meteorology at a Canadian university. He received the Patterson Medal for 1961 for distinguished service to meteorology in Canada at the conference of Learned Societies, McMaster University, on June 6.*

*2. Weather recording instruments on the university grounds enable students to make first-hand observations of meteorological data.*

*3. A meteorological device atop one of the university buildings is studied by Associate Professor K. L. S. Gunn.*

*4. Research Associate Dr. Eberhard Vowinckel and Professor Marshall assess climatological data compiled during the International Geophysical Year.*

*5. Professor Marshall points out an interesting feature on a weather map to members of a post-graduate class of D.O.T. meteorologists and a visiting Ghanaian student.*

*6. A weather map analysis is done by Associate Professor Svenn Orvig for a post-graduate class.*

3

5

6

# DOT'S Interesting

**Scattered from coast to coast, D.O.T. employees are active people—on the job and off. Following are items about happenings of general interest**

WASHINGTON, D.C.—More than 100 weather experts from all over the world gathered in the International Conference suite of the U.S. Department of State on March 26th for the 34th session of the Commission for Synoptic Meteorology of the World Meteorological Organization.

Canada was represented by F. W. Benum, R. R. Dodds and E. B. Humphrey, all members of the department's meteorological branch.

The delegates were welcomed by the Honorable Harlan Cleveland, assistant secretary of state for international organization affairs. During the session they were addressed by Dr. F. W. Reichelderfer, chief of the United States weather bureau, and by Mr. D. A. Davies, secretary-general of the World Meteorological Organization.

During the 26-day session weather observations, codes, communications and methods of forecasting were considered.

MONTREAL—Montreal Region Air Services held their first winter festival on March 30th. A variety of sports events were included in the program, but the highlight was the crowning of Pierrette Walsh as queen.

The main sports event was a hockey game between D.O.T. and T.C.A. A closely contested match all the way, T.C.A. ended up as 6 to 5 winners in the last minute of play.

OTTAWA—Plates stating recommended safe maximum engine power and weight capacity limits must now be installed on pleasure boats 16 feet or less if they carry outboard motors of 10 horsepower or more. This ruling was put in effect by the department's nautical safety branch on July 1st.

This compulsory plate scheme was instituted in an effort to reduce the small boat accident toll, which it has been found is due in large measure to overpowering or overloading small craft, or a combination of both.

To obtain the self-affixing plates, boat owners can obtain application forms at Customs Offices or D.O.T. Steamship Inspection offices, fill them out and send them along with a one dollar fee to the Superintendent of Nautical Safety, Department of Transport, Ottawa. Once placed on a boat, the plate will remain on that craft for its entire operational life.

OTTAWA—Torquil Reed, a member of the staff of Office Services in Ottawa, had the distinction of having one of his paintings appear in color on the cover of the April edition of the Canadian Geographical Journal. Mr. Reed is well known locally for his work in oils and has had many paintings reproduced on calendars and magazine covers.

TORONTO—Clarence Penner, superintendent of training in the research and training division, met. branch, recently spent three months as visiting lecturer in meteorology at the Graduate School of the University of Chicago.

Dr. Sverre Petterssen, chairman of the department of geophysical sciences, extended the invitation on behalf of the university, long recognized as one of the world's outstanding institutions in the field of atmospheric sciences.

TORONTO—A D.O.T. communications specialist and a McGill University professor received the Patterson Medal for distinguished service to meteorology in Canada on June 6.

Arthur J. Childs, superintendent of communications, met. branch, and Dr. J. Stewart Marshall, professor of meteorology at McGill, were awarded medals for 1961 at the Conference of Learned Societies held at Hamilton's McMaster University.

Mr. Childs has played a major part in the design development and operation of Canada's meteorological communications system, which is recognized as one of the finest and most efficient of its kind and is the envy of many national weather services.

Dr. Marshall organized and now chairs the first department of meteorology at a Canadian university (see page 10). Under his leadership, the Stormy Weather Group at McGill University has become one of the worlds most respected research organizations in cloud physics and radar meteorology.

Dr. Marshall has also distinguished himself by his work on precipitation nuclei, his recent contributions to the Alberta hail research program and his development of new radar instrumentation and new forecasting techniques which effectively complement older methods.

The Patterson Medal was struck in honor of the late Dr. John Patterson, controller of the meteorological service of Canada from 1929 to 1946. It is awarded from time to time for an outstanding achievement in meteorology or for sustained contributing to meteorology over several years. The award may be made to any resident of Canada.

The only award made prior to 1961 was to Dr. Patterson himself in 1955.

*Patterson Medal winners Dr. J. Stewart Marshall and A. J. Childs are shown with three of their colleagues on the day of the presentation. Left to right: Dr. Marshall, Dr. F. K. Hare, Dean of the Faculty of Arts and Sciences, McGill; Dr. B. W. Boville, Dept. of Meteorology, McGill; Dr. C. O. Hines, Defence Research Board; and Mr. Childs.*

Edmonton Meteorologist *Robert Stark*, must surely be one of the most prolific suggestors the plan has ever had.

His 13th and most recent award—an award-in-kind—was made for pointing out that the words "weather warning discontinued" as used by district weather offices, is poor terminology since it could be mistaken for "weather warning *is* continued." He recommended that "weather warning, over" be used in radio broadcasts.

EDWARD SOROZAN, a met technician at Moosonee, suggested that the local station be provided with publicity material about the upper air program and other activities of the met branch for distribution to visitors.

Moosonee station attracts many interested American and Canadian tourists and, as the suggestor explained, the staff does not always have time to give more than the basic details of the function and purpose of an upper air station.

It was decided that this idea was a good public relations gesture, and leaflets and literature have been made available. Mr. Sorozan received an award-in-kind, type "C".

OTTAWA—Listening to a lecture in a classroom at the Air Services School at Ottawa Airport sat Mr. Ronald MacDonald. In a room down the hall listening to a lecture sat Mr. Ronald MacDonald—Junior, that is.

The Glace Bay, N.S., father and son were attending 14-week courses in meteorology. Mr. MacDonald, Senior, who gives the weather on T.V. for the Sydney area, was taking an advanced course for senior meteorological technicians. Ronald, Jr., 16 years newer to the world of meteorology, joined the department as a met technician-in-training and was sent to the school in Ottawa for preliminary training.

In the above photo Ronald, Sr. tells Ronald, Jr., that taking a reading on a sunshine recorder is a much more scientific method of weather observing than is crystal ball gazing.

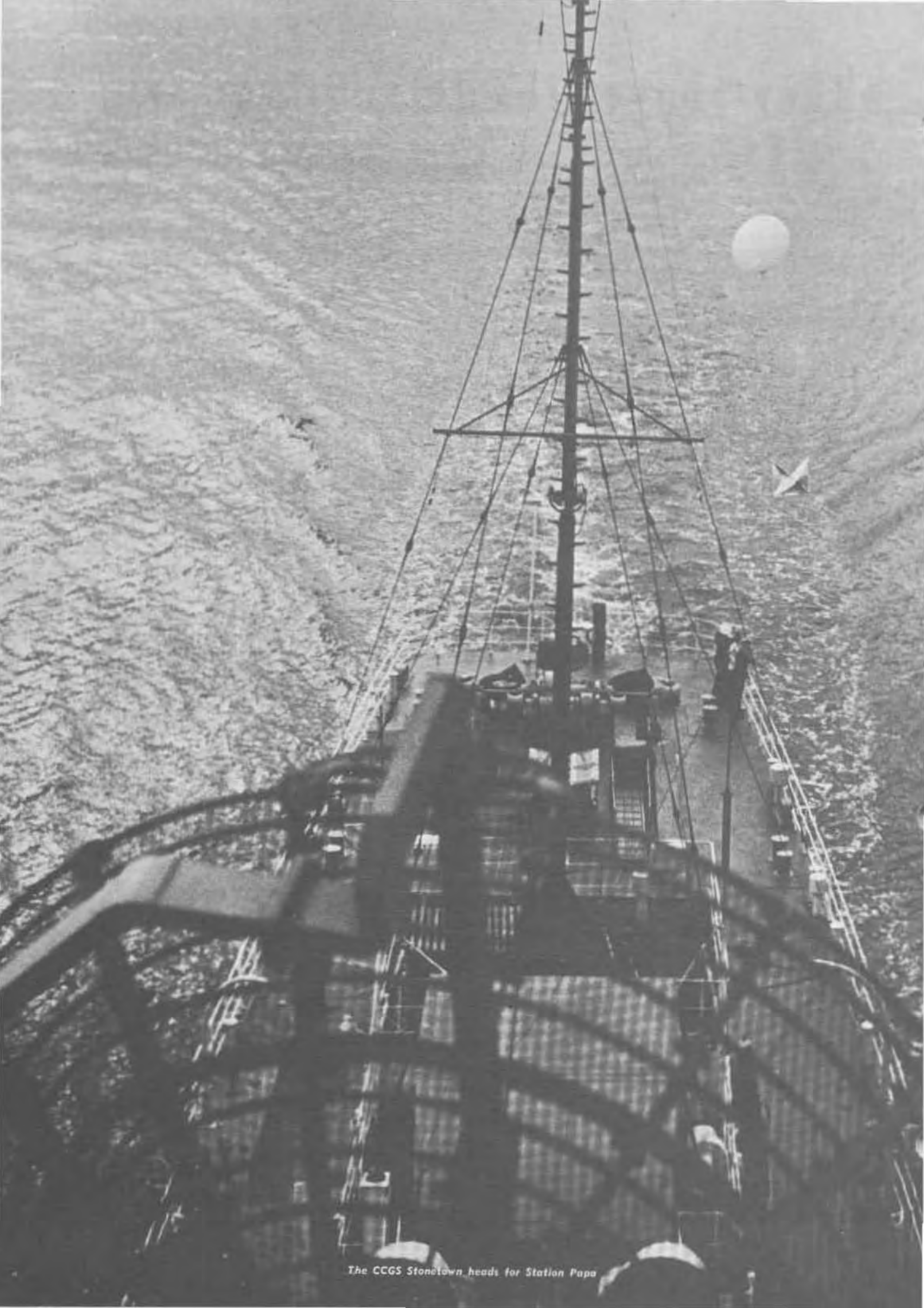
Montreal Met. Technician *Thomas Yamashita* is richer by $80 as a result of a contribution to the suggestion award plan.

He recommended that the monitor facsimile chart of trans-Atlantic prognostic charts replace ozalid copies of the chart previously used for display in the Montreal weather briefing office.

Since it resulted in an estimated $800 saving in time and ozalid paper, Mr. Yamashita's suggestion was immediately adopted.

*Griffith A. Toole*, officer-in-charge of the meteorological station at Aklavik, N.W.T., suggested a means to reduce icing of contacts on MSC type 4 radiosonde. As a result, a modification was made during winter months at the sites where this type of radiosonde unit is in use and the malfunction that prompted Mr. Toole's suggestion was eliminated.

He received a $30 award.


The CCGS Stonetown heads for Station Papa

# In The Middle of Nowhere

**by Captain John J. Lingaard,**

*Master, CCGS Stonetown*

Most men think of an escape from life—and women—as an idyllic existence among the sheltering palms of some South Sea Island, now that one can no longer join the disbanded French Foreign Legion.

But the men of the CCGS Stonetown offer a new cure for the love-lorn—spend 70 per cent of your time bobbing up and down 800 miles off Canada's West Coast ensconced in a weather ship.

That's what the 43 of us do who man this ship. Our average age is 40 years, and three out of four of us are married. Half of us have more than five years service, and one out of three has more than seven.

We spend seven weeks out of port, three weeks in, and judging by the crew's length of service that's the way most of us like it.

Actually most of that escapism stuff is said only in fun, but we've had the odd fellow on board who wouldn't trade the Stonetown for an island paradise.

Weather ships—or ocean station vessels as they are correctly called—have been in existence since 1946 when, under the authority of ICAO (the International Civil Aviation Organization), they first served in the Atlantic Ocean. The cost of operating them was shared by 18 member nations, with six of the countries —U.S., Britain, France, Holland, Norway and Sweden—manning the vessels.

Soon it was decided to extend the service to the Pacific and, in December, 1950, Canada joined the program by providing and manning two ex-RCN frigates—the Stonetown and the St. Catharines.

For 12 years now the former navy vessels have provided continuous service at station PAPA some 800 miles west of Vancouver (50 degrees North Latitude, 145 degrees West Longitude). Only once has a ship left station before her relief arrived and then only to effect repairs to damage suffered in a rescue mission.

The work carried out by these hardworking members of the Canadian Coast Guard fleet is varied—varied enough to keep crews happy and busy throughout each seven-week patrol away from home and family.

Observing weather conditions, on the surface and in the upper atmosphere, is the "raison d'être" for Station PAPA. The observations are made at regular intervals every day by the five meteorological technicians aboard. For upper air readings, airborne automatic weather observers (hydrogen-filled balloons carrying radiosonde equipment) are released twice a day. They attain heights up to 80,000 feet before bursting.

The balloons' transmitters send signals which are interpreted aboard the weatherships into temperature, pressure and humidity. Targets attached to the balloons enable their course to be followed by radar by which speed and direction of upper winds can be determined.

All this information and more—current conditions on the surface, and weather reports collected from merchant ships within some hundreds of miles of Station PAPA—is coded and sent to the radio station at Vancouver where it is put on a continent-wide meteorological teletype network and thence to connecting circuits around the world.

The CCGS Stonetown and the CCGS St. Catharines have other duties, too. To assist in navigational aid to ships and aircraft they are fitted out with LORAN and can furnish with considerable accuracy their position at all times. With their radio beacons constantly transmitting on medium frequency, ships and aircraft fitted with direction finding equipment can obtain a line of position at ranges of several hundred miles. Those at close range (15 miles for ships, 100 for aircraft) can, on request, receive their precise position by radar.

During a normal 49-day patrol, well over 100 planes are given not only their position, but their true course and speed plus weather conditions appropriate to their altitude.

The weatherships also play an important role in communications.

*Continued on next page*

*Second Steward Harry Watkins. Fifty-six-year-old Harry has served aboard the Stonetown since 1956.*


*Typical winter weather at Station PAPA and Waiter George Ludlow braves the elements to get a breath of fresh air on the fore-deck.*

*Continued from previous page*

Because of atmospheric conditions, ranges involved and the powerful equipment carried, we accept scores of messages daily for onward transmission to shore stations. In many cases the originators may be out of radio contact with any station other than PAPA.

Oceanographic research is a job which particularly interests the crew. The data required to further such studies entails hundreds of separate operations during the course of a patrol. Water temperatures are taken at varying depths, the position of the thermocline is observed before and during storms, the salinity of the ocean at different seasons is checked, a study and assessment of swell patterns is made, currents are determined and samples of plankton (organic life) collected.

One of our favorite pastimes is fishing but even this serves a useful purpose. Fish caught are opened up and their stomach contents examined to see what they eat so far out in the ocean—we find they eat a great deal of small squid.

From time to time rare or unidentifiable fish are caught and preserved—such species as hand-saw fish, frost fish, lantern-fish and snipe eel. But what we really like to catch—and like to eat—are salmon and pomfret. As many as 200 salmon have been caught by the Stonetown's crew during a summer.

Other forms of life which attract interest are birds and marine mammals. We keep one log for the sightings of whales, seals and dolphins and another for such birds as owls, larks, snow buntings, sparrows, swallows, Canada geese, sandpipers and cormorants. A surprising number of these land and shore birds find PAPA a haven of rest on their annual migrations. The ubiquitous albatross has also found its way onto the decks of the weatherships, but always has to be helped off again.

With such a variety of work to keep us occupied, it's not surprising that a normal patrol goes quickly. But it's not all work and no play.

Recreation is an important part of every day and the facilities aboard are tops. The Stonetown's hobby-shop is fitted out with an excellent selection of power tools. Materials for model-making, leather and copper work can be bought at the canteen. Any profit from these sales, incidentally, is used to buy other amusement items such as table tennis equipment, darts, cards and games.

Movies are shown twice a week and a good "box library" is provided for each patrol by the B.C. Open Shelf Library.

A committee of three organizes tournaments and competitions and in fine weather—which, unfortunately, is all too infrequent—runs sailing and rowing races using the ship's lifeboats.

Study is not neglected. Lectures on a variety of subjects are given by the ship's officers and many men take advantage of the DVA correspondence courses.

Perhaps one of the most important duties we could be called upon to carry out would be the rescuing of survivors of a ditched aircraft. Although the weatherships are stationed at PAPA primarily to carry out the extensive weather observations already outlined, the fact that we are there is reason enough for us to be fully prepared to engage in search and rescue activities should the need arise.

With the ever-increasing amount of air traffic across the Pacific Ocean, the possibility of a plane, through engine trouble, lack of fuel or other cause, being unable to make land is also on

Harry Watkins is a keen fisherman, but even he didn't bargain for such a rare catch as this handsaw fish when he threw his line overboard.

"See what I caught for supper, boys", is what Chief Officer Alan Arthur seems to be saying as he displays this nice salmon for all to see.

To a land lubber this is a mighty queer bird, but to the men on the weatherships it's just another "gooney" or albatross. Chief Steward Guenter Schweitzer and Chief Engineer Robert Camdon check their new found friend's wing spread.

the increase. The only hope of survival for persons aboard such a plane would be to put down in the ocean alongside a ship capable of carrying out their rescue. D.O.T. weatherships are specially equipped to do just this.

It has been the Stonetown's good fortune to date not to have been called upon to carry out such a task, but in such an event she would give the pilot information about wind, sea and swell patterns to allow him to figure out the best course on which to "ditch".

If it was during daylight, a sea-lane of dyemarkers, some 8,000 feet long, would be laid by the ship. At night, such a lane would be outlined by 20 light floats and the area at the point of ditching would be illuminated by 400,000 candlepower parachute flares. If conditions of low cloud or fog prevailed, the aircraft could be guided onto the ditching course by radar.

Considering the rough weather prevailing in the North Pacific throughout most of the year and the fact that modern aircraft are unlikely to remain afloat for very long, such rescue operations would be extremely hazardous. However, some degree of assurance can be had in knowing that the crews of the D.O.T. weatherships are trained to a high standard of preparedness. Exercises simulating as closely as possible the conditions that are likely to be experienced are held frequently. And, of course, the weatherships are equally as well-prepared to help ships in distress should an emergency happen within reasonable steaming distance of the station.

TORONTO—Keith McLeod, superintendent of public weather services, meteorological branch, has returned from Geneva after a two-year tenure as chief of the administrative division of the secretariat of the World Meteorological Organization.

Mr. McLeod, who was on leave of absence from the department, was the first Canadian meteorologist—in fact, the first North American—to hold an executive position with the secretariat. His wife and four teenage children were with him in Geneva.

*Paul Tremblay*, a meteorological communicator at Montreal International Airport, recommended a different method of preparing and relaying teletype tape at the airport's weather office. Since it was found that this resulted in improved communication procedures Mr. Tremblay was awarded an overnight case.

# 1963

## news on the dot

# E. A. BARKS HEADS NEW RESEARCH DIVISION

Edward A. Barks was appointed chief of a new research division in the civil aviation branch on October 1.

A native of Ottawa, Mr. Barks was officer-in-charge of the Moncton forecast office and regional meteorologist for the Atlantic Provinces from 1948 until his new appointment.

Graduating from Queen's University, Kingston, with an Honors B.A. in mathematics and economics in 1941, Mr. Barks joined the department's meteorological branch the same year. After a two-year training period he was appointed meteorologist at Gander and in the summer of 1943 was promoted to officer-in-charge of the Botwood forecast office.

From 1944 to 1948 Mr. Barks was at Goose Bay, Labrador, in charge of the forecast office serving military and civil flying operations over the North Atlantic and into the Arctic. During this period he visited weather offices in the Canadian North, Greenland, Britain and Holland in connection with his work.

The formation of the new division, officially called operational research and development, was announced early in 1961 as a result of the continued increase of activity in all phases of civil aviation.

A small staff of specialists in analytical research, aviation, mathematics and engineering has been recruited over the past year. Some of the problems they are currently studying include the future needs of airport users, aircraft traffic separation at very high levels, bomb scares, noise abatement at airports, workloads in cockpits of modern aircraft and aircraft instrumentation to ensure safety.

In carrying out such studies, Mr. Barks and his staff will work closely with airport users, the aircraft industry, technical research organizations and other government departments and agencies.

Mr. Barks is married and has two children.

# News on the DOT

DEPARTMENT OF TRANSPORT STAFF PUBLICATION MARCH - APRIL 1963

Return to TMBrison



# PAGE TWO

## OUR COVER

Mr. Albert Hollingworth is only one of more than 2,000 voluntary weather observers who keep an eye on Canada's weather from east coast to west coast. But he is worthy of representing all of them since he is the third generation of his family to carry out this important task for Canada's public weather service. (see story page 6)

## INSIDE NEWS

This issue of News On The DOT is devoted to stories about the work being carried out by our meteorological branch. There are so many different projects and studies going on, in addition to their daily task of weather forecasting, we thought this was the best way to tell our readers about some of them.

Meteorology, the study of the properties and movement of the lower atmosphere, began some two thousand years ago and since then has engaged the interest of many great thinkers, including Plato, Aristotle and Galileo.

At first meteorology consisted of observing and recording weather data as a result of man's curiosity about the world in which he lived. This led to the perfection of devices to measure certain characteristics of the atmosphere, such as pressure, temperature, humidity, wind speed and precipitation.

The barometer, thermometer, and rain gauge are still the basic instruments of meteorology, although radio, radar, electronic computers and, most recently, the orbiting TIROS weather satellites which observe clouds, radiation, and other phenomena from about four hundred miles in space, have added new and exciting data. The very recent strides made in space science will further develop the science of meteorology.

It is one thing to observe and record the weather for historical purposes; it is quite another to predict with any degree of accuracy the weather for the coming week or even for the next few days. This latter problem has always fascinated mankind, and folklore abounds in quaint sayings and advice about tomorrow's weather.

It was not very long ago that the farmer, the sailor, and the storekeeper each tried his hand at weather forecasting, or relied on the local prophet, who, perchance, had made one or two fortunate guesses.

The trans-Pacific or trans-Atlantic jet pilot has no such notions, for his arrival thousands of miles away in the next few hours cannot be left to chance; his route forecast is just as essential to his flight as the fuel he carries. Folklore has yet to be written concerning the behavior of jet streams and weather conditions at forty thousand feet.

The scientific forecasting of weather is a younger branch of meteorology. It relies not only on local observations, but also on observations taken at the same time in other localities in the lower atmosphere and over a wide area of the earth's surface. The weather data thus obtained must be analyzed by trained meteorologists, then translated into forecasts of the weather which may be expected to develop.

A meteorological service thus consists essentially of a select group of highly trained weather technicians, an efficient communications system to transmit weather data to central weather offices, and a staff of university-trained meteorologists capable of analyzing the data collected.

The meteorological branch of the Department of Transport is Canada's main organization for the dissemination of weather services to aviation, industry, and the general public. This government weather service provides forecasts for all flying in Canada and over the neighboring waters, including trans-Atlantic and trans-Pacific flights. A great number of industries are served by forecasts tailored to their particular needs or by statistical information on climate in their locality.

There are many ways in which the meteorological branch aids the average man. It provides frost warnings for fruit growers, storm warnings for fishermen, humidity and precipitation data, for the control of forest fires, and weather advice to shippers of perishable goods.

There are at present over 2,200 full-time employees in Canada's weather service. These employees are stationed throughout Canada from St. John's, Newfoundland, in the East to Dawson City, Yukon, in the West; from the Great Lakes to Resolute and the most northern outposts in the Arctic. They are situated in both rural and urban locations, the chief centres being Vancouver, Victoria, Edmonton, Whitehorse, Calgary, Winnipeg, Toronto, Ottawa, Montreal, Moncton, Gander, Goose Bay, and Halifax.

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**News on the DOT**

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ROGER DUHAMEL, F.R.S.C., Queen's Printer and Controller of Stationery, Ottawa, 1963

Le présent numéro de NEWS ON THE DOT renferme plusieurs articles excellents sur le travail de la Direction de la météorologie du ministère des Transports. Écrits par des membres de notre service météorologique, ces articles intéressent un vaste domaine d'activité: observation des glaces, études sur la pollution de l'air et sur la microclimatologie, la prévision du temps à longue échéance, etc.

Le service météorologique canadien relève du ministère des Transports parce qu'il s'est d'abord employé à répondre aux besoins des transports. Bien qu'à l'heure actuelle, son activité s'étende à d'autres domaines que la prévision du temps et les services à l'intention de la marine et de l'aviation, ses travaux fournissent des renseignements essentiels à d'autres directions du Ministère. C'est l'un des plus anciens services de l'État et son histoire remonte à une période antérieure à la Confédération. De nos jours, ses travaux exigent les services d'une armée de scientifiques et de chercheurs qui visent des objectifs relevant de la science et de la technologie les plus avancées.

Le présent numéro est expédié aux nombreux observateurs météorologiques bénévoles qui recueillent continuellement dans tous les coins du pays et à tous les carrefours des renseignements climatiques qui apportent une aide précieuse à la Direction de la météorologie.

En un sens, ces hommes et ces femmes sont nos associés, à nous qui travaillons au ministère des Transports. En leur adressant ce numéro, nous voulons leur témoigner notre reconnaissance et leur donner une idée de l'ampleur des travaux du Ministère.

## LE MOT DU SOUS-MINISTRE

## FROM THE DEPUTY MINISTER'S DESK

J. R. Baldwin

This issue of News On The DOT contains several excellent articles about the work of the meteorological branch of the department. Written by members of our weather service, these articles cover a wide area of activities—ice-observing, air pollution and microclimatological studies, a long-range weather forecast and more.

The Canadian weather service comes under the Department of Transport mainly because it made its earliest strides forward in support of transportation requirements. Although its current work goes far beyond public weather forecasting and aviation and marine service, its functions complement and provide vital information for the other branches of the department. One of the oldest services of government—its history goes back beyond Confederation—today's operations require the services of the battery of scientists and researchers whose objectives carry us into advanced fields of science and technology.

This issue is being sent to the many voluntary weather observers who assist the meteorological branch by providing continuous climatic information from all corners and crossroads of the country.

These men and women are, in a sense, associates of all of us who work for Transport. By sending them this issue we hope we will be showing our gratitude for their assistance, as well as letting them know something of the magnitude of the department's operations.

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# 10-Year Weather Forecast

BY JOHN DE BONDT • Long-range forecasting is nothing new to the meteorological branch, but the forecasters have out-prophesied themselves in the department's new report on "Canada in the Jet Age."

Offering a prognosis extending all the way to 1972, they predict the branch will triple its annual capital expenditures in ten years and increase its administrative costs by 50 per cent.

In dollars and cents that spells \$3,995,000 per year for capital cost by 1972 compared to \$1,209,000 in 1961-62, and \$25,465,000 per annum for operating expenditures as against \$16,901,000 now. Their financial barometer also indicates a warming trend in revenues, to \$303,000 per year from \$248,000.

The forecast, like the entire air services report, is based on the logical assumption that Canadians will want the branch to go on providing more and better weather services to serve a growing country.

Branch Director Dr. P. D. McTaggart-Cowan and his aides believe they can give these services more efficiently with the help of many new electronic paraphernalia, ranging from transmissometers at airports (to measure visibility on a runway) to high-speed digital computers (used in research and forecasting).

The transmissometer is a true jet-age tool, made necessary by the huge size of modern airports. At Vancouver International Airport, for instance, the touchdown point on the main instrument approach is two miles away from the weather office where the observations are made.

When visibility is nearing the point where it is no longer safe for an aircraft to land, small variations become very important. The transmissometer measures the visibility where it counts most for the pilot and records its findings automatically in the observing room at the weather office.

Another jet-era instrument is the ceilometer. It accurately measures the height of the cloud base at a critical point on the final approach path.

The next ten years, according to the meteorologists' long-long-range forecast, will see ceilometers and transmissometers installed at all major airports.

The system will also be extended to the control towers, so that air traffic controllers can provide a pilot on approach with instant weather information.

The high-speed computers mentioned will be used in climatology to process mountains of data and in research to solve lengthy equations of hydrodynamics and thermodynamics.

The growing importance of meteorology in many fields is clear from a list of subjects with which meteorological research will concern itself during the next decade. They will include hail, atmospheric turbulence, air pollution, stratospheric circulation, aircraft hazards, numerical weather prediction (weather forecasting with the help of electronic computers), forecasting methods based on data from weather satellites and storms.

The report forecasts that the annual capital and operating cost of meteorological research will rise to \$3,000,000 by 1972 from \$706,000 in 1961-62.

Other details in the 10-year weather outlook include:

- More and more automatic weather stations will be installed, to fill gaps in the department's network of observing stations and in some cases to replace stations where manned operation is uneconomical;
- There will be few or no additions to the 33 stations where upper air observations are made up to about 100,000 feet by electronic instruments carried aloft by balloons. However, better techniques and better instruments are in the charts;
- More men and more money will be devoted to taking observations in the upper stratosphere (100,000—300,000 feet). One of the methods used will employ rockets, and several launching pads will be built;
- The forecasting system will be redesigned for better versatility. It will be based on having a central analysis office, a number of "weather centrals" and a network of "weather offices". Three or four specialized offices will service such industries as agriculture, fisheries and forestry;
- Automation will be introduced to many of the communication processes necessary in meteorology. Weather reports and charts will be collected and sorted automatically;
- About 100 climatological observing stations and an equal number of rainfall stations will be added each year to the existing network—as has been the case during the past few years;

Will they be able to predict the daily weather for sure? The forecasters won't commit themselves, but they promise greater accuracy with two electronic successors to the almanac:

- Weather radar, now being installed at Halifax and definitely in the offing for other cities, will give meteorologists a better picture of existing weather and
- Computers will help them work out the possibilities more precisely.

Which, as a general synopsis, sounds pretty good.

# Le Service météorologique du Québec, unique en son genre

**Par M. G. O. Villeneuve,**
**Directeur suppléant de la météorologie, ministère des Ressources naturelles du Québec.**

Il y aura bientôt quarante ans, le gouvernement du Québec établissait dans la province un réseau de stations météorologiques. Ce réseau fonctionne encore aujourd'hui et fournit des données climatologiques aux autres ministères de la province ainsi qu'au Service météorologique du Canada à Toronto.

Ce service provincial relève d'un seul ministère, celui des Ressources naturelles. Il s'agit là d'une innovation récente. Autrefois, divers ministères, dont ceux des Terres et Forêts, de l'Agriculture et du Commerce, pour n'en nommer que trois, se partageaient la tâche d'établir les stations, de publier les bulletins, etc., mais l'an dernier, en vue d'assurer un service plus efficace, toutes ces initiatives ont été confiées au ministère des Ressources naturelles.

Les autorités provinciales s'intéressent activement à plusieurs aspects des conditions météorologiques. Elles ont fait porter leurs recherches sur la prévision du débit de certains bassins hydrographiques, sur l'établissement d'une échelle des dangers d'incendie de forêt d'après les conditions atmosphériques, sur les causes de la disparition de certaines espèces de poissons, sur le gel du revêtement des grandes routes. Les sylviculteurs prévoient l'amélioration d'importantes variétés d'arbres, alors que les agronomes envisagent la culture de certaines régions incultes de la province.

Chaque problème résolu en fait naître un nouveau que doivent résoudre ceux qui font appel, à cette fin, aux données climatologiques.

A l'heure actuelle, environ 300 stations fonctionnant à longueur d'année et 150 stations saisonnières transmettent régulièrement des rapports au service provincial. Les stations exploitées durant l'été s'appliquent surtout à déterminer l'indice d'inflammabilité des forêts, tandis que celles qui sont exploitées durant l'hiver publient un rapport quotidien sur l'état de la neige à l'intention des adeptes des sports d'hiver.

Trois sections se partagent le travail. La première est formée d'inspecteurs qui ont pour mission de visiter les stations pour y vérifier les instruments, de renseigner les observateurs bénévoles et d'assurer la liaison entre ces derniers et les scientifiques qui se servent de leurs données. La deuxième vérifie et classifie les données climatologiques que fournissent régulièrement les observateurs et publie un rapport climatique mensuel. La troisième, formée de deux ingénieurs forestiers, d'un ingénieur civil, d'un météorologiste, d'un agronome et de quelques adjoints, s'occupe d'étudier et d'interpréter ces données.

Cette dernière section publie chaque mois un feuillet météorologique renfermant des instructions, des nouvelles et des conseils à l'intention des observateurs.

La surveillance de toutes les stations occupe 450 observateurs bénévoles des deux sexes, de toutes les couches sociales et de toutes professions, notamment des curés, des professeurs, des éclusiers, des pompiers, des gardes-forestiers, des agronomes, des instituteurs, des retraités et autres, qui tous contribuent à la conservation de nos richesses naturelles.

*Station météorologique du Jardin Zoologique de Charlesbourg, Québec.*

## More Than 2,000

# Volunteers Man Coast-to-Coast Network

A country's climate is one of its most valuable natural resources. Bountiful rainfall, temperatures suitable for crops, animals and people, and the absence of disaster phenomena such as tornadoes, hurricanes, drought and flood—these are a blessing to a country and its people.

From grass roots to outer space, weather exerts a controlling influence on our daily lives. Its influence is so far-reaching and yet so personal that it sets the stage for international events and frequently decides for each of us what we will do next and where we will go.

One of the many things the department's meteorological branch does is to provide climatic information and advice. To do this, weather reports must be gathered from all parts of the country—a monumental task which would be difficult to accomplish without the legion of voluntary weather observers who man a dense network of climatological stations.

Farmers, doctors, ranchers, bankers, school teachers, editors, pensioners, students, clergymen—in fact, people from all walks of life are tackling the job.

These men and women receive no pay from the department for their twice daily observations and the monthly report they submit. However, all their instruments, forms, envelopes and postage are provided.

It's a fact that long before national weather services were established, amateur weathermen, using crude and often unreliable instruments, recorded their observations of the weather.

The story of how Benjamin Franklin used a kite to demonstrate that lightning was electricity is well known, but few people are aware of Franklin's other contributions to our knowledge of the atmosphere and weather.

In 1739 he kept daily records of weather and water temperatures on his voyage from England to America, and was probably the first man to track the passage of a hurricane along the Atlantic coast, using a network of observers. This he did in 1743.

Yet another famous American, Thomas Jefferson, showed a keen awareness of the weather. He kept an almost continuous record of observations from 1776 to 1816 and envisioned a national network of weather observers as early as 1797. By January 1800 there were 12 stations regularly observing the weather in the United States.

In Canada official recording of observations began in Toronto early in 1840. Several more stations were added in the 1860's and, in 1871, the National Meteorological Service was established. By 1876 there were more than 100 such stations, 15 of which reported daily to Toronto by telegraph for forecasting purposes.

An outstanding example of voluntary weather observing is in the Muskoka area at Beatrice, Ontario, where observations have been taken at the same location since 1876. Three generations of the Hollingworth family have kept the weather records.

The station was established in 1876 by J. Hollingworth, who reported weather observations until 1918 when his son John H. Hollingworth took over. The present observer, Albert Hollingworth, a grandson of the original observer, followed in their footsteps in April, 1941. This record is unique in Canada and surpassed at few stations elsewhere in the world.

During the past 85 years the number of stations has increased steadily in Eastern Canada. By the end of the last century they extended into Western Canada, followed later by their establishment in the Sub-Arctic and Polar regions. There are still vast areas of Canada where weather stations are several hundred miles apart, but most of the populated areas are represented by synoptic or hourly reporting stations every hundred miles or so and by climatological stations approximately 25 miles apart.

At the end of 1962 there were 2150 weather reporting stations of all kinds in Canada. Two hundred and sixty-five of these are synoptic stations communicating data for forecast purposes. This information is supplemented by reports from the 1900 voluntary observers. Six hundred and sixty of the latter stations record precipitation only, while the others observe daily maximum and minimum temperatures as well as rainfall and snowfall.

Many government and industrial organizations, power companies, agricultural experimental farms or research stations have added weather observing duties to their employees' general routine, but most of the observers are private citizens who voluntarily take on the duties of "weatherman" for their community. Most of them find it an absorbing hobby and have the satisfaction of knowing that they are adding to the general knowledge of the climate of Canada. In fact, their data facilitates the study of the complicated mosaic of world weather and climate.

*Thousands of weather reports from volunteers flow into the weather data processing section at meteorological headquarters each month. The information they contain is transferred to punched cards to give the vital weather data across Canada for any given month.*

*Voluntary Observer Harvey Howard (left) of Lumby, B.C. shows a friend the instruments in the Stevenson screen on his property.*

John

John H.

Albert

# Three Generations of Weather Observers

Twice a day for 87 years the Hollingworths of Beatrice, Ontario, have recorded the symptoms of the same patient—the weather.

This weather dynasty sets a Canadian and perhaps even a world record for continual observation of the weather at the same spot by the same family.

Three generations have tended their thermometers and barometers with a continuing bedside concern.

It all began with grandfather—the late John Hollingworth.

A coal miner in England, he grew dissatisfied with his lot and emigrated to Canada with wife Betty in the 1860's. They spent a few years in Toronto and in 1868 decided to move north to Muskoka to homestead under the Free Grant Act. With the deed to Lot 4, Concession 1 of the Township of Watt tucked safely away, John Hollingworth cleared the land, built a home and began farming.

In February 1876, Mr. Hollingworth became a voluntary weather observer for the National Meteorological Service—a task he carried on throughout the active years of his life and then relinquished to son John H. in 1918.

From father to son, from father to son passed both the homestead and the weather duties. John H. turned both over to Albert (our present observer and, incidentally, this issue's cover subject) in 1941.

Albert, his wife Mabel and their two sons and daughter have remained on the farm, but since 1956 have not worked the land. Albert finds construction work is a more profitable occupation these days, but he still finds time to take the daily weather observations. Although oldest son Donald is working in Toronto, young Gordon and Lois still work and go to school in the area, so perhaps the Hollingworth weather dynasty will go on for yet a fourth generation.

A climatological station requires constant attention. Observations must be taken regularly and punctually 365 days of the year. Meticulous care in taking the observations and entering the data of the monthly reports is very important.

It is equally important that the observing site be located in an area which is representative of the locality and, for comparison purposes, the environment of the station should remain as little changed as possible. Since the value of the station records increase in almost direct proportion to its length, it is desirable that the observations should be continued in the same location as long as possible. That is why the meteorological branch is greatly indebted to the many faithful observers, like the Hollingworth family, who have taken observations for very long periods.

When mailing his monthly report an observer may ask himself, "Does anyone ever look at these reports?" "Am I wasting my time?"

Let's look at what happens after he drops it in the letterbox. The thousands of reports received at regional processing centres and headquarters each month, are each checked to see that station name, month and year are entered. They are then passed along to machine operators who transfer the data to punched cards.

Just as there are many kinds of report forms, there are also many types of cards—hourly, daily, upper air, radiation etc. After punching, the cards are processed by machine to spot possible errors in punching or in actual observations. This is done by comparing data from one hour with that of the following hour, or data from one station with similar data from an adjacent station.

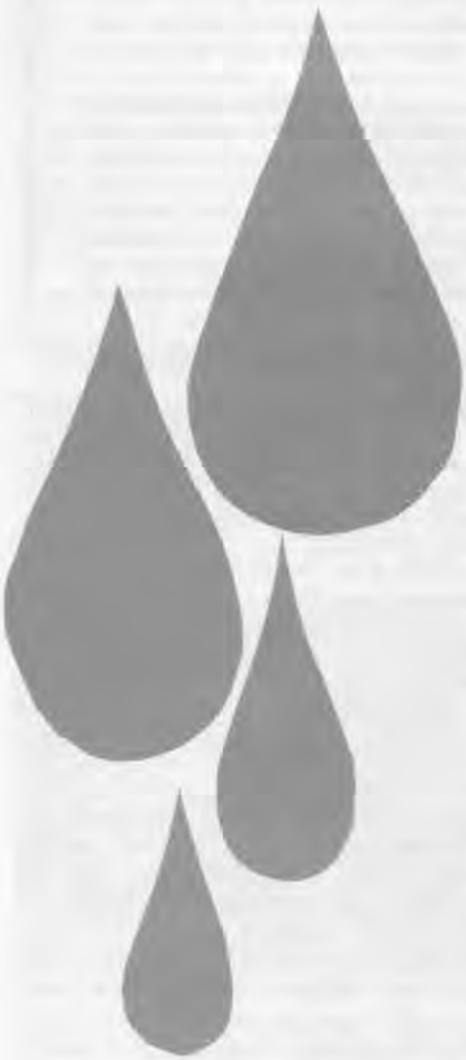
Veteran meteorological technicians inspect the cards suspected of containing errors and examine machine listings where such things as daily precipitation amounts are printed out for all stations according to the dozens of regions in the country. Different control methods are used for different card types. After the necessary corrections have been made, the products are several decks of cards containing the vital weather data for that month all across Canada.

These cards have two important uses. First, listings and tabulations are run from them for photographing and subsequent printing of the climatic data periodicals. Secondly, they are available for use in projects where it is desirable to examine, say, the temperature over a long period at one station, or the rainfall at several stations for several years. The cards can be used many times and enable the climatologists to employ many more data in their research than was possible by simple clerical procedures.

Far from having little value, the forms mailed each month have greater economic and historical value than most voluntary weather observers realize. They are valuable documents which can be considered part of our national archives and they form the basis for our evergrowing knowledge of the climate of Canada.

Unlike other perishable things in life, weather data increase in value with each year of observation added to the records—without the corps of climatological observers, the knowledge of Canadian climate would be very inadequate.

# the raindrop counters



Sixty voluntary observers have a job counting—counting raindrops, that is. By so doing they help the department find out what makes it rain, why it rains more at one time than another, and whether it is possible to influence the amount of rain that falls. They count raindrops that fall naturally and raindrops that fall through artificial inducement.

Since time immemorial man has been curious about the atmosphere in which he lives, but his knowledge of something as apparently simple as rain is far from complete. The raindrop counters are helping add to this knowledge. They count by measuring the amount of rain that falls. Research specialists use this information to determine whether adding chemical substances such as silver iodide crystals to the clouds causes any changes in rainfall.

It is less than 20 years ago that the first cloud seeding experiments were conducted, but since then the idea of increasing the natural rainfall has tantalized the minds of many. The adage: "everybody talks about the weather, but nobody does anything about it" might cease to be an adage in years to come.

Success in the experiments would have far-reaching benefits: forest fire control; prevention of crop failure through drought; hydro-electric resources; more snow for ski resorts are but a few of the manifold possibilities.

In Canada 850 billion gallons of water are used every day.

Where does it go? About 500,000 gallons go to grow every ton of hay; 17,000 gallons to grow every bushel of wheat. To manufacture a ton of rayon takes 350,000 gallons of water; one ton of meat requires 6,000 gallons; one ton of rolled steel, 24,000 gallons; a ton of bleached paper, 35,000 gallons, and so on. As agriculture and industry grow, the demand for water will increase.

If man can unlock the secrets of the clouds he will be a long way toward solving the increasing demand for water supplies and resources.

In 1959 the department's meteorological branch launched an investigation into the processes of precipitation. They called it the Precipitation Physics Project.

Meteorologists assigned to the job chose a 70-mile radius of the farming and mining country surrounding Rouyn-Noranda in northwestern Quebec as the project site. Headquarters were established at McWatters, 12 miles east of Rouyn, and the region was bisected into two similar areas, each 35 miles square. In each area 30 gauges for measuring the amount of rainfall were installed at five-mile intervals. Every 1/100 of an inch of rainfall is recorded by these gauges and, although they operate automatically, they require daily chart changes and a daily measurement of the collected rainfall. This is where the raindrop counters come in, 42 of these gauges being tended by voluntary observers. In the more remote areas where it was necessary to place the other 18 gauges, area supervisors make weekly visits to change charts and record the measurements.

Many of the volunteers are farmers, who rely heavily on the weather to plant and harvest. They are anxious to help solve a problem which may result in economic benefit to themselves. Some volunteers are members of the Forest Protection Service of Quebec, some are employees of the Canadian International Paper Company, while still others are high school students.

Area supervisors visit the volunteer observers once a week to collect rainfall records, check the operation of the gauges and advise on problems which may have developed. The supervisors, provided by the Canadian Pulp and Paper Association, are men familiar with the area. They often travel 500 miles by automobile each week to collect all the records. Sometimes they must journey by small boat or on foot through dense woods to get at the more remote gauges.

The records are forwarded to meteorological headquarters in Toronto for analysis, where project researchers compare the rainfall from clouds seeded with silver iodide with rainfall from unseeded clouds to arrive at an evaluation of the effect of the seeding. Because of the great natural variability of rainfall, a great many storms must be analysed before an effect can be determined with any degree of certainty.

To seed clouds an aircraft flies through them releasing silver iodide smoke. Only the clouds over one area are treated at one time. Which of the two test areas receives the treatment is determined by a random method such as the toss of a coin. The treated area is compared with the untreated area for a possible increase in rainfall.

Since there are only 10 to 15 suitable seeding occasions during the four-month season (May 15 to September 15) and each seeding lasts only a few hours, it takes several years to collect sufficient information to arrive at a conclusion. Weathermen are hopeful that significant results will be available at the end of five years—that would be after the 1964 season is over.

In addition to the extensive network of gauges, many other observations are taken on the ground and in the air—observations with complicated weather radars and other elaborate instruments. There are six stations for this part of project. Three of them have special radio receivers to record the number of lightning strokes.

Rain gauges are set out each spring—and removed again at the end of September for winter storage. The problems of keeping such a network of raingauge stations running smoothly are many, and it is very important not to miss any observations. Some of the causes of missed observations to date have involved gauges being knocked over by cattle and the disappearance of others—no doubt to serve as a trophy on some enterprising collector's shelf.

Ironically, one of the project's greatest difficulties has been—of all things—heavy rainfall!

In 1960 there was abnormally heavy rainfall in the test areas. Farmers were unhappy. Tourists stayed away and many a picnic was spoiled.

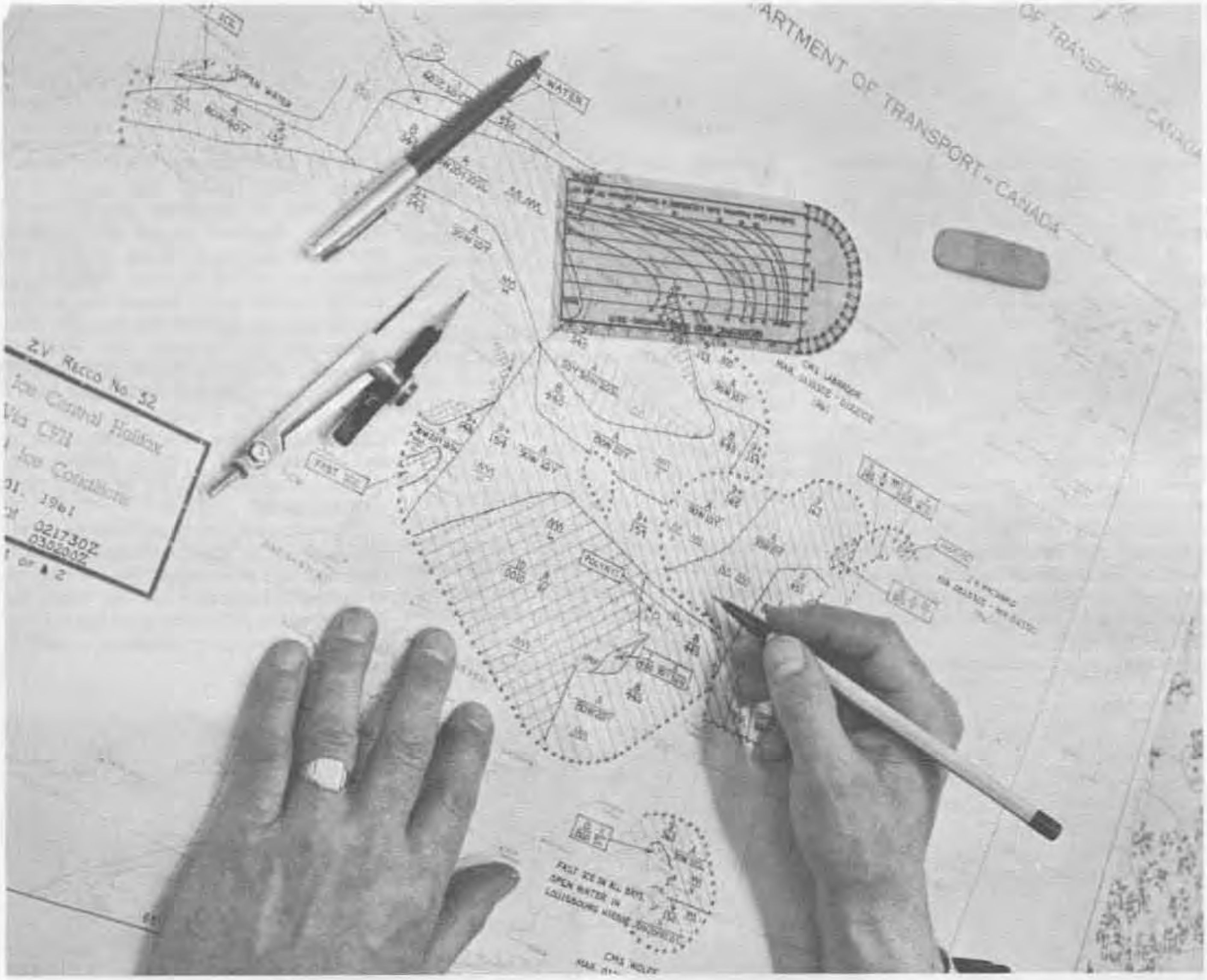
Bad weather is usually accepted philosophically, but in this case there was a scapegoat. Some of the public suspected the Precipitation Physics Project of being the culprit. In spite of assurances from the meteorological people that it was a natural occurrence, it appeared for a while that continuation of the project was in jeopardy.

In 1961 rainfall was normal, but in '62 the season started out dry. Again, the project was suspect, but by the time the summer was over the rainfall was back to normal and the project had "weathered the storm" of criticism.

D.O.T.'s meteorological branch is not alone in this immense scientific undertaking. Many agencies and associations assist, both in manpower and in funds. About a hundred people are involved directly or indirectly in the project, the annual cost of which runs close to the quarter-million mark. Among the participating agencies are: the department's telecommunications branch, the National Research Council, the Department of Forestry, the Canadian Pulp and Paper Association, the RCAF, the Army, the Ontario and Quebec Departments of Lands and Forests, and others. Information gained from the project will be useful right across Canada.

The volunteer observers perform a valuable service to their government and to their country. It is hoped that as a result of their efforts we may one day know the answers which will allow us to control the resources of nature to provide a better life for all of us.

*Two observers tend their daily chores, measuring rain (left) and changing sunshine recorder diagrams (right).*




*Plotting information on the ice forecast map at Ice Central, Halifax.*

# Battling Ice

by

D. C. Archibald
Chief, Basic Weather

Ice means different things to different people. Depending upon culture and background, it conjures up a variety of pictures: To the Eskimo it is associated with a mode of life; to the Arctic pilot it means emergency landing fields; to the northern marine navigator it spells potential hazard, but to Foster Hewitt it means "he shoots, he scores"! Meteorologically speaking, however, ice means none of these things. During the last few years it has become a subject of widespread interest and concern for Canadian transportation, commerce and industry.

It is just five years since D.O.T.'s meteorological branch got its baptism of ice over the Gulf of St. Lawrence. Then we had five ice observers and the seasonal tonnage through the Gulf was less than 100,000. Today we have 18 observers and shipping has increased almost 15-fold to 1,410,000 tons since that season of 1956-57. Some ports, previously closed in mid-winter months, are now in use all winter with substantial economic savings.

To find out where the ice is, the meteorological branch makes aerial reconnaissance of shipping routes and supplements this information with on-the-spot reports from observers aboard selected icebreakers.

The aerial data are graphically plotted on a chart to give a complete view of ice coverage, age, topography and physical features.

Ships equipped to receive facsimiles get these charts transmitted directly from selected stations and, in addition, a chart of forecast ice conditions is prepared for facsimile transmission at ice central office at Halifax.

Of course radio is used to reach ships not equipped for chart-facsimiles, so that the widest possible use is made of the information.

Ice observers are busy people. With bases at Sept-Iles, Sydney and Gander on the eastern seaboard and at Churchill, Frobisher, Cambridge Bay and Resolute in the North, ice observing is carried out in some part of Canada each month of the year. Last year observers flew half a million miles—or the equivalent of 20 times around the earth—in the course of their duties.

A typical day for one of these men (as yet no woman has invaded this frigid field) would actually begin the afternoon before with the tentative decision to make a flight the next day. The aircraft captain is alerted to be ready for an 8:00 a.m. take-off, to make the maximum use of daylight.

If weather conditions are favorable, the pilot and the ice observers (three for a flight using decca navigation and radar equipment) meet an hour before the take-off to review the weather situation and forecasts over the planned route and determine the possibility of obtaining visual information. Usually flights are made at 2,500 foot altitude, but, depending on cloud conditions, can be much lower.

The plane takes off and the observer commandeers the spot with the best possible view—ideally this is 180° forward visibility and vertically downward visibility. He charts on his map of the area the concentration of ice, whether it is young, winter or polar ice, leads and other water openings if any. All of this is recorded on the chart at the precise point of observation.

Conventional navigation systems, along with Decca navigator, enable the observer to know the precise location. If weather conditions deteriorate so that part of the flight is made through cloud, radar gives an indication of the extent of ice and the ice edge can be followed with precision.

While one ice observer is thus occupied the other two operate the Decca and radar equipment. On flights of five to ten hours duration they take turns doing the visual observing since it can be very tiring.

Sometimes reconnaissance flights are directed to render tactical support to a ship beset in ice. Direct air-to-ship communication gives the vessel's captain the complete picture of ice conditions and the areas best suited to penetration—in effect, it gives him a periscope 2,500 feet high but with "telescopic view".

When the observers return to their base they work up the complete ice information into a chart of the entire area of the flight. This is passed by facsimile transmission to the Ice Forecast Central which in turn issues "ice-advisories". The observers stay on the job until the completed charts and messages are relayed.

Today's ice observers get an "assist" from current meteorological satellites orbiting around the world. The Tiros satellites—a space age contraction of Television infra-red observation satellite—have been orbiting the earth about 450 miles above and incline to the equator at a 48 to 58 degree angle. From pictures received by the read-out station large scale ice areas can be recognized.

TIROS' successor, the NIMBUS series, will be launched late in 1963, and if they are as successful the ice experts will be happy.

The NIMBUS will be in polar orbit, which means a continuous series of satellites view the whole world's weather every 24 hours, providing daily coverage of the Gulf of St. Lawrence. This should result in more detailed charts and corresponding economies in ice patrolling.

The department's ice observing program is one of the main keys which unlocks the doors to improved surface transportation and to our vast Arctic frontier.

# NO JACK, THAT'S NOT A BEAN-STALK

## it's an an-

### emometer or a

### lysimeter or a soil

#### heat flux recorder

**or something**

While satellites observing the weather over tremendous areas are stirring everyone's imagination, a quiet but enthusiastic group of scientists in Toronto is doing just the opposite, studying the weather over small areas.

They are E. I. Mukammal, head of the microclimatological section of the meteorological branch, and his staff, meteorological officer H. F. Cork and met. technicians J. W. Shurie and N. G. MacPhail.

These men are not interested in depressions over Baffin Island or storm centers over the Pacific. What does fascinate them are weather conditions in one particular forest or under one particular corn patch.

One result of their studies is that the cause of a disease called tobacco fleck is now known. It is hoped this knowledge may enable the Department of Agriculture to find ways of fighting the disease and thus save millions of pounds of tobacco annually which would otherwise be destroyed.

Just as the climate differs in various parts of the country, the "microclimate" differs in various parts of a garden or on both sides of a railway embankment. It may be warm, sunny and dry in an opening in a field of corn, but dark, cool and damp under some of the leaves.

In such microclimatological studies great reliance is placed on super-sensitive and reliable instruments capable of measuring the small differences in weather elements near the ground and other equipment for quickly collecting and processing an enormous amount of data. All this would be impossible without electronics.

To find the cause of tobacco fleck, Mr. Mukammal and his staff co-operated closely with the federal Departments of Agriculture and of National Health and Welfare, and with the Ontario Research Foundation.

The microclimatologists started with a research station near Port Burwell in 1958 and later added five satellite stations, where meteorological observations were taken during the tobacco seasons between 1958 and 1961. At the main research station there were 63 temperature sensing elements and 17 wind measuring instruments in operation.

A 100 ft. tower was erected in a tobacco field and instrumented at different levels. In and around the field were thermometers, rain gauges, anemometers, dew recorders, radiation recorders and devices for measuring evapotranspiration, most of which were super-sensitive electronic devices.

A tremendous amount of data was accumulated during four summers, processed electronically and analyzed. It showed that the cause of tobacco fleck was ozone.

The fleck most frequently occurred after a spell of warm, humid and hazy conditions, with winds from the southwest.

Since the disease occurs in mature leaves and thus fleck severity is greatest around harvest time, the meteorologists, knowing the requisite weather conditions, can now warn farmers one or two days ahead if weather fleck is expected to occur. Farmers can then harvest as many leaves as possible before tobacco fleck strikes.

Another study made possible by electronics is a research project on leaf wetness. The quantity of moisture deposited on leaves by rain, fog or dew is important in the development of plant diseases, particularly those caused by fungus. Micro-organisms require water deposits for movement and infection.

The World Meteorological Organization has urged a world-wide drive to gain a full understanding of the formation of dew and to develop methods of measuring the amount of water deposited on a plant and the time it stays on.

Last summer's project was carried out at Guelph, Ontario, in collaboration with the Ontario Agricultural College. Precise and sensitive instruments were installed, including lysimeters (floating pots of soil that sink when rain or dew falls on them), thermometers, rain gauges, anemometers, dew recorders, soil heat flux and moisture meters and sunshine and radiation recorders.

Three of the latter were mounted on a trolley which ran back and forth for some 20 feet through a cornfield at 18 inches above the ground. Continous readings of the measurements clearly showed the passage of the instruments through patches of sun and shade in the crop. The readings obtained were the average over 20 feet and therefore better represented conditions in the entire crop than measurements at a single point would have.

Most of these instruments are so sensitive and so specialized that they are not available commercially. The meteorological instrument division in Toronto designs and builds them. Says Mr. Mukammal, "I give full credit to the instruments division—without their help our microclimatological projects would not be possible."

A further research project upon which Mr. Mukammal and his staff are engaged, again in collaboration with the Ontario Research Foundation, is the effect which Lake Erie has on southern Ontario's weather. This study will help them find new regions suitable for growing peaches, as much of the province's present fruit growing area is being made into subdivisions.

Not long ago the meteorological branch sent out a questionnaire to government departments, universities and other interested bodies. In it they asked whether there were any special projects in microclimatology which required specialized studies. The object of this nation-wide survey was to examine each individual problem and classify it according to its nature, locality, importance and urgency, so that evaluation of the work involved and applicability to different areas could be determined. Answers poured in by the dozen, making up a sizeable file of work to be done.

One result of the questionnaire was that the meteorological branch now has under consideration a co-operative project with the federal Department of Forestry to study the microclimate of forests, particularly with respect ot the regeneration of forests, and the causes of outbreak and spread of forest fires.

Meteorologist L. B. MacHattie, seconded to the Forestry Department, would assist in the coordination of the project. Again, electronics would play a major part in the collection and processing of data.

*IN THE FIELD—Sensitive instruments at the tobacco fleck (left) and leaf wetness projects.*

# DOT's Interesting

*A thousand pounds of coal is swung across the strait.*

LANGARA ISLAND, B.C.—The department's Sikorsky helicopter, in service on the West Coast, came in for a "first" shortly before Christmas.

Supplies were being delivered to Langara Island aboard the CCGS "Alexander MacKenzie", but the swell and weather were too rough for the work-boat to land.

The alternatives were clearcut—either wait the weather out for close to four days or hook a 1,000-pound sling to the helicopter and attempt to transfer the 9,000-pound cargo, including a ton of coal, over to the island.

No difficulties were encountered; in fact the entire operation was finished within an hour.

MONCTON, N.B.—A mass application of fire-fighting foam—30,000 gallons of it—was used to extinguish a fire which severely damaged a Maritime Central Airways aircraft at Moncton airport in January.

The foam prevented the fire from spreading to other aircraft and the hangar itself. The airport's emergency crew used one of their large airfield type crash trucks, capable of discharging 5,000 gallons of foam per minute, to bring the blaze under control after a spark set off the fire in the C-46 cargo liner.

MCA officials praised the D.O.T. airport fire brigade for their efficiency.

HALIFAX, N.S.—Clive E. Brown of the CCGS "John A. MacDonald" is the first of the marine engineers being trained under the department's training scheme to receive a second class motor certificate.

A junior engineer aboard the MacDonald since June, 1960, Mr. Brown served his four-year apprenticeship at the Kingston Shipyard, Kingston, Ontario.

HALIFAX, N.S.—Officers aboard eleven of the larger icebreakers of the Canadian Coast Guard fleet are being trained to observe and code weather information.

Two courses were conducted in December by Malcolm Carmichael, port meteorological officer at Halifax. The first course, held at Halifax aboard the CCGS "John A. MacDonald", was attended by nine officers and the other one conducted aboard the CCGS "D'Iberville" at Quebec City, had six officers as students.

The men were instructed in carrying out synoptic meteorological observations during operations in coastal waters and the Arctic. Their reports will benefit the ships themselves, as well as providing the meteorological branch with valuable information about marine weather conditions.

More courses will get underway this spring.

OTTAWA—The first air services fire prevention contest was an unqualified success. Fifty-seven establishments submitted entries last fall. A small, isolated airport—Baker Lake, N.W.T.—turned out to be the winner of the grand award. One of the novel innovations described in the Baker Lake submission was the use of "stone-boats as fire vehicles to carry equipment and extinguishants to all points of the site. A series of well-placed, covered holes in the lake are kept ice-free to ensure a speedy supply of water in case of fire. Added precautions taken at the airport include intensive training in the use of fire fighting equipment for all personnel and constant inspections to spot possible fire hazards."

Winners and runners up in the four classes were:

*Class A*—(Major establishments staffed with airport fire fighters)
- First—Montreal International Airport
- Second—Frobisher Bay Airport
- Third—Edmonton International Airport

*Class B*—(Other than Class A and staffed with airport fire fighters)
- First—Quebec Airport
- Second—Moncton Airport
- Third—Port Hardy Airport

*Class C*—(Other than Class A or B Airports)
- First—Baker Lake Airport
- Second—Ottawa International Airport
- Third—Fort Nelson Airport

*Class D*—(Miscellaneous Installations)
- First—Big Trout Lake Meteorological Station
- Second—Carmi Aeradio Station
- Third—Lansdowne House Meteorological Station.

OTTAWA—A delegation of 19 Canadians, headed by D.O.T.'s H. J. Williamson, chief, technical and policy coordination, left for Geneva, Switzerland, in mid-January to attend the plenary assembly of the C.C.I.R. (International Radio Consultative Committee). The C.C.I.R. is a special committee operating under the auspices of the International Telecommunications Union (ITU).

Four other D.O.T.'ers were in the delegation: W. J. Wilson, J. E. Wilson and D. L. Loftus, radio regulations engineering and W. A. C. Schultz, research and development. The remainder of the delegation was made up of representatives of the CBC, the Canadian Telephone Association, the Electrical Industries Association and National Defence.

The assembly, which convened on January 16 and continued to February 15, discussed technical and administrative subjects in the field of telecommunications. Canadian interests lay chiefly in the discussions of application of radio as pertaining to space activities and those concerning Canadian interests in radio astronomy.

TORONTO—Frank Upton was recently promoted to meteorological officer 7, in the basic weather division at Toronto. The new assignment deals primarily with the development of plans in the modernization of the meteorological observing program, especially at airports, and with the study of present methods and procedures for the reduction of barometric pressure.

Although still under 50, Frank is a long-time meteorological employee. In late 1931 he signed on as a temporary office boy with the meteorological branch (then part of the Department of Marine) and in 1936 was promoted to typist 1 at the munificent salary of $720 per annum. Subsequently, he served as a meteorological technician handling map plotting and weather observing duties at Toronto and North Bay.

In 1943 Frank underwent training as a meteorological officer and graduated near the top of the class. In 1956, he was placed in charge of the aviation forecast office at the RCAF Station, Portage la Prairie and, in 1961 became acting senior meteorological officer at the RCAF Station, Winnipeg.

In the spring of '62 Frank got his 25 year pin. He was the first meteorological officer serving with the Department of National Defence to receive a long service award.

ALMONTE, ONT.—One of the smallest establishments in the Toronto Air Services Region, the monitoring station here, was the first to be awarded the McIntyre trophy for fire prevention and safety.

A committee chaired by Regional Fire Prevention Officer R. J. Armour judged all establishments in the region.

"The Almonte station was as clean as a whip", says Mr. Armour, "and the officer-in-charge and his staff were very interested in fire prevention. They actually asked me how they could further improve on their efforts. I told them they couldn't."

The station's officer-in-charge is E. Davey. His staff members are radio operators A. E. Berry, G. F. Gaston, S. R. Ritchie and J. P. Curran.

The trophy was presented by Regional Director David P. Glen at Almonte on February 15. Also present at the ceremony was W. R. Butler, regional controller of T & E.

The McIntyre trophy was established in 1962 from monies donated towards the retirement of D. A. McIntyre, regional superintendent of airports.

*THE McINTYRE TROPHY—From left: W. R. Butler, regional controller of telecommunications and electronics, Toronto; E. Davey, officer-in-charge of the Almonte monitoring station; and David P. Glen, regional director, air services, Toronto.*

## Slips That Pass In The Forecast

"Correction to Montreal Forecast: Please read seasonable temperatures instead of reasonable temperatures".

* * *

"Ottawa weather summary: civil serpants are enjoying the mildest week-end of the year".

* * *

"Temperatures in Quebec province are behaving in an erotic manner today".

* * *

"The threat of cold weather hangs over local residents like the sword of Demosthenes".

# Smoke Get In Your Eyes?

# Ask The Weatherman

Nowadays, it's "Ask the weatherman" on air pollution problems. The department's meteorological branch frequently acts as consultants on such questions. Their regular clients are federal, provincial and local health authorities. Atomic Energy of Canada, too, has taken advantage of their facilities to check on radio-activity.

The branch's newest weapon in the fight against air pollution is a 24-foot trailer crammed with instruments, including a small electronic computer.

Backbone of the system is a telescoping 82-foot aluminum tower, which may be put up or taken down with a minimum of effort. Attached to the tower, when it is up, are temperature sensors and anemometers at three levels (20, 40 and 80 feet), and an instrument called a bivane which measures the horizontal and vertical fluctuations of the wind.

Signals from the instruments are conducted by electrical cabling to the computer, which is designed to automatically convert them into a punched tape record.

Housed in the trailer, as well, is an air sampler which provides a continuous record of the relative smokiness of the air.

Records of both temperature changes and wind speed changes with height are carefully collected for an indefinite period. The data are transcribed automatically onto punched cards by the branch's data processing section. When a record of predetermined length is available, the air pollution meteorologist, Dr. R. E. Munn, carefully analyzes it and suggests methods of combatting a local air pollution problem, such as the proper location and height of a smoke stack.

For the past two summers the portable system was set up at Douglas Point, on the eastern shores of Lake Huron, where Ontario Hydro is constructing a nuclear power reactor. More recently the system was located in Ottawa at the Montreal Road site of the National Research Council, where it was used in a joint field project studying air pollution.

Working with Dr. Munn in the trailer are met. officers J. Emslie and H. J. Wilson and met. technician J. Kovalick. In summer the air pollution specialists are usually assisted by students.

## WIRE TAPPING

**From a feminine caller: "Can I go to work tomorrow and leave my clothes on the line?"**

* * *

**A teenager asks: "Please send me leaflets on weather, but not on clouds—I already know enough about clouds."**

* * *

**An anxious young thing: "I'm being married tomorrow. What can I expect?"**

* * *

**Requesting advice, a lady called to say she planned to take a hot bath and have a cup of tea before retiring. "Which should I do first—drink the tea or take the bath?"**

Sir Casimir Gzowski


# A Man Of Many Talents

On March 5 the Post Office Department issued a five cent stamp commemorating the life and work of Sir Casimir Stanislaus Gzowski.

The stamp probably set many people to scratching their heads and wondering: "Now, who was he? I've never heard of a Gzowski River, lake, bridge or town, so he probably wasn't an explorer. Perhaps he was an artist or musician? But his name is obviously Polish or something, so why would he be honored by a Canadian stamp?"

These ponderers can't be considered uninformed. Only very few Canadians are aware of the engineering contributions this Polish-Canadian made to his adopted country during the last half of the 19th century. His efforts were concentrated in transportation and many projects he initiated or helped construct now come under the Department of Transport. So, in a way, all D.O.T.'ers should feel a warm spot for this almost unknown man.

Gzowski was born in 1813 in an area which had been annexed by Tsarist Russia as a result of the Partitions of Poland. In the Polish Uprising of 1830-31 he joined the insurgents and, when the movement was crushed a year later, crossed over to the Austrian part of Poland, where he was promptly interned. Along with his compatriots he was deported to the United States in 1834.

With no knowledge of English and only $5 to his name, Gzowski and his resourcefulness were soon tested.

He taught music and fencing to provide the necessities of life and began to study law. In 1838 he was licensed to practice in the State of Massachusetts—a remarkable feat in such a short time.

Gzowski, however, dreamed of returning to engineering, having graduated from a Russian technical institute as an engineer at the age of 18. He seized the first opportunity that came along and became a civil engineer in railway and canal construction in Pennsylvania. His firm sent him to Canada in 1842 to look over the specifications for improvements to the Welland Canal. He moved here permanently later that year when offered the job of superintendent of public works for what is now Western Ontario.

And thus began a 50-year career devoted to developing Eastern Canada's canals, railways and bridges.

Gzowski remained in public service until 1848 and then went into private business. First he was chief engineer of one of the earliest railways linking Montreal with the U.S.A. Then he became involved in the harbor works at Montreal. In 1853 he created a firm to build railways and tackled the Grand Trunk line from Toronto to Sarnia. With the construction of the International Bridge across the Niagara River in 1873, his reputation as a leading engineer in the New World was assured.

To chronicle all his achievements would produce far too lengthy a list, but even the highlights are evidence enough of his valuable services to the development of transport in Canada: chief engineer, St. Lawrence and Atlantic Railroad (1848); engineer of harbor works, Montreal (1850); chief engineer, Grand Trunk Railway developments (1853-59); organized Toronto Rolling Mills (1857); general railway construction (1860 onwards); member of Dominion Canal Commission (1870-71); principal figure in construction of International Bridge from Fort Erie to Buffalo (1870-73); member of senate of University of Toronto (1873-93); honorary ADC to Her Majesty the Queen (1879); chairman, Niagara Falls Parks Commission (1885); founder of Canadian Society of Civil Engineers (1887); President of that organization (1889-91); knighted (1890); active in Montreal harbor improvements (1890).

Sir Casimir Gzowski died in 1898 at the age of 85. He left behind the memory of what many Poles believe to be the most distinguished representative of their nation to have settled in Canada—a man whose contribution to the life of Canada deserves the honor of a stamp being issued in his memory.

## From the Tip of the Pen

**(Excerpts from letters received by the Meteorological Branch)**

"The eager members of my class feel that since weather will undoubtedly form the major part of their informal conversation for the rest of their lives, they might as well know something of what they will be complaining about."

"Please send 40 copies of Meteorological Branch Department of Transport Canada to the students of our school."

"Can the general public obtain a copy of the almanac used by the weather office? If not I will ask my M.P. to take action."

"Would you please send us the latest weather maps out. If possible could you send us one which the weather had to be registered a week ago when you receive the letter and one right up to the present time when I get the maps, or when you receive my letter and after."

On the back of an envelope: "Dear Postman: If this letter does not have the correct address on it, please do not return it, I have already read it."

"I am extremely interested in the booklets on weather you would send me free. My science teacher recommended your firm instead of any of the others."

"I don't know if the Christmas holiday season is the same in Canada as it is here in the United States. Our Christmas Day is Tuesday, December 25. It's kind of silly to send a Christmas card to a company but strange as it may seem I'm sending one to you and the people of Canadian Transport."

"Please send me some leaflets on weather. P.S. I'm 15, 16 in January—and not going steady (just in case)".

A red-faced weatherman asks us to thank the anonymous sender of a Christmas card inscribed: "I have just swept six inches of partly cloudy off my side of the drive."

Christmas, 1962, 450 nautical miles from the North Pole.

The summer of 1962 saw a large-scale building boom get under way at the world's most northerly settlement—Alert, North West Territories.

The meteorological station at Alert forms the nucleus of an ever-increasing scientific community including the joint weather services, magnetic observatory, seismic vault, and year-round tide measurement facilities. It is the jump-off point for many scientific expeditions working in the area.

Temporary buildings built in 1950 were intended for a test period of five years only and were no longer adequate. Last May the work crews went in, and by the end of November had completely rebuilt the base.

New 18-room living accommodation arose along with a combined meteorological office and mess equipped with water storage and modern sanitary facilities. A rawinsonde installation was built away from the camp to lessen interference with the upper air equipment. Other new construction included a remote antenna farm and transmitter building complete with emergency stand-by power plant, a powerhouse with two 75 KVA generators, an enlarged garage at the station, and a new one at the airstrip to house the snowblower, plus bulk fuel storage tanks, and pipeline from the airstrip to station. During the two-month summer the all-season 7,200 foot airstrip was widened from 150 to 200 feet to complete the "new look" at Alert.

C. G. Goodbrand

Modern laundry equipment 2,700 miles North of Toronto.

# 82° 30′ N

Construction at latitude 82° 30′ North.

*Ronald Watson*, a meteorological communicater at Montreal International Airport, suggested teletype log forms be revised to conform to double line spacing of a standard typewriter. The idea was accepted and he received a $15 award-in-kind – an overnight case.

A suggestion made by *Real Dagenais* resulted in the rearranging of the time punching clock in the meteorological teletype office at Montreal International Airport.

Mr. Dagenais, a meteorological communicater, pointed out that the change would save time for the various operators who use the equipment. He received a camp stove as an award.

Meteorological Technician *Anthony Smith* of Toronto, sent in a suggestion while he was on duty aboard the CCGS D'Iberville last summer. He asked that the calibration of sea thermometers be extended to provide corrections from 25°F to 95°F – their full measurement range. Acceptance of the suggestion will permit more accurate readings and better assist the staff in this phase of meteorological observations.

Mr. Smith received a $30 award-in-kind.

*Dorothy Barton*, a stenographer at meteorological headquarters, now has plenty of "time on her hands". As a result of a suggestion she made she chose two clocks—an electric alarm and a travalarm as awards.

Mrs. Barton pointed out that if form letters were available in French to answer French requests for publications it would not be necessary to have the English reply translated each time. A savings in time and postage has been realized through adoption of this suggestion.

Meteorological Technician *Victor J. Wadman* of Dauphin, Manitoba, recommended that Askania Theodolites be equipped with a shield or bumper to prevent damage to the housing of the main telescope.

While it was found that this suggestion was not practical, it drew attention to the fact that these telescopes were being damaged and a circular letter was issued outlining the correct method of handling.

Mr. Wadman received a camp stove.

A meteorological branch clerk, *L. T. O'Neill*, suggested that carbon paper used only once in public weather service requisitions be returned to that section for reuse. A minor savings has resulted and Mr. O'Neill received an electric alarm clock as an award.

# waterfront weatherman

***By* Jack Hamilton**
***as told to John de Bondt***
***Photos by* Ted Grant**

My name is Hamilton.

Jack to you if you like.

I'm the port meteorological officer in Vancouver. My job is mainly to get ships plying the Pacific to report the weather for us.

There are plenty of vessels crossing the Atlantic regularly and it is not difficult to get weather observations from that body of water.

But fewer ships ply the Pacific and that's why I have to keep at it all the time to get weather reports with any regularity.

I visit practically every ship—of any nationality—entering Vancouver Harbor, except of course those vessels which I know are making weather reports for another country.

If I find one that isn't reporting for anyone, I try to enlist its services for Canada, either as a permanent observing station or, if that is not possible, on a voyage-to-voyage basis.

I also visit ships docking at New Westminster occasionally. And, of course, I am the shore-based contact man for those ships that do report for us.

When such a ship is in port, I visit it and have a chat with the master or whoever is in charge of meteorological observations.

I check the ship's weather instruments for accuracy, accept the reports of the last voyage, and try to help the captain with any problems he may have in weather reporting.

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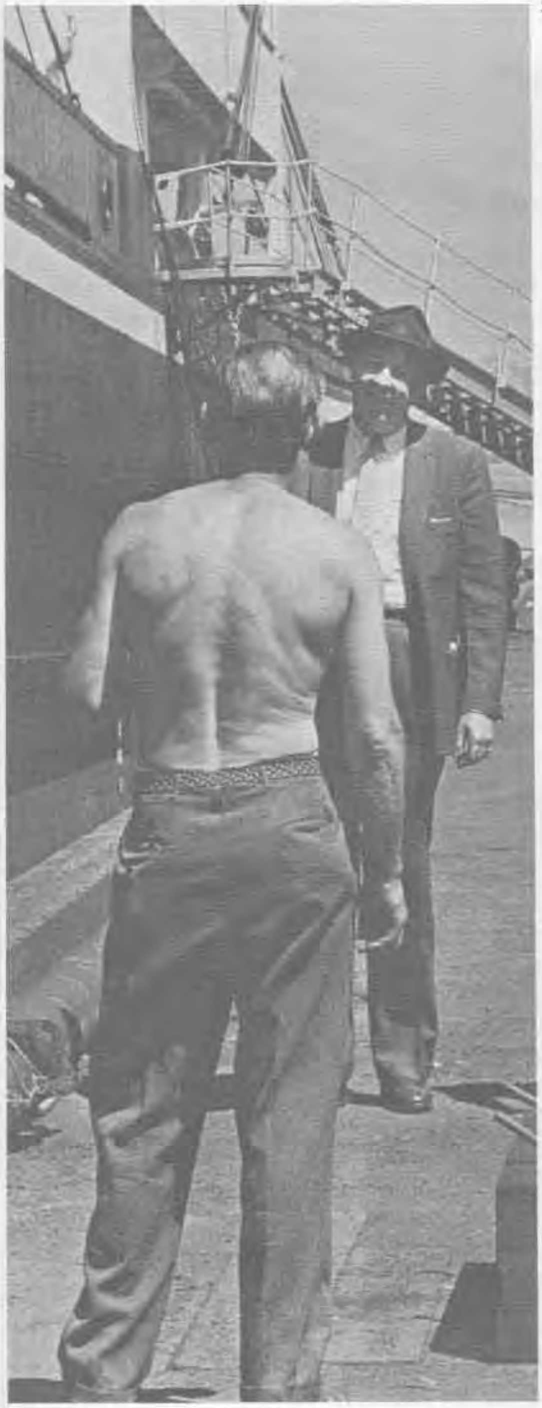

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***1. A well-known figure around the wharves, Jack Hamilton talks to a dock worker.***

***2. Jack opens his briefcase to get out some forms as Takeshi Takashima, second officer of the Japanese vessel Caledonia Maru, looks on.***

***3. Jack checks the barometer of the Caledonia Maru.***

***4. A correction tag shows 0.5 millibars should be added when reading the barometer on the Norwegian freighter Kristin Bakke.***

To keep up to date with ship movements I am in close touch with shipping companies, port authorities, the Vancouver examiner of masters and mates and the Coast Guard rescue officer.

I also keep climatological records for Vancouver and advise the Vancouver navigation school on meteorological matters and on training in meteorology.

And oh yes, I am the custodian of Vancouver's master clock.

There are only three port meteorological officers in Canada, and I am the only one on the West Coast. My colleagues at the opposite end of the country are M. A. Carmichael at Halifax and F. K. Upton, who is stationed at Montreal during the navigation season and at Saint John, N.B. in winter.

I was born here in Vancouver—47 years ago—and the sea and ships are a family tradition. My father was a master mariner and I myself served a year on the weathership Woodstock on the Pacific during the second World War.

I have been with the meteorological branch since 1941 and in my present job for ten years now.

In those years I must have climbed thousands of gangplanks. Everybody around the waterfront knows me, I guess.

Last year alone I boarded 684 ships. Signed up 93 new observers, too!

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*5. Jack interviews second mate Takashima of the Caledonia Maru.*

*6. Jack phones the office from the Kristin Bakke.*

*7. One of Jack's non-dockside duties is keeping Vancouver's weather records. Here he reads sunshine recorder charts on which strips burnt out by the sun indicate the number of hours of sunshine.*

*8. "See you next trip."*

# building boom at cape st. james

The ill winde that bloweth at Cape St. James, B.C. has, true to the old saying, blown someone some good. Because of it the three-man staff of the DOT station are getting a brand new set of buildings: new staff dwelling, new operations building, new power house, a better wharf—the works.

But an ill wind it is. It blows almost constantly and at times reaches speeds of 120 miles per hour. In 1960 a storm flattened the recreation hall.

Cape St. James is a small, precipitous and what one official report modestly calls "windswept" piece of rock on Kunghit Island at the southern tip of the Queen Charlotte Islands. Apart from winds it is sometimes rocked by earth tremors.

The terrain could hardly be less suitable to build on. There are very few flat spots, but plenty of vertical drops, up to 275 feet. The present buildings had to be scattered, or piled almost, on three different levels. The ground, to round out the poor construction picture, is muskeg.

The spot can only be reached by ship and is supplied quarterly from Prince Rupert—weather permitting. Ships must anchor a mile off shore and supplies are then brought in by smaller craft, lifted to a dock by hoist and pulled up to any of the three building levels by a miniature gauge railway.

Precisely because of this exposed location—water and weather can be viewed for miles around—Cape St. James became a D.O.T. lighthouse, one of Canada's most important weather observing stations, and a radio beacon.

The lighthouse was made fully automatic a few years ago.

The radio beacon (NDB) serves as an aid to marine navigation as well as to aviation, since flight conditions on the west coast of the islands are invariably better than farther east.

The meteorological station is the most exposed weather detecting location on the outer coast of British Columbia. It takes hourly synoptic and aviation weather observations 24 hours a day.

The entire population consists of radio operator A. J. S. Laing and his wife, and meteorological technicians D. B. Jones and R. O. Duffy, who are both single. Mr. Laing is the officer in charge.

Apart from operating the NDB, performing whatever lightkeeper duties remain and taking hourly weather observations, they maintain all the equipment and take sea water temperatures for oceanographic purposes.

In spite of its physical drawbacks, Cape St. James is the best location around for the department's purpose. A few years ago a small landing party was sent to explore Kunghit Island for other inlets but it was found that the station's functions could all be carried out at lower cost at Cape St. James.

The recreation building that was destroyed by the wind was, like the others at the station, a wartime prefabricated structure. All buildings were held in place by cables over the roof anchored in the ground.

New buildings were constructed during the 1962 building season and are being finished now. The new staff residence is a double, in which Mr. Laing and his wife will be occupying one half, the single staff the other.

The total cost of the new buildings, including repairs to the wharf and sewer and water facilities, is around $320,000. All buildings are anchored specially to their concrete foundations and every stud and joist is securely set with metal anchors.

The two greatest problems at Cape St. James are the difficulties of supply and the limited ground area available for buildings. The answer to one problem hampers a solution for the other.

Because of the hazardous weather conditions and slow shipping facilities, the department built a 100-foot square landing pad on the middle level to make quick helicopter transportation to and from the mainland possible.

This immediately precluded plans for a second residential building—all the building areas were used up.

Although a lower building might catch less wind, the limited lot size made a bungalow plan impractical and that is why now the only residence in Canada's smallest subdivision is a two-storey double.

*Landing supplies at Cape St. James*

Page 14, all at Vancouver International Airport: 13. Harry Karl, met. plotting; 14. Airport Mgr. W. L. Inglis; 15. Dan Ross at Weatherfax machine; 16. Gil Garon at weather teletype; 17. Airport office. Sorry, no names. 18. Meteorologists John Henderson (left), Reg. Hamilton; 19. Met. technician Glenn Lawrence; 20. Teletype Rm. Supt. Jim Tennant.

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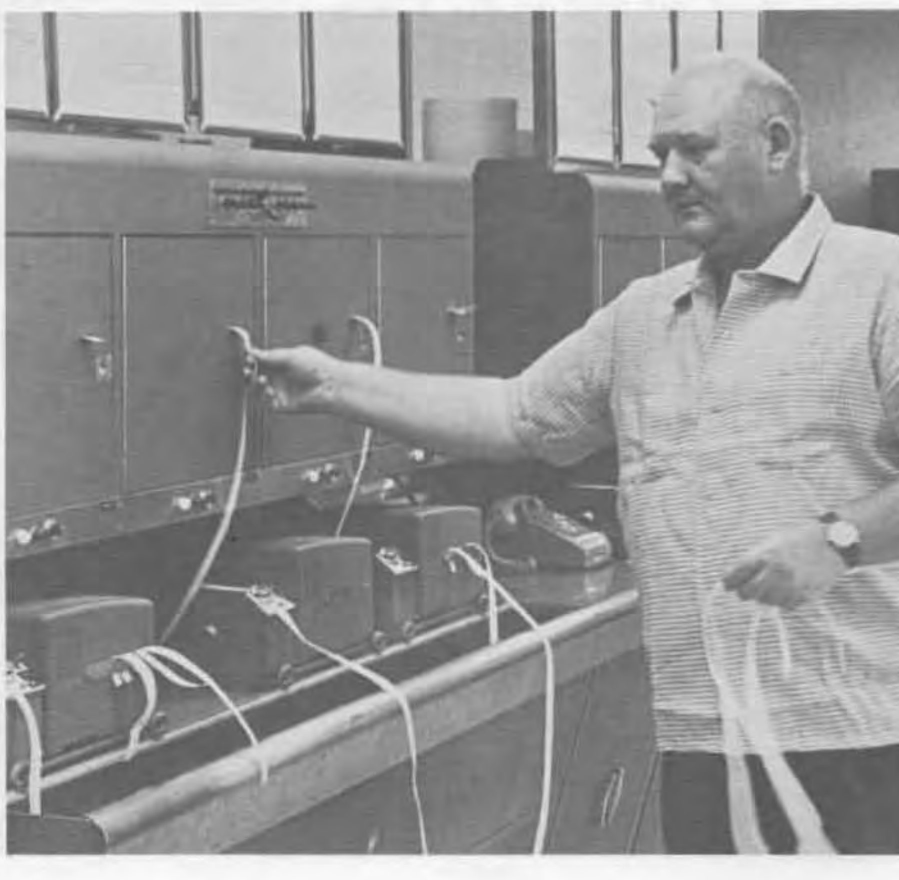


## IMPROVES SERVICE

Dorval Meteorologist *Donald K. Smith* thought the time the late afternoon and evening public weather forecasts by the Dorval, P.Q. public weather office are issued should be advanced an hour to coincide with major radio and TV broadcast times. His suggestion was adopted since it provided improved service to the public. An additional benefit was an expected decrease in calls to the weather office.

Mr. Smith selected a briefcase as his award.

## CLARIFIES FORM

Edmonton met. technician *Lloyd W. Johnson* suggested several amendments to the Supplementary Personal History forms (E-8-36A) that will virtually eliminate the possibility of misunderstanding on the part of new employees completing these forms.

He chose an electric alarm clock as his award.

## COST CONSCIOUS

From now on, expensive and delicate instruments will be labelled, "The replacement cost of this equipment is $ . . . . .— Handle with care" or words to that effect. It is expected that mentioning the price on each instrument will help decrease breakage through careless handling.

*Verne Marsh*, a meteorological technician in Toronto, came up with this idea and won $30 in cash with it.

## STOPS HAZARD

*Gordon P. Hogan*, a meteorological technician at Halifax International Airport, noticed that a safety hazard existed when facsimile recorder writing blades were being disposed of. He recommended a suitable container be used, rather than putting the blades directly into waste paper baskets. Instructions have been issued to this effect and Mr. Hogan granted a $10 award-in-kind. He chose an Ansco Candid Camera.

## STARK AGAIN

News on the DOT has lost track of the number of suggestion awards Edmonton meteorologist *R. G. Stark* has won already. He's scored a dozen times at least and now he's at it again, winning $15 worth of books.

He suggested that the coastline of Canada and the provincial boundaries on the U.S. Weather bureau's 30-day outlook chart be outlined in ink before the chart is transmitted on the Weatherfax system by the Central Analysis Office in Montreal.

The facsimile map is most useful in forecast offices as it arrives several days ahead of the printed copy—at least at Edmonton. However, Mr. Stark found it difficult to find exact locations because the background was too faint.

## STREAMLINER

Meteorological Officer *John M. Wingfield* of Hamilton, Ont. advocated a change in Form 701–Office Record of Long Distance Telephone Calls so that it would no longer be necessary to have each call signed for individually.

His streamlining idea was put into effect and he chose an electric alarm clock as his award.

**The Larsons**

# IN WEATHER, TOGETHER

The Larsons of Montreal are perhaps Canada's most weatherwise couple. Both work for the Meteorological Branch. Both finished the "met" presentation and operations course at Ottawa's air services training school.

Harry Larson, an operations technician, finished the course last April. His wife, the former Betty Cramer, finished it before him, in September 1962, a month and a half before she had her (first) baby, Burns Ross.

Betty, a "met" presentation technician with a B. Comm. degree from the University of Saskatchewan, joined the D.O.T. met branch in 1948 after having been in weather work with the R.C.A.F. since 1942. While with the department in Edmonton, she also studied physics and mathematics at the University of Alberta for two years.

Harry joined D.O.T. in January 1957 and in June of that year married Betty "to gain the benefit of her experience in meteorology."

He has since, he says, also gained experience in such arts as bottle warming and diaper changing.

**C. Elmer Stevens**

# MONCTON MET MAN

C. Elmer Stevens, 46, superintendent of forecast offices operating requirements at the meteorological branch in Toronto, has been appointed regional meteorologist for the Moncton air services region.

He succeeds E. A. Barks, who was recently named chief of the new operational research and development division in headquarters civil aviation branch.

Mr. Stevens was born in Moncton and received his primary and secondary education there. He graduated from Acadia University in 1937 with a BA, majoring in mathematics.

He joined the meteorological branch in 1939 as senior meteorological observer in Halifax and subsequently served at Regina, Calgary, Prince Albert, Trenton, Summerside, Moncton and Goose Bay. In 1942 Mr. Stevens was promoted to meteorologist.

His eleven years of service at Goose Bay constitute a record for meteorologists at that location. He was there from 1946 to 1958, serving as officer-in-charge from 1951 on.

In 1958 he spent the greater part of a year in Ottawa as liaison meteorologist at headquarters and took up his branch headquarters position at Toronto in 1959.

*NON-ABOMINABLE SNOWMAN—Welcoming carnival-goers at Lakehead last winter was this jolly looking celebrant, built by D.O.T.'ers (from left, standing:) Walter Heikkinen, Joe Taylor, Lorne Swazey, Wilbur Wright, Jack Baillie, Lance Podd, Fred Stewardson, (kneeling:), Jim Surcess, Maurice Robichaud and Frank Lozinski. Not shown but very much "in the picture" were Art Loftus, Jim Bond and Gordon Grant.*

## LAKEHEAD AIRPORT STAFF BOOST CARNIVAL

Fort William—A giant snowman built by D.O.T. staff at Lakehead Airport to publicize the Fort William Winter Carnival last February brought praise from public and officials alike. It also proved to be one of the most successful regional public relations efforts the department has ever experienced.

Maurice Robichaud of the meteorological staff at the airport dreamed up the idea of the snowman, as many people taking part in the carnival arrived by air. (All Northwestern Ontario participated in the events and festivities).

The entire Lakehead staff enthusiastically supported the idea and contributed their spare time to build the structure.

The carnival committee, the Lakehead Chambers of Commerce, the Mayor of Fort William and many local businessmen voiced their appreciation of such a spontaneous contribution. Press and TV soon dubbed the DOT snowman "Lakehead Airport's Official Carnival Welcomer."

The public loved the jolly welcomer and made it a background for thousands of snapshots. One of them, showing the builders, is reproduced above.

**Paul A. Tremblay**, meteorological communicator at Montreal International Airport, asked that desk type telephone sets be replaced by hanging hand set types in closed panels. As a result the possibility of knocking the telephone off the desk has been eliminated and the general appearance of the teletype office improved. Mr. Tremblay selected a set of copper pictures as his award.

● The department is looking for sponsors for "dial-the-weather" service in major cities. Non-commercial recorded forecasts have been available in Montreal and Toronto for some time, but because they are so popular cost of expanding the service to meet the demand is too much for the public purse.

Commercial sponsorship has worked well in Calgary and Vancouver and the department hopes it will find sponsors in other large centres.

The department will provide the weather information, while an answering service would lease the telephone facilities and derive its revenue from offering the utility as a medium of advertising.

*Yvon Tessier*, a meteorological communicator at Montreal International Airport won a $10 award-in-kind for suggesting certain minor changes in the order of weather traffic relays four times daily. As a result of his changes a savings in time and tape were realized. Mr. Tessier chose a travel alarm clock.

*Toronto* — Project 09062 — climatological data processing aid to Nigeria — is an example of D.O.T.'s co-operation with the Department of External Affairs in bringing technical aid to other members of the Commonwealth.

In the above photo Mr. B. S. V. Cudbird, officer-in-charge of data processing, climatological division of the meteorological branch, explains an aspect of the division's punched card system to Isaac Emore (left) and Dennis Tekenah of the Nigerian Meteorological Service. Mr. Cudbird not only assisted these men at met headquarters, but he returned to Nigeria with them to help set up their system.

# Let's Face it

by
Lloyd Judd
*Stores Supervisor,*
*Meteorological Branch*

D.O.T.'s meteorological branch must go abroad for much of the fine instrumentation it uses in weather work.

They know why the Ontario government, in the midst of its campaign to "Buy Canadian", still admits: "Let's face it—some things have to be imported."

When it comes to the highly specialized instruments required in its work, the branch finds there is a very limited demand in Canada for them apart from its own needs, so manufacturers do not find it profitable to produce them.

One exception, however, is the recent move to have radiosonde instruments made in Canada. This has reduced the dollar value of the meteorological branch's imports by almost $250,000 annually.

In 1962 instruments were purchased from England, the United States, Australia, Switzerland, Germany, Israel, Italy, Russia and Austria. Strangely enough, one of the few labels missing was the "Made in Japan" one.

From England the branch bought thermographs, hygrographs, casella anemometers, spectrophotometers, thermometers, sunshine recorders, pure latex radiosonde balloons, and radar targets and shrouds. Australia supplied a special type of recorder capable of operating for a year without attention at isolated stations. They also supplied Met. radiometers for measuring radiation.

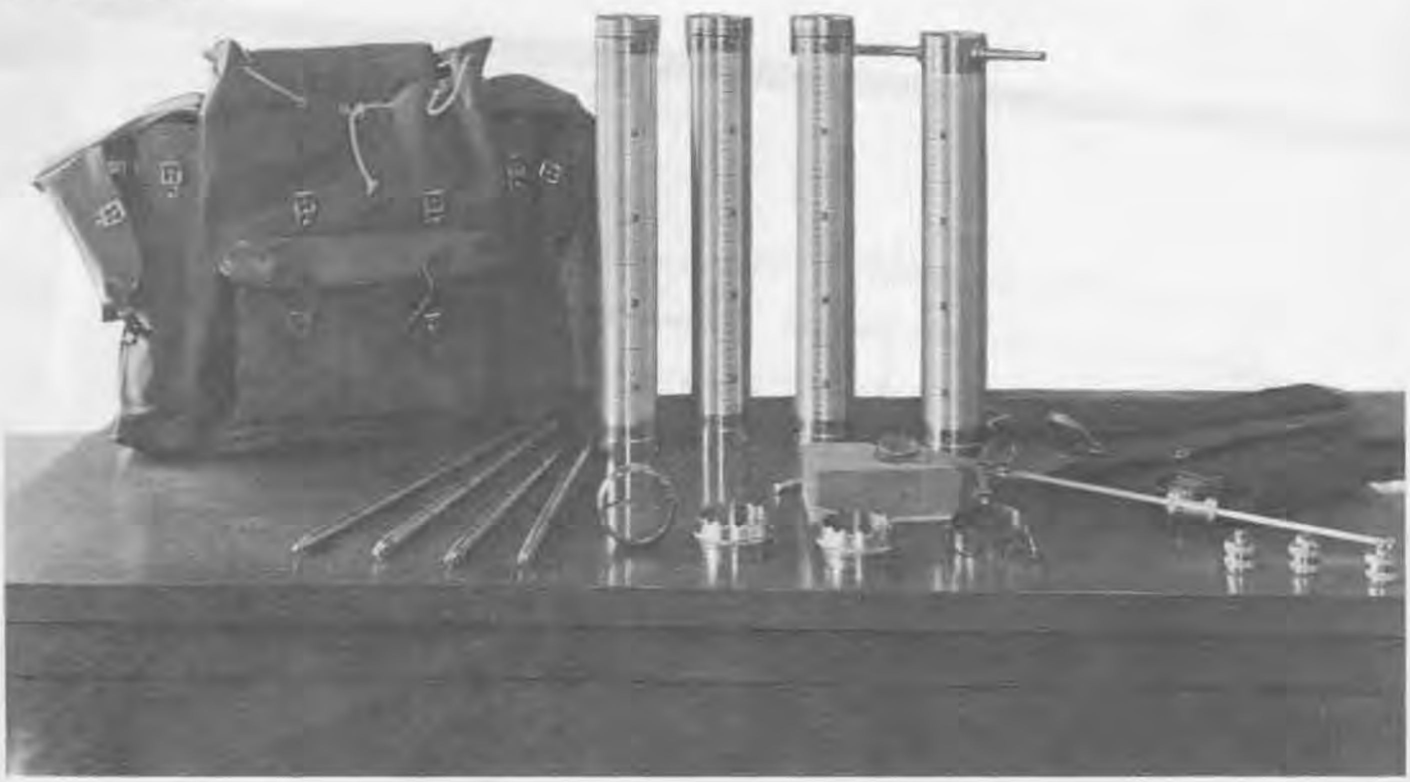
Tiny Switzerland, world renowned for its precision clock works, sent specially constructed clock escapements for operating recording instruments, while Germany provided theodolites, aneroid barometers and sunshine recorders. From Israel a special type of thermometer screen was imported to see if it can be adapted to Canadian requirements. Snow sampling equipment from Russia and snow and rain measuring equipment from Italy have also been obtained to assess their value for our needs.

A great deal of the specialized equipment is American-made including: ceilometers for measuring cloud ceilings, transmissometers for measuring horizontal visibility, special rain gauges, pyrheliometers for measuring radiation, wind recording digital systems, runway visual range signal data converter systems, angle visualizers, snow sampling and ice measuring equipment, meter scanner and pulse timers, complete discon systems, thermal shields and resistance standards.

All of this and yet the bulk of equipment used by the meteorological branch is not imported, but obtained right here in Canada. How can this be so?

Most of the standard instruments can't be bought from any manufacturer, so they are built in the branch's own instrument workshop. Component parts purchased from a variety of Canadian suppliers go into these "home-made" instruments. In 1962 upwards of one and three quarter million dollars was spent on these components.

*Italian snow sampling kit*



*R. A. Hornstein (left) accepts the Patterson Medal from his "boss", Dr. P. D. McTaggart-Cowan, director of the meterological branch*—RCAF PHOTO

# "Mr. Weather" of the Maritimes Awarded Patterson Medal

Reuben "Rube" A. Hornstein, chief forecaster at the meteorological branch's Halifax Weather Central was presented with the Patterson Medal at the Canadian International Air Show dinner held at the time of the Canadian National Exhibition.

The Patterson Medal, established in honor of Dr. John Patterson, director of the meteorological service from 1929 until 1946, is awarded to residents of Canada for distinguished service to meteorology. It is not necessarily awarded annually, but only when in the opinion of the award committee there is a nominee worthy of it.

Dr. P. D. McTaggart-Cowan, director of the meteorological branch, pointed out in making the presentation that "Rube" Hornstein has perhaps visited more Canadian homes and contacted more people in Canada than any other scientist, In radio he was a household word in the Atlantic Provinces for 13 years of Sunday evening weather programs "Meet Your Weatherman". For nine years his national program "Ask Your Weatherman" provided easily-understood yet scientifically-accurate answers to weather questions. Since 1955 he has appeared on the TV program "Gazette", both as a weatherman and as a skillful interviewer.

Mr. Hornstein is also well known for his popular booklets "Weather and Why", "It's in the Wind" and "Weather Facts and Fancies" all of which have sold in the thousands. "Rube" hastens to point out that the revenue enriches the coffers of the Receiver-General of Canada and not his own purse!

"Rube's" fame in the Maritimes is illustrated by the fact that a box of fudge, addressed to "Intermittent Drizzle", Halifax, was promptly delivered to his desk.

The citation accompanying the Patterson Medal Award concluded with the tribute "Mr. Hornstein is dedicated to bringing the best possible service in meteorology to all people in the Atlantic Provinces and to bringing an understanding of meteorology to every young Canadian.

## Appointed University President

Dr. P. D. McTaggart-Cowan, director of the meterological branch, has been appointed president of Simon Fraser University at Burnaby, B.C. effective Janaury 1, 1964.

In a press release concerning the new appointment, Minister George McIlraith said, "Dr. McTaggart-Cowan has been a fine administrator and a dedicated civil servant".

Patrick Duncan McTaggart-Cowan was born in Scotland and came to Canada at an early age. He graduated from the University of British Columbia in 1933 with first-class honors in mathematics and physics. A Rhodes Scholar, he attended Oxford and graduated with an Honors degree in the Natural Sciences. In 1961 UBC conferred upon him the honorary degree of Doctor of Science, Honoris Causa.

Joining the Canadian meteorological service in 1936, Dr. McTaggart-Cowan was posted to Botwood, Nfld. From 1937-42 he was in charge of the meteorological office there and at Gander.

Over the years Dr. McTaggart-Cowan has been active in the formation and operation of the World Meteorological Organization. As well, he has been a Canadian member of numerous ICAO meetings and has worked closely with the North Atlantic Treaty Organization in the regional planning group respecting meteorology for NATO forces.

The new university president was recognized for his services to Canada when he was awarded the M.B.E. and Coronation Medal. His part in aviation was recognized when he received the Robert M. Losey award from the Institute of Aeronautical Sciences in the United States. This latter award was made for his "outstanding contributions to the science of meteorology as applied to aeronautics".

*Roland Richards*, a meteorological technician at Sydney, N.S. airport, received a $15 award-in-kind for suggesting that the rating factors on Form E–8–130 (Annual Performance Evaluation) be numbered. He chose a set of copper hand-tooled pictures and a dipless desk pen set.

*Gerard B. Salmon*, meteorological technician in Montreal Region, recommended that the hot water tank in the radiosonde operations building at Sept Iles, Quebec, be insulated to effect a savings in electricity. He selected a travalarm clock as his $10 award-in-kind.

*J. C. R. Gagne*, a meteorological communicator at Montreal International Airport, is richer by $20 as the result of a recent suggestion. He felt that meteorological teletype relay offices should be supplied with blank teletype and facsimile charts preprinted with lines and headings, on Krona-Film Base celluloid sheets. He pointed out if the data was entered in pencil or washable ink, day to day changes could be made easily.

Mr. Gagne was granted an award since his suggestion resulted in improved work procedures. He selected a radar lite and an electric alarm clock.

*Montreal*—On October 1st spools of magnetic tape started whirling and an output printer clattered out its first chart as Minister George McIlraith pushed a button to commission the new meteorological computer at the central analysis office at Montreal International Airport.

The computer, a Bendix G-20 leased from Computing Devices of Canada, digests basic meteorological data at a rate of 100,000 computations per second and produces weather charts showing actual and expected distributions of pressure.

"The meteorologist still retains his role as a forecaster", Mr. McIlraith said, "for he must interpret the charts and use them to prepare the forecasts for general distribution."

The computer takes over many of the tasks now carried out by meteorologists and frees them to interpret the computer product and provide more specific weather information for aviation, agriculture and mariner interests and the general public.

Techniques to solve the equations of motion applicable to the behaviour of the atmosphere were developed as early as 50 years ago but could not be usefully applied until the advent of highspeed electronic computers.

Modern meteorology requires the processing and analysis of data gleaned from thousands of observing stations but only a computer can process it fast enough to give a timely analysis. To produce a chart showing expected pressure distributions 36 hours ahead, the G-20 computer performs 14,000,000 arithmetical operations in six minutes.

# 1964

news on the dot

# terminal weather picture

A staff of 225 weathermen, forecasters, technicians and communicators dovetail their efforts at the three new international terminals into the nation's weather picture under the meteorological branch.

Edmonton and Toronto each have staffs of 80 persons and Winnipeg, 65.

In each area incoming weather information from every direction provides data to be digested by a special aviation briefing office which, in turn, passes on to the airline despatchers and aircrews an up-to-the-minute picture of weather conditions over much of North America.

Tie-ins to national and regional facsimile circuits provide a steady flow of weather data in chart form both in and out of the three airports.

Four times daily these offices have scheduled forecasts tailored to flying needs. They give expected weather conditions at all airports in their areas as well as a general flying forecast.

Besides these aviation-oriented services, the offices provide certain local and area services. Edmonton, for example, issues four forecasts daily for the general public of Alberta and Western Saskatchewan as well as special seasonal marine forecasts for Great Slave, Lesser Slave, Athabaska and Great Bear Lakes.

An experimental program of special forecasts for Alberta farmers, prepared in consultation with an agriculturalist from the provincial government, is also part of Edmonton's responsibilities.

The forecasts emphasize the probable effects of expected weather conditions on current farming operations.

In Toronto the airport office prepares marine area forecasts for the Great Lakes and James Bay and fire hazard forecasts for Northern Ontario. It also has a special weather role for residents of the Toronto metropolitan area. Automatic telephone equipment offers an increasingly popular service by providing both current and forecast weather information.

All the offices provide news stories for the local press and briefing of personnel for TV weather shows. Weather data for business and industry is frequently given in answer to telephone calls.

The Winnipeg office has its own area of responsibility for public weather forecasts. It includes Manitoba, eastern half of Saskatchewan, northwestern Ontario and Hudson Bay. Marine forecasts are given for Lake Winnipeg and Hudson Bay and for forestry operations in the northern parts of Manitoba and Saskatchewan.

*Aircrew get up-to-the-minute weather information at Winnipeg's aviation briefing office.*

# A FOND FAREWELL FOR A/V/M de Niverville

It was officially called "a reception in honor of A/V/M A. de Niverville, C.B. LL.D." but for weeks people around Ottawa's No. 3 "Temporary" building were affectionately referring to it as "the Dinny Do".

"Are you going to the "Dinny Do?" they asked each other.

"Of course," was the answer in most cases, and that is how the spacious Assembly Hall at Lansdowne Park came to look a bit crowded the night of November 6, last.

More than 250 well-wishers—D.O.T. employees and their guests—joined the Minister in paying tribute to the retiring Assistant Deputy Minister, Air. Among those present were Deputy Minister John R. Baldwin; Mr. de Niverville's successor, Assistant Deputy Minister C. S. Booth; and Assistant Deputy Minister, Marine, Gordon Stead; all branch directors including Dr. P. D. McTaggart-Cowan from Toronto, and regional directors and other key personnel from Toronto, Montreal, Winnipeg, Edmonton and Vancouver.

Percy Saltzman, a Toronto met. man who is well-known all over Ontario as a CBC-TV weatherman, acted as master of ceremonies at the reception.

His rapid-fire comedy routine enthralled everyone. Marking a weather map on a blackboard, he explained, "There's always a low (L) over Quebec (Q) with Frost (F) in it (this produced the letters FLQ on the map), bringing cold northerly winds over Ottawa, replacing the usual hot air".

Pursuing the point, he said, "Whereupon the temperature at Ottawa reaches it do-point Zero! and when Diefenbaker steps out into that chill north wind, he says, "Man, that's Pearson!".

In a take-off on his own TV routine in which he invariably flips a piece of chalk in the air, he said, "I do it to signal the fact that the weather is a toss-up".

Besides a buffet supper and dancing, the "Dinny Do" also included a floor show put on by the members of air services headquarters.

Written and directed by Architect Stan White the show included skits about such subjects as civil servants and red tape.

Mr. White's wife, Hugette, gave a spirited rendition of a folk song in which a question was asked and re-appraised and re-assessed and eschewed and reviewed and:

*"On Friday we rehearsed it,*
*On Monday we reversed it,*
*Our decision wasn't final till*
*we'd checked with F. T. Woods*

*We're sorry we've begun it.*
*Perhaps we'd better shun it.*
*We haven't signatures enough*
*Position's not secure enough*
*At noon on Monday Baldwin called*
*to say that he had done it"*


*Percy Saltzman, with his rapid-fire comedy routines, enthralled everyone.*

# Senior Appointments

## Director of Meteorological Branch

The appointment of Dr. Thomas G. How as director of the meteorological branch was announced late in February. Dr. How was formerly regional director of air services for the department at Vancouver.

Dr. How, 52, is a native of Vancouver. He graduated from the University of British Columbia with an Honors B.A. degree in 1933. Two years later he received a Master's degree from the same university and then went to Purdue University, Lafayette, Indiana, to lecture in physics and work on a doctorate. In 1938 a Ph.D degree was conferred on him.

Dr. How joined the department in 1938 as officer-in-charge of the Edmonton weather office, a position he held until 1946 when he was appointed regional meteorologist in charge of both the district aviation forecasting and public weather offices in the same city. Two years later he moved to meteorological headquarters in Toronto as superintendent of public weather forecast services. He returned to Edmonton in 1950 when he was promoted to district controller of air services and in 1954 was transferred to Vancouver in a similar capacity, as regional director of air services. At these two locations Dr. How was in charge of all functions related to civil aviation, meteorology and telecommunications for the Edmonton and Vancouver areas.

Dr. How was selected for a two-year assignment at headquarters in 1959 as part of the department's program to give senior officers special training on a rotating basis. There, as deputy director of air services, he assisted the assistant deputy minister, air, in policy planning and coordination of services and represented him on high level committees and at international organizations. In 1959 he was senior technical delegate for Canada at the ICAO Twelfth Assembly at San Diego and the following year attended the ICAO Conference on Atlantic Weather Ships at The Hague, Holland. Dr. How resumed his position as regional director of air services at Vancouver in 1961.

The new director of the meteorological branch was made a Member of the Order of the British Empire in 1946. He is a fellow of the Royal Meteorological Society; a member of the Institute of Public Administration; and director of the Air Pollution Control Society of Vancouver. In 1963 he was vice-chairman of the Community Chest Campaign, Public Service Division. Dr. How is married and the father of two children.

Dr. T. G. How

*Head table guests, left to right: Jim McTaggart-Cowan, Richard Baldwin, Mrs. McTaggart-Cowan, Deputy Minister J. R. Baldwin, guest-of-honor, Mrs. Baldwin, Gillian McTaggart-Cowan and Richard Penner.*

# $6,000 Science Award Fund Honors Former Met Branch Director

January 10 was meteorological family night when some 290 people gathered in the Great Hall of Hart House, University of Toronto, to honor Dr. P. D. McTaggart-Cowan, the departing director of the meteorological service. Along with members of the met branch, representatives from government scientific services, education, and a good sprinkling of experts from the meteorological field of the United States attended this farewell dinner for the man who was leaving to become president of the new Simon Fraser University at Burnaby, B.C.

Highlight of the evening was the announcement made by Deputy Minister John R. Baldwin that contributions to the McTaggart-Cowan Science Award Fund had reached almost $6,000. A complete surprise to the guest-of-honor, the fund was established and subscribed to by members of his staff from all over Canada and by his friends in education and government.

The fund will be administered by Simon Fraser University to provide awards to students in the physical sciences to foster an interest in meteorology.

The evening was a gay one. The guests assembled and then the skirl of bagpipes announced the arrival of Dr. McTaggart-Cowan and family and Mr. Baldwin and family, the head table guests.

After the dinner the "speeches" began. Rube Hornstein, the Maritimes "Mr. Weather", in his best CBC manner, praised Dr. McTaggart-Cowan's manifold gifts to Canadian meteorology. He reviewed the former director's life from his early days in Scotland through the University of British Columbia, Rhodes Scholar days at Oxford, his career in the meteorological services of Canada, and finally, predicted "sunny skies" for his new career as president of Simon Fraser.

Mr. Hornstein's remarks were interrupted frequently from the floor by members of the staff recounting humorous stories and anecdotes of Dr. McT-C's (as they fondly referred to him) career. The "interrupters" included Bill Ganong, Keith McLeod, Morley Thomas, Bev. Cudbird, Percy Saltzman, Hugh Bindon, Larry Campbell and Des Kennedy.

It has long been a tradition in the branch that former directors' pictures are hung in the director's office. On this occasion Don Archibald, chief of the basic weather division, presented a framed photograph of Dr. McTaggart-Cowan to him and he in turn presented it to the branch to be hung alongside his predecessors.

Mr. Baldwin then announced the establishment of the Science Award Fund and Harold Hutchon, regional meteorologist at Montreal, presented a scroll which read:

IN COMMEMORATION OF
THE ESTABLISHMENT OF THE
PATRICK DUNCAN MCTAGGART-COWAN
SCIENCE AWARD
ON THE OCCASION OF THE FAREWELL
DINNER GIVEN BY HIS COLLEAGUES
IN THE METEOROLOGICAL SERVICE
OF CANADA
GREAT HALL OF HART HOUSE
UNIVERSITY OF TORONTO
JANUARY 10, 1964

The scroll was decorated with school colors (chosen for the occasion since, as yet, none exist); they seemed particularly appropriate to a fledgling university in British Columbia—salmon pink and forest green.

Dr. McTaggart-Cowan warmly thanked his friends for gathering in Toronto and indicated his appreciation of the cooperation he had received, not only from the branch staff, but from his colleagues in weather services throughout the world. He and his family—wife Margaret, daughter Gillian and son James—then formed a reception line to receive the many guests wishing to say goodbye and extend their best wishes for future success in his new career in education.

# World Meteorological Organization

## WHAT IT DOES

*By John de Bondt*

One of the most heartening examples of international understanding and co-operation within the United Nations is the World Meteorological Organization or WMO, in which weathermen of the Department of Transport play a major role.

Dealing with the one subject of perpetual interest to people everywhere, the weather, scientists in Canada, Russia, India and more than 100 other countries belonging to the WMO share the same workshop: the atmosphere.

The atmosphere provides the world's weather and knows no political boundaries. Weather over Canada is normally influenced by conditions in other countries but Canadians know all too well we usually get the blame for all cold weather on this continent.

It is perhaps natural that such an international—and safe—subject as the weather promoted some of mankind's earliest international thinking. The first effort towards international collaboration in meteorology occurred in 1853 when a meeting of seafaring nations drew up a program of weather observations over the oceans to contribute to the safety of life at sea.

A quarter of a century later this international co-operation was extended over land as well as sea and a system for exchanging weather information between different countries was set up under the International Meteorological Organization.

### Aviation gives impetus

During the present century the birth and development of aviation created a new need for detailed weather information along air routes and at airports. This gave a tremendous impetus to the study of the weather.

At the same time the revolutionary advances in other branches of science and technology, such as radio communications, greatly helped meteorologists in meeting this new challenge.

The creation of the United Nations provided a new framework for international collaboration in various areas including technical and scientific fields. Consequently, when the directors of the national weather services met in Washington in 1947, they adopted the world meteorological convention establishing a new organization founded on a formal agreement between governments.

The convention was ratified by a large number of states and officially came into force on March 23, 1950.

In December 1951 the general assembly of the United Nations approved an agreement between the UN and the WMO by which the latter was recognized as a specialized UN agency.

### 8,500 Observing Stations

One of the essential tools of meteorology is the weather map on which weather developments are followed. Such maps are drawn several times a day and are based on observations of pressure, temperature, wind, rain and other elements, on the ground and in the upper air.

The World Meteorological Organization unites some 8,500 observing stations set up for this purpose throughout the world.

The data obtained are transmitted many times daily, at fixed hours, throughout the year. Millions of observations are thus made and transmitted each year.

The worldwide exchange of weather observations provides the basic information for forecasting the weather for the benefit of aviation, shipping, agriculture and the general public.

To make weather observations from stations throughout the world comparable and meaningful, it is necessary to standardize instruments and methods of observation. To achieve this, the WMO issues guides and technical regulations internationally agreed upon.

### Assists in many fields

However, the World Meteorological Organization does not merely draw up regulations. It also carries through projects of interest to all nations, calling for action on more than a national scale.

The organization's program includes assistance to member countries in developing their water resources, participation in tropical research and assistance in overcoming world-wide or regional deficiences in meteorology.

Weather forecasting for agriculture, international comparison of meteorological instruments and publication of a wide variety of international manuals and technical studies are other examples of the organization's work.

The WMO also:

—keeps abreast of and uses new developments in science and technology such as rockets and satellites, which provide valuable weather information;

—takes part in arid zone research and helps improve living conditions in barren areas;

—contributes to locust control and helps protect crops from this pest;

—encourages scientific research and instruction in meteorology;

—publishes the informative WMO Bulletin.

As well, it plays a very active part in the United Nations programs of technical co-operation and assistance towards economic development. It provides advice to facilitate the establishment and development of national meteorological services.

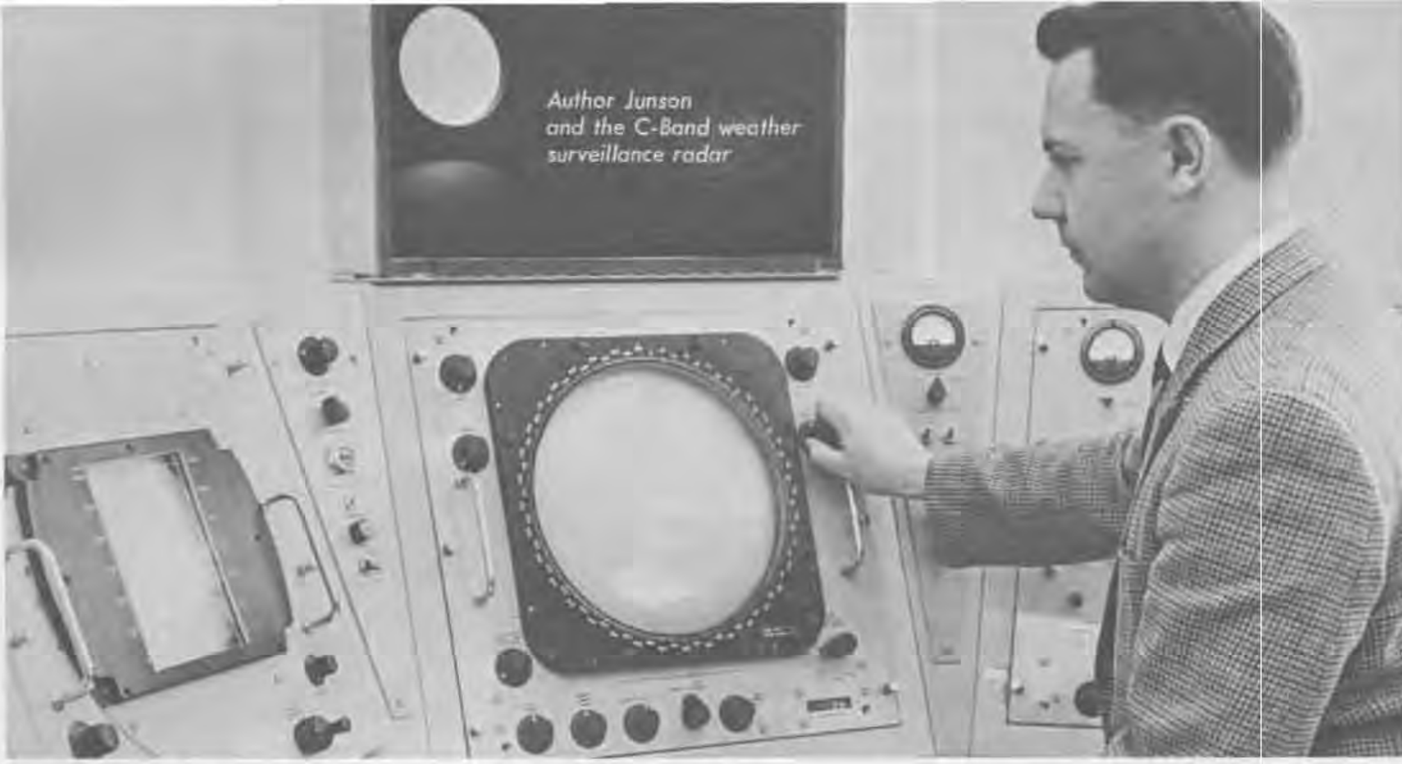
It also promotes the training of meteorologists and specialists in all branches of weather science by fellowships, scholarships and training courses.

### Canadian Participation

Canada, as one of the largest countries in the world, has an extremely important role to play in international meteorology and scientists of the department's meteorological branch, as well as from other government agencies, have been active in the work of the WMO since its inception.

C. C. Boughner of the meteorological branch is president of the WMO committee for climatology. Other branch employees serving as chairman of various working groups are Dr. D. P. McIntyre (international research projects in meteorology), Dr. W. L. Godson (IQSY meteorological program), E. I. Mukammal (plant injury and reduction of yield by non-radioactive pollutants), J. P. Bruce (publication and exchange of data in hydrometeorology), F. W. Benum (meteorological codes) and R. R. Dodds (definition of terms used to describe intensity of meteorological phenomena).

Other government meteorologists serving on various working groups are Dr. R. M. Holmes of the federal Department of Agriculture, Dr. K. M. King of the Ontario Agricultural College and R. H. Clark of the Department of Northern Affairs and National Resources.



Author Junson and the C-Band weather surveillance radar

# An Electric Eye on the Weather

*By J. H. Junson, Meteorological Technician, Winnipeg Weather Office*

A new "weatherman" has joined the staff of Winnipeg's airport weather office. He has an electronic brain that will be used in several ways to help forecast the weather.

For instance he will be able to "see" storms in places where there are no weather reporting stations.

The new helper is known as a C-Band Weather Surveillance Radar. This set is the first of four to be installed by the Department of Transport at various airports across Canada. Halifax, Toronto, and Edmonton are also scheduled to get these $200,000 radars.

The Winnipeg set will scan the horizon for 200 miles in all directions. It will be on the lookout for storms—snow, rain, hail or tornadoes—over the vast area from eastern Saskatchewan to northern Manitoba, northwestern Ontario and parts of North Dakota and Minnesota.

## Pin-Points Storm

When it detects a storm it will pin-point the position, track its movements, indicate the intensity or size and much more.

Pilots of light aircraft and crews of huge airliners will be able to look at the radar scope and plan the safest course for trips out of Winnipeg. It will tell them where there is likely to be severe turbulence, heavy precipitation or icing conditions; and also indicate how high the clouds extend, and in which direction they are moving.

Other people will benefit from radar also. With extra attachments it will be able to tell the farmer or hydrologist how much water has fallen on a certain area.

## Thunder, Hail

Meteorologists will be able to use time-lapse photos of the radar scope to do studies on where thunder and hail storms are most likely to develop.

How does this electronic genius do it?

It works on the echo principle, like the sounds that are echoed back from the walls of a large empty building.

The radar sends out bursts of ultra-high frequency energy of more than 5,000 megacycles. They travel at the speed of light until they hit a wall of precipitation that reflects them back to the set.

The antenna picks up this back-scattered energy, and a receiver amplifies it, then displays it on the weather office radarscope as a small patch of light.

## Performs Feats

It has to be a mathematician to perform these feats. The radar brain instantly works through equations to tell the operator where a storm is brewing, which way it is moving, how violent it is becoming, what kind of precipitation is falling, and when it is likely to reach a certain spot.

However, it does have its trouble. Even though it can "see" for 200 miles, it is most accurate for only 70 miles or less. This is due to the earth's curvature, and the loss of power with distance. It also gives a weak distorted picture if the antenna dome is covered with ice and snow.

The antenna that transmits and receives the ultra-high frequency energy is mounted on a 70-foot tower near the west side of Winnipeg's International Airport. It is a 12-foot dish that rotates horizontally, or nods vertically, depending on what the operator is scanning.

## Sweeps Sky

If he is sweeping the horizon in search of storms, the antenna rotates; but if he wants a close look at one storm area, the antenna nods up and down, and paints a vertical picture of the storm.

The transmitter and antenna are connected by underground cable to the viewing screen in the new terminal building. This screen or scope is placed in a darkened corner of the pilot briefing area of the weather office, where it can be watched by the briefer on duty, and viewed by pilots entering the briefing room.

Winnipeg's new "weatherman" is expected to be a busy helper at the airport weather office in the years ahead.





**1** *In flight students T. Givilt (Vancouver) and G. Paquet (Montreal) copy clearance from Ottawa Tower.*

**2** *Instructor Bob Bulbrook explains instruments used in CF-DTB to students Paquet and Givilt.*

**3** *In the meteorological communication relay centre, the students learn how meteorological traffic is relayed and collected.*

**4** *Students are shown the arrival and departure control positions in Montreal's area control centre. Mr. D. Johnston, (third from left in rear) officer-in-charge of the centre, explains the operations.*

**5** *Gilles meets the officer-in-charge of the marine/aeradio station, Mr. G. Coffin (left). Others in photo include F. Gingras, regional controller of telecommunications (second from left) and A. A. Johnson, supervisor of the air services school (right).*

**6** *Mr. P. Cordeau of the ATC tower (left rear) explains control position to students. In the foreground is Miss M. Carpenter, a control assistant.*

**7** *Radio Operator "500", Gilles St. Pierre, sits at the operating "Range" position at Montreal aeradio.*


3

3 *In the meteorological communication relay centre, the students learn how meteorological traffic is relayed and collected.*

Aboard the Leningrad, J. R. Strong and Russian hosts watch the convoy safely by-pass an area of ice.

# CANADA BROKE THE ICE IN RUSSIA

Canada and the Soviet Union, neighbors across the North Pole, have decided to trade a little over-the-back-fence gossip about ice.

The two largest countries in the world with a year-round ice problem have already begun an exchange of key officials and scientists; a first in international ice co-operation between Canada and Russia.

This "Eaton's telling Simpson's" exchange began last February when seven Canadians, headed by Assistant Deputy Minister of Transport, Marine, Gordon Stead, went to Moscow. Others in the group were J. R. Strang, D.O.T.'s director of shipbuilding; A. H. G. Storrs, D.O.T.'s director of marine operations; Captain W. Dufour, C.C.G.S. d'Iberville; W. E. Markham, D.O.T.'s meteorological branch; Miss Moira Dunbar, Defence Research Board, and Dr. A. E. Collin, of the Department of Mines and Technical Survey's Bedford Institute.

The Canadian visit was originally scheduled for early February, with the Russians to pay a return visit to Canada in March. Light ice conditions in the Baltic, however, delayed the Canadian visit until late February so the Russian visit had to be put over until next year.

The Canadians were met in Moscow by A. A. Afanasiev, director of the Northern Sea Route Administration. They found the capital city to be typical of Central Russia with its many onion-domed buildings,

*At the Marine Museum, Captain A. I. Mikulinsky briefs the Canadians on the statistics of Soviet sea-borne freight turnover.*

parks, museums and monuments. The days in Moscow were devoted to discussions, official dinners and receptions, with time enough for sightseeing and entertainment.

Headquarters of the Northern Sea Route are located in Moscow and it is from there that all vessels are assigned to various districts of service. The Canadian party was given a general briefing on all the ships in the icebreaking fleet but, naturally, extra attention was devoted to the Lenin, the world's largest nuclear-powered icebreaker and the fleet's showpiece. Unfortunately, the group didn't get to see her because she was in drydock at Murmansk, undergoing her first refit and refuelling in three years.

The only difficulty the Canadians experienced during talks with their Russian hosts was that of interpretation. As is the case everywhere, first class interpreters are in short supply in Russia and so the ice talks were slowed down on occasion while points were clarified. However, most Russians engaged in maritime or scientific fields have a working knowledge of English and the Canadians found this a great help. Miss Dunbar, too, as the only Canadian who could speak Russian, assisted whenever possible.

Limitations of time and translation rather than reticence to answer were the chief problems of an otherwise valuable exchange of technique and theory.

The theory of handling the problems of ice varies widely in the two countries. The Russian ministry is more inclined to favor strength and power of vessels: if a vessel is big enough and strong enough it can cut through any ice, no matter what the thickness. Canada, on the other hand, relies heavily on the application of scientific knowhow to ice. Therefore the Canadians were anxious to increase the time allotted to scientific talks during their tour. They managed to turn their scheduled three-hour visit to the Arctic Institute into an all-day affair, and to change the hour scheduled for the Museum of the Arctic into an entire morning. The visits to these two Leningrad institutions were the highlights of the tour.

The Institute's program covers operations and research in oceanography, meteorology, glaciology and geophysics. It organizes and runs 100 permanent polar stations, the Arctic Ocean Drifting stations, the annual airborne scientific expeditions to the Arctic, and the Antarctic program. It also manages the ice reconnaissance program and does the ice forecasting for the Arctic.

Before leaving the Institute Mr. Stead presented officials with a letter found posted on the door of one of the huts on the ice-floe station, North Pole 7, which drifted into Baffin Bay in 1962. This genuinely pleased the 30-odd Russian scientists present and was very well received.

The shoe was on the other foot in Moscow. There parts of an old Canadian icebreaker were pointed out to the group. The wheelhouse and radio shack of the Litke, originally the Canadian ship Earl Grey, were on display. She was sold to the Russian government in 1914, and was in service until quite recently.

For three days of the trip the Canadians saw Russian operations first hand from the deck of the Leningrad while escorting a convoy to and from the ice edge. Miss Dunbar says she found it a spacious and well-furnished ship, beautifully kept by everyone, including female crew members. (Women are employed on most ships in the Russian merchant fleet.)

The Leningrad is 400 feet long, with an 80-foot beam, and is powered by eight diesel-electric motors.

The Canadians were given an exhaustive briefing by a solicitous group of the ship's officers, and a naval architect went along on the trip to answer questions on design.

The similarity between Russian and Canadian handling of convoys became obvious on the Leningrad. Miss Dunbar, who has had considerable experience with D.O.T.'s northern operations said: "Standing on the bridge listening to what went on, both on the icebreaker itself and between it and the vessels following, the only noticeable difference was in the language. The Russians have the great advantage, however, of dealing almost exclusively with ice-class vessels which enable the convoys to stay close together and move faster, but the techniques are very similar."

Even apart from icebreakers the total strength of the Russian ice-strengthened fleet is about 350 vessels which explains the advantage outlined by Miss Dunbar.

The tales of World War II suffering heard in Leningrad staggered the imagination. Blockaded for nearly three years, 632,000 civilians are said to have starved to death whereas only 16,700 were killed in bombing raids and shelling. The Canadians visited a mass burial ground where it is thought 400,000 persons are buried. In spite of these experiences, Leningrad today is a city of beautiful architecture, wide boulevards and happy-faced citizens.

On February 29 the Canadians said good-bye to their Russian hosts and left aboard the Red Arrow (the state railway company's speedy train) for Finland to see the shipyards where many Russian vessels are built.

Helsinki, the Canadians found, was extremely gay and bright. Even without understanding the language, they thought the advertising signs and window displays appealing and, in some cases, spotted familar trademarks.

It was the weekend when they arrived so they had time for some much needed rest and relaxation. They were guests of honor at a buffet supper hosted by Canadian Ambassador Cleveland.

While in Finland the delegation inspected the offices and shipyard of the Wartsila/Koncernen Ltd. and the Board of Navigation; toured the factories of Oy Stromberg Ltd., builders of electrical equipment for the shipyard; visited the Finnish Technical Institute and spent a day aboard the icebreaker TARMO in the Gulf of Bothnia.

They were particularly interested in the modern shipyard where the Moscow and Leningrad, the largest diesel icebreakers afloat, were built for the USSR. In fact, when they were there another vessel of the Moscow class was under construction. It will be christened Kiev.

The group broke up in Finland. Miss Dunbar, Dr. Collin and Mr. Markham went on to spend a day or two each in Stockholm, Copenhagen and Hamburg, talking with ice experts in those countries in order to complete the picture of Baltic practice in this field. Messrs. Stead, Strang and Storrs journeyed to London for a few days' business and then home, and Captain Dufour returned to Canada via Paris where he spent a few days leave.

In summing up the visit, the members of the Canadian delegation felt to a man that they were well-received in all the countries visited and that their various hosts were most willing to answer questions and show them as many things as possible in the time allowed. The trip was well worthwhile in the sense that they learned a lot both about ice problems and the people they met.

Perhaps, most important, they were able to draw favorable comparison with Canada's ice operations.

The ice they saw was land fast and easier to handle than that in the Gulf of St. Lawrence as far as they could ascertain. However, they didn't view Russian operations in the Arctic, which presumably would be much more difficult than in the Baltic.

Some equipment they saw was new to them, as were some techniques, but, as Mr. Stead said: "Any changes that will be made in our operations or new equipment that will be added as a result of our visit, will be of minor importance.

"On the overall picture we are satisfied that we are as advanced as Russia in our icebreaking operations and the organization of Russian and Canadian ice operations is remarkably similar. Since we rely more heavily on such scientific support as ice forecasts, reconnaissance flights, computer analysis and so on, perhaps we are even ahead."

The Canadians are looking forward to repaying the Russians' fine hospitality when the delegation from the U.S.S.R. visits here next winter, and hope to show them as much as possible of the unique ice conditions in the Gulf of St. Lawrence.

*Miss Dunbar, Captain M. V. Sorokin, Mr. Stead and Captain Dufour study the design of the icebreaker Leningrad.*

*Mr. Stead, Captain Mikhailov, Y. P. Zheltovsky, chief engineer, and Mr. Strang view the Leningrad's automatic manoeuvering control panel.*

*Examining a model of the atomic icebreaker Lenin at the Marine Museum are, left to right, Messrs. Markham, Storrs, Strang and Stead and Konstantin V. Bannov, deputy chief of the Northern Sea Route Administration.*

*Messrs. Markham, Stead, Strang and A. I. Ignatiev, head of the icebreaker test laboratory of the Arctic Institute, engage in lively discussion in the Leningrad's engine room.*

*A roundtable discussion in the headquarters of the Northern Sea Route in Moscow.*

# Calling it a Day

*Head table guests enjoy the farewell remarks made by Jim McPherson at the dinner given in his honor. Left to right are: Dr. P. D. McTaggart-Cowan, former director of the meteorological branch; the guest of honor, D. C. Archibald, chief of basic weather, and Mrs. McPherson.*

JAMES ALEXANDER McPHERSON, supervisor of the surface meteorological inspection program for Canada, retired on July 1. He had been on retirement leave since January.

A graduate of the Universities of Alberta and Toronto, Mr. McPherson joined the meteorological service in 1936 as an observer. After several promotions as a meteorological officer he was appointed to the position he held at the time of retirement.

During his 27 years of service Mr. McPherson visited many parts of Canada inspecting stations, establishing new ones and carrying out programs of instruction. His background of scientific and technical training fitted him uniquely for the duties he performed.

Before going on retirement leave early in January, Mr. McPherson's colleagues honored him at a dinner. Dr. P. D. McTaggart-Cowan, then director of the meteorological branch, and D. C. Archibald, chief of basic weather, paid tribute to his service. As well, he was presented with an engraved watch and a wallet, the gifts of his many colleagues and friends across Canada.

*D. C. Archibald, chief of the basic weather division, meteorological branch, visited the joint Arctic weather stations at Eureka and Alert, N.W.T., this Fall. Here he tells News on the DOT readers of two unusual construction projects recently completed in that part of the world.*

# FOURTEEN YEARS and all that

*E. M. Chmilar, airport mechanic, and A/C A. Gibel, equipment officer, who represented the Canadian airship mechanics and U.S. equipment officers respectively at the brief ceremonies concerning the completion of the Eureka air strip.*

It took 14 years to build the runway.

Slow, you say? It depends.

What do you do when you only have three to six weeks a year to work on a runway because you're at Eureka, 80 degrees north on Ellesmere Island?

You wait for the three weeks of summer, and work round the clock in shifts under the most difficult conditions to take advantage of the 24 hours of sunlight. If you are as energetic and resourceful as the men at Eureka's Joint Arctic Weather Station, 14 years later you will have a mile-long, 200-foot wide strip.

Airstrip mechanics from D.O.T.'s civil aviation branch, aided by some from the United States Weather Bureau and equipment operators from the U.S.A.F., forced a permanent airstrip on an unyielding permafrost.

There were never more than six men working on the runway at a time and one summer there was only one man. Still they managed to complete the strip from the original plans laid out in April, 1950 by D. C. Archibald, chief of the basic weather division.

Realizing the need for a year-round strip for resupply of critical parts and emergency evacuations, Mr. Archibald selected and laid out a site about three-quarters of a mile from the station.

Eureka's first strip, which was about six miles from the station, was abandoned a few months after the station opened in 1947 after it became unusable.

Aircraft landed on sea ice in Slidre Fiord when possible and heavy mechanical equipment and supplies were brought in once a year by icebreaker.

This Fall Mr. Archibald, Dr. R. H. Simpson and J. G. Dyer, the latter two of the U.S. Weather Bureau, visited Eureka to inspect the completed strip. They praised the joint efforts of both services. E. M. Chmilar represented the Canadian airstrip mechanics and A/I C A. Gibel, the U.S. equipment operators, at the ceremony.

*The world's most northerly power line, at Alert N.W.T., connects the weather station to the airstrip one mile away. This photo was taken at 2.00 a.m. on a September morning.*

# Northernmost Power Line

The world's most northerly power line went into operation August 24. It was the climax to two years of careful planning for the construction of a line to connect the Joint Arctic Weather Station to the airstrip at Alert, N.W.T.

The line is 7,000 feet long.

In this barren land, where permanently frozen ground extends to a depth some 1,500 feet, the top 12 to 18 inches of which thaws out for only a few weeks during the summer, construction of a power line was a difficult and complex task. Added to occasional winds in the vicinity of 100 miles per hour, which meant special poles had to be used for a minimum wind loading, spacing of poles and the routing of the line itself to avoid large snow drifts were also problems. It was decided to use steel poles with three telescoping sections. The total length of the poles was about 23 feet, the largest diameter section of which was sunk five feet into the ground.

G. Fraser, Winnipeg regional construction, was in charge of the pole line erection. He was assisted by Alert station staff and two others from Winnipeg region.

They found the only way to excavate the holes for 60 poles was by using 750 pounds of dynamite and shaped charges. Tauno Rante, the versatile station mechanic, set and detonated all the charges successfully. After the poles were in place and the soil backfilled, there still remained the problem of working at the top of the poles to set the cross arm and string the cable.

Unfortunately, the ladder for the job did not arrive with the rest of the equipment and a platform had to be improvised and attached to the forklift at the front of the tractor. And it was in that way that the lineman was elevated aloft. This was hazardous. Several times the caterpillar tractor slid sideways down the hill. Despite all these difficulties the power line was completed and the airstrip lights can now be switched on from the weather station's operations room a mile away.

It is planned to erect an anemometer at the airstrip by carrying the cable of the same pole line to the automatic recorder in the operations office. In this way instantaneous observations of winds can be obtained and relayed to incoming aircraft. Other benefits derived from the airstrip power supply include a safer type of heating furnace used in the airstrip garage and a power supply for the airstrip beacon.


CONTROL DATA

*Montreal*—Michael Kwizak, meteorological services, operational, development and evaluation, Montreal International Airport was a recent guest on the CBC radio national network's "Accent on Careers", to discuss the profession of meteorology. He is seen here *above* with Mrs. Brenda Hilton, electronic data process operator.

A PETERBORO STUDENT wrote to the public weather section:

*"S.O.S. I'm in a real jam (mess)! Next Wednesday we have a science project on weather to be handed in. I have not yet started and as this counts much toward my final mark I've pushed the panic button. Our teacher takes half the marks off for each day we're late so I'm pleading maybe even begging PLEASE SEND ME SOME MATERIAL. I need material badly! Anything, at all to do with weather, maps, diagrams, charts and pictures. Some things we have to include are clouds, precipitation four types—how man's activities are limited because of weather. This is mainly pictorial and have no pictures so far at all. I realize there will be a cost so make the total no more than $1.00 Thanks. Please hurry—Thanks a bunch of millions. I'll be real grateful. Please Hurry! Urgent. P.S. Please include ough on end of Peterborough or natives get restless—Thanks again."*

# J.R.H. Noble Appointed Director of Meteorological Branch

The appointment of John Reginald H. Noble, 52, as director of the meteorological branch was announced in August. Earlier Dr. T. G. How, regional director of air services at Vancouver, had been named to this position but for health reasons he declined the appointment.

Mr. Noble has been deputy director of the meteorological branch since 1959, when this responsibility was added to his position of chief of administration. He has played a major role in the planning and coordination of the over-all meteorological program.

Mr. Noble's service with the meteorological branch dates from 1937 when he was duty meteorologist at Botwood, Nfld. From 1938 to 1940 he helped establish and direct the operations of the forecast offices at St. Hubert, Quebec, and Halifax, N.S. He moved to Ottawa in 1940 as meteorological advisor to the chief of the air staff and staff officer (meteorology) RCAF. During this period he also represented the branch director in matters pertaining to the requirements of the Canadian Army and Navy. In 1946 he was appointed chief of administration.

Mr. Noble graduated from the University of Toronto with an honours B.A. degree in 1934 and received his master's degree from the same university the following year. He is married and has two sons.

Shortly after Mr. Noble's appointment was announced the Toronto Telegram ran the following editorial:

## HAIL, WEATHERMAN

*"The thunderous sound in the air is the applause of welcome for John R. H. Noble as he steps on Canada's stage as the country's director of the Department of Transport's meteorology branch.*

*The new weatherman inherits far-flung weather stations, far-ranging electronic and far-reaching radar devices to assist him in forecasting the weather. We do not desire to shake his confidence in these magical things, but it has happened that information derived from them has sometimes been somewhat off the beam. People, relying on the prediction of a fair day have had to swim home, and forecasts of a deluge have been followed by a scorching sun.*

*Mr. Noble it is to be hoped, enjoys the best of health, but a touch of rheumatism at the right time in the right place is not to be spurned as an aid to confirm whatever fallible instruments foretell.*

*At any rate, we wish him luck."*

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news on the dot

## Basic and Advanced Meteorological Courses

To train meteorological technicians capable of taking weather observations needed in the preparation of forecasts, the school presents a three-month basic weather course. High school graduates are hired as either surface observers or radiosonde observers. The latter are sent on to a 16-week upper atmosphere course at Scarborough, Ontario, after completion of the course in Ottawa.

In addition to the basic course for newly recruited trainees, the ASTS presents a number of advanced courses in meteorology to practising meteorological technicians.

Each of these courses is designed to increase the employee's knowledge in meteorology and to prepare him to perform the specific duties of higher positions. One course teaches them how to provide weather information to pilots, another trains them to support the forecaster in the preparation of weather maps and charts, and still another covers radar.

Six other courses are presented and more are in the planning stage.

WEATHER-WISE—Student weather observers take readings on roof of terminal building.

# Patterson Medal Awarded to D. B. Kennedy

Left to right: Mr. J. R. Noble, Mr. Kennedy and Air Chief Marshal F. R. Miller

The Patterson Medal for distinguished service in meteorology in Canada has been awarded to D. B. (Des) Kennedy, head of the meteorology and oceanography section at Canadian Forces Headquarters. He received the medal on November 4 from Air Chief Marshal F. R. Miller at a brief ceremony at headquarters. J. R. Noble, director of the meteorological branch attended.

The Patterson Medal honors a former director of the meteorological service of Canada and is given to any resident of Canada for a unique outstanding achievement or for sustained contributions over several years.

Mr. Kennedy, who is seconded to CFHQ from the Department of Transport, has been actively engaged in the organization of meteorological support for the Canadian Armed Forces since early in the Second World War. In the words of the citation that accompanied the award "he has distinguished himself as an interpreter between the civil and military interests in meteorological matters."

During the war years he pioneered meteorological instruction for wartime aircrew, was in charge of the intensive training program to provide meteorological officers for the British Commonwealth Air Training Plan and, later, was engaged in administration of the meteorological offices at the wartime air stations across Canada. In 1946 he was awarded the MBE in recognition of these wartime activities.

Shortly after the war he was appointed to the position of meteorological adviser at air force headquarters and subsequently served as liaison meteorologist and as meteorological adviser to the chairman, chiefs of staff. As such he has been a major contributor to the development of an efficient military meteorological organization.

*Toronto*—The 25th anniversary of the formation of the Canadian Branch of the Royal Meteorological Society was observed by the some 180 Toronto members and guests on November 5. The speaker for the occasion was J. R. N. Noble, director of the meteorological branch, who spoke about "Meteorology in Canada—A Look at the Past and Some Thoughts about the Future."

The Canadian Branch of the Society was formed in August, 1939, with 34 members. Today the membership is about 385, with Centres in Toronto, Montreal and Winnipeg.

The future of meteorology in Canada was presented by Mr. Noble as being one of great expansion in all areas, not only in the government service but also in the schools and universities and, in fact, in all walks of Canadian life.

Head table guests at the anniversary dinner were, left to right: Alec MacVicar, Mrs. D. Holland, Dr. A. Thomson, Mrs. Knox and John Knox, Mr. Noble, Mrs. Noble, Douglas Holland, Mrs. MacVicar and Louis Shenfield.

# Fishing Vessels Have A Friend In Gander Weather Office

by Frank Roe, *Officer-in-charge,*
*Torbay Meteorological Observing Station*

Scant hours after the weather office at Gander International Airport issues a hurricane warning, the port of St. John's prepares for a friendly invasion.

From a vantage spot on Signal Hill, where Marconi received the first wireless signals from across the ocean, the flotilla of 150-odd vessels can be seen looming on the horizon. Heading for harbor with the hurricane on their heels, they include the ships of the famed Portuguese fishing fleet. The hurricane's name might be Cleo or Dora or Ethel, but the men of the Grand Banks fishing fleet don't want to be introduced to her. In late summer or early fall hurricanes force the fleet to head for St. John's harbor as often as three or four times a season.

Many nations fish the Grand Banks throughout the year, but the Portuguese probably have the greatest number of vessels in the area.

Seventy ships sail each year from Portugal, accompanied by their modern trim-looking hospital ship the "Gil Eannes". Their crews, along with those of Spanish and French fishing vessels, are a familiar and welcome sight to the citizens of St. John's. Their white-hulled fleet, which combines both steam and sail, is perhaps the last of its kind in the world and many people go to the waterfront to take photos of it.

This year for the first time marine area forecasts issued by the Gander weather office were broadcast in Portuguese by the CBC at St. John's. As well, the "Gil Eannes" maintains an active liaison with D.O.T.'s meteorological service by taking and transmitting weather observations regularly.

## World Meteorological Organization

The old adage that everyone talks about the weather but no one does anything about it is no longer true. Weather is being harnessed to man's needs in many places on earth, thanks largely to the efforts of the World Meteorological Organization (WMO) of which Canada is a member.

A specialized agency of the United Nations, the WMO has been in existence since 1951 and has some 125 member states.

With its headquarters in Geneva, Switzerland, it standardizes meteorological activities throughout the world and acts as a tie between national weather services such as D.O.T.'s meteorological branch.

An important aspect of the organization's work is the development of a world weather watch. It will include an increased world-wide network of observing stations and a weather satellite system.

The WMO also boosts research, observations from ships at sea, the international exchange of weather reports and programs of water resource development.

Of the eight technical commissions of WMO, two are headed by Canadians. C. C. Bougner, chief of climatology, was elected president of the WMO commission for climatology, while Keith T. McLeod, superintendent of public weather services, was elected president of the WMO commission for maritime meteorology. Election of Canadians to these two important posts demonstrates Canada's leadership in international meteorology and the high regard in which Canadian meteorologists are held by their fellow scientists.

On March 23 Canada joined other member states in officially observing World Meteorological Day. The theme for this year's observance was Tropical Meteorology and throughout the year, to coincide with ICY, the WMO will make special efforts in the field of meteorology in Africa.

## L'Organisation météorologique mondiale

Le vieil adage selon lequel tout le monde parle du temps mais personne ne s'en occupe, n'est plus vrai. On modifie le temps en fonction des besoins de l'homme à plusieurs endroits du globe, grâce surtout aux efforts de l'Organisation météorologique mondiale (OMM) dont le Canada fait partie.

L'OMM, qui est une institution spécialisée des Nations Unies, existe depuis 1951 et compte environ 125 États membres.

Son siège social est à Genève (Suisse). Elle normalise les initiatives météorologiques dans le monde entier et entretient la liaison entre les services météorologiques nationaux comme la Direction de la météorologie du ministère des Transports.

L'établissement d'une veille météorologique mondiale constitue un aspect important des travaux de l'Organisation. Celle-ci augmentera le réseau mondial de stations d'observation et établira un système de satellites météorologiques.

L'OMM favorise également les travaux de recherche, les observations effectuées par des navires en mer, l'échange sur le plan international de messages météorologiques et la réalisation de programmes d'aménagement des ressources hydrauliques.

Deux des huit commissions techniques de l'OMM sont dirigées par des Canadiens. M. C. C. Bougner, chef de la Division de la climatologie, a été élu président de la Commission de climatologie de l'OMM, tandis que M. Keith T. McLeod, surintendant des services météorologiques publics, a été élu président de la Commission de météorologie maritime. Le fait que des Canadiens aient été élus à ces deux postes importants démontre que le Canada joue un rôle de premier plan dans le domaine de la météorologie internationale et que les savants des autres pays tiennent les météorologistes canadiens en très haute estime. Le 23 mars, le Canada et les autres membres ont observé officiellement la Journée météorologique mondiale. Le thème choisi pour cette année est celui de la météorologie tropicale. Au cours de l'année, dans le cadre de l'Année de la coopération internationale, l'OMM favorisera la réalisation en Afrique d'initiatives particulières dans le domaine de la météorologie.

# RUSSIANS GET FIRSTHAND LOOK AT CCG ICE OPERATIONS

By Ken Parks


Ice, be it the Canadian or the Soviet variety, will always be a problem to seafaring men who face the task of keeping shipping on the move when Old Man Winter is holding sway.

Such was the obvious deduction following a visit during March of three Russian marine experts to Canada, during which they steamed through the Gulf of St. Lawrence aboard the Canadian Coast Guard icebreaker "John A. Macdonald" and observed Canadian methods of dealing with sea ice.

The party's visit was the return half of an exchange program of ice studies that was opened the previous winter by a Canadian marine and scientific group that visited Russian and Finnish marine operational and research facilities.

The Soviet party was headed by Alexander Alexandrovich Afanasiev, chief of the navigation department and member of the Marine Ministry, U.S.S.R. With him were Yuri Georgievich Levin, chief of the Arctic and Icebreaking Fleet Board, Arctic Seas Steamship Line, and Lonid Vassilievich Padorin, chief of the commercial department, Arctic Seas Steamship Line.

Accompanying them on their Canadian marine journey were Gordon W. Stead, assistant deputy minister, marine; Marine Operations Director A. H. G. Storrs, and Miss Moira Dunbar, geographer and ice expert with the Defence Research Board. They were members of the delegation that went to Russia last year, the others being J. R. Strang, D.O.T's director of shipbuilding; Capt. Wilfrid Dufour, master, CCGS "d'Iberville"; W. E. Markham, officer-in-charge of the department's ice central office at Halifax, and Dr. A. E. Collin, oceanographer with the Mines and Technical Surveys' Bedford Institute of Oceanography at Dartmouth.

Travelling as interpreter with the visitors on their Canadian tour was Gregory Belkov of the National Research Council. In matters concerning shipping, however, the Russians displayed a considerable understanding of English marine terms.

Before going to Sydney they visited Halifax where National Harbours Board Port Manager J. R. Mitchell and District Marine Agent Frank Weston took them on a tour of the harbor.

They also lunched aboard CCGS "Edward Cornwallis" at the Dartmouth Marine Agency, went aboard CCGS "Narwhal" and saw the northern supply vessels that are based at the agency.

By the time the delegation boarded CCGS "John A. Macdonald" at Sydney, ice conditions had eased somewhat in the eastern half of the Gulf but there was still enough to provide heavy going for some miles off Sydney and in the Bay of Chaleur area. They

*GETTING THE HIGH-UP "LOW-DOWN"—The Russian icebreaking experts enjoyed a trip in CCGS "John A. Macdonald's" helicopter during their Canadian visit. Seen here with Pilot J. E. McSweeney, officer-in-charge of helicopter operations, Moncton Region, seated at the controls, are Mr. Afansiev, Mr. Levin and Mr. Padorin.*

had an excellent opportunity to see how Capt. Paul Fournier worked the "John A." in fairly heavy ice when, bringing the freighter "Dartwood" out of Chandler, Que., they encountered a heavily rafted area.

The Russian visitors showed keen interest in the various types of icebreakers they saw working in the area, including Canadian Coast Guard vessels "d'Iberville", "Labrador" and "Sir William Alexander".

On the second evening of the Russians' trip, they were guests of honor at a reception in the officers' lounge. For the occasion, the ships' staff under Purser R. Hughes and Chief Steward James Coleman prepared a buffet that did full justice to the "international V.I.P." occasion.

During the evening Mr. Afanasiev addressed the ships' officers and described Russian icebreaking problems and tactics. Ice in the Russian Arctic, it seemed apparent, was heavier than that usually met by Canadian ships in the Canadian Arctic Archipelago. This was due to the fact that, generally speaking, the vast, unbroken expanse of ice north of the Russian coast tended to freeze to much greater depths than was the case among the islands, where sheltered conditions and strong currents provided varying degrees of break-up and open channels.

The Gulf of St. Lawrence ice, however, presented a much more difficult problem to shipping than the ice usually found in the Baltic Sea, where a passage broken through the relatively land-fast ice tends to stay in the same place and repeated passage of shipping keeps it open.

In the Gulf of St. Lawrence, Canadian Coast Guard icebreakers can escort vessels and, due to movement of the ice by wind and current, the track they have made may close again within minutes or move many miles within a few hours, so that it cannot be followed twice. Such movement also causes pressure ridges to form that may be 20 or 30 feet deep, sufficient to halt the heaviest icebreaker or endanger an ordinary ship that gets caught in them.

Russia's icebreaker builders favor vessels of somewhat narrower hull design than that which has been found most successful in coping with the conditions faced by Canadian Coast Guard icebreakers. In the latter, provision is made for a limited amount of cargo carrying capacity, to meet the need for delivery of once-a-year supply shipments to Arctic outposts that are beyond the safe reach of conventional cargo ships, even those of ice-reinforced construction. The smaller vessels are also designed to work as lighthouse supply and buoy tenders.

The "John A." docked at Sept Isles, Que., from where the visiting party took off, accompanied by the Ottawa officials, for Quebec City. There, accompanied by District Marine Agent George Gaudreau, H. L. Land, chief, St. Lawrence Ship Channel, and National Harbours Board Port Manager Paul Bousquet, they toured the department's district marine agency and the NHB harbor facilities. During the visit, they stopped briefly for coffee aboard CCGS "Montcalm" and talked with Capt. R. J. Turbide and Chief Engineer J. S. McClintock.

From Quebec the party flew next day by D.O.T. aircraft along the St. Lawrence River to Montreal, taking the visitors low over the seaway installations to give them a good view. Following the flight the Russian party remained in Montreal to visit the harbor.

During their shipboard visit the Russian guests were each presented with a Canadian Coast Guard badge mounted suitably for hanging as souvenirs in their offices. They, in turn, presented every member of the ship's company with souvenir badges bearing the likeness of the Russian atomic icebreaker "Lenin".

*STUDYING THE ICE AREA—Looking at the D.O.T. ice information office map at Sydney, N.S. during a discussion of icebreaking tactics are, from left, Gordon W. Stead, assistant deputy minister, marine; Mr. Afansiev, Miss Moira Dunbar of Canada's Defence Research Board; Mr. Padorin, Mr. Levin and Gregory Belkov of the National Research Council, who acted as interpreter for the visiting party.*

# METS' DAILY

Every Day at 12 noon and 12 midnight, Greenwich Mean Time, meteorological technicians at 32 D.O.T. stations across Canada and at hundreds of other places all over the world do exactly the same thing: they release a balloon carrying a rugged but finely calibrated instrument called a radiosonde.

The balloons, filled with hydrogen, climb at a speed of some 1,000 feet per minute. As they rise they expand until they burst. This usually happens somewhere between 80,000 and 100,000 feet, two to three times as high as the jetliners fly. The balloons are about 20 feet in diameter then.

The radiosondes contain sending elements that measure the pressure, temperature and humidity of the air while they ascend. They also have small radio transmitters that continuously send the information back to a ground station.

Because the balloons drift with the wind as they rise, wind speed and direction at any level can be accurately calculated by tracking the course of the radiosondes.

The information is speeded via radio and wire to forecast offices where the results are analyzed.

The atmosphere up to 100,000 feet above the surface is really a comparatively shallow layer of air. If one were to make a small globe the size of an apple, this sheet of air would be represented by the skin.

The air, however, has no small weight and 9110 of the total mass of the atmosphere is compressed into this shallow layer. Most of the weather phenomena which affect man's day-to-day activities originate below 100,000 feet.

The radiosondes' twice-daily "eye-witness reports" of conditions in this upper atmosphere enable meteorologists to predict what they call "atmospheric flow patterns." These in turn form the main basis for the daily weather forecast.

Radiosondes may drift a long way during their 2-2½-hour climb and instruments have been found several hundred miles from their point of release. A paper-and-bamboo parachute is attached to the package, so that it will float down fairly gently after the balloon has burst.

However, since most radiosonde stations are at remote locations, very few instruments are recovered and the entire item is regarded as expendable.

# DOUBLE

In Canada the materials expended in upper air observations, including instruments, transmitter, balloon, battery, hydrogen and parachute, add up to a cost of about $35 for each ascent.

Radiosondes are made to the department's own specifications and since the factory has to tool up specially for the manufacture of such a made-to-order item the meteorological branch buys the entire output at once. Placing large orders—usually a three-year supply—is also made necessary by the fact that far northern stations must have a two-year stock on hand in case the once-a-year supply ship misses it because of ice or storms. Weather is the meteorologists' stock in trade, but it can also work against them!

Early this year the department bought 84,000 radiosonde instruments from the Sangamo Company of Toronto, at a cost $1,166,000. This was for the electronics only; balloon and parachutes were not included in this figure.

Each ascent is meticulously prepared and computed to get maximum value from it. Two men work about five hours to complete one upper air observation. This includes filling the balloon with hydrogren, monitoring the signals, computing and coding the data and checking the computations for error.

World attention has focused lately on earth satellites probing the outer fringes of the atmosphere, but meteorologists have been sounding the upper air for almost 50 years. Canadian investigations of the upper atmosphere have been going on for more than 30 years.

The early sounding devices included a smoked plate on which the data were registered. The instrument had to be recovered to get at the information.

Apart from balloons, kites have also been used to take instruments into the upper reaches. For a brief period in 1935 observations were taken by aircraft, but these rarely got above 20,000 feet.

*Photographed at the May RDAS's Conference are, left to right, seated: T. G. Howe, regional director, Vancouver; George Scott, assistant deputy minister, air; J. R. Baldwin, deputy minister; and J. Roy Baxter, assistant deputy minister, personnel. Back row: J. R. Noble, director, meteorological branch; M. Baribeau, regional director, Montreal; J. A. Lenahan, regional director, Moncton; W. E. Fenn, regional director, Winnipeg; D. P. Glen, regional director, Toronto; G. E. McDowell, regional director, Edmonton; and F. G. Nixon, director, telecom. and electronics.*

# RDAS's Hold First Ottawa Conference

During the week of May 17 the regional directors of the six air services organizations met with headquarters officials for four days of formal and informal discussions covering topics of mutual interest.

Deputy Minister J. R. Baldwin spoke to the group early in the week. He pointed out that the conference was taking place at a time when many changes in financial and personnel administration are being implemented throughout the government and it is important that the department's senior officers be conversant with such changes. Further on he mentioned that more and more emphasis is being placed on the integrated approach to transportation, as recommended by the MacPherson Royal Commission Report on Transportation. As the department continues to grow and expand it will play an ever-increasing role in the nation's transportation and the approach must be to consider the field as a whole—what applies to air affects marine and vice versa. This includes high level communication matters as well as other transportation functions.

Before winding up the successful week the regional directors were guests of honor at a dinner at the Beacon Arms hotel. The event was attended by the Minister, the Hon. J. W. Pickersgill, and some 75 headquarters personnel.

*L. T. Campbell, left, recently appointed chief, administrative division, meteorological branch and George H. Legg, who replaces Mr. Campbell as liaison meteorologist at Ottawa.*

# Staff Changes In Met Branch

L. T. Campbell, formerly liaison meteorologist at Ottawa, has been appointed chief of administration for the meteorological branch. He is being replaced at headquarters by George H. Legg, superintendent, forecast office operating requirements section.

Mr. Campbell, a native of Iroquois, Ontario, graduated from Queen's University in 1941 with an honors degree in mathematics and physics. In 1942 he joined the meteorological branch and spent the next 10 years filling a variety of assignments at weather offices in Montreal, Goose and Gander. He assumed the duties of liaison meteorologist at Ottawa in 1952 and remained as such until his recent appointment to fill the position vacated by the present director of the branch, J. R. H. Noble.

In appointing a successor to Mr. Campbell it was decided to fill the position, in future, on a 2-year rotational basis. The reason for this being that the position of liaison meteorologist offers an excellent opportunity for broadening experience and obtaining an intimate knowledge of both department and government procedures and policies. As the title of the position implies, the duties are to advise officials of Transport and other government departments on meteorological matters and, because its headquarters are outside of Ottawa, to keep the meteorological branch informed on developments in Ottawa.

George Legg, the first meteorologist to fill the position under the new plan, has been with the branch for 24 years. In 1941 he graduated from University of Western Ontario with a honors degree in mathematics and physics. During the war years he served at a number of Department of National Defence weather establishments. He obtained a master's degree in physics in 1947 and was appointed officer-in-charge at Whitehorse, N.W.T. The following year he became shift supersivor at Malton, Ontario and in 1960, assumed an administrative position at Toronto headquarters.

# Cross-Canada Dateline

*Toronto*—Early in June J. R. H. Noble, director of the meteorological branch, announced the names of 22 co-operative weather observers who were presented with an award for excellent weather reporting over a number of years.

There are more than 2,200 weather reporting stations in Canada. At stations other than those staffed by D.O.T. employees. Observations are taken by co-operative observers who perform their duties in the public interest.

This year's awards, desk barometers, are the 11th of a series of annual awards. Recipients were as follows:

| | |
|---|---|
| R. H. Dean | Toronto Highland Creek, Ont. |
| Armand Savoie | St. Charles de Caplan, Que. |
| Rev. Sister Marie Emmanuel | St. Romuald, Que. |
| Rev. Philippe Mailhot, S.C. | Victoriaville, Que. |
| Charles T. Doherty | Pleasant Bay, N.S. |

| *Observer* | *Station* |
|---|---|
| A. Dickinson | Alouette Lake, B.C. |
| J. Blake | Coquitlam Lake, B.C. |
| Mrs. Ruth Mason | Hope Kawkawa Lake, B.C. |
| David N. Way | Sardis, B.C. |
| Norris E. Hyde | Sicamous, B.C. |
| Red Deer Fire Dept. | Red Deer, Alta. |
| Mrs. Steve Zinkewich | Vilna, Alta. |
| Stanley Barholz | Brownfield, Alta. |
| G. R. Portsmith | Kitscoty, Alta. |
| J. B. Larre | Butte St. Pierre, Sask. |
| Ewalt Schwanke | Kuroki, Sask. |
| K. E. Robertson | Denzil, Sask. |
| Victor Shebeski | Arborg, Man. |
| Edward G. Hoehn | Grass River, Man. |
| G. W. Jackson | South Bay Mouth, Ont. |
| Mrs. Walker Drummond | Millgrove, Ont. |
| R. C. Robinson | Durham, Ont. |

*Scott Air Force Base, Illinois*—Weather matters of national concern to Canada and the United States were the topic of conversation for these weather scientists. At USAF Air Weather Service headquarters for briefings, Dr. Donald P. McIntyre (center), chief of research and training, D.O.T. meteorological branch, met with Brig. Gen. Ray W. Nelson, Jr., air weather service commander (right), and Dr. Robert D. Fletcher, air weather service director of aerospace sciences. (A copy of the January / February issue of News On The DOT is seen on the table.)

# D.O.T. makes Awards to Ships' Weather Observers

For the past 17 years the meteorological branch has presented book awards to certain merchant and Canadian Government vessels for excellence in their voluntary work of making weather reports during voyages on the high seas, Canadian coastal waters and the Great Lakes.

Most maritime nations of the world enlist the aid of merchant vessels in obtaining weather data from the oceans. Indeed it is from the reports of these ships that most of man's knowledge of oceanic weather has been acquired. Out of a world total of about 4,000 ships, Canada has 122 ships which report weather conditions regularly for our benefit, and that of any other country which may receive their reports.

Four times a day, at fixed hours, the ships' officers take a few minutes out from their regular shipboard duties to record pressure, temperature, wind, humidity, clouds, visibility, waves, and several other aspects of the weather prevailing at the time. They transform all this information into a condensed code which is known the world over, and hand the report to the ship's radio officer who transmits it to the nearest coast radio station, which in turn relays it to the meteorological service of the country concerned. This message, together with hundreds of others, is used immediately by meteorologists ashore to prepare forecasts for the mariners themselves, for aviation, the general public, and numerous other agencies.

Since this work is, by tradition, voluntary, the meteorological branch presents these "Excellent Awards" annually to ships whose weather reports for the past year were of excellent standard in regard to both quantity and accuracy. The awards are a small tangible token of the branch's gratitude for work well done on its behalf.

This year the branch presented 55 awards to the captains and officers of 38 merchant and Government ships. The awards are always books of general interest to seamen. This year's selection was "Oceans—A Pictorial History of Man's Explanation of the Deep."

*Dr. P. D. McTaggart-Cowan, centre, receives Patterson medal from J. R. H. Noble, director, meteorological branch. Applauding at left is Dr. Andrew Thomson, this year's other recipient of the coveted award.*

# Awarded Patterson Medal

Dr. Andrew Thomson and Dr. Patrick D. McTaggart-Cowan were honoured on June 8 by the presentation of Patterson Medals made at a luncheon of the Royal Meteorological Society (Canadian Branch) held at the Faculty Club of the University of British Columbia. The occasion was unique in that both recipients are former directors of the department's meteorological branch and the presentation was made by the present director, J. R. H. Noble.

The Patterson Medal award, established in honor of the late Dr. John Patterson on the occasion of his retirement as director of the Department of Transport's meteorological branch in 1946, is given for sustained contributions to Canadian meteorology over a period of years or for a single outstanding contribution by a Canadian to the advancement of the science.

Andrew Thomson, D.Sc, M.A., O.B.E., a native of Dobbington, Ontario, was director of the meteorological branch from 1946 to 1959. Prior to joining the branch in 1932, Dr. Thomson had been associated with Thomas A. Edison in research during World War I. He played a leading role in a number of scientific expeditions, served as director of the famous Apia Observatory in Samoa and as aerologist in New Zealand. Dr. Thomson was made an officer of the Order of the British Empire in 1946, awarded the Gold Medal of the Professional Institute of the Public Service of Canada in 1952 and received the Honorary Degree of Doctor of Science from McGill University in 1958. The citation accompanying the Patterson Medal award noted his outstanding contributions to Canadian meteorology for more than 25 years and emphasized his leadership in forging a link between the universities and the government service, and his service to international meteorology through his lengthy membership on the Executive Council of the World Meteorological Organization.

Patrick Duncan McTaggart-Cowan, D. Sc., M. B. E., a native of Scotland, came to Canada as a youth and graduated from the University of British Columbia in 1933. He attended Oxford University as a Rhodes Scholar and received an honors degree in Natural Sciences in 1936. Dr. McTaggart-Cowan joined Canada's weather service in 1936 and was appointed director in 1959. He resigned in early 1964 to accept his present position as President of Simon Fraser University at Burnaby, B.C. He was made a Member of the Order of the British Empire in 1946 and in 1959 received the Robert M. Losey Award from the Institute of Aeronautical Sciences in recognition of his outstanding contributions to the science of meteorology as applied to aeronautics. In 1961 his alma mater conferred upon him the honorary degree of Doctor of Science.

The citation accompanying the Patterson Medal award to Dr. McTaggart-Cowan noted his sustained contributions to Canadian meteorology and emphasized his role in the development of meteorological services for trans-Atlantic aviation and in international meteorology, his leadership in the development of meteorological services, and his encouragement of meteorological research within the government service and at Canadian universities.

*Toronto*—The first two-year course for the Master's degree in meteorology at the University of Toronto ended this spring with nine graduates. Seven are employed by the meteorological branch, one has transferred to the Department of Agriculture and one has since resigned from D.O.T.

Inaugurated at the University of Toronto in 1963 the course allows more time for research and thesis work as well as for advanced courses in specialized fields. The first year is an academic year followed by two months of "Advanced Forecasting Training" by the meteorological branch. The second year is devoted primarily to research studies and thesis but it includes advanced courses in selected specialized fields such as hydrometeorology, micrometeorology, numerical weather prediction and cloud physics.

Meteorological branch training staff participate in lecturing, laboratory instruction and research and thesis supervision.

# Did You Know?

- Canada's lowest temperature ever, 81 degrees below zero, was officially recorded at Snag, Yukon on February 3, 1947.
- Canada's highest temperature, 115°F, was officially recorded at Gleichen, Alberta on July 28, 1903.
- Less snow falls in the Arctic than practically anywhere else in Canada.
- Fifty hurricanes have visited Canada in the last 50 years.
- Canada has added two words to the weatherman's dictionary—chinook and blizzard.
- A desert is a place getting less than 10 inches of rain a year. Parts of British Columbia are desert by this definition.
- Canada's weather service is 28 years older than Canada—it began in Toronto in 1839, 126 years ago.
- Daylight saving time was invented in Canada.
- The windiest place in Canada is not the corner of Portage and Main in Winnipeg, but Cape Hopes Advance in Northern Quebec.
- Despite talk of "April showers", April is not the rainiest month in Canada—in fact, in most parts it is one of the least rainy.
- The most northerly weather station in Canada is at Alert on Ellesmere Island, 600 miles from the North Pole.
- The highest weather station in Canada sits atop Old Glory Mountain in southern B.C.
- One hundred years ago grammar schools were required by order to take daily weather observations.
- Despite the old saying, the fact is that it is never too cold to snow.
- Tornadoes do occur in Canada. Regina suffered severe damage from one in 1912, and Sarnia was heavily hit in 1957.

# Retirements

## A. R. McCauley

A. R. McCauley, regional meteorologist at Vancouver, retired in August after 35 years of government service.

A native of Moose Jaw, Saskatchewan, Mr. McCauley graduated from the University of Saskatoon in 1928 and went on to the California Institute of Technology from which he received a Master of Science degree. In 1930 he joined the federal government's weather service and seven years later was assigned to Vancouver to establish a forecasting service. In 1948 he was appointed regional meteorologist and held that position until retirement.

Mr. McCauley was feted by his co-workers in the Vancouver region at a party at the Capilano Canyon Garden. It was a joint celebration, in honor of both Mr. McCauley and A. H. Wilson, and was attended by some 200 guests.

*A. R. McCauley (standing right) and P. D. McTaggart-Cowan are amused by greeting card attached to retirement gift.*

*CCGS STONETOWN*, a Pacific Ocean weather ship based at the Department of Transport Victoria District Marine Agency, is a former Royal Canadian Navy frigate. Along with two similar vessels, she was acquired by the Department of Transport and converted to a weather ship in 1950. She occupies Ocean Station "Papa" in the Pacific Ocean, some 900 miles west of the British Columbia coast. She was built at Canadian Vickers Limited, Montreal.

## CCGS STONETOWN

LENGTH: 283 feet.

BREADTH: 36 feet, 5 inches.

DRAFT: 13 feet, 6 inches.

POWER: Steam reciprocating; twin screw; 3,700 IHP.

GROSS TONNAGE: 1,883.

# 1966

## Senior Management Seminar

*The winter sports for which Mont Gabriel, near Montreal, is famous were left far in the lurch January 3-14 as 65 members of D.O.T.'s senior management met at the lodge to engage in a heavy round of lectures and seminars on plans for introducing a decentralized system of financial management and the latest in management concepts. A similar seminar is planned for April 11-22. Shown left to right are—seated, D. A. Lane, Ottawa; H. H. Bindon, Toronto; D. B. Kennery, Ottawa; F. W. Benum, Toronto; E. Winsor, Ottawa; D. A. H. Farmer, Ottawa; H. Gourdeau, Ottawa; Darell DeBow, Ottawa; Miss Shirley Lago, Ottawa; Don Black, Ottawa; Harvey Johnston, Ottawa; H. Thompson, Ottawa; E. Hickson, Ottawa; W. A. McPherson, Ottawa; G. C. Tilley, Ottawa; A. R. Haines, Ottawa;— econd row, W. H. S. Neales, Ottawa; R. B. Campbell, Ottawa; M. E. Louch, Ottawa; J. E. Devine, Ottawa; T. I. Nightingale, Ottawa; J. E. Smyth, Winnipeg; W. D. G. Stratton, Moncton; H. J. Williamson, Ottawa; N. Dreskin, Ottawa; T. G. How, Vancouver; I. K. Leslie, Charlottetown; J. E. Goulet, Montreal; H. R. Kaatz, Winnipeg; M. Baribeau, Montreal; F. M. Weston, Dartmouth; G. M. Mulvihill, Ottawa;—third row, D. J. Hartt, Ottawa; A. E. Weichel, Toronto; L. T. Campbell, Toronto; C. H. Delisle, Montreal; G. G. McLeod, Ottawa; J. I. Carmichael, Ottawa; H. A. Vaughan, Moncton; R. W. Goodwin, Ottawa; W. L. Inglis, Winnipeg; T. H. Prescott, Moncton; I. A. Macaskill, Edmonton; P. A. Chouinard, Ottawa; H. A. Stevenson, Vancouver; E. O. Ormsby, Saint John; A. H. G. Storrs, Ottawa; J. M. Platt, Ottawa; R. L. Davies, Montreal;—back row, D. A. McDougal, Ottawa; D. G. Keddie, Ottawa; E. F. Porter, Ottawa; D. M. Ripley, Ottawa; J. A. L nahan, Moncton; J. R. MacKay, Ottawa; J. N. Ballinger, Ottawa; R. R. Macgillivray, Ottawa; H. J. Taylor, Edmonton; H. M. Wilson, Toronto; T. M. McGrath, Ottawa; H. C. McCaully, Ottawa; D. H. Hemming, Ottawa; G. Sicotte, Ottawa; F. T. Hughes, Winnipeg; A. H. Taylor. Course-members not photographed are K. H. Ewing, Edmonton; R. A. Gould, Ottawa, and R. E. Harris, Toronto.*

*Director of the Meteorological Branch J. R. H. Noble (centre) presents a skill saw to Mr. Humphrey. Mrs. Humphrey is seated at left.*

Over 70 meteorological branch co-workers of BLAKE HUMPHREY, together with representatives of private communications agencies, gathered on December 2 to wish him well at a retirement luncheon. Mr. Humphrey retired after 35 years of government service, 28 of which were spent with the met branch.

Mr. Humphrey began his met career as a teletypist in Lethbridge, Alberta and was appointed district teletypist supervisor in 1941. The increasing importance of Edmonton as a communications centre led to his transfer there in 1946. He was responsible for field administration of meteorological communications in Western Canada and worked closely with Canadian and American military personnel.

In 1952 Mr. Humphrey was transferred to Toronto headquarters as divisional supervisor (Weatherfax) of the national facsimile system used to transmit weather information in chart form to weather offices across Canada and to ships at sea.

At the luncheon the guest of honor was presented with a slide projector and screen and a skill saw. F. W. Benum, chief, forecast division, was the master of ceremonies and J. R. Noble, director, presented the gifts. The picture shows Mrs. Humphrey, left, Mr. Noble and Mr. Humphrey.

## Recent Suggestion Award Winners in D.O.T.

J. J. Kinisky, a meteorological technician at Edmonton, received a $50 award for suggesting that a particular make of photocopying machine be modified to save in consumption of ammonia when it is not in use.

# Met branch develops new forecasting aid

By WILLIAM DUNSTAN

Most water temperatures are taken by means of an immersion thermometer "in a bucket"; Don Massey of the meteorology branch's climatology division takes them from 500 feet or more up in the air!

Since the beginning of last year, he has been flying over the Great Lakes testing an infra-red radiation thermometer as an airborne indicator of surface water temperature.

T. L. (Lloyd) Richards who, as head of the Lakes Investigation unit, is in charge of the project, explains that some means of taking water temperatures over a large area in a short space of time would be extremely useful in forecasting meteorological conditions over large lakes and their adjacent land areas. It also could help greatly in assessing water losses through evaporation and in studies of the formation and dissipation of ice.

The radiation thermometer seemed worth investigating and the area of experimentation chosen was the Great Lakes, where the met branch has a continuing need for observations of surface temperatures.

The thermometer works by sensing the radiant energy from the surface at which it is directed. It compares this reading with an accurately calibrated reference black body and converts the difference to an electrical signal which varies with temperature. This reading is shown on a meter and transcribed automatically onto a chart by means of a pen.

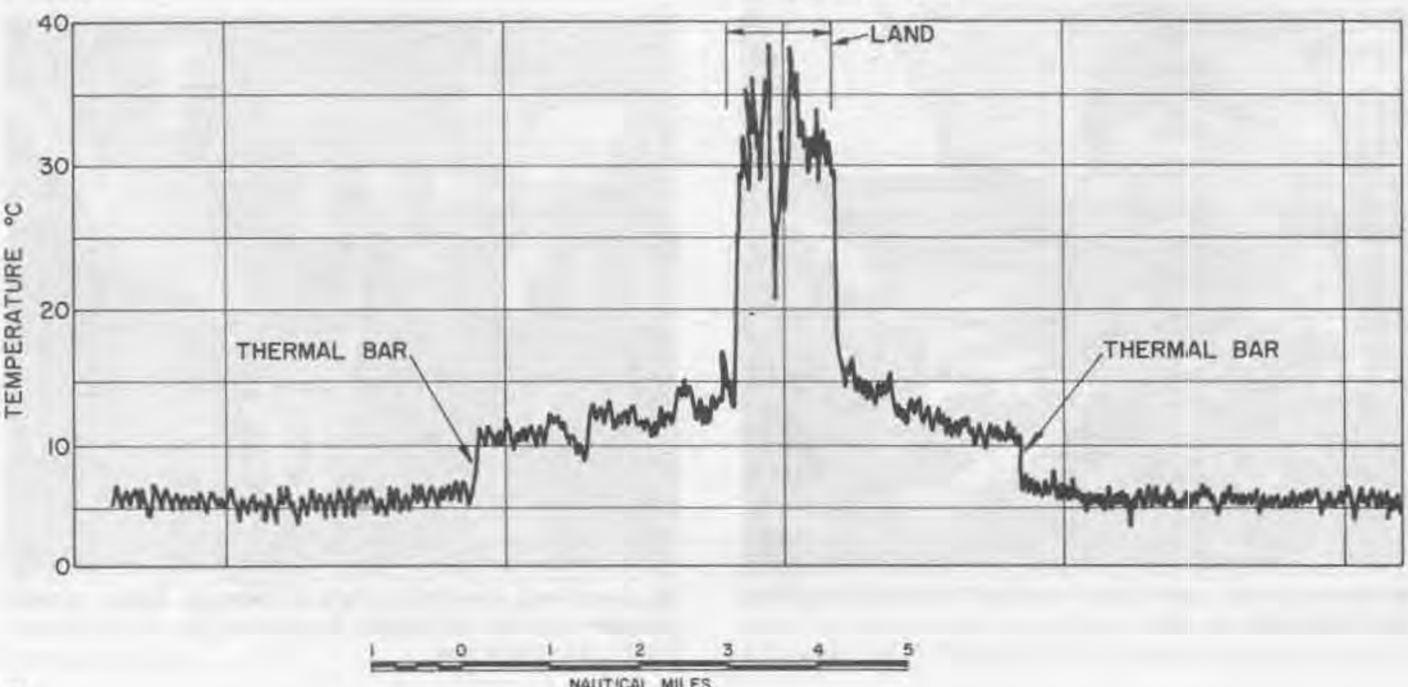
Don Massey, a research assistant, made his first flights in conjunction with the meteorological branch's regular ice survey of the Great Lakes, pointing the sensor through a camera-bay in the bottom of a twin-engined Lockheed 14. The first readings fluctuated wildly, mainly because of cold air flowing into the bay around the sensor.

Lloyd Richards took the problem to Wendell Smith, elec-

*continued on page 10*

*This temperature trace was made at the Lake Ontario shoreline last May.*

*Les températures indiquées ont été captées au-dessus du lac Ontario en mai dernier.*



# On prend la température de l'eau — à 500 pieds dans les airs

Qui donc aurait pensé qu'on en serait venu un jour à prendre la température de l'eau. . . à 500 pieds dans les airs. C'est pourtant ce que fait Don Massey, du Service de la météorologie.

Depuis le début de cette année, Don fait des envolées régulières au-dessus des Grands Lacs, où il met à l'épreuve un thermomètre aux rayons infra-rouges qui sert a déceler les températures de l'eau.

Le directeur du projet, M.T.L. (Lloyd) Richards, nous explique que cette façon de prendre la température de l'eau, à cause de la vaste étendue de territoire couverte en peu de temps, permet aux spécialistes de formuler des prévisions météorologiques pour les grands lacs et les terres adjacentes. De plus, elle permet d'évaluer les pertes d'eau causées par l'évaporation et d'étudier la formation des glaces.

Ce thermomètre spécial est équipé de dispositifs ultra-sensibles qui captent les éléments de la température. Ces informations sont ensuite transmises à d'autres appareils hautement spécialisés pour être enfin enregistrées et notées automatiquement sur un graphique.

Don Massey a tenté ses première expériences en pointant tout simplement son thermomètre par une ouverture au fond d'un bi-moteur Lockheed 14. Les indications ont oscillé follement sur le graphique, et cela à cause de l'air froid circulant autour du thermomètre.

Lloyd Richards a immédiatement soumis le problème à M. Wendell Smith, un spécialiste de l'électronique, qui a proposé divers moyens de protéger contre les courants d'air les dispositifs trop sensibles du thermomètre. On a réussi ainsi à réduire sensiblement tous les inconvénients de ce côté.

La prochaine phase du programme a été d'évaluer l'utilité du nouvel instrument, découvrir les erreurs commises dans l'enregistrement des températures et d'en déceler les causes. A cette fin, on a fait appel à la garde côtière qui a prêté les services du Porte Dauphine. Plusieurs envolées ont été effectuées au-dessus du navire à des altitudes variant entre 200 et quelques milliers de pieds. A bord du navire, on a pris la température de l'eau et fait d'autres tests sur les conditions météorologiques. Les résultats ont été comparés à ceux qu'on obtenait du haut des airs. Ce fut un succès. La différence notée ne s'élevait qu'à un degré centigrade, plus ou moins.

Lloyd Richards est convaincu qu'on vient donc de mettre au point un instrument pratique qui saura rendre les plus grands services dans tous les domaines de la météorologie. Il reste encore

*continué à la page suivante*

*Lloyd Richards, who is in charge of the research project, takes the temperature of Lake Ontario by pointing the sensor head of the radiation thermometer out of his office window at the mile-distant lake.*

*Lloyd Richards, qui a la responsabilité du projet, prend la température du lac Ontario en pointant le thermomètre en direction du lac sis à environ un mille de son bureau.*

*Research Assistant Don Massey sits at the controls of the airborne radiation thermometer through which he records lake temperature while in flight.*

*L'adjoint aux recherches Don Massey vérifie les données transmises par le thermomètre qui a décelé, du haut des airs, les températures des lacs qu'on survole.*

**New Aid:**
tronics expert in the instruments division. The result was a baffle, like a streamlined stovepipe, which protrudes from the bottom of the plane and induces a gentle outflow of air from the cabin. Fluctuation was cut down further by raising the sensor higher off the floor in a shock-resistant bracket. As well, they experimented with a polyethylene film placed over the sensor head. This also cut down the fluctuation but made the reading two or three degrees too high.

Next phase of the program was to evaluate the instrument's usefulness for making lake-wide surveys and for detecting small-scale water temperature variations. It also was necessary to study the causes and extent of errors. This is where the department-operated C.C.G.S. Porte Dauphine came in. Numerous flights were made over the research vessel at altitudes ranging from a few hundred to a couple thousand feet as Great Lakes Institute technicians on the ship measured water temperatures and the meteorological conditions in the air between the aircraft and the water. In all these tests the new instrument did well and the technique now is considered reliable to within about one degree celsius*.

"We feel that already we have developed a valuable and practical research tool," says Lloyd Richards, "but there are numerous implications of a highly scientific nature that call for more sophisticated research. The higher the aircraft flies, the more distortion there will be in the readings, depending on the moisture content and temperatures of the intervening air, as well as other factors. The complex problem of determining what precise effect these factors have is being tackled by Rod Shaw, a staff member of the met branch who now is taking his Master's degree from the University of Toronto through D.O.T.'s educational assistance program. He has made this study the subject of his M.A. thesis."

Basic experiments are pretty well completed now and Lloyd Richards expects that operational flights will begin this spring. Besides this specific application, the project has made a considerable contribution to general scientific knowledge.

A report on the test and evaluation of the airborne radiation thermometer has just been published as a meteorological branch technical paper. Rod Shaw's contribution will be described in his Master's thesis, and Lloyd Richards expects to present an overall review of the whole program to a world-wide symposium on the hydrology of lakes and reservoirs to be held in Italy this fall.

**La température de l'eau:**
évidemment beaucoup de travail à faire dans ce domaine, puisqu'on ne connait pas encore tous les facteurs qui influeront sur le fonctionnement de l'appareil à de plus hautes altitudes, par exemple. Un travail de recherches sur ces questions est actuellement en préparation. C'est Rod Shaw, membre du personnel du service de la météorologie, qui prépare présentement sur le sujet sa thèse de maîtrise de l'Université de Toronto.

De son côté, Lloyd Richards se propose de soumettre un exposé général de son programme lors d'un symposium mondial sur l'hydrologie des lacs qui aura lieu en Italie à l'automne de 1966.

**The celsius scale is the centigrade scale, renamed by many scientists to honor Anders Celsius, a Swedish mathematician and astronomer of the Eighteenth century who invented the centigrade scale.*

*Toronto*—In March twenty-five Canadian weather observers received pendant type wall barometers as awards for excellence in weather observing and reporting. Among the recipients was Mr. W. H. Wearne, of Telkwa, B.C., who has been taking regular weather observations for the meteorological branch since 1922. This was the second award to Mr. Wearne.

In announcing the awards, J. R. H. Noble, director of the meteorological branch, stressed that Canada is particularly fortunate in having the co-operation of many individuals in maintaining weather stations. These co-operative weather observers are supplied with instruments by the branch. They take time each morning and evening to observe and record observations of temperature and precipitation. The observers at several of the 2300 weather stations in Canada have performed their duties for many years in the public interest without remuneration from the meteorological branch.

The weather reports submitted by the co-operative observers, along with reports received from 275 stations staffed by employees of the department, are used in the compilation of weather statistics for the various monthly reports published by the branch.

The awards are the twelfth of such annual awards. Winners were selected on the basis of faithful service over a period of at least five years, along with excellent weather reporting. To some of the observers, weather is an interesting hobby, others make use of the observations in their business activities and some take the observations solely as a public service.

# Grandfather's Mystery Solved

By LYONE BOULT*

It was raining, the ground was muddy and nearly everyone was disappointed that it was not a white Christmas.

My husband's grandmother, however, was not unhappy about it. It gave her an opportunity to repeat: "In my time . . . " and to describe what she called "real" winter and "real Christmas weather". She "remembered" the soft snow that "always" fell slowly in large sparkling flakes on Christmas eve, blanketing the fields, the houses and the horsedrawn carriages that trotted merrily towards the church for the midnight service.

It was a very poetic picture, but not an entirely true one. She chose to remember the occasional December 24 that was white and mild, blotting out from her memory the other more numerous rainy, cold, nasty Christmas Eves when the roads were flooded and too muddy to be passable.

No one ever challenged her. We let her cherish that beautiful Christmas Eve memory to the end of her days, even though we had found out the truth about Christmas weather for every December 24 "in her time", way back to the early 1880's, even before her marriage.

You see, every day grandfather had recorded in a diary what the weather was like, sometimes only in abbreviations after other entries for the day. "*Rain*", "*Rain*" "*Cold, roads all washed out and gutted after thaw*", "*Miserably damp and cold and stormy*", "*Rain*". The diary implacably was inscribed year after year for December 24. Then, one bright year—1907, to be exact—there was this entry: "*Lovely Christmas Eve. Snow fell softly, mild, all went to midnight service and reveillon with family*".

For years we wondered what could have motivated such an intense and sustained interest in the weather that grandfather never missed even one day in recording what it was like, even if it was the only entry. He even recorded the weather for the few days back he had missed on the actual dates. It was mystifying, and nothing in grandmother's conversation gave a clue to his motive. She only remembered, very wisely, that the weather was so much nicer and seasonable in those days.

Then one short line among other more important items in our Department of Transport magazine The DOT gave us the answer: "One hundred years ago grammar school teachers were required by rule to record the weather every single day of the year".

We could now account for grandfather's apparent uncommon interest in the weather. He had been a schoolteacher and had recorded the weather not by choice, but because it was one of his routine duties. He had probably never mentioned it to his wife because he had never thought of it.

We are glad that grandfather did keep his diary—no matter what the reason—because we know with certainty that the weather in the "old days" was just as fickle as it is today and criticized just as much.

**Mrs. Boult is a secretary on the Minister's staff.*

# Ice Observers Spot Clues to Tragedy

When three ice observers from the meteorological branch went to work at Sydney, N.S., on February 23, 1966, it seemed a day like any other. A routine ice reconnaissance patrol in a DC-3 was their assignment.

But shortly before take-off Senior Ice Observer John Clarey and Ice Observers H. Jones and W. Webb had another job.

The 336-ton Grand Bank trawler Blue Mist II was missing and the Marine Ice Operations office at Sydney asked them to join in the search which, they were told, was already underway with no results.

The trawler, with 13 crew members aboard, radioed on February 18 that she was fighting heavy seas and would probably be late arriving at Grand Bank. She was never heard from again.

The DC-3 took off—on a direct route from Sydney to Cape St. George. One hour and two minutes later the radar screen picked up a target a few miles off track. The DC-3 swung around for a look. The men were disappointed. It wasn't the Blue Mist.

But then the break came. While swinging back on course, they noticed from 1,000 feet an object that looked like a white whale. The plane flew in closer. It was an overturned fishing dory.

Special precision navigation equipment carried aboard the ice reconnaissance aircraft pinpointed the exact position. This was radioed to the CCGS ALEXANDER and also to Goose Bay Radio and the information was passed on to RCAF search and rescue. The DC-3 continued on its ice reconnaissance mission. But 28 minutes after the transmission of their message, RCAF search and rescue asked the observers to return to the overturned dory and hold until an RCAF Neptune scrambled from Greenwood, N.S.

Using the co-ordinates previously obtained, the DC-3 wheeled around. Only the precise navigation equipment made it possible to return to the exact spot and again keep the dory in sight. Closer inspection during the holding pattern revealed more debris. It was another dory broken up, a large seine net floating in the water, and smaller bits of wreckage. The DC-3 held its pattern until the RCAF search and rescue Neptune arrived. After the second pass sighted the floating debris the ice observers successfully marked all objects in the water. Then they diverted a nearby trawler to the spot. The men continued on their ice reconnaissance mission knowing that they had done all they could, and done it well.

In August 1959 ice observers in Churchill were requested to search for the overdue Norwegian motor vessel VINGNES. The ship was in distress when sighted from the aircraft. Extensive fire damage had severely damaged the rudder and rendered the navigational instruments useless. As a result of information passed by radio, the CCGS ERNEST LAPOINTE came to the rescue.

These examples have shown a dual value in having the precision navigation equipment so necessary to ice reconnaissance. They are very effective in emergency searches.

*Toronto*—When Dr. P. D. McTaggart-Cowan resigned as director of the meteorological branch to become president of Simon Fraser University at Burnaby, B.C. his friends and associates endowed an award bearing his name at the new university.

Recently it was announced that the first recipient of the award is Peter Vitins of Vancouver, B.C. Mr. Vitins, one of the top four students at Simon Fraser University in the 1965 fall term, had an "A" average in a full five - course program in science. His particular interest is chemistry and he organized and was the first president of the university's Chemistry Club.

# *Assignment-* TRINIDAD

An acute shortage of weather forecasters at Trinidad's Piarcro Airport is now over thanks to D.O.T.'s meteorological branch and India-born Canadian meteorologist Arvini Jivanhal Shah.

For some time before 1963 the government meteorological office at the country's main airport neded staff with basic training, capable of taking and transcribing readings. The office which serves eight international airlines, had been forced to replace written weather forecasts by verbal reports when their regular but slim staff of four forecasters and seven meteorological assistants had been reduced by two.

Through Canada's External Aid office the Trinidadian Public Service Commission asked that a meteorologist be loaned to it for a two-year period. They needed an expert to train new forecasters and meteorological technicians, to overhaul, revise and streamline the weather office's operational duties and to survey the instruments and office equipment and make recomdations.

Mr. Shah (pronounced Shaw) was selected for the job. To most, a posting abroad—north, east, south or west— would be a novel experience. But not so for Mr. Shah. To him, travel is second nature. In fact, the novelty would be if and when he spends five or 10 years in one place.

Graduating from the University of Bombay with a B.Sc. degree in chemistry and physics, he later attended the University of California at Los Angeles, finishing in 1952 with an A.B. degree in meteorology. He then joined United Airlines in San Francisco as a staff meteorologist. In 1954 he gave up his job and left the States to tour Europe. After the tour he joined the British Colonial Office's overseas civil service as a meteorologist and was posted to Jamaica for three years.

He found that particular posting rewarding. The biggest prize by far, however, was a local nurse whom he married. When his three years in Jamaica were up, accumulated leave credits allowed him and the new Mrs. Shah time to fly to India to visit his family. In the meantime he had applied to Canada's Department of Transport to see if a vacancy existed in the meteorological branch. One did. It was offered and he accepted.

In June, 1958 the Shah's came to Canada and after a three-month training stint were posted to, of all places, Churchill, Manitoba. From the endless sunny days of Jamaica to the almost endless winter days of Canada's North must have been quite a change, but the Shah's thoroughly enjoyed the 2½ year posting. While Mr. Shah looked after the weather, Mrs. Shah continued nursing.

In 1961, it was on to the weather office at Montreal International Airport and then, in October of 1963, came the posting to Trinidad.

Returning to Canada this past April, Mr. Shah can look back on many accomplishments. From the moment he arrived in Port-of-Spain, the capital of Trinidad, he found plenty to do. To increase the inflow of basic weather data, he established contact with various agencies requesting additional weather data covering an area 800 miles to the east, 200 miles to the west, 300 to the north and south and across Trinidad. He investigated the efficiency of the meteorological instruments and recommended improvements, supervised the operational staff and helped out with shift work to ease the pressure created by staff shortage.

Within six months of his arrival Hurricane Cleo posed a serious threat to neighbouring islands. Luckily Mr. Shah was there. He was the only hurricane forecaster available since the divisional assistant director was away at the time. He worked around the clock until the hurricane was out of Trinidad's area of responsibility.

The primary purpose of the 2½ year assignment, however, began within a few months of his arrival when he set up the first training program for meteorological assistants. The first two-month class was attended by three recruits. The second, by 11. All 14 graduates with the exception of one are now on the Piarcro weather office staff.

In January, 1965 Mr. Shah began a 14-month course for forecasters. Seven Trinidadians were given basic courses in physics, mathematics, elementary meteorology, dynamics, atmospheric thermo dynamics, synoptic meteorology, and operational meteorology. After a few months of on-the-job training the seven were able to undertake full responsibility of duty forecasters.

Mr. Kamaluddin Mohammed, Trinidad's minister of public utilities, described the courses as first class, and praised Canada for affording the technological assistance.

As for Mr. Shah, he was well satisfied with the graduates and their examination results. He enjoyed his posting to the lovely Caribbean islands, but was pleased to be back "home" in Canada. He is now with the weather office at Toronto International Airport.

# Two D.O.T. Meteorologists awarded Patterson Medal

Two Department of Transport meteorologists, D. G. Black, of Ottawa, and J. M. Leaver, of Montreal, were awarded the Patterson Medal during the National Meteorological Congress held in Sherbrooke, P.Q. early in June.

The Patterson Medal Award, founded in 1946, was given to each recipient for his extensive contributions to meteorology in Canada over a period of many years.

Awards in previous years have gone to Dr. Andrew Thomson, Dr. P. D. McTaggart-Cowan, D. B. Kennedy, R. A. Hornstein, Dr. J. S. Marshall and A. J. Childs.

*Donald George Black* joined the Canadian meteorological service in 1942, and served for more than 20 years as a meteorological officer seconded to the RCAF. He served at Pennfield Ridge, New Brunswick; Debert, Nova Scotia; Trenton, Ontario; and Winnipeg, Manitoba. He was senior meteorological officer at the RCAF aviation forecast office, Trenton, for many years and later became meteorological staff officer at training command headquarters, Winnipeg. He is now superintendent of research, training and development at headquarters.

Don Black made major contributions to meteorology in Canada during World War II and helped to shape post-war development of meteorological training within the RCAF. He has also assisted in the development of the central training school for RCAF meteorological observers at Trenton, Ontario.

Born at Tamworth, Ontario, he is a graduate of Queen's University.

*James McGill Leaver* is chief of the meteorological branch's central analysis office in Montreal. He has developed this service from a small unit to a national centre serving the whole country by weather facsimile circuits. The service has become one of the world's foremost numerical prediction units.

Jim Leaver was one of the chief instructors and organizers of the wartime meteorological training courses during the 1940's and was among those credited with maintaining high scientific standards in the Canadian meteorological service during its period of greatest expansion.

A native of Ottawa, Mr. Leaver graduated from Queen's (B.A.) and the University of Toronto (M.A.). He joined the meteorological service in 1938 and served at St. Hubert, Quebec; Trenton, Ontario; Toronto; Ottawa, and currently is at Montreal.

# Cross-Canada Dateline

*Goose Bay*—As part of a familiarization program, members of the Goose Bay weather office staff visited the U.S. Strategic Air Command Alert Force facility at Goose Bay. The group pictured at right in front of a KC-135 aircraft are, left to right: Capt. E. Palmer, E. G. Morrissey, Major J. W. Hunter, P. O. J. Pitre, D. W. Layton, J. H. Wilson, F. J. Amirault, D. M. Fraser, W. A. McFarlane, A. D. J. O'Nee.

*Vancouver*—The department's B.C. weather service is experimenting with special forecasts for the operators of small boats who do not normally have access to forecasts on the marine radio band.

The special service is the result of research by the B.C. safety council, which found that more than 60 percent of the province's losses of small craft in 1965, totalling 84 with a loss of 114 lives, occurred in rough weather for which the boats were not equipped. It appeared that since general forecasts did not give sufficient localized information, little attention was paid to them.

As soon as he learned of the need, Regional Meteorologist John L. Knox arranged for the collection of weather information for release four times daily to radio stations in navigational areas. Small craft operators are urged to check radio reports before setting out and to take transistor radios with them.

It is hoped that this service will cut down on the toll of small craft.

# *Wave Study May Flood Lake Shipper's Pockets*

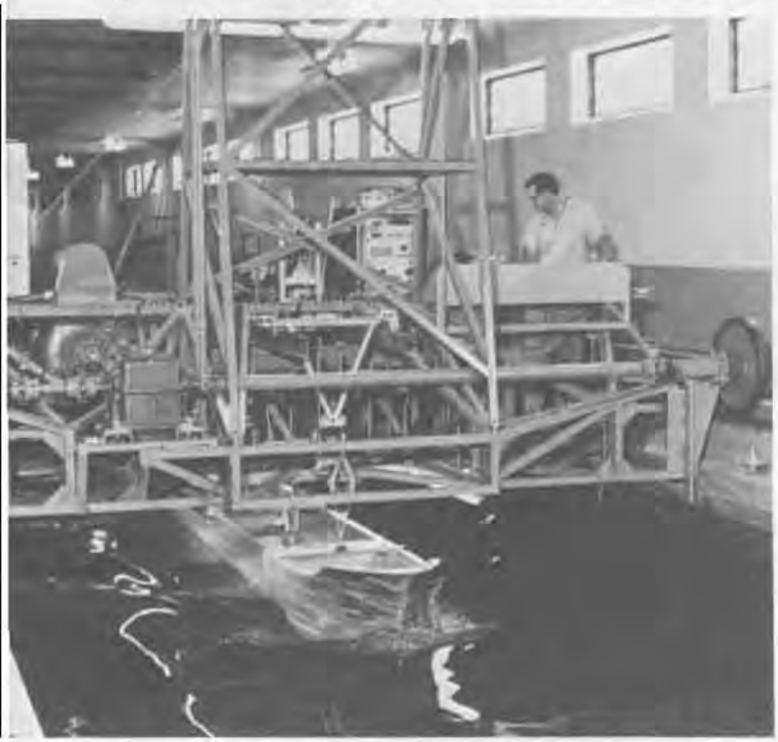


by William Dunstan

A seasonal increase of several million dollars in revenues to the Great Lakes shipping industry could be the result of an enormous international weather research project co-ordinated by D.O.T.

Shipowners are hoping that tests will prove their ships may safely be permitted to increase permissible loading draft throughout the season in the Great Lakes, the Seaway, and the Gulf of St. Lawrence.

This wide-ranging program began in 1961. Shipowners asked steamship inspection service of the marine regulations branch if regulations could be changed to permit them to take Great Lakes carriers, as built, into the Gulf of St. Lawrence beyond inland water limits and if the Great Lakes load-line rules and seasonal limits could be altered to allow deeper loading for a longer navigational season.



Model ship is towed through test tank at National Research Council, Ottawa. Test models move at controlled speeds through measured turbulence while stresses are measured by means of instruments on the overhead towing apparatus.

They stood to gain much. Each inch of draft in a typical 700-foot upper lake vessel represents more than 100 tons of cargo. An increase of 12 inches in draft for all seasons thus would represent approximately 1,300 tons more cargo, or an increase of about $5,000 income per trip. If this were applied over three months a year, allowing two round trips a month, it would represent an increase in earning capacity of $30,000 for each ship.

With larger loads and therefore speedier handling of mass commodities such as grain and ore, too, it is likely that the cost of transportation would be reduced appreciably.

To D.O.T. the big question was safety. To assess the hazards involved, it was necessary to know a good deal about sea conditions in the Gulf of St. Lawrence and the Great Lakes. Since no accurate data was available, a program was launched to obtain some. The Dominion Marine Association gave the federal government $60,000 toward the project. In the United States, where the U.S. Coast Guard is responsible for the American part of the joint enterprise, the Society of Naval Architects and Marine Engineers is contributing funds and technical assistance.

Warren Bonn of steamship inspection division, marine regulations branch, is co-ordinator of the Canadian project. It involves marine regulations, marine works and marine operations and the Meteorological and Telecommunications branches of D.O.T. and the oceanographic groups of the Department of Mines and Technical Surveys.

The marine science branch of the Department of Mines and Technical Surveys first undertook a five-year hindcast study based on available meteorological data recorded on land. There was some hesitation in accepting the findings, however, since the wind-wave formulas currently available are based on ocean conditions. The "fetch" on inland waters is much shorter than on the ocean, where winds can pile up water and waves over thousands of miles. It was decided to make a practical study of wind and wave conditions in the areas concerned to check the accuracy of the formula.

Staff of the National Research Council man strain-gauge equipment installed in three ships—*Ontario Power*, *Saguenay* and *Seaway Queen*—to gauge the strain produced by waves and cargo. Free-floating wave recorders which signal their readings back to the ships provide data on the seas producing the stresses. These recorders were developed by the Bedford Institute of Oceanography for the project.

Among special equipment developed for the project are two floating weather towers from each of which a fibreglass mast rises 58 feet above lake-level. They were designed by Dr. L. A. E. Doe of the Bedford Institute of Oceanography and built in D.O.T.'s Prescott district marine workshop. One is anchored at Superior Shoals, some 40 miles from the north shore of Lake Superior, and the other is in the upper Gulf of St. Lawrence, near Anticosti Island. A third tower, built for the institute, will be installed at sea for independent observations.

The towers have been designed to stay in position with a minimum of disturbance. Each of these open-frame metal structures is equipped with buoyancy chambers which would maintain them quite high out of the water if allowed to float free. However, each is chained to a 30,000-pound anchor and held down well below buoyancy level. The resulting upward push keeps it fairly steady vertically. A 5,000-pound wing anchor keeps the tower from twisting so that the instrument platform eight feet above the water receives little, if any, disturbance.

Instruments make hourly tape recordings of weather data, which are collected periodically. Equipment later will be modified to radio all information, including air and water temperatures, wave measurements, wind velocity and direction, to recording stations on shore.

Not all was smooth sailing for the floating towers. Clay Margison, district engineer, explained that some modifications in the original design had to be devised to cope with certain stress situations. The plans also posed problems for Jack Reilly, the shop foreman, for since the shop was making a completely new piece of equipment, numerous decisions had to be made concerning both details of design and construction techniques.

The first installation became a victim of the weather conditions it was intended to record. After performing satisfactorily for a month, the tower somehow managed to drag itself up where its buoyancy chambers were at the surface. Wave action snapped the tower in two and submerged the upper portion so that, as Warren Bonn says rather ruefully, "the anerometers began recording currents instead of winds."

Other instrumentation includes accelerometers and wave recorders moored off-shore in a number of locations. Their observations are transmitted to recording stations by means of electric cable and radio. Meteorological stations on land also provide data which is incorporated in the survey.

The summing-up of the Canadian data in this wide-ranging, international program will be made at Ottawa in a test tank operated by the National Research Council. Scale models of the types of ships concerned are cut, hinged, and fitted with strain gauges. By this means, the stresses produced in the ship by any particular sea state can be reproduced in the model.

Corrected hind-cast formulas will be derived from the recorded wind and wave information and it then will be possible to review historically from 20 to 40 years of weather data. The wind and other data so obtained will be put through a computer and processed to determine the worst sea conditions which have occurred in the Great Lakes and the Gulf of St. Lawrence. These worst conditions will be compared and reproduced to scale in the model testing tank and then made slightly worse as a safety factor. The stresses produced in the model ships under various load limits will determine what the full-size ships can stand. The Steamship Inspection Service will then know whether or not the lakers can safely increase their loads and extend their season.

When the necessary knowledge is gained, the steamship inspection service will get together with colleagues in the U.S. Coast Guard to reach agreement on recommendations. These recommendations will be considered by the governments of the two countries in deciding whether the joint regulations currently in force should be modified.

Clay Margison, Prescott district engineer, and Jack Reilly, Aids to Navigation shop foreman, study blueprints of floating towers which were built for use in the international wave study.

# Lake Weather Gets Going-Over

Vacation attractions of Lake Huron took second place to duty in late July when the meteorological branch joined forces with the Great Lakes Institute for an intensified weather survey at Baie du Dore field station.

Lake weather got a through going-over from 1,000 feet to water level (and below!) when the basic resources of the field station were supplemented by the research ship CCGS Porte Dauphine and an aircraft carrying the airborne, infra-red radiation thermometer which the meteorological branch recently developed for taking lake temperatures from the air.

The field station has a weather tower in some 45 feet of water about two miles from shore. Rising 30 feet above the surface, it records the air temperature and wind at heights of 7½, 15 and 30 feet above lake level. A newly-instrumented, outboard-powered catamaran takes similar data from the 7½-foot level down to the water-line.

The Porte Dauphine's meteorological boom takes a micro-profile of the temperature, humidity and wind from the surface to a height of 44 feet. In addition, the ship sends up wiresonde balloons to a height of 1,000 feet, tethered by means of nylon cords, to record these factors at higher levels. Water temperatures also are taken, both by means of an immersion thermometer and special ship-board tests of the radiation thermometer.

During the survey the radiation thermometer also was used in an aircraft to take lake temperatures from higher altitudes over a greater area.

Lloyd Richards, head of the met branch lakes investigation unit, was in charge of the project. Research Assistant Don Masse was his principal aide. Other D.O.T. personnel included Meteorologist R. W. Shaw, who was in charge of operating the infra-red thermometer on board ship, and Research Assistant George Irbe, who operated it on the aircraft. Research Assistant R. G. Chapel was in charge of the wiresonde operations. Michel Moschos, instrument technician, was responsible for the lake tower and the catamaran, while Student Assistant Robert Root is the permanent staffer at the field station during the summer.

The main objective of the project, Mr. Richards explained, was to study the transfer of energy from winds to waves. Since this has been found to vary with the temperature of the water and the temperature structure of the atmosphere, an intensive study of temperatures was of special importance. The many methods of recording not only ensure provision of the necessary data but also afford an opportunity to compare the methods of collecting these data.

Lloyd Richards and Bob Root check equipment aboard the new 28-foot "Met Cat" research catamaran. The craft is instrumented to record weather data near water-level.

# Double Ceremony-

# *Launching and Christening For New CCG Weatherships*

by K. M. Parks,

Monday, July 4, was an important day for the Canadian Coast Guard. As the sun was setting, hundreds of people thronged the shipyard of Burrard Dry Dock Company Limited in North Vancouver. They were there to see the first of two new weather-oceanographic vessels, CCGS "Vancouver", officially being accepted for Canadian Coast Guard service, and a sister ship, CCGS "Quadra", being launched.

Gordon W. Stead, assistant deputy minister, marine, accepted "Vancouver" on behalf of the Department of Transport while Mrs. J. R. Nicholson, wife of the Minister of Labour, was sponsor of "Quadra".

The scene was an impressive one. The gleaming new "Vancouver", ship-shape and already undergoing trials, lay quietly in her berth beside the ways down which "Quadra" slid smoothly into the harbor after Mrs. Nicholson broke the traditional bottle of champagne against her towering bow.

The ceremony had an international flavor unique in the department's shipbuilding annals. Senor Carmelo Matesanz, representing His Excellency Javier Conde, Spanish ambassador to Canada, was present in recognition of the naming of the new ship after the Spanish navigator who, along with the English Captain Vancouver, explored the Canadian west coast in the eighteenth century. In an address at the launching, Labour Minister Nicholson referred to "Vancouver" and "Quadra" as ships of international importance, designed for none but peaceful purposes for the benefit of many nations. They are equipped, he said, with the most advanced scientific equipment for the purposes of meteorology and oceanography of any such ships now afloat.

In his remarks during the acceptance ceremony and speaking briefly at the reception which followed the launching, Mr. Stead referred to the far-reaching contribution the two ships would make in the field of research.

He paid tribute to the work that had been done over the years by the old weather ships, "St. Catharines" and "Stonetown". He noted that the two new ships had been designed, not only for peak efficiency in work, but with a degree of comfort and spaciousness of living accommodation that would be appreciated by crews who had to man the rough ocean station for weeks at a time.

J. W. Hudson, executive vice-president of the shipbuilding firm, was master of ceremonies at the launching. Rev. Father Simpson and Rev. Canon Stanley Smith, chaplain to the Mission to Seaman, Vancouver, blessed the new ship. Hon. Clarence Wallace, president of the Burrard Company, spoke briefly and expressed his firm's pride at carrying out the construction of the new vessels.

Mr. Wallace announced that the Department of Transport was presenting a model of the new weather ship to the Inter-governmental Maritime Consultative Organization headquarters in London, England, because the ships were leaders of their type in the world and their work would have such international significance. He thanked the Spanish government, through Mr. Matesanz, for the gift of a commemorative plaque that would be placed aboard CCGS "Quadra" at a later date.

Mr. Matesanz, in a brief speech, made particular reference to the historic relationship of his country with Canada's Pacific coast and said he felt quite at home on the coast with its many traditional Spanish place names.

During the reception Mrs. Nicholson was presented with an inscribed silver tray as a memento of the launching.

An interesting sidelight was the presentation by Mrs. Arthur Laing, wife of the Minister of Northern Affairs and National Resources, of a picture of Captain George Vancouver to Capt. Lingard, master of CCGS "Vancouver". Mrs. Laing was sponsor of that ship when it was named.

CCGS "Vancouver" and CCGS "Quadra" are identical ships and are the longest vessels in the Canadian Coast Guard fleet. They measure 404 feet, three inches in length, are 50 feet wide, have a depth of 30 feet, six inches from the upper deck and draw 17 feet, six inches of water. Each has a load displacement of 5,530 tons and is powered by turbo-electric engines with oil fired boilers, developing 7,500 shaft horsepower. They have a maximum speed of 18 knots and range of 8,400 nautical miles at 14 knots.

They were designed by G. T. R. Campbell and Company, naval architects, of Montreal, to the requirements of the department's shipbuilding, meteorological and telecommunications and electronics branches as well as those of the Department of Mines and Technical Surveys and the Pacific Oceanographic Group at Nanaimo, B.C.

The hull and superstructure forms were achieved following extensive model testing at the National Research Council laboratories, to ensure the smooth operation needed in ships housing a great deal of delicate scientific equipment. Their speed will enable them to reach Ocean Station "Papa" with a minimum of delay and will also be of importance in instances when they are involved in search and rescue work. Each has a bow water jet reaction steering system for low-speed manœuvring, as well as Flumetype anti-rolling tanks to make them steadier in heavy seas.

Both ships will have recreation and hospital facilities and will be fully airconditioned. Each will have four radio-equipped lifeboats, an oceanographic launch and workboat. Total complement of each will be around 96 persons, including 15 technical officers such as meteorologists, oceanographers and electronics technicians.

CCGS "Vancouver" will be undergoing equipment trials of various types until some time in October, when she will replace one of the present weather ships. CCGS "Quadra" is expected to be completed in the spring of 1967. The two ships were built at a total cost in excess of $20,000,000.

# Novel Weather Tower

Meteorologist Dave Colwell, project engineer with the net branch research and development section, Toronto, inspects a novel weather tower designed by the section for use in the Columbia river basin, British Columbia. The tower, which will be installed this fall, will record precipitation, temperature, and snow depth. This information will be sent to a receiving station by means of radio.

# Ice Survey Program Keyed Up To Five-Million-Dollar Tune

Two Douglas DC-4 aircraft with a range of more than 2,500 miles plus safety fuel reserves and a unique assortment of domes and blisters protruding from their fuselages constitute the Meteorological Branch's $5 million answer to many of the problems posed by aerial ice reconnaissance responsibilities.

That is the price-tag of a five-year contract for Kenting Aviation Limited, Toronto, to supply the modified aircraft, avionic equipment, flight crews and maintenance. The department, of course, provides the necessary trained ice observing specialists.

Ice reconnaissance has been among Met's specialties since 1957, when it was made responsible for providing such services in support of shipping in ice-congested waters of the eastern Canadian seaboard, sub-arctic and arctic waters. Through operational trials and an intensified training program, Met's ice reconnaissance unit has developed personnel, equipment and procedures which made it one of the world leaders in this field.

Introduction of the faster, longer-range aircraft is expected to greatly facilitate ice reconnaissance of the enormous region involved and to increase the flying safety margin. The greatest frequency of unfavourable landing weather conditions usually occurs at northern airstrips during the periods when ice reconnaissance is especially important. Thus a returning reconnaissance aircraft may have to fly long distances to reach an airstrip with suitable landing conditions.

Extensive modifications give the planes a strange look. The forward portion of the fuselage is topped by a transparent oval-shaped dome canopy which shelters the main observing position. Both rear sides of the aircraft's body bulge with huge transparent blisters through which the observers survey the ice conditions below. Under the belly protrudes a large rubber radome which houses the radar antenna. The metallic structure of the doppler radar aerial can be seen to the rear.

The interior bears little resemblance to that of a conventional airliner. Instead of neatly-aligned rows of seats, the space is occupied by numerous cabinets housing what looks like an elaborate laboratory. There also is office space, a galley, and a rest area with bunks. The storage area carries an impressive array of engineering tools and spare parts including one complete spare engine and a mountain of survival equipment, clothing, and rations in case the aircraft should be forced down somewhere in the Arctic wasteland.

Right behind and above the pilots, sits the principal visual ice observer. He is the key man and is responsible for mapping the ice as observed along the path followed by the aircraft. His eyes are constantly scanning the area around him, assessing such sea-ice features as coverage, size of individual pieces, age, and topography. Directly in front of him and slightly below eye-level are arrayed the instruments of his trade: 24-hour clock, true heading indicator, radar altimeter, radar scope, doppler position indicator—even a closed circuit television monitor system which enables him to observe the ice directly below the craft or at close range through the magic of zoom lenses. The television monitor extends the range of visibility beyond that of the human eye under certain conditions of atmospheric obscurity.

The electronic and navigational console bears some similarity to those found in the control room of any radio broadcasting station. It is manned by the radar ice observer, a navigator and an avionic technician who also assists the navigator.

A radar ice observer works in close coordination with the main visual ice observer. His primary task is to keep a continuous and accurate plot of ice limits and water features as observed through radar regardless of the visibility conditions. His position at the console is equipped with approximately the same instrumentation provided at the visual station.

An overall precision navigation system provides a high degree of position accuracy, so necessary in the charting of ice conditions as well as enabling the aircraft to rendezvous with ships requiring tactical support.

The navigation equipment itself is among the best available anywhere. Its operation is based on the measure of speed against time along a certain course, supplemented with highly sophisticated electronic parameters. Doppler radar provides accurate ground speed and drift angle information. This information is displayed and then fed into a computer wihich translates the data into actual geographical position co-ordinates. To minimize the consequences of equipment failure, each component is installed in duplicate.

During a mission, all crew members are kept in constant communication with one another through an intricate intercommunications system. Outside communication with ships, ground stations or other aircraft can be originated from any of the main positions.

Flights frequently are of long duration. Sorties up to 12 hours are common and at certain seasons Arctic reconnaissance involving up to 20 hours of flying a day for three to five consecutive days have become routine. Thus the crew must be large enough to take shifts: a minimum of three pilots, a navigator, an avionic technician, two engineers and four ice observers form the standard crew. The ice observers rotate at their appropriate tasks for shifts of approximately two hours each.

The two planes will make routine reconnaissance of the entire eastern and northern shoreline as well as a good deal of the seaway and great lakes. Two smaller aircraft will be chartered to supplement the work of the two DC-4's in the great lakes, the seaway and the approaches to Goose Bay.

Much of the ice observer's service to shipping is immediate-prompt information to Canadian Coast Guard icebreakers on ice conditions when navigating in ice-congested waters. Among other aspects of this service is that of establishing the average data of ice formations and recession in specific areas. Through this information, it will be possible to set navigational seasons in the far north as well as determine ice conditions surrounding potentially strategic harbours.

As an unusual "fringe benefit" service, the observers report the numbers of whales, seals and other mammals sighted. This information is passed along on a confidential basis to the appropriate government agencies.

Technicians make final examination of the first of two DC-4's to go into service while E. Stashyshyn, supervisor ice observer (left) and Ice Observer John Clarey check their charts.

# RETIREMENT?
# Not in a Lifetime!

Meteorology still plays a large role in the life of Dr. Andrew Thomson, O.B.E., Toronto, who, although he retired in 1959 as Dominion meteorologist and director of the meteorological branch, still maintains numerous scientific contacts throughout the world.

In Ottawa recently to attend meetings of the associate committee on geodesy and geophysics sponsored by the National Research Council, he made many perceptive comments about last winter's "busman's holiday" to observe at first hand the various weather services in South America.

He went mainly because, he said, information was scanty and he was curious to learn something about arrangements where, instead of Canada's single weather service, each country has from three to six services. These may include services run by the army, airforce, department of agriculture, department of water resources, and another subscribed to by commercial airlines.

In Brazil, the navy is responsible for observing stations on the coast; stations in the interior are under the department of agriculture and the air force operates the upper air stations. Directors of these services meet each month or so to discuss their responsibilities.

Despite the multiplicity of services, total government expenditures on meteorology in South America are extremely small in comparison with the Canadian weather budget.

Telecommunications facilities are generally poor and there are only 10 radiosonde stations on the entire continent.

At Guatemala, where he began his visit, the meteorological service has an annual budget of $63,000. At Bogota, Columbia, an expenditure of approximately $1,500,000 may be undertaken by the United Nations to reorganize the meteorological service. In Ecuador, the U.N. already has spent more than $1,000,000 in building a climatological and hydrological service and hopes to set up a forecast office at the Quito airport.

Dr. Thomson spent some time with the weather service in Peru and at Santiago, Chile, where the U.N. has been successful in reorganizing the weather service with the aid of a grant of more than $1,500,000 spent over a number of years. Assistance also was provided through a gift from the United States.

Canada's meteorological service is highly regarded in South America, reports Dr. Thomson, and a number of officials expressed the wish to have professional staff trained in this country. While Canada trains a good number of technicians and professionals from Commonwealth countries, there is, however, no program for providing such training to the people of South America.

# WE GOOFED!

Remember "Assignment Trinidad" in our August issue, the story of Meteorologist A. J. Shah, who had been seconded for some three years to Trinidad? And remember the picture which accompanied the story?

It was a picture of Mr. Shah, all right, but not the one in the story. The picture of the gentleman in question appears below.

The man whose picture appeared in the August issue, if you're still with us, is that of Dr. G. M. Shah, an atmospheric physicist who has carried out research in ozone and twilight sky illumination in India under the well known scientist Professor K. R. Ramanathan. He was here on a fellowship from 1964 to last August, doing research at Met's atmospheric research section in Toronto. He evidently liked it here, for he applied to come back to a permanent position with his family and an offer has been made to this extremely well qualified scientist. He is expected to initiate and head a research program on airglow and aurora in the atmospheric research section.

A. J. SHAH

# Smile, Met – You're on Candid Camera!

Paul Leach, National Film Board, photographs a sunshine recorder for use in a film on met activities.

The Meteorological branch is "on camera" these days as a National Film Board crew, under writer-director J. J. Carney, prepares a feature film in color of its activities.

Under the working title *In One Day*, the film is intended to tell something of the diverse activities throughout Canada in which our weathermen are engaged in the course of a typical day.

Shooting so far has taken the crew on ice reconnaissance out of Frobisher; to Montreal; to Baie du Dore, Beatrice, Burlington, and Toronto, Ontario; to Churchill, Manitoba; Marmot Creek and Penhold, Alberta; Victoria and Old Glory, British Columbia. At press time, they were at Eureka, North West Territories, having gone in the new ice reconnaissance aircraft featured in this issue. Final major sequences to be taken will be of icebreaker activities off Sable Island and the Labrador coast.

Notes on the filming contain the *amazing* information that the crew kept encountering weather quite contrary to requirements, despite the "authoritative auspices": Rain wanted at Burlington was found at Marmot, where not wanted; at Penhold to shoot hail research—no hail; at Churchill for rocket-sonding, too much wind wiped out two shoots, but after the disappointed N.F.B. crew departed, this mocking wind abated; at Baie du Dore stiff breezes nearly ruined the filming, and cameramen, clambering from catamaran to tower, risked life and limb for difficult shots; aboard the helicopter filming the weathership the wind, coming through the open door, blew the lens shutter down a stop unknown to the cameraman who, on landing and learning, feared the worst.

This film, which is expected to do a great job of informing the public of weather services available and the enormous research and scientific activities involved, is scheduled for release next July.

*Toronto*—Met Director J. R. H. Noble was elected president of World Meteorological Organization's regional association IV, which includes both North and South America, at its fourth annual meeting in Asheville, North Carolina, last October. Mr. Noble, who will hold office for four years, succeeds Ing. Elliott Coen of Costa Rica. The new vice-president is Ing. Juan Mas Sinta, Mexico's permanent representative to W.M.O.

Mr. Noble thus becomes a member of the executive committee of W.M.O., which meets annually in Geneva, Switzerland.

*Bagotville, Quebec*—We pass on, without comment, an extract from a recent report by our Canadian Forces weather office.

"Unusual requests—briefing for homing pigeon leaving Bagotville 091700Z, arriving Toronto approximately 091600Z with overnight stop at Montreal. Handler seemed worried about 20 kt. wind in Bagotville area. Forecaster unable to speak to pigeon."

On vous transmet, sans commentaire, la remarque suivante tirée d'un récent rapport du bureau météorologique des Forces canadiennes à Bagotville:

«Requêtes peu communes—aperçu du temps pour pigeon voyageur quittant Bagotville 091700Z, attendu à Toronto 091600Z, après un arrêt de nuit à Montréal. Des vents de 20 noeuds, région de Bagotville, semblent inquiéter le propriétaire. Impossible de communiquer avec le pigeon.»

# 1967

the digit

*Vancouver*—A service established last year by the Vancouver weather office in co-operation with interested radio stations in the area, has been given credit by the B.C. Safety Council for a significant drop in the number of lives lost among small craft owners operating in coastal waters.

In a letter to T. G. How, regional director of air services, the council said that four lives were lost during the 1966 season compared to 33 persons, who died the year before because boaters took their vessels out in weather for which the craft were not equipped.

"We place a great deal of emphasis in the saving of lives on the weather reports designed and issued by your office," the council said. "Our board of directors has discussed this matter and they will be writing you an official letter of thanks for this service."

*W. H. Mackie, regional superintendent of observing services for the Vancouver region, presents a book award to P. Plaistowe, chief officer of the S.S. Waihemo on behalf of the Meteorological Branch.*

## SHIP HONORED

*Vancouver*—A New Zealand ship, one of 140 merchant and government ships making voluntary marine weather observations for Canada, was recently honored for its work by the Meteorology Branch.

The S.S. Waihemo, owned by the Union Steamship Company of New Zealand and under the command of Captain A. Dodds, made close to 10,000 weather reports during her nearly 20 years of sailing between Vancouver and Australasia which ended last year as the result of sale to new owners.

The ship's award, a copy of the book "The Wondrous World of Fishes," was presented to Chief Officer P. Plaistowe by W. H. Mackie, regional superintendent of observing services for the Vancouver Air Services Region.

The ship's senior radio officer, R. F. Elsom, also received an award in recognition of his valuable assistance in transmitting the weather reports to shore receiving stations.

The Branch makes these awards annually to certain masters, deck officers and radio officers in recognition of outstanding work in providing weather observations on the high seas, Canadian coastal waters, and the Great Lakes.

In selecting the award winners, the number of observations made and their overall accuracy are taken into account. Of the 140 participating ships, the best 20 per cent are singled out to receive the awards.

# Tribute to Snag

*Snag*—With the closing of the Department's weather station at Snag, an era has passed into history.

For years the very name has been synonymous with frigid temperatures. No place in North America registered official temperatures as low as those at Snag.

On the coldest of mornings there was a measure of comfort to be gained from learning how much colder it was at the Yukon weather outpost.

Of course, local pride may have been wounded on occasion when records of 50 or 60 below were compared with the continent's all-time record of 81.4 below, recorded at Snag on Feb. 3, 1947.

But this was an easy price to pay for the insulation provided against our cold by the knowledge that men at Snag were facing much worse and surviving.

It remains to be seen whether the new location of the weather station (it's now at Burwash Landing) can produce temperatures to excite the imagination like those of Snag.

# THE MANY ROADS TO expo67

by Bryan Goodyer

*Information Services Division*

—A $35,000 installation manned by the Met branch to provide continuous special weather services to the operations control centre on the fair site.

This will include hourly weather observations from the site and from Montreal, short and medium range forecasts for the grounds, and periodic observations from major cities around the world.

To provide the information, an automatic weather observing station will be installed and operated on the site.

Weather bulletins will also be posted on a system of electronic notice boards located throughout the grounds that will include traffic reports and changes in programs for the Expo visitor.

# automatic weather stations for the supersonic age

by William Dunston

*Information Services Division*

Five automatic weather stations, to be installed for a total cost of some $250,000, will help D.O.T. prepare ground support for tomorrow's supersonic transports.

When those huge SST's arrow from continent to continent within the next decade, they will need approach clearance while still more than 1,000 miles from target—indeed, clearance even before take-off will eventually be normal procedure. This will demand fairly precise knowledge of what the weather will be like within fractions of an hour. Accordingly, increased attention is being given to mesometeorology, which is concerned with weather changes within distances of miles and tens of miles and, therefore, within a short space of time.

Tenders have been called for the weather stations, which were designed and developed within the Meteorological Branch. These first production-type stations will assist Dr. Joseph Clodman, supervisor of the synoptic and dynamic research units, in a mesometeorological research project which involves the collection of data within the general area of Toronto International Airport.

The automatic weather station was designed by Jay Dickson, an electronic design specialist of instrument division, who also built a test model of the prototype. The stations are instrumented to record cloud cover, visibility, temperature, dew point, wind speed, wind direction, altimeter setting or pressure, and precipitation in 100th inches. Each weather station sends its reports to a recording centre via cable for compilation and analysis. It can be adapted to report by radio if required.

*Tom Burling, of the synoptic research unit, shows mesometeorological network.*

The project began about four years ago, with Mr. Dickson engaging in design and construction while project management was handled by Henry Belhouse, supervisor of electronic and upper air instruments engineering and research.

Extensive field tests included a three-month trial at Wiarton, Ontario, where the findings of the automatic station were satisfactorily compared with the hourly reports of the aviation station located there.

Delivery of the five stations likely will not occur before next fall, by which time the test model will have performed a very useful service. It is to be installed at Expo 67 from where it will submit regular weather reports for the information of those who plan to attend Canada's world's fair.

But back to Dr. Clodman, who already has experimented with regular observations from various points in the testing area. Similar studies have been made elsewhere, he says, but in other cases the recording stations were placed at regular intervals throughout the area concerned, while physical features of the terrain were largely ignored. He considers that local features—topography, bodies of water and urban effects, for instance, have considerable bearing on short-term weather forecasting. He has, therefore, set up stations where such features may be expected to make appreciable local changes in weather.

Local influences are only part of the picture, of course. In scientific parlance, Dr. Clodman hopes that the network will provide "information on the physical mechanisms which are involved in the interactions between synoptic scale processes, meso-scale eddies and local influences."

It is possible that these automatic weather stations will have a wide application. A number of proposals has already been made by regional offices as to their field operational use.

The introduction of the automatic station is not without new problems of its own. For years, the definition and coding of many weather quantities have been based upon the discretionary are powers of the human observer. The automatic station, on the other hand, makes precise and objective measurements that do not involve judgment and in some cases these must be defined and coded in a different way.

This problem was one of the main topics of discussion at a world conference in Geneva recently, attended by both Mr. Dickson and Mr. Belhouse. The attitude taken was that there are obvious limitations in the duplication of all human accomplishments by machine and this should not necessarily be the goal to pursue. Since the automatic station does perform certain functions reliably and well, procedures should be adapted to take advantage of the benefits it can offer.

Only continuous research can broaden the scope of usefulness of the automatic weather station. Whatever the outcome, it is certain that the knowledge necessary to improve short-term weather forecasting is increasing through this and other research projects. Some of what is learned today may keep many a supersonic aircraft out of trouble tomorrow.

A $15 award went to K. L. Leek, officer in charge of the upper air station at Stephenville, Nfld., for suggesting that a thermometer holder be used at weather stations where some thermometers are temporarily out of service because of extremely low temperatures.

Mr. Leek said a holder or rack would provide a safe place to store the instruments so that they would not be broken accidentally.

*Dr. D. P. McIntyre, left, Met's chief of research and training, is shown at a recent reception held in Tokyo at the home of Japanese Prime Minister Sato. With Dr. McIntyre are Dr. G. Benton, research director of the United States' Environmental Science Services Administration, and Mrs. Benton. Dr. McIntyre was in Japan as a Canadian delegate to the 11th Pacific Science Congress.*



# FROM THE DEPUTY MINISTER

*This issue contains a story on one of the rarities in the Department, a female meteorological technician.*

*Leaving aside the enormous and invaluable help which is provided at the clerical, stenographic and secretarial level, the number of women occupying administrative or technical positions within the Department is not very large. I do not believe that this situation results from any fault or prejudice on the part of the Department. Certainly at the senior level, we admire and respect all their attributes, values and abilities; and hold no prejudice against their working capability. Admittedly some of the positions in the Department, for example where heavy physical work is involved or where there are isolated postings, are obviously unsuitable at least within the present Canadian social context. On the other hand, in a large area of administrative, technical, scientific and professional work, women can usefully be involved.*

*I hope and expect that as time passes and as a result of the applications which they themselves may make, women will perform a larger role in the Department in those areas of employment where as yet they are relatively few in number.*

# winsome weather watcher scores airport "first"

by Mary Botosan

*Cloud ceiling check.*

Thermometers, barometers and anemometers are the tools of her trade.

Twenty-one-year-old Joan Moreland is the newest addition to the staff of the Meteorology Branch of the Department of Transport at Windsor Airport and the first woman to be employed there as a meteorological technician.

The dark-haired young woman, whose home is in Wallaceburg, has been in the business for two years. She received her training with the Department of Transport at Uplands Airport in Ottawa, then worked for two years at Toronto International Airport before requesting a transfer to Windsor so she could be closer to her home.

An interest in geography and mathematics led Joan to apply for the position with the Meteorological service on the completion of Grade 12 at Wallaceburg High School.

"To qualify for the position, you must apply to the Department of Transport, Meteorological Branch, which often has posters in the post office telling of coming competitions," she said in a recent interview. "Generally, you are interviewed and write a 'sort of' IQ test which involves varied questions from cars to mathematical problems."

There are few women in comparison to the number of men who apply for the jobs with the Meteorological Branch, she said, adding: "There were 30 in our training class and only two girls. The other girl dropped out before completing her training and I was the only one to finish."

As a meteorological technician, Joan is required to take weather observations during her working shift and to assist pilots by personally providing them with all available weather information on routes and terminals in which they are interested.

The technician on duty is required to prepare and send out weather reports each hour of the day. Special observations are taken more frequently whenever precipitation of any kind begins or when visibility lowers due to precipitation or other obstructing phenomena such as smoke or fog.

Wet and dry bulb temperature readings are taken and from these the technician must determine the dew point and humidity. Barometric pressure is calculated from the barometer and wind velocity from an anemometer.

"We also go outside to observe the amounts and types of clouds and estimate their height," Joan said. "Some weather stations have automatic electronic equipment for measuring heights both day and night, but in Windsor we have only a ceiling projector for night use."

During the daylight hours, therefore, when ceilings fall to a thousand feet or less, it becomes mandatory to send up ceiling balloons from which the height of the base of the clouds can be calculated by making note of the length of time taken before the balloon fades from sight.

When the observation is completed, a perforated tape is typed up and the entire observation is transmitted by teletype in the form of a one-line report which is coded for the sake of brevity.

In addition to the hourly and special observations, more detailed information is sent out each six hours. These reports are referred to as synoptic observations, which form the basis of weather maps at major weather offices where forecasts are prepared.

Synoptic reports contain the amount of precipitation which has fallen during the past six hours, the maximum and minimum temperatures for a certain period of time, plus most of the current data which normally is contained in the hourly reports.

In the same manner as hourly observations, the synoptic report is sent out by teletype to Toronto and Montreal International Airports. From these two relay centres, the report is transmitted rapidly all over Canada, the United States and Europe.

There have been a few times during her career when Joan has had to make special reports for emergency landings of aircraft. At times, the technician may receive telephone inquiries from the local police asking for weather information on certain days in reference to an accident.

"In Toronto, I even received a few calls from people who said they had seen Martians and wanted to know if we had sighted any," she said.

"Being a girl, it might be a little more difficult to become an officer in charge," Joan said when asked about chances for advancement in the department.

Time spent and performance evaluation are the two main considerations for promotion. A minimum of seven years with the department is required to become OIC at a weather briefing station.

Joan said she enjoys working in Windsor. She added that she liked the Toronto International Airport but found that the city was "much too big for a small town girl like me."

Joan is the eldest daughter of Mr. and Mrs. Douglas Moreland of Wallaceburg.

*—reprinted from the Windsor Star*

*The long range forecast.*

*Barometer check.*

## Alex Burnside

One of the most colorful careers in the history of the Meteorological Branch came to a close recently with the retirement of Alex Burnside after 45 years of service.

Officially, Alex joined "the service" in May 1922 as an office boy. He was made a permanent employee on Aug. 20, 1931 when he was listed as an instrument maker's helper.

In June 1946, he started the first of a number of assignments in the north when he was sent to Southhampton Island. Later he served at radiosonde stations at Baker Lake and Churchill.

Unofficially, the stories about Alex are legion, rich in the wit and human interest of the early days of the 20's when the meteological service was establishing itself in "The Observatory" at 315 Bloor Street West in Toronto.

"In those days, Alex recalls, "all the weather forecasting for Canada with the exception of the B.C. coast was done from Bloor Street."

"Part of my job was to take a copy of the daily weather map over to Eaton's department store where it was put up so that everyone could see it" he said.

Fired because of his almost legendary escapades at least eight times in the first six months of his employment by Sir Frederick Stupart, who was then director of the service, Alex persevered by making sure there were no other applicants for his job so that he was inevitably re-hired.

"I remember Sir Frederick saying on one of the early occasions I was "fired": 'Burnside, you'll never hold a position and you'll never amount to anything,'" recalls Alex with a chuckle.

An incurable storyteller (many of the reminiscences of his career were recorded during an informal chat just prior to his retirement last February), Alex remembers with ease the details of exploits that ranged from being thrown into jail while out doing weather research, to meeting a polar bear face to face while stationed on lonely Southhampton Island.

A classic episode involved a trip to a distant Quebec weather station, necessitated by a series of inaccurate observations. There, Alex discovered that the observer, who was also the community's mayor, fire chief and what-have-you, had gone hunting, leaving a list of weather statistics for the days ahead with the local telegrapher.

During his long career, Alex, who remains a dedicated sports enthusiast, won at least 200 trophies for marathon running.

He represented Canada in the marathon at the 1934 British Empire Games in London, England, and competed in the Boston marathon four times where he once finished in fourth and sixth place in two different races.

A manager, coach and trainer of numerous minor and intermediate hockey leagues around Toronto, Alex has long been active with boys' clubs and juvenile sports.

*Left to right, Fred Hunt, Frank Harris, Alex Burnside, and J. R. H. Noble, director of the Meteorological Branch.*

# W. C. Thurber

W. C. Thurber, officer in charge of the Saskatoon weather office, has retired after 25 years with the Department of Transport.

Born in Nova Scotia, Mr. Thurber attended public and high school and qualified as a teacher. After teaching briefly, he decided to head west, as he put it, "to try my luck" in the Saskatchewan of 1922. There he obtained his degree from the University of Saskatchewan in 1936 and joined the Met. Branch in 1941.

As a meteorological officer, Mr. Thurber was assigned to posts that included Yorkton, Sask., Churchill, Man., and Norman Wells, N.W.T.

His two longest assignments were, however, a tour of duty as officer in charge of the forecast office at Fort William, Ont., from 1947 to 1951, and a tour of duty as head of the weather office at RCAF station Saskatoon from 1952 until the station closed in 1963.

Last Dec. 12, a group of 40 friends that included D. M. Robertson, regional meteorologist at Winnipeg, gathered in the air terminal building dining room at Saskatoon to honor Mr. Thurber and his wife Jean.

*Mr. and Mrs. W. C. Thurber*

# N.B. Volunteer Wins Met. Observer Award

*Moncton*—A New Brunswick man, who has been making voluntary weather observations for the past six years, was one of 24 Canadian weather observers honored recently by the Met. Branch.

Bernard Allan, an employee of the Fredericton research station, Department of Agriculture, was presented with an inscribed pendant type wall barometer by S. W. Dewar, superintendent of general weather services for the D.O.T.'s Moncton region on behalf of Met. director J. R. H. Noble.

In a personal letter which accompanied the award, Mr. Noble stressed that Canada is particulary fortunate to have the co-operation of many individuals such as Mr. Allan in maintaining weather stations.

He said the weather reports submitted by the observers along with the weather reports received from 275 stations staffed by D.O.T. employees are used in the compilation of weather statistics for the various monthly reports published by the branch.

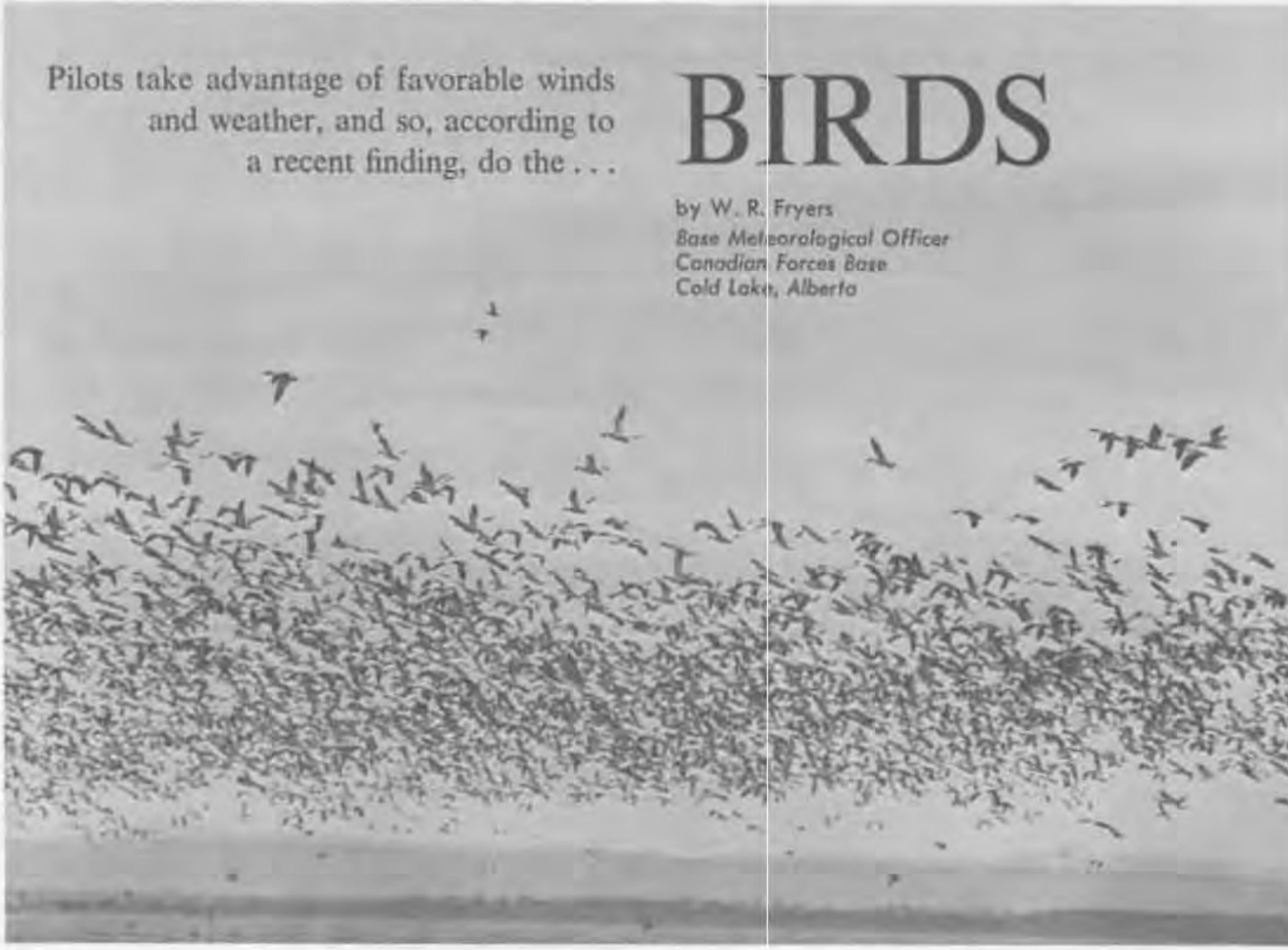
To make their observations, the volunteers are supplied with the instruments necessary to observe and record temperature and precipitation twice daily.

These are the 13th annual awards presented to those selected on the basis of faithful service over a period of at least five year.

Pilots take advantage of favorable winds and weather, and so, according to a recent finding, do the . . .

# BIRDS

by W. R. Fryers
*Base Meteorological Officer*
*Canadian Forces Base*
*Cold Lake, Alberta*



By now, most of the readers of "The DOT" will be familiar with the new importance of bird hazards to aircraft. (See article in the issue of May-June 1964.)

With aircraft coming in bigger sizes and higher speeds every year, the hazard is growing in economic cost too. Something had to be done. Something is being done.

Behind the news stories, there is a lot of urgent action underway to find a means to 'beat the birds.' Many nations are active in this field. None more so than Canada.

All the major airlines and aeronautical organizations in Canada are co-operating in research and development schemes aimed at studying the hazard and eliminating or at least reducing it.

Under the direction of the National Research Council of Canada, which is master-minding the effort, every conceivable avenue of study is being followed, every possible scheme of counter action to cope with the bird hazard is being tried.

One of these is the scheduled forecasting of migration intensity.

Last year—1966—the forecasters of the weather office at the Canadian Forces Base at Cold Lake, Alberta, issued daily forecasts on the movements of birds known to be in the flight zone throughout the spring and fall migration seasons for the guidance of flying operations at the base. Their pioneer effort could well become a pattern for similar routine service in other countries of the world.

Why Cold Lake?

Perhaps it was the equipment of 42 Radar Squadron nearby. Perhaps it was the big stake in air safety for the low-flying CF-104's, where one big bird can bring down a $1,500,000 plane. Perhaps it was the lively interest of the station weather office staff in a challenge involving weather, although not in the scope of their regular duties.

Or perhaps it was because LAC Pete Desfosses broke his leg playing football in September 1965.

No longer able to function as an active weather observer, he was assigned to clerical duties in the office of the senior meteorological officer.

Pete was still on clerical duty when Dr. W. W. Gunn visited the station in October 1965.

Dr. Gunn is an ornithologist—a bird expert, that is—representing the National Research Council and the Wildlife Service of Canada, who came to present the case against birds (involved with airplanes) and the need for project support in studying the problem.

The commanding officer, Group Captain W. J. Buzza, was sympathetic. The senior meteorological officer was sympathetic, too, and he had a man to help with the job. . . LAC Pete Desfosses.

The first step was the assessment of miles of film already available, showing the hour-to-hour picture of bird activity as revealed by radar on the PPI scope. Such films had been taken at several radar sites across Canada but no system for analyzing and cataloguing them had been devised.

They were simply piling up in Dr. Gunn's basement at home, a wealth of evidence awaiting a favorable combination of circumstances to tell their story.

The circumstances turned up at Cold Lake.

A code patterned after meteorological codes was devised and tested by the Fryers/Desfosses team. Hour-by-hour analysis began, first on work sheets, then on coded abstract sheets, and finally on punch cards.

The job grew and by the time Pete's leg was entirely healed a larger team had been assembled under his direction and put under contract as a private enterprise working outside of office hours.

The working up of final results from this vast accumulation of data has now been handed to the computers of the Meteorological Branch of the Department of Transport in Toronto.

Enough evidence on bird migration characteristics was on hand by the spring of 1966 to justify the second step of the project—the forecasting of bird activity to protect aviation.

Birds, it seems, fly the weather. That is, they use favorable winds and weather in 'flight-planning' their migrations.

Thus, there is more than a little sense in asking a weather office to predict bird movements, since the techniques for predicting bird movements turned out to be remarkably similar to the techniques used in making a weather forecast.

First, there must be a network of observing stations reporting regularly on existing conditions. This provides essential data for preparing the forecast and later for verifying it.

In the case of weather forecasts, we have a network of observing stations reporting hourly on the state of the elements.

In the case of the bird activity forecasts, the observations of bird positions are made by radar stations at regular intervals and photographed to provide a record of the PPI scope display. This information was turned over regularly to the duty forecaster at the Met. section.

Second, there must be a history of the trends and normals for each season. In the weather business, we call it 'climatology.' In the bird business, there doesn't seem to be one yet, so I would suggest one: *migrecology*. (This combination word, made up from *migrate* and *ecology*, has excellent references, i.e., Latin and Greek roots.)

In any case, the short and skimpy records that we did have were very valuable for reference in deciding on seasonal normals and for timing daily peaks and minimums of bird activity.

Finally, the "bird-movement forecaster" must use all the available data and his own knowledge of basic principles to estimate trends into the future.

In the case of bird forecasts, the valid period was 24 hours, the time of issue, 10 a.m. daily.

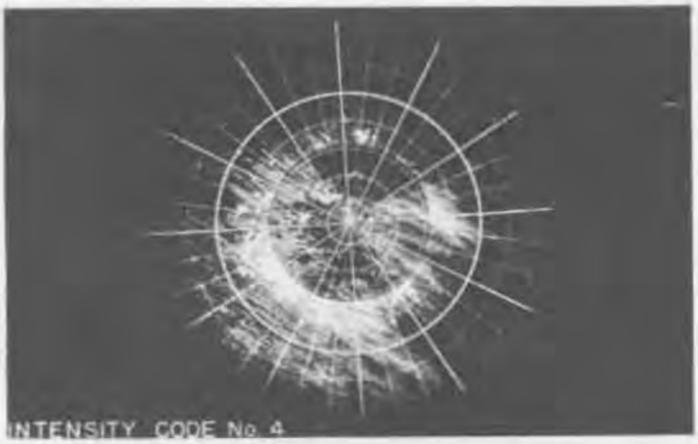
The forecast set out the anticipated intensity of bird activity for each hour, graded according to an eight-point intensity scale. Thus a forecast of Intensity Code Eight for 7 p.m. would indicate maximum bird activity and maximum hazard to aviation at that time.

Sounds relatively simple, doesn't it. It isn't really. There is a lot of art and a lot of science still to be put into it. We are just at the beginning.

As this is being written, Corporal Pete Desfosses is in Aixen Province in France, comparing notes with French technicians and helping with the setup of a new radar observing facility for recording bird activity in that area.

The results will go to Brussels where a special office will soon begin to issue warnings of bird migrations for aviation in Europe.

We at Cold Lake were proud to have had a chance to help.




*BIRD WATCHERS 1967—Electronic bird watchers at a Canadian Forces radar base record bird activity in the area by means of a time-lapse movie camera attached to the console of a PPI (Plan Position Indicator) scope (above). Top photo shows what the scope has seen: Bird activity, which is rated on an intensity Code scale ranging from zero to eight, was about medium at the time the picture was taken.*

*LES OISEAUX N'Y ÉCHAPPENT PAS—Les oiseaux, cause d'ennuis pour l'aviation dans certains secteurs du pays, sont surveillés de près à l'aide d'un radar panoramique auquel on a attaché une caméra pouvant capter leurs déplacements à intervalles réguliers. L'appareil spécial (photo ci-dessus) est installé dans un des immeubles d'un poste de radar des Forces canadiennes en Alberta. Dans la photo du haut, on voit la présence d'oiseaux captée sur l'écran de radar.*

# *MET. Employee Paid $170 for Suggestion*

A Montreal employee has been awarded $170 for a suggestion that resulted in a large saving for the Department of Transport.

S. D. Wood, a communicator with the Central Analysis Office of the Met. Branch at Montreal Airport, suggested that one of the office's teletype circuits be eliminated since its information was available almost simultaneously on other circuits.

The saving on the rental of equipment and the purchasing of paper for the machine amounted to $1,700 a year.

In other awards announced recently, 33 D.O.T. employees have been presented with a total of $790.

They include the following:

S. D. Wood

# NOMAD: Met's New Sentinel at Sea

An unusual-looking buoy bobbing up and down in the rolling Atlantic off the coast of Nova Scotia is proving to be a welcome asset to the staff of the Meteorological Branch.

Called NOMAD (for Navy Oceanographic Meteorological Automatic Device), the device is a self-contained and unattended weather station housed in a buoy that automatically takes its meteorological observations at pre-determined intervals and transmits them by its own radio to receivers ashore.

The first of its kind in Canadian waters, the weather buoy has been loaned to the Met. Branch by the United States Navy for two years.

For the Navy, the loan offers an opportunity to have the serviceability of the equipment tested in severe winter conditions. For Canadian meteorology, it will provide valuable experience in the maintenance and operation of a seaborne station.

The NOMAD was designed to be completely self-contained and to be capable of unattended operation at sea for at least 12 months.

The buoy itself consists of a boat-shaped hull, 20 feet long by 10 feet wide on deck, built up of welded aluminum plates.

Fully-loaded (at a total weight of about eight tons), it draws approximately seven feet of water and has a freeboard of 18 inches.

The interior of the hull is divided into compartments to provide 12 wells in which are housed 48 battery cells and the main electrical components.

NOMAD

The meteorological instruments are housed in waterproof boxes supported on two tubular masts which rise from the aftward end of the deck.

At the forward end, a four-legged tower carries a flashing warning light and two windmills which operate a battery charger.

A 20-foot length of cable supported on floats trails from the stern of the buoy to carry an instrument which measures the temperature of the sea 18 inches below the surface.

The buoy, controlled by its own clock, automatically makes reading of air and water temperatures, barometric pressure, wind speed and direction, converts them into groups of Morse code letters and transmits them at three-hour intervals.

The NOMAD signals on a special frequency which can be picked up by radio stations more than 800 miles away in normal daytime conditions although considerable loss of strength occurs at night due to fading.

Beginning in June, however, the D.O.T. aeradio station at Goose, Labrador, began picking up the buoy's signals in an effort to obtain better night reception.

From the radio stations, the coded reports received are forwarded to the weather office at Sydney where they are translated into the equivalent values of temperature, pressure and wind and sent out over the meteorological teletype circuits to the forecast offices in Eastern Canada where they contribute valuable information for the preparation of weather forecasts for a wide variety of users.

NOMAD's forerunners have operated chiefly in sub-tropical waters, the Caribbean and the Gulf of Mexico, one of them being the first automatic floating weather station to detect a hurricane (Ethel, of September 1960), and another was the first to continue to function throughout a similar storm (Hurricane Carla, of September 1961).

The buoy was shipped by motor transport early last September from Washington, D.C., to the D.O.T. dockyard at Dartmouth, N.S., where it was prepared for its sea trials by technicians from the U.S. Navy and the Telecommunications and Meteorological branch of the Department of Transport.

Within two weeks, all was ready and Canadian NOMAD N4S was towed out to its chosen anchorage by CCGS *Edward Cornwallis*.

The mooring operation was carried out without a hitch in a depth of 50 fathoms despite rough seas and at 20 minutes past 11 o'clock on Sept. 20, 1966, NOMAD transmitted its first observation.

Its powerful signal continued to be received on schedule by D.O.T. stations at Sydney and Canso, N.S., and St. John's, Nfld., throughout the fall, winter and spring in spite of the gales which so frequently lash the western Atlantic at that time of the year.

The buoy was retrieved from its mooring site last April 27 and towed to Dartmouth for inspection and overhaul. Other than a heavy coat of barnacles below the waterline and some superficial damage to the deck railing, it showed little evidence of its seven months at sea.

After six weeks ashore, during which a thorough check of all its component systems and a re-charging of its batteries were carried out, Canada's unique weather buoy is now back "on station," faithfully transmitting its observations.

## J. S. McGowan

*Left to right, Terry Thompson, D.C. Archibald and Mr. McGowan*

Jack Stewart McGowan, senior meteorological technician in charge of the Toronto City Observing and Information Office, has retired because of ill health, ending a 28-year career with the Meteorological Branch.

Mr. McGowan graduated from McMaster University with a degree in chemistry in 1934. Before joining the Met. Branch, he spent most of this earlier career in Kapuskasing.

Following temporary duty at Kingston, Ottawa and Sioux Lookout, Mr. McGowan was transferred to Toronto, where he spent 20 years serving the public interest by providing weather information for the City of Toronto from records of his meteorological observations.

On May 24, Mr. McGowan was presented with a radio by D. C. Archibald, chief of the basic weather division, and Terry Thompson, formerly Mr. McGowan's assistant, acting on behalf of his friends and colleagues in the branch.

Mr. McGowan now resides in Hamilton.

## A. F. Chisholm

Alex Chisholm, a D.O.T. meteorologist, retired last May after more than 36 years of active service in the Meteorological Branch.

A graduate of the University of Dalhousie, he received his master's degree before the age of 22 and entered the service.

Mr. Chisholm was posted to Toronto on July 18, 1930 and remained at Met. headquarters and the Malton Forecast Office until 1952, first as a staff forecaster, then in 1947 as second in charge of the Malton office.

In addition to the daily forecasts, he carried out research studies, one of which was designed to improve forest fire hazard forecasts, and also took responsibility for all the aviation forecasts in Canada until the establishment of forecast offices at airports in 1939.

In 1952, Mr. Chisholm won a posting to Gander and completed his 31-year career as a forecaster there.

On his return to Toronto, he was transferred to the research section and began work on the programming of large electronic computers.

His chief interest lay in mesometeorology and short range forecasting and the use of computers to carry out research on accumulated punched card records of hourly data. He reported on his work in Technical Circular No. 620: "A system for automated study of multi-dimensional relationships within large-volume data samples."

At a gathering held in his honor, his colleagues presented Mr. Chisholm with a set of luggage since he and Mrs. Chishlom plan to do some travelling in between spending some time on his favorite hobby, gardening.

*D. P. McIntyre, left, chief of research and training, and Mr. Chisholm.*

# His Christmas is Helping Others

# La joie des autres fait son bonheur

Like most people who are bustling about doing their last-minute Christmas shopping right now, a quiet but dedicated Winnipeg meteorologist is hard at work—although he's shopping for a somewhat larger "family".

He's Eric Dexter, a man who has devoted 10 days of his annual leave each year for the past eight years to organizing help in the form of food and gifts for needy families in the Manitoba capital.

For the past four years, Mr. Dexter has headed the Anglican Social Service program which comes under the Christmas Cheer Board, an agency of Winnipeg's United Way.

Ask Mr. Dexter about it and he'll tell you it's a job that's getting bigger all the time.

"Through congregations, individuals and organizations, we solicit donations of canned goods, toys and money," he said.

"A church hall is used to sort the goods and pack the hampers from lists of names supplied by the Christmas Cheer Board," he added. "We are not in any way limited to the denomination, although we do receive all the Anglican referrals."

In addition to the donated goods, Mr. Dexter is responsible for the purchase of needed groceries and toys as well as the turkeys, chickens and hams that go in every hamper.

Last Christmas when the project involved 35 congregations in Greater Winnipeg, Mr. Dexter had 30 women working as volunteer packers, six men and teenagers moving hampers and loading cars, and about 120 men and women delivering the bulging hampers of food and goodies to those who need them.

"When the smoke cleared away and we could take stock of what we had accomplished, it was found that we had packed and delivered 693 hampers, which brought assistance to 3,010 people including about 2,200 children and teenagers who also received gifts, and my budget for the job was $5,200 over and above the donated goods and toys."

And why does he do it?

"The flood of letters of thanks that follow the Christmas season always seem to make it worthwhile and draw me back to it again the next year," replied Mr. Dexter.


Comme il le fait assidûment depuis déjà huit ans, un météorologiste de Winnipeg a entrepris encore cette année sa campagne qui a pour but de semer un peu de bonheur dans les foyers nécessiteux de son milieu au temps des Fêtes.

En effet, M. Eric Dexter, depuis huit ans déjà, consacre dix jours de son congé annuel à aider les familles dans le besoin de la capitale du Manitoba en leur procurant des aliments et des cadeaux. Sa grande famille à lui, en cette période de l'année, c'est la classe pauvre de son milieu. C'est en atténuant la misère des autres au temps des Fêtes qu'il trouve son propre bonheur.

Au cours des quatre dernières années, M. Dexter a dirigé l'exécution du programme du Service social de l'église anglicane qui relève du Christmas Cheer Board, agence de la Fédération des œuvres de Winnipeg.

Interrogé, M. Dexter nous a précisé que cette œuvre prenait des proportions de plus en plus considérables.

«Nous sollicitons des dons de conserves alimentaires, de jouets et d'argent par l'entremise de communautés paroissiales, de personnes, et d'associations», a-t-il déclaré.

«Le tri des marchandises et la préparation des paniers destinés aux personnes dont les noms figurent sur des listes qui nous sont fournies par le Christmas Cheer Board se font dans une salle paroissiale», de poursuivre M. Dexter. «Notre aide est accordée à toute personne, quelle que soit sa religion, bien que nous nous occupions de toutes celles qui appartiennent à la religion anglicane.»

En plus de s'occuper des dons de marchandises, M. Dexter voit également à l'achat des articles d'épicerie et des jouets ainsi que des dindons, poulets et jambons dont chaque panier est pourvu.

L'an dernier, à Noël, 35 communautés paroissiales du Grand Winnipeg ont participé au projet. M. Dexter devait alors diriger 30 emballeuses bénévoles, 6 hommes et adolescents occupés au transport des paniers et au chargement des voitures et environ 120 hommes et femmes qui livraient aux nécessiteux les paniers remplis d'aliments et de sucreries.

«Lorsque la fumée s'est dissipée et que nous avons fait le bilan de notre œuvre, nous avons constaté que nous avions emballé et livré 693 paniers et aidé ainsi 3,010 personnes, dont 2,200 enfants et adolescents qui reçurent en outre des cadeaux. Le budget de l'œuvre s'établissait à $5,200, sans compter les dons de marchandises et de jouets.»

Qu'est-ce qui motive M. Dexter?

«Les nombreuses lettres de remerciements qui me parviennent après les Fêtes semblent toujours justifier la nécessité de l'œuvre et m'y ramènent l'année suivante», nous a-t-il répondu.

# world weather watch

by J. R. H. Noble, Director,
*Meteorological Branch, Department of Transport*

*Described as the most ambitious and challenging undertaking ever conceived by the World Meteorological Organization, World Weather Watch is a long-term experiment in international co-operation that gets underway in 1968. Here, condensed from an address delivered at the Canadian Meteorological Society's First Annual Congress in Ottawa recently, a Canadian authority discusses the concept.*

World Weather Watch is the name given to the integrated world wide system for meteorological observation, weather services and research conceived and planned by W.M.O. The system will be made up of the present world system augmented by facilities for the acquisition of additional basic data, by improved telecommunications and data processing facilities and further supported by research and training.

The plan, which is scheduled for implementation during the period 1968-71, recognizes the probability of new advances in such areas as the use of satellites for both sensing and communications, of automatic stations and of constant level balloons.

It further recognizes the importance of developing physical-mathematical procedures to simulate the behavior of the atmosphere which are much more complex and realistic than are now available. Accordingly, the present plan envisages the incorporation of the products of these advances as they become operationally applicable.

Historically, World Weather Watch emerged as WMO's response to the resolution passed by the General Assembly of the United Nations on "International Co-operation in the Peaceful Uses of Outer Space".

Information required by nations includes both meteorological observations and processed data. For operational work, the information must be received in a timely and co-ordinated fashion while for research purposes the information must be readily accessible in convenient forms.

*Essential Elements*

It follows that the essential elements of World Weather Watch are:

1) Observational networks and other observational facilities, called the Global Observing System;

2) Meteorological centres and the arrangements for the processing of the observation and for the storage and retrieval of data, called the Global Data Processing System; and

3) Telecommunication facilities and arrangements necessary for the rapid exchange of the observations themselves and of the processed data, called the Global Telecommunications System.

A further very important purpose of World Weather Watch is to stimulate and facilitate the research work which is necessary to improve the understanding of the processes taking place within the earth's atmosphere, which introduces a further element of WWW, namely:

4) The research program.

One of the most serious obstacles towards the achievement of all the above objectives is the lack of sufficient skilled meteorological personnel of all classes in many countries. The successful implementation and operation of World Weather Watch, therefore, depends on yet another element:

5) Education and training.

In broad terms, the initial phase of the WWW plan will seek to achieve by 1971:

a) Substantial improvement in the Global Observing System to provide better and more complete data for meteorological analysis and forecasting;

b) Implementation of the Global Data-Processing System;

c) Improvement of the Global Telecommunication System.

*Global Observing System*

The present global observing system is principally deficient over most ocean areas, in the tropics and in remote land areas.

To remedy these deficiencies, extension of conventional observing networks and deployment of meteorological satellites and other new observing tools will be used to ensure a more homogeneous distribution of meteorological observations on a global basis.

The present North Atlantic and other ocean weather stations should be retained without reduction in number or program, regardless of any reduction in the direct utilization of the stations for aeronautical purposes, until such time as completely satisfactory and proven alternative observing systems are available which could maintain in full the necessary regular reliable data output. New stations should be established in critical locations where essential meteorological observations cannot be obtained by more economical means.

As a first step, between five and 10 additional fixed-ship ocean weather stations should be established, mainly in the Southern Hemisphere.

Substantially increased use should be made of mobile ships for obtaining surface and upper-air observations over ocean areas, especially in the Southern Hemisphere. By the end of 1971, there should be a total of at least 100 ships taking upper-air observations in addition to a normal surface observing program.

To meet the vital need for surface observations from ocean areas, the present selected ship program should be substantially increased and, if possible, doubled during the period 1968-71.

Commercial aircraft still constitute a valuable source of upper-air data, especially over the oceans and other sparsely inhabited areas and the selection and distribution of such reports should be developed as an integral part of the plan.

Meteorological satellites already provide, on an operational basis, valuable data on the extent and character of the global cloud cover. Much improved meteorological satellites will likely be in orbit during the period 1968-71. These satellites are expected to provide data on cloud distribution during both day and night and certain other global atmospheric parameters for operational purposes.

*Global Data-Processing System*

The Global Data-Processing System envisaged under WWW consists of a system of World, Regional and National Meteorological Centres. It is important to recognize that while WMC's and RMC's will operate in support of NMC's in no way will they control or dictate the manner in which NMC's go about fulfilling national needs.

In broad terms, the GDPS is aimed at securing maximum efficiency in the utilization of manpower and facilities. WMC's will concentrate on global type of products primarily describing large-scale synoptic phenomena whereas RMC's will concentrate on continental or sub-continental type products.

By making use of processed data so provided, many nations will find it possible to concentrate a greater part of their efforts on expanding the current weather services with emphasis on meso-scale analysis and forecasts. Each nation determines within relatively wide limits which products it will require from WMC's and RMC's.

WMO has recognized three WMC's—Washington, Moscow and Melbourne. The first two are already operational to a substantial degree while the third is still in the planning stage.

*Global Telecommunications System (GTS)*

The purpose of the improved Global Telecommunication System during the period 1968-71 will be to collect and distribute raw observational data to national, regional and world meteorological centres and subsequently to distribute the resulting processed information to other WMC's, RMC's, and NMC's.

The present communication system is inadequate to provide essential services to all countries. During the period 1968-71, countries should seek to install jointly a reliable global circuit which will interconnect all regions and have sufficient capacity to exchange the meteorological data and products required.

*The Research Program*

Scientific research will primarily be the responsibility of individual nations. The role of WMO will be that of assisting in the co-ordination of research activities.

As a concrete step toward making WMO's role effective, the organization's fifth congress reaffirmed the importance of close collaboration between WMO and the International Council of Scientific Unions and further approved a resolution covering a WMO/ICSU agreement for a jointly-sponsored Global Atmospheric Research Program.

*Education and Training*

Discussions at the fifth congress of WMO highlighted the vital importance of accelerating and expanding activities in the field of education and training.

It is absolutely essential to the success of WWW that these activities be given top priority particularly in the developing countries.

In support of these undertakings, the fifth congress approved an amount of $500,000 in the regular WMO budget for the four-year period 1968-71 to be used for long-term fellowships.

In addition, developing countries were urged to take advantage of resources available through the United Nations Development Program and where possible to secure support through bilateral arrangements with developed countries.

*Canada's Position*

Canada is on record as being in full support of the WWW plan. Our national plans include proposals for improving data-acquisition networks to a level which at worst even in isolated areas will meet the minimum specifications laid down for WWW and in most parts of our country will be substantially better than the minimum.

Canada endorses the concepts inherent in the integrated world-wide system of data-processing and will continue to participate in the further development.

I am sure those familiar with our national Weather-Central/Weather Office organization will recognize a striking similarity between our national organization and the WWW global concept of WMC's, RMC's and NMC's.

At this stage it is not possible to specifically identify our precise relationship to, and degree of participation in, the Global Data-Processing System. The matter is, however, being actively studied.

Canada proposes to improve the national meteorological data communications system in a manner which will be consistent with both our own needs and with the WWW plan. Approval in principle for a major improvement is already available and detailed plans are being developed.

It goes without saying that we in the national service view with enthusiasm the action taken by WMO in support of a global atmospheric research program. It is premature to attempt to specifically identify a role in the program. However, it is obvious that Canadian meteorologists will find a place at the appropriate time.

As mentioned earlier, WWW is to be implemented primarily through national programs executed by individual nations using their own resources. Developing countries will be assisted through UNDP to which Canada makes substantial contributions. Canada has provided and is ready to continue to provide assistance to developing countries under bilateral arrangements through the External Aid Office.

There are reservations about the "Voluntary Assistance Program" recently approved by the fifth congress but for the present at least, it will probably be our policy to adopt a "wait and see" approach.

*Summary*

In summary, taking a broad view, WWW means many things to many people.

To some, it is a means of highlighting an awareness of the benefits which may accrue to mankind through applications of meteorological services.

To others, it means a contribution to the science of meteorology through improved knowledge of how the atmosphere behaves.

To still others, it means more effective operations through better observational coverage, improved communications and more effective data processing.

Hopefully, WWW could narrow the gap between the level of operations of developed and developing services.

The WWW plan can be considered as a framework or guide which outlines courses of action or strategies that nations can follow in the development of effective and efficient national meteorological services through a co-ordinated, international scheme of co-operatively sharing skills, knowledge and resources.

The next four years are crucial in that for continued support in personnel, material and financial resources, the benefits of WWW must be demonstrated during this period.

## Ships' Officers Cited For Weather Reporting

*Toronto*—Officers and men from six Canadian Coast Guard ships were among those of 36 merchant and government ships who have received a total of 59 awards from the Department of Transport for excellence in voluntarily making marine observations for the Meteorological Branch during 1966.

The awards, which take the form of books of general interest, are presented annually to deck officers and radio officers whose work in making and transmitting weather observations attained an exceptionally high standard of quality and quantity.

Four ships' radio operators, including E. R. Bonneau of CCGS *D'Iberville*, S. A. Greer of CCGS *Labrador*, N. T. Kristensen of CCGS *John A. Macdonald*, and W. W. Schulz of CCGS *Camsell*, received copies of the book "From Semaphore to Satellite" for transmitting the greatest number of voluntary reports during the year.

Among those presented with awards for individual reporting was Desmond Daly of St. John's, Nfld., a deck officer aboard CCGS *Sir Humphrey Gilbert*, who was one of 15 deck officers to receive a copy of "Birds of Canada" by W. Earl Godfrey.

Cited as a group for their work were the officers and men of CCGS *Narwhal*, among those ships operating out of eastern Canadian ports who contributed to the voluntary observations.

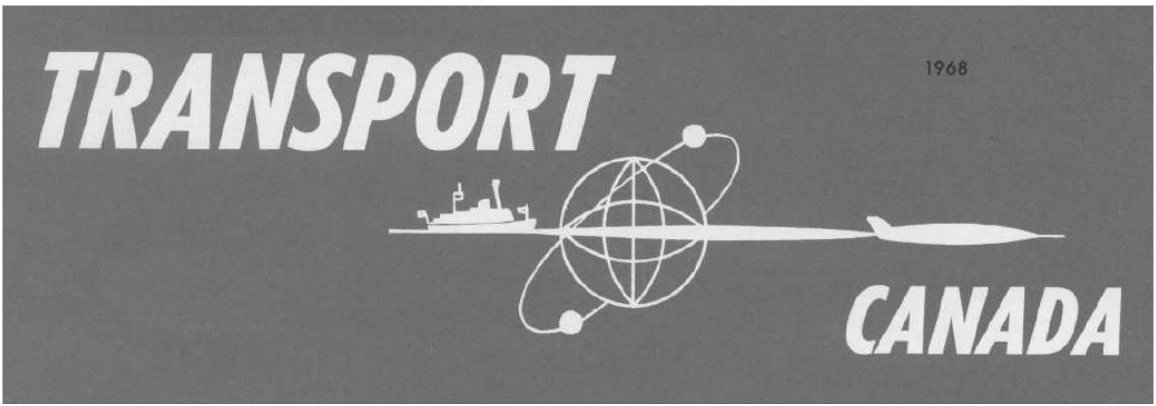
The ship was awarded a copy of "Patterns of Canada," edited by W. J. Megill.

Aside from a few stationary weather ships posted at strategic locations, the merchant ships of the world are the principal source of information on the weather over the oceans, said J. H. R. Noble, director of the Met. Branch, who announced the awards.

About 4,000 ships belonging to some 35 different nations send reports as often as four times a day by radio to the meteorological service of the nearest country, he said.

In 1966, Canadian ships made about 45,000 reports, used by meteorologists to prepare their daily forecasts.

# 1968



# weather wonderland

If you've ever wondered why hurricanes are named (for easier identification) or maybe what the temperature is 200 miles up (2,000 degrees F.), then a visit to the meteorological exhibit at the new National Museum of Science and Technology in Ottawa is a "must."

There, among a fascinating variety of exhibits in what Dr. David Baird, the director, calls his "Fun Museum," the visitor can find out for himself a little of the science of meteorology by pushing buttons, breathing into weather instruments or watching instantaneous weather reports flash across a moving screen.

The subject is the world's weather, the way it affects us and the manner in which it is observed and presented—whether as a topic of discussion among friends or a briefing on which a pilot bases his flight plan.

The display also takes a peek at the future with a life-like model of the Essa weather satellite showing its all-seeing cameras which peer down at the earth and photograph the ever-changing weather patterns and shows how the meteorologists working at ground stations decipher the co-ordinates and draw in national and provincial boundaries to make sense of what the satellite has photographed.

Starting with an invitation from Dr. Baird, the Met. exhibit was put together by Percy Saltzman, one of the Branch's best known boosters, Al Mowat of the weather services section, Pat Connor and Claude Buffett, the two Met. staffers who assembled the equipment, and Charles Taggart of the Meteorological Satellite Data Laboratory who worked on the satellite exhibit.

"The thing that's different about this exhibit and the reason that everyone gets so much out of it," says Mr. Mowat, who spent two weeks in Ottawa helping to get the project launched, "is the fact that visitors press the switches and make the equipment work by themselves."

Mr. Mowat, whose enthusiasm for the project led him to bring along his personal tape recorder to record the official opening of the museum by Dr. Baird and State Secretary Judy LaMarsh, and interview a few of the hundreds of visitors who went through the exhibit during its first two weeks, says the exhibit was established relatively inexpensively to help make the Meteorological Branch better known to the public as well as to interest young people in meteorological careers.

Proof that the exhibit is accomplishing both objectives is contained on tape as well as on a notebook left at the centre of the exhibit where visitors are encouraged to leave their names and their impressions of the display.

The comments range from the "keen" and the "cool" of the younger generation to "beautiful" (a lady visitor) to "excellent and informative."

"Good to see Met. in action," wrote an Ottawa-based Met. technician; "Above all it is thought-provoking," added a science teacher; and summed up in the words of an elderly gentleman visitor: "It's better than what I've seen at Expo."

# *five bursary winners now deep in studies*

by Bryan Goodyer
*Information Services Division*

The five winners of the 1967 Department of Transport bursaries are now deep in the throes of their first year at college, thanks in part to a generous gesture nearly five years ago by D.O.T. employees.

The five, who include three girls and two boys, are: Gwenyth L'Hirondelle, Fort Nelson, B.C., Denise M. A. Schuetze, Sidney, B. C., Cheryl L. Stewart, Ottawa, John Roger Walker, Winnipeg, and Paul Graham Knox, Vancouver.

All were awarded $500 bursaries as part of the Department's annual student aid program designed to encourage and financially assist children of serving, retired and deceased employees of the Department to obtain a university education.

The funds for these bursaries are derived from the annual interest revenue from the investment of the balance of $25,000 in surplus D.O.T. insurance funds remaining after plebiscites held in 1961 and 1964, in which employees elected either for the return of their pro rata share of the surplus funds or to have their share transferred to the scholarship fund.

Revenue from the trust fund, although originally sufficient to provide for only three bursaries, now provides for five annual awards.

## Gwenyth L'Hirondelle

Gwen L'Hirondelle, daughter of P. D. L'Hirondelle, officer-in-charge of the weather office at Fort Nelson, B.C., was born at Peace River, Alberta, 16 years ago.

After completing her elementary grades in Whitehorse, Yukon Territory, and junior high school in Fort Nelson, she graduated from Grade 12 at Victoria Senior Secondary School with a 91 per cent average.

Gwen, whose hobbies are music, sewing and swimming, is now attending the University of Victoria where she is majoring in English.

In addition to the D.O.T. Bursary, she also received a scholarship from the Government of British Columbia and the Sara and Jean MacDonald Bursary, administered by the University of Victoria.

## Paul G. Knox

Paul, son of J. L. Knox, regional meteorologist with the Vancouver air services region, was born in Toronto and attended elementary school there.

After attending Burnhamthorpe Collegiate for two years, Paul enrolled at Magee High School in Vancouver when his father was transferred to the west coast.

Active in musical productions, the student council and the school newspaper, Paul graduated from Magee with first class honors and is now enrolled in first year arts at the University of British Columbia.

In addition to the D.O.T. Bursary, Paul won a $300 B.C. Government scholarship.

He plans to take an honors degree in sociology and then go into either law or town planning.

Roberta Pattison

# where are they now?

It was just over four years ago that the first D.O.T. "scholars" were named and presented with $400 bursaries to help them finance their first year of college.

Where are they now?

Roberta Pattison, now 22, daughter of Robert F. Pattison, officer-in-charge of the meteorological station at Saskatoon, has completed four years of higher education at the University of Saskatchewan.

After completing the two-year pre-veterinary course, she was accepted into the first class of the new Western College of Veterinary Medicine and is now mid-way through the four-year course, reports her dad.

Roberta spent last summer working in the Department of Pathology at the college.

## Special Stamp to Honor Met.

*Ottawa*—The Post Office Department has announced that a special stamp commemorating the 200th anniversary of the first meteorological readings made in Canada will be issued on March 13.

The readings, the first recorded observations by barometer and thermometer in Canada, were officially recorded on Sept. 10, 1768 at Prince of Wales Fort near Churchill, Man.

There are, reports the Meteorological Branch, remarks on the weather of earlier record made by soldiers and explorers but these are largely non-instrumental and were made in transit rather than at a fixed point over a period of time.

The observations made at Prince of Wales Fort were published in the Philosophical Transactions of the Royal Society in 1771 by William Wales and Joseph Dymond, both prominent scientists of the day who had come out to Hudson Bay as guests of the Hudson Bay Company and under instructions from the Royal Society to observe the transit of Venus.

Wales, one of the foremost astronomers and mathematicians of his time, later accompanied Captain Cook on his two voyages around the world.

The Wales and Dymond observations were made under the headings of barometer, thermometer (one inside, one outside), winds, weather and other miscellaneous headings.

Observations were made three times a day on the average, but there are some days with two, some with three, and the occasional day with as many as five observations.

The first weather entry dated Sept. 10 notes it was "rainy with a gentle breeze" and the final one records that the two weathermen "took down the instruments and packed them up."

"These men," our meteorologists agree, "would be most intrigued with the way in which the weather, which is now observed at the airport, about 10 miles from Fort Churchill, is gathered."

## Met. Film Premieres

*Ottawa*—"In One day," the 18-minute color film on Canada's weather service, has been previewed and received "rave" reviews from members of the Meteorological Branch and senior D.O.T. officials in Ottawa.

The National Film Board has also announced that theatrical rights to the 35 mm film have been sold to Columbia Pictures for release in theatres across Canada.

The film, which gives a handsomely impressionistic view of what goes on day in and day out from Weather Station Alert to Ocean Station Papa to the outskirts of Metropolitan Toronto, was produced by a National Film Board crew under writer-director J. J. Carney.

It opens with a . . . but wait . . . why not see for yourself. Watch for it at your local theatre!

# *computer meteorology: toward a better forecast*

by Edouard Deslauriers
*Information Services Division*

Jim Leaver, chief of the Meteorological Branch's Central Analysis Office at Dorval, Que., likes to compare his office's weather forecasts to a product that is "consumed" daily by its Canadian "customers".

To this end, Mr. Leaver is concerned that the product is produced as efficiently as possible so that it can keep abreast of the demands for more frequent and more accurate weather reports.

Enter the computer, the forecaster's number one 'tool" in the ceaseless task of gathering and analyzing Canada's weather.

In 1962, the CAO installed its first computer and put it to work. Five years later, the need for more computing speed and the need for a computer capable of handling more data made it obsolete.

The CAO's newest computer, now installed and working at Dorval, digests the information fed into it at least 10 times faster than the first and it is estimated that it handles 350,000 mathematical operations a second.

With the help of this computer, the Central Analysis Office can now forecast the weather three days in advance.

Through continuing experiments and research, the computer is being fed more and more information and it is hoped that within the next decade it may provide the weatherman with the data required to forecast the weather five days in advance.

All over the world, meteorologists have adopted the mathematical approach to the forecast problem and numerical weather prediction is now the order of the day.

Whereas, in the past, the weatherman would rely almost exclusively on his experience and knowledge to make weather forecasts, he now looks into the future with a new type of "crytal ball" which gives him a clearer picture of things to come.

THE COMPUTER: VITAL AID TO FORECASTING—*A Department of Transport meteorologist, working towards his post-graduate degree, processes meteorological data at McGill University.*

LA CALCULATRICE: AIDE ESSENTIELLE À LA PRÉVISION—*Un météorologiste du ministère des Transports, poursuivant des études en vue d'obtenir un diplôme postuniversitaire, traite des données météorologiques à l'université McGill.*

For many years, weather prediction services were almost entirely dependent upon the synoptic approach, supplemented by semi-objective techniques obtained from theoretical studies of dynamic meteorology.

In other words, the weatherman, with the help of synoptic models or weather maps depicting typical atmospheric situations, would make forecasts based on his experience and upon incomplete statistical analyses.

These were subjective techniques to which the forecaster applied his theories of dynamic meteorology.

Calculations such as those now made by the computer were originally initiated by meteorologists who realized many years ago that the mathematical approach to weather forecasting was the one most likely to provide long-range and more accurate findings.

Meteorologists also realized then that man himself could not possibly attempt to solve by hand the millions of calculations for the complex mathematical equations involved in the objective analysis of weather observation data. The time spent on calculations alone would have made a forecast impossible.

It is in fact estimated that 64,000 people working around the clock could hardly expect to achieve in one day what the computer is now doing in one set of operations.

Numerical weather prediction is defined as a technique utilizing numerical computations to predict the dynamic and thermodynamic evolution of the atmosphere.

Mr. Leaver, officer in charge of the Central Analysis Office, accompanied by the heads of the various units comprising CAO—Ralph Anderson (Analysis and Prognosis), D. E. McClellan (Extended Forecast), M. Kwizak (Operational Development and Evaluation) and J. Simla (Computing Services)—took us on a tour of the office, explaining how the technique is being applied here in Canada.

Mr. Leaver compares the CAO to the "basic manufacturer" whose product—in this case a weather forecast—is produced for consumption in Canada.

To produce its forecast, the CAO relies on information provided by a network of 2,500 surface weather observation stations and 700 upper air stations strategically located across the northern hemisphere.

The surface stations provide reports transmitted to CAO at regular six-hour intervals. The upper air stations are increasing their schedule of observations to four times daily with information bearing on pressure, temperature, wind and humidity.

Upper air stations gather their information with the help of weather balloons which reach levels up to 100,000 feet.

These balloons carry a package containing highly sensitive equipment to measure meteorological parameters in the atmosphere. This information is transmitted by radio to ground receiving stations and then relayed by teletype to CAO through the meteorological communications system.

Extraction of data, analysis and prediction are the three main functions performed at the Central Analysis Office.

All the coded reports received from the various observation stations must be systematically verified to ensure that the information accepted for further consideration in the processing cycle is free of errors.

Some 50 of the more than 72 available pieces of information are extracted from each station after verification and these constitute the data required for objective analysis.

It is estimated that the computer goes through about 50 million mathematical operations in the extraction of data alone.

The data is collected from the teletype circuits by means of perforated paper tape. The information, thoroughly scrutinized with the help of a paper tape reader, is then transferred electronically to a magnetic tape, providing high-speed input to the "central processor."

The next phase of the process deals with data analysis and prediction. Here it is estimated that the number of mathematical operations involved may run to as high as 200 million, depending on the quantity of data fed into the computer.

The computer solves all these complex mathematical operations in a scant nine minutes.

The end result is a large weather map on which are charted the flow patterns in the upper atmosphere over the whole northern hemisphere. This provides the meteorologist with an over-all picture of the situation and allows him to predict weather conditions 72 hours in advance.

Through the Central Analysis Office, sections of this large weather map containing data relevant to certain areas of Canada are then forwarded to the weather centrals, the "wholesalers," where more information of a regional nature is added before they are passed on to the "retailing outlets," the local weather offices across the country.

And so, finally, we the "consumer" are let in on the secret:

"A large high pressure area centred over the northern section of the country continues to give sunny skies over the central part of Canada. A light northerly flow of cool air continues to hold temperatures a few degrees below normal for this time of year . . ."

GATHERING THE BASIC INFORMATION—*Instructor shows student met. technicians how to use the instruments in a Stevenson Screen at the D.O.T. Air Services School at Ottawa International Airport.*

CUEILLETTE DES INFORMATIONS DE BASE—*Un instructeur enseigne à des techniciens stagiaires en météorologie la façon d'utiliser les instruments installés dans un abri Stevenson de l'École des Services de l'Air du ministère des Transports, à l'aéroport international d'Ottawa.*

# la machine écarte la conjecture des prévisions de la météo

par Edouard Deslauriers
*Services d'information*

Il existe à Dorval, à quelques pas de l'aéroport international de Montréal, une petite «manufacture» inconnue de bien des gens, mais d'où sort cependant un produit de qualité exceptionnelle que plus de 20 millions de Canadiens dévorent en un rien de temps dès qu'il est mis sur le marché . . . et celà, quotidiennement. C'est un produit qui exerce en effet une telle influence sur le comportement de chacun de nous qu'on ne saurait s'en dispenser, pas même pour un jour.

Il s'agit, comme plusieurs l'ont sans doute deviné, des prévisions de la météo. Mais, d'où viennent ces prévisions? Comment les fait-on? Aujourd'hui, nos météorologistes peuvent prévoir le temps qu'il fera jusqu'à trois jours d'avance. Dans un avenir prochain, leurs prévisions pourront couvrir une période d'environ cinq jours.

**ASSEMBLING THE FORECAST**—*Meteorologists at work in the forecast office, Montreal International Airport.*

**PRÉPARATION DES PRÉVISIONS**—*Météorologistes au travail, au bureau des prévisions de l'aéroport international de Montréal.*

Au Canada, pays reconnu comme l'un de ceux qui, au cours des années, a le plus contribué à la recherche dans le domaine de la météorologie, nos méthodes de prévision du temps sont des plus avancées à l'heure actuelle.

Nos spécialistes à la Direction de la météorologie du ministère des Transports, gardant à l'œil les progrès technologiques dans le domaine des observations et des prévisions météorologiques, ont adopté et perfectionné de nouvelles techniques qui permettent aujourd'hui au Canada d'assumer un rôle de premier plan dans le cadre de la «veille météorologique mondiale» actuellement en voie d'organisation.

Depuis le commencement des temps, l'homme a cherché à comprendre, par tous les moyens à sa disposition, les processus dynamiques et physiques en cours dans l'atmosphère. Au cours des siècles, il a mis sur pied et développé diverses méthodes de prévision du temps.

Il y a quelques années, avec l'avènement de l'ère de l'automatisation, le météorologiste a enfin mis la main sur un instrument des plus précieux, soit la calculatrice. Grâce à cet instrument, on a espoir de pouvoir, dans un avenir prochain, prédire les changements de temps au moins cinq jours d'avance.

Une de ces calculatrices, conçue pour traiter les données d'observation du temps recueillies dans tout l'hémisphère nord, a été installée au Bureau central d'analyse du ministère des Transports à Dorval en 1962. Exploitée à son maximum, cette calculatrice a été récemment remplacée par une autre pouvant calculer plus rapidement et capable de traiter un plus grand nombre de données. Cette nouvelle calculatrice assimile les données qui lui sont fournies en un temps dix fois plus rapide que la première. On estime qu'elle peut faire 350,000 opérations mathématiques à la seconde.

Les météorologistes du monde entier ont aujourd'hui adopté la méthode mathématique pour résoudre le problème de la prévision. Alors que, dans le passé, le météorologiste comptait presque exclusivement sur son expérience et ses connaissances pour établir ses prévisions, il scrute maintenant l'avenir dans un nouveau genre de «boule de cristal» qui lui donne une vision plus nette des phénomènes futurs.

Autrefois, les services de prévision du temps avaient recours à la méthode synoptique, que l'on complétait par des techniques semi-objectives mises au point à la suite d'études de météorologie dynamique. En d'autres mots, le météorologiste, s'aidant de modèles synoptiques ou de cartes du temps représentant des situations atmosphériques typiques, faisait des prévisions basées sur son expérience et sur des analyses statistiques incomplètes. Il s'agissait en fait de techniques subjectives auxquelles le prévisionniste appliquait ses théories de météorologie dynamique.

Des calculs comparables à ceux qu'effectuent nos calculatrices d'aujourd'hui ont d'abord été tentés par des météorologistes qui s'étaient déjà rendu compte, il y a plusieurs années, que l'application de la méthode mathématique au problème de la prévision du temps était de loin la plus apte à procurer des données à longue échéance et plus précises. On a vite réalisé cependant qu'il était impossible à l'homme seul de faire à la main les millions de calculs impliqués dans les équations mathématiques complexes que comportait cette méthode. Rien que le temps passé à faire les calculs aurait suffi à rendre impossible la prévision. On estime, en effet, que 64,000 personnes travaillant 24 heures sur 24 pourraient à peine espérer terminer en un jour ce que la calculatrice peut maintenant faire en une seule série d'opérations.

Dans le langage du météorologiste, on définit la prévision numérique du temps comme une technique utilisant des calculs numériques pour prévoir l'évolution dynamique et thermodynamique de l'atmosphère. Jim Leaver, responsable du Bureau central d'analyse de Dorval, accompagné des chefs des différents services formant le B.C.A., Ralph Anderson, (analyse et pronostic), D. E. McClellan (prévision à période prolongée), M. Kwizak (mise au point opérationnelle et évaluation), et J. Simla (services des calculs), nous a fait visiter le Bureau central d'analyse, nous expliquant comment cette technique est appliquée ici au Canada.

Pour effectuer ses prévisions, le B.C.A. reçoit des données d'un réseau composé de 2,500 stations d'observation météorologique en surface et de 700 stations d'observation en altitude situées à des points stratégiques à travers l'hémisphère nord.

Les stations de surface transmettent des messages d'observation météorologique au Bureau central régulièrement, soit toutes les six heures. Les stations d'observation en altitude, de leur côté, envoient leurs données deux fois par jour. Dans certains cas, on essaie d'augmenter le nombre des observations à quatre par jour. Ces données portent sur la pression, la température, le vent et l'humidité.

Les stations d'observation en altitude obtiennent leurs données à l'aide de ballons météorologiques qui s'élèvent jusqu'à 100,000 pieds. Ces ballons sont munis de dispositifs très sensibles pour mesurer les paramètres météorologiques dans l'atmosphère. Les données sont transmises par radio à des stations réceptrices au sol, puis relayées par téléscripteur au B.C.A. grâce au système de communications météorologiques.

Les trois principales fonctions du Bureau central d'analyse sont l'extraction des données, l'analyse et la prévision. Tous les messages chiffrés que l'on reçoit des diverses stations d'observation doivent être systématiquement vérifiés; ceci, afin de s'assurer que tous les renseignements retenus pour étude ultérieure dans le cycle du traitement soient dignes de foi et exempts d'erreurs. Sur plus de soixante-douze pièces d'information fournies par chaque station, environ cinquante sont extraites après vérification, et celles-là seulement constituent les données dont on se sert pour l'analyse objective. On évalue à environ 50 millions le nombre des opérations mathématiques qu'effectue la calculatrice uniquement pour l'extraction des données.

On reçoit ces données par téléscripteur sur ruban de papier perforé. La donnée, minutieusement examinée au moyen d'un lecteur de bande en papier, est alors transmise électroniquement à une bande magnétique avant d'être confiée à «l'ordinatrice centrale».

La phase suivante du processus consiste dans l'analyse des données et la prévision. Pour cette étape, on estime que le nombre des opérations mathématiques impliquées peut aller jusqu'à 200 millions, selon le nombre de données introduites dans la calculatrice.

Et la calculatrice effectuera toutes ces opérations mathématiques complexes en neuf minutes exactement!

Le résultat final du calcul est la production d'une grande carte du temps sur laquelle apparaissent les configurations de la circulation de l'air dans la haute atmosphère au-dessus de tout l'hémisphère nord. Grâce à cette carte, le météorologiste a en mains une bonne description de toute la situation et peut ainsi prévoir les conditions atmosphériques 72 heures à l'avance.

Des sections de cette grande carte comportant des données propres à certaines régions du Canada sont ensuite envoyées, par le Bureau central d'analyse, aux centres régionaux, qui y ajoutent un plus grand nombre de données de nature plutôt régionale.

Enfin, le produit fini nous est officiellement transmis dans une forme qui peut ressembler à ce qui suit: «Une grande zone de haute pression dont le centre est au-dessus de la partie nord du pays continuera de donner un ciel ensoleillé dans toute la partie centrale du Canada. Un léger courant d'air frais venant du nord maintient les températures à quelques degrés au-dessus de la normale pour cette période de l'année.» . . . ou encore, parfois: «Fuyez! Un ouragan approche!»

THE "CUSTOMER"—*This prairie farmer, like many other Canadians, depends on the long range and accurate forecast for information essential to his livelihood.*

LE "CLIENT"—*Ce cultivateur des Prairies, comme bien d'autres Canadiens, compte sur les prévisions à long terme et exactes qui lui fournissent des renseignements essentiels à son travail.*

# the flying lab adds new dimension to teaching

by Bryan Goodyer
*Information Services Division*

The odd-looking four-engined DC-4 settled onto the runway in a perfect three-point landing, then taxied onto a parking apron just outside the offices of the Air Services Training School at Ottawa International Airport.

Inside, 11 students who, for the past two weeks, had been studying radar and avionics theory, threw on their overcoats and headed out across the tarmac to board the aircraft.

The plane, one of two leased by the Meteorological Branch of the Department of Transport from Kenting Aviation Limited of Toronto, was being temporarily used as a classroom while on a routine patrol of the St. Lawrence Seaway.

A two-day layover at the school was arranged so the students could gain operational experience in the techniques of ice observing utilizing the sophisticated electronic equipment on board the aircraft.

"Flight training is playing an increasingly important part in the instruction given at the Air Services School," said A. A. (Art) Johnson, superintendent of the D.O.T. establishment which last year had more than 14,000 students enrolled in 98 courses.

Mr. Johnson said that the in-flight training given to student air traffic controllers and radio operators is always one of the highlights of each course.

*Students learn the ropes.*

One of D.O.T.'s DC-3's, CF-DTB, has been specially equipped with a communications system which permits the students to tune in on all radio contacts made by the pilot with the various towers, ATC centres and radio range stations.

In addition, the instructor provides a running commentary throughout the flight. Students follow the flight's progress on charts and gain a good understanding of what is involved in flight operations.

The flight also shows them how important their roles are to aviation—roles that they will be playing soon in real life, as in-flight training takes place just before graduation.

Some courses for electronics technicians also involve flying. The course in flight checking of navigational aids requires about one week of in-flight training in one of the specially-equipped "flying laboratories" used for checking the accuracy and reliability of the navigational facilities across the country.

Courses in maintenance and adjustment of navigational facilities such as ILS and VOR also require the use of aircraft for short periods while teaching certain techniques.

In the case of those taking the final phase of the ice-observing course, the chance to go up with the DC-4 under the supervision of the radar and navigation instructors means an opportunity to put the theory they learn in the classroom to work.

"This part of the training is designed to increase the ice observers' awareness of the capabilities and limitations of these electronic aids to ice reconnaissance," is the way Gerry Flucke, one of the three instructors who give the students ice observing theory explains it.

Gerry's lectures are backed up by those of Emil Stasyshyn, an instructor from the Met. Branch in Toronto who has been involved with the ice observing course for the past nine years and Jacques Le May, an instructor with the Telecommunications and Electronics faculty of the Air Services School.

"The equipment aboard the ice observing planes is the most sophisticated ice reconnaissance system used anywhere in the world," explained one of the instructors as the trio explained the equipment and how it is used by the 20 trained ice observers who work for the Department of Transport.

The observation of ice on a large scale began in 1956 when the D.O.T. started training ice observers and began the job of providing information to shipping.

In 1966, a five-year contract worth $5,000,000 was awarded to Kenting Aviation which supplies two DC-4 aircraft modified to carry close to $500,000 worth of equipment used to plot the movement and location of ice on special charts for distribution to ships working in the Gulf, the Great Lakes or in the Arctic.

"This is actually the first course of this type," said Gerry Flucke, who explained that in future the operational flight experience would be the climax of 10 consecutive weeks of ice observing training.

The students will spend the initial two months of the course in Toronto and then take the final two weeks in Ottawa.

Why are the last two weeks given in Ottawa?

"We have the training facilities and staff here," replied one of the instructors, "and in addition can draw on the resources of other branches of the D.O.T. (Civil Aviation and Telecommunications and Electronics branches), Computing Devices of Canada and the Canadian Armed Forces (RCAF) in Ottawa.

The "average" ice observer, it was explained, stays on the job about two or three years and the position is often a steppingstone in the careers of meteorological technicians.

"Most of them, however, are in it because they like the work and the travel," said Gerry.

Outside on the parking apron, the students were giving the DC-4 the "once over."

Extensive modifications have given it a strange look. The forward portion of the fuselage is topped by a transparent oval-shaped dome canopy which shelters the main observing position.

Under the belly protrudes a large fibreglass "radome" which houses the radar antenna.

The metallic structure of the doppler radar aerial can be seen to the rear.

The interior bears little resemblance to that of a conventional airliner. Instead of neatly-aligned rows of seats, the space is occupied by numerous cabinets housing what looks like an elaborate laboratory.

There is also office space, a galley and a rest area with bunks.

The storage area carries an impressive array of engineering tools and spare parts including one complete spare engine and a mountain of survival equipment and rations in case the aircraft should be forced down somewhere in the Arctic wasteland.

Right behind and above the pilots sits the principal visual ice observer. He is the key man and is responsible for mapping the ice as observed along the path followed by the aircraft.

His eyes must constantly scan the area around him while the plane is in flight, assessing such sea-ice features as coverage, size and individual pieces, age and topography.

The electronic and navigational console bears some similarity to those found in the control room of any radio broadcasting station. It is manned by the radar ice observer, a navigator and an avionics technician who also assists the navigator.

An overall precision navigation system provides a high degree of position accuracy, so necessary in the charting of ice conditions as well as enabling the aircraft to rendezvous with ships requiring tactical support.

Flights frequently are of long duration. Sorties of up to 12 hours are common and at certain seasons Arctic reconnaissance involving up to 20 hours of flying a day for three to five consecutive days have become routine.

Thus the job of ice observing is one that is becoming increasingly more important, not only in terms of the saving of precious time and money, but in the recruiting and training of qualified personnel in the Air Services school's flying classroom.

By this time, the students were aboard the aircraft meeting the navigator, the avionics technician, and the ice observer who would familiarize them with the plane's equipment, so that they would be ready for the two operational flights planned for the next day which would give them a chance to use this equipment operationally.

"It's great," said Denis Blanchard of Montreal when asked about his job. "I wouldn't trade it for anything."

"I like it very much," added Jack Power, a native Newfoundlander who now makes his home in Toronto. "It gives you the chance to travel and do things the average guy will never do."

Jack, prior to his appointment to the ice observing course, was a member of the crew of the Canadian Coast Guard Ship *John A. Macdonald* when it made an historic voyage through the Northwest Passage late last year and went to the aid of a crippled United States Coast Guard cutter stranded deep in the polar ice pack at the top of the world.

It was under these conditions that Jack was called upon to put his training and experience to work as the ship picked its way through the treacherous ice.

"It was pretty grim for a while but we hung on and finally got a lucky break when the wind shifted," Jack recalled.

Up front the students were being called to attention by their instructors. The time had come to get down to specifics in preparation for the flights the following day.

"Let's call this class to order," said one of the instructors as he moved to the front of what must be one of the most unusual classrooms in Canada.

*Ice observers at work.*

## new position

Melvin Garfield Hagglund, 49, former deputy superintendent of the strategic plans and policies forecast division of the Met. Branch, is now at work at his new appointment as chief of airports planning and research.

In this position, a new one which comes under the office of Eric Winsor, director of the Airports and Field Operations Branch, Mr. Hagglund will be responsible for the planning of airport ground facilities and services.

He will also be responsible for maintaining liaison with other branches, other departments, outside agencies and the aviation industry in the co-ordination of plans.

A native of Beatty, Sask., Mr. Hagglund served more than four years with the Royal Canadian Air Force as a navigator both in Canada and overseas during the Second World War.

He graduated from the University of British Columbia in 1949 and from the University of Toronto in 1950 with an M.A. in physics (meteorology).

In June 1950, Mr. Hagglund joined the Met. Branch as a duty forecaster in Edmonton where he spent four years that included a one-year tour of duty as officer in charge of the weather station at Resolute Bay, N.W.T.

Other appointments included a posting as superintendent of Arctic meteorology in the basic weather division at Met. headquarters in Toronto and service on loan to the Royal Canadian Navy and the Canadian Army where he served in Dartmouth and Halifax, N.S., aboard H.M.C.S. *Magnificent* and at Army headquarters in Ottawa.

A member of the Canadian Meteorological Society and the Professional Institute of the Public Service of Canada, Mr. Hagglund is married and has three children.

*M.G. Hagglund*

## C. C. Warkentin

Cornelius ("Cornie") Warkentin, senior inspector of meteorology for the Winnipeg region, has retired after 27 years of service with the Meteorological Branch.

Mr. Warkentin was born in Russia and come to Canada in 1923. He graduated from the University of Manitoba with a Master of Science degree.

Following a tour of duty as a lecturer, he joined the Met. Branch in 1940 as an instructor. Eleven years later, he was appointed senior meteorological inspector for the region, the position he held until his retirement.

A luncheon sponsored by Winnipeg colleagues was held last November to honor Mr. and Mrs. Warkentin at which an attache case and travelling bag were presented to the couple by D. M. Robertson, regional meteorologist.

Among special guests at the affair was D. C. Archibald, chief of the basic weather division at Met. headquarters in Toronto.

Mr. and Mrs. Warkentin plan to remain in Winnipeg although they do have some travelling scheduled to visit members of their family in Europe and Africa.

## Drama at Baker Lake

*Baker Lake, N.W.T.*—The weather at this northern D.O.T. outpost, located 400 miles north of Churchill, Man., was not unusual for the time of year as Met. Technician Jack Hilton went about the business of making an upper air observation early one morning.

He had risen at 4 a.m. to complete his task. By 8 a.m. he was nearly through.

His weather report showed a layer of cloud covering 70 per cent of the sky about 2,000 feet above ground level, the visibility was good, the temperature was 30 degrees above zero and a northwest wind of 23 miles per hour was gusting to 30.

As he went about his work, he noted and watched with interest as a float-equipped Cessna 185 taxied into the lake in preparation for take-off.

Suddenly, while swinging into the wind, the craft was hit by a strong gust of wind and one wing tip went under.

Realizing the seriousness of the situation, Jack shouted for his co-worker, Met. Technician Marvin Steer. Together they dashed the 200 feet from the weather office to the lake shore, launched a 20-foot canoe equipped with a 10 horsepower outboard engine and set out for the ill-fated plane, a distance of two to three-hundred yards.

By the time the pair reached the aircraft, it had overturned. Three of the four occupants were clinging to the pontoons. A fourth occupant had jumped into the frigid lake as the plane had overturned and was drowned.

The two rescuers pulled the shocked survivors into the canoe and took them to safety while waiting for help to arrive to find the missing man and recover the aircraft.

It was a day that the two technicians noted in their records as far from routine!

## Suggestion Winner

*Ottawa*—A suggestion that resulted in the use of what was thought to be rejected meteorological material has won a $15 suggestion award for a D.O.T. employee.

D. W. J. Challis, a meteorological technician at Fort Churchill, Man., was granted the award after his suggestion was found to be an improvement in meteorological operations.

# THE ICE THAT FOULS THE FALLS

by William Dunstan
*Information Services Division*

Legend has it that on March 30, 1848, ice blocked the lower end of Lake Erie so completely that the Niagara River dried up and water ceased to cascade over the great falls. While there is some doubt that the river dried up completely, it is an undisputed fact that the flow was drastically reduced. The public was fascinated and many walked along the top of the falls, picking up cannon balls and other souvenirs, before the ice dam broke.

Since the river began producing electrical power, however, large-scale formation of ice has been anything but a happy occasion. The river is the greatest single power source in the world, pulsating electricity into some of the largest industrial and residential communities on the continent. Problems due to icing can cut heavily into the power output, which in Canada alone is valued at approximately $5,000 an hour.

The river is under international control, with the Ontario Hydro Commission and the New York Power Authority joining forces to implement the international agreement.

Howard Ferguson of the hydrometeorology section of Met is working with the Ontario Hydro Commission to establish an "energy budget" on the river: in general terms, this is a study of the heat gained and lost by the river and the attendant formation and dissipation of ice.

Until recent years much of the ice drifted into the river from Lake Erie, which freezes over almost completely in a cold winter. An ice boom now has been installed at the lower end of the lake and this has drastically reduced the movement of ice into the river.

However, ice from other sources still is found in enormous quantities. Water in the shallow, fast-flowing river becomes super-cooled in winter and a crystalline type of ice known as "frazil" ice develops in the water. This adheres to obstructions on the river bottom and builds up on sluice gates and water intakes. Pan ice may form along the river shore and then break off to float downstream, often made slushy by snow which falls frequently over the area. A phenomenon common to shallow rivers of this type is the formation of anchor ice on the bottom during cold nights. This latter can act as a dam, reducing the flow by as much as 30,000 cubic feet per second. That is roughly a hundred times the flow of water consumed by a city of a million people.

Under the international treaty, a minimum flow of 50,000 cubic feet per second must be allowed to go over the falls for the scenic effect. The rest may be used for power. In winter, the mandatory flow is approximately 30 per cent of the total.

This flow usually is adequate to float the ice over the falls. Sometimes more water is needed, however, and it is necessary to divert some of the water which ordinarily would be used for power. The result sometimes is a drastic reduction of power for a relatively short period.

Two small icebreakers and control gates help keep the ice broken up and moving. If icing conditions could be forecast more accurately, however, action could be planned to combat the particular type of icing anticipated.

That's where Howard and his staff come in. A number of instruments record such things as net radiation, fluctuations in air and water temperatures and wind velocity. Readings are taken by Hydro technicians, who also have their own instruments, lookouts and a helicopter for keeping tab on water levels, ice cover, and other pertinent factors.

The records are assessed by Howard and his fellow scientists, who work out complex equations to demonstrate the energy gained and lost under various conditions. A general equation for the energy balance is: $Q_n - Q_e - Q_h - Q_m + Q_i = Q_t$, where $Q_n$ = net incoming radiation; $Q_e$ = net energy loss by evaporation; $Q_h$ = net conduction of sensible heat to the atmosphere; $Q_m$ = energy lost by snowmelt; $Q_i$ = energy represented by the river inflow, $Q_o$ = river outflow energy, and $Q_t$ = net gain in energy storage.

See?

Approximately 550 man-hours were spent by Met staff in installing the instruments. One of the technicians, usually Bob Chapil, visits the sites about once a month. He spends some 12 hours each

*Above the falls, Ontario Hydro's powerful little icebreaker churns toward the control dam.*

*Met's Howard Ferguson inspects a net radiometer that is installed above the river at the control dam. Raised and lowered by a winch, the instrument measures the energy radiated from the river's surface.*

time, checking, repairing and replacing instruments. Meteorological officer Howard Cork and technician John Hebgin spend about 56 man-hours a month processing data.

This involves checking chart traces, "scaling" the charts to obtain values of the physical variables, tabulating and interpreting results and preparing statistical summaries. Howard Ferguson and Howard Cork spend an additional 25 man-hours a month evaluating energy balance factors, relating the results to the formation and dissipation of ice, attending project meetings, providing consultation to Ontario Hydro and writing reports and papers.

Results of the study are potentially extremely valuable. Improvements in ice forecasting can lead to more efficient power generation operations, for plans could then be made to cope with the conditions anticipated. Potential economic benefits of such improvements would be in the range of tens of thousands of dollars a year in Canada alone.

The results also will be of immediate practical interest in many regions of the world including Russia, Iceland, Scandinavia and the northern United States. Aside from the economic factor, such studies contribute to the International Hydrologic Decade (IHD) effort to improve man's knowledge of his water resources, and the physical processes which affect them.

More than 90 countries are participating in IHD, which was launched in 1965 by a number of United Nations agencies.

The Canadian contribution involves the concerted efforts of scientists from all provincial and federal water agencies and most major universities and other technical specialists working in hydrology or related fields.

Met's 40-odd IHD research studies, in addition to the Niagara River project, include a study of the use of weather satellite data for determining surface snow or ice cover, a study of the effects of mountainous terrain on precipitation in British Columbia, an investigation into the potential effects of tree harvesting in Alberta's Rocky Mountains for increasing water yield for the Canadian Prairies, and intensive studies of evaporation near Chalk River, Ontario.

A major effort now planned is the International Field Year on the Great Lakes, an IHD study period of 18 months starting in 1970.

Nor is this all. Met is deeply involved ni other international activities aimed at helping the world to improve its management of our two most precious resources—air and water. Met and similar bodies in other countries are working to co-ordinate efforts for such activities as the World Weather Watch, the Global Atmospheric Research Program and, of course, the International Hydrological Decade, for the maximum benefit of all.


*Ontario Hydro engineer Stan Pitt, at the instrument control console in the control dam office, examines the anemometer traces showing wind speed and direction. Other dials and tracing instruments record changes all along the river.*

# goodbye to old glory

*Old Glory Mountain, B.C.*—A colorful page in the story of the Meteorological Branch ended this winter when the three-man weather observatory atop this 7,700 foot mountain in the West Kootenays was destroyed by fire.

The station will, of course, be replaced by an automatic weather station but, in the eyes of veteran Canadian weathermen, things will never be the same.

The end of one of the country's most unusual stations came with dramatic suddenness:

"WEATHER STATION OLD GLORY MOUNTAIN BURNED TO GROUND IN EARLY MORNING HOURS OF JANUARY 7," read the wire to headquarters. "BUILDING AND CONTENTS A TOTAL LOSS. INJURY TO ONE PERSON SEVERE FROST BITE AND EXPOSURE."

It seemed like such an ignominious end for the well-known station at which so many west coast weathermen had served.

It all started 25 years ago when the need for a mountain observatory to provide information for aviation, weather data and icing conditions became obvious.

*Met. Technician Bill Raithby, survivor of the fire that destroyed the weather station atop Old Glory mountain, surveys interior British Columbia from his post high atop the mountain. These photos were taken less than a year before the fire.*

### A new route

The fledgling Trans-Canada Airlines (now Air Canada) was flying a new route between Vancouver and Lethbridge, Alta., at low altitudes and needed a navigational aid about midway between the two centres.

D. C. Archibald, chief, basic weather, who was then western superintendent of Met., chose Old Glory mountain as a site for the observatory after making two survey trips on foot through the area.

And so one of Met's most unusual stations was established 14 miles by road and trail from Rossland B.C., on a remote mountaintop.

The main building erected there provided office space and living quarters for a staff of three Met. technicians. The building was of frame construction heated by a hot air, coal-burning furnace. A fuel storage shed about 10 to 15 feet to the north contained drums of fuel for the small lighting and power plant.

A forestry lookout, the only other building on the mountain, is located 150 feet from the main building.

You get to the site by hiking with pack-horses in summer and on skis in winter, which made it essential that all staff chosen for duty there be experienced skiers.

### Weather reports

Communications consisted of B.C. Telephone Company radiotelephone facilities and separate telecommunications radiotelephone equipment for transmission of weather reports to Castelgar.

Although the weather station was built in 1942–43, Bart Dudley, its first operator who now lives in Rossland, did not actually start work until the fall of 1944. He was joined a few weeks later by Hugh McCaffery from Winnipeg and Ray Skirten from Calgary.

Since then a large group of men have sent out weather observations from atop Old Glory, some of them who remained several years and others who stayed only one summer.

During all this time, the men at the station were kept supplied with food, coal and other essentials by Wilf Gibbard of Rossland, who led his packhorses up and down the steep trails of the mountain in good weather and bad.

At the site, the technicians made hourly reports on the weather to Castlegar and every six hours forwarded a synoptic report to the Vancouver weather office.

On the day of the fire, two of the station's three-man complement, Peter Wright, officer in charge, and Don Todd were in Rossland on a mail and supply trip.

Twenty-four-year-old Bill Raithby was in charge of the station.

### All in order

After filing his last reports to Castlegar and Vancouver, he did some studying, lit the furnace and went to bed.

It was shortly after midnight and everything seemed to be in order.

"I lay in bed for a short time and the next thing I knew I smelled smoke," recalls the young technician, who has since recovered from his ordeal.

"I jumped out of bed and ran downstairs to the furnace room, grabbing a fire extinguisher on the way, but the room was filled with smoke and I had to get out."

Fleeing into the snow dressed only in his underwear and a pair of bedroom slippers, Bill "half-walked, half-crawled" to the forestry cabin where he broke a window and crawled in to find shelter.

When no weather reports were received from the station and Raithby couldn't be reached by radiotelephone, a search party was organized by Peter Wright and Don Todd in co-operation with the Royal Canadian Mounted Police and two Rossland residents.

### Up the mountain

Accompanied by Peter's dog "Cher," a one-year-old Labrador-Shepherd, the group left Rossland and fought their way up the mountain in a blizzard.

At the top seven hours later, they found the station levelled and discovered a near-frozen Bill Raithby huddled in the unheated forestry shelter suffering from frostbite and shock, more than 25 hours after the fire had broken out.

He was airlifted from the site to hospital in Rossland by a helicopter from Nelson, B.C.

A footnote to the story comes in an item from the Rossland Miner which reports that a mountain rescue team is being formed in the area as a result of the dramatic rescue on Old Glory.

But it is the final line of the wire to Met. headquarters that officially marks the end of what was probably Canada's highest manned weather station: "WEATHER STATION OLD GLORY PERMANENTLY CLOSED EFFECTIVE JANUARY 7."

## Dorothy Moffat

A long and faithful career in the government service has come to an end with the retirement of Miss D. R. Moffat.

Miss Moffat had been secretary to the chief of forecast division at Met. headquarters for the entire period of her service, a total of 22 years.

Her first boss was Mr. (now Dr.) McTaggart-Cowan, who later became director of the Met. Branch, and is currently president of Simon Fraser University in Vancouver.

Her only other boss was the present incumbent Frank W. Benum who, together with Miss Margaret Sanders, presented Miss Moffat with a going-away gift on behalf of her fellow employees at a testimonial dinner.

*Miss Moffat, Mr. Benum and Miss Sanders*

A $15 award went to Fred Androschuk, a meteorological technician on Sable Island, for suggesting that a larger container be provided for the shipping of upper air meteorological records.

# Aviation Met. Pioneer Dies

Cyril H. Bromley, a pioneer in the aviation meteorological service, has died in British Columbia.

A native of Liverpool, England, Mr. Bromley emigrated to Canada after the First World War in which he served with the Royal Navy.

He was appointed in 1930 as officer in charge of the first meteorological office at the original site of Calgary Municipal Airport.

During the Second World War, he served with the Royal Canadian Navy, leaving it with the rank of Lieutenant Commander to resume his meteorological work.

He retired in 1956 and went with his wife to live at White Rock, B.C., where he died Aug. 7, 1968.

C. H. Bromley

## Meteorologist Receives NORAD Award

*Toronto*—A. D. Dow, a meteorological officer with the Met. Branch, has returned to civilian employment in Canada after three years of service as a Canadian Forces commissioned officer on exchange duty with the United States Air Force.

On July 22, Mr. Dow was presented with the NORAD Certificate of Achievement by Brigadier-General R. B. Hughes, Vice-Commander, NORAD Region. The citation read in part:

"This certificate is awarded to Major Alvin D. Dow for outstanding and commendable performance of duty while serving as Chief, Current Operations Branch, Staff Weather Agency, Headquarters, North American Air Defence Command, from 4 July 1965 to 31 May 1968.

"During this period, he displayed exceptional professional ability, leadership and outstanding judgment in the performance of his duties. His outstanding initiative and resourcefulness resulted in significant contributions to the air defense of the North American Continent.

"Throughout his assignment, he maintained an objective and unprejudiced attitude in the interservice and international aspects of this command. His consistent outstanding performance of duty provided a unique contribution to this headquarters and reflects great credit upon himself, the North American Air Defence Command, and the Canadian Armed Forces."

The certificate was signed by P. H. Greasley, Major General, United States Air Forces, Acting Chief of Staff.

*Brigadier-General R. B. Hughes, U.S.A.F., (left), presents the NORAD Certificate of Achievement to A. D. Dow, Met. Branch.*

MÉTÉOROLOGISTE HONORÉ—*Un météorologiste des Transports, M. Alvin D. Dow, qui vient de compléter trois ans de service avec l'Aviation américaine dans le cadre d'un programme canado-américain d'échange de personnel, s'est fait décerner un certificat de mérite de NORAD. Pendant son séjour aux États-Unis, M. Dow, à titre de chef de service, était attaché au quartier général du Commandement de la défense aérienne du continent nord-américain. Le certificat, décerné en reconnaissance des précieux services rendus à NORAD, a été présenté à M. Dow, à droite, par le brigadier général R. B. Hughes de l'Aviation américaine.*

## Into Each Life . . .

*Toronto*—Despite their best efforts, the Met. branch's annual Weathermen's Golf Day had to be postponed because of bad weather.

Undaunted, however, the weathermen re-scheduled the event and with the help of warm, sunny weather and 100 enthusiastic participants, made it an unqualified success.

Winner of the cup donated by Met. Director J. R. H. Noble as first prize was Linda Plaskett of the research and training division.

Linda was presented with the award by Ted Wiacek, officer in charge of the weather office at Toronto International Airport.

After a gruelling day on the links, the golfers retired for a social period of celebration and commiseration where, it was reported, many of them are alleged to have turned in better performances than they did on the fairways.

# 1969

TRANSPORT

CANADA


*R.-J. Fichaud*

## M. R.-J. Fichaud, nouveau météorologiste régional

Une autre nomination récente aux Services de l'Air de la région de Québec est celle de M. Raymond-Jean Fichaud au poste de météorologiste régional. M. Fichaud a été confirmé dans ses nouvelles fonctions il y a quelques mois. Il occupait auparavant le poste de surintendant régional des services météorologiques généraux.

Natif de Montréal, M. Fichaud est entré au Service météorologique en 1949 après avoir obtenu une maîtrise ès sciences de l'Université de Montréal. Il détient également une maîtrise ès arts de l'Université de Toronto.

M. Fichaud, au début de sa carrière avec le ministère des Transports, a d'abord été affecté au bureau météorologique de Goose Bay. En 1953, il revenait à Montréal pour y assumer les fonctions d'analyste et de prévisionniste au Service central d'analyse.

En 1957, il est passé au service de la marine comme météorologiste. A bord du H.M.C.S. Bonaventure, il a acquis une précieuse expérience en œuvrant dans des régions éloignées du Canada — régions de l'Atlantique Nord, de la Méditerranée et des Caraïbes.

Il a quitté la marine en 1962. Après un séjour de quelques années à Trenton comme officier d'état major au Commandement du transport aérien (météorologie), il est revenu à Montréal en 1966 à titre de surintendant régional des services météorologiques généraux.

## First R. E. Munn Bursary

The first Dr. R. E. Munn Bursary has been presented to Norman Poulton, son of Mr. and Mrs. J. Poulton of Toronto, at the last general meeting of the Toronto local of the Department of Transport Component, Public Service Alliance of Canada.

The bursary was named after Dr. Munn, a meteorologist and member of the Toronto local, to honor his dedicated work and time spent in the formation and operation of the former Meteorological Headquarters Association, which later was one of the founding bodies of the former Canadian Air Services Association.

The bursary, presented annually to a dependent of a member of the Toronto local, is worth $100.

Mr. Poulton, the first recipient of the bursary, is a first year Arts and Science student at the University of Toronto.

*Left to right, Dr. Munn, R. G. Chapil, local president, and Mr. Poulton.*

WITH THANKS—*W. H. Mackie, regional superintendent of observational services, Vancouver, presents a book award to Commodore Clifford Edgecombe, right, master of the S.S. Oriana. At left is Radio Officer E. R. Le Gear, who also received an award for excellence in voluntarily making weather observations for the department while at sea. The Oriana, whose officers have won awards annually for the past six years, originated 857 weather reports during 1967.*

# Suppression of Hail in the U.S.S.R.

*by J. D. Holland,*
*A/Supervisor,*
*Physical Research Unit,*
*Meteorological Branch.*

*Mr. Holland spent two weeks in the U.S.S.R. during the past summer, studying Soviet hail research and hail suppression activities at the invitation of the Soviet Government.*

*A 100 millimeter gun used for firing silver iodide shells into hail clouds.*

Hail is a serious problem in many parts of Canada, particularly Alberta, where a hail research project has been in operation since 1956.

Sponsored by the federal and provincial governments with the Meteorological Branch playing a leading role, the project's aim is to acquire enough information about the nature of hailstorms to be able to reduce or suppress completely the damage they cause.

Reports from the Soviet Union over the past few years indicated that the Russians have already solved the hail problem, so it was that I found myself in the U.S.S.R. in July, 1968, along with Dr. W. Hitschfeld of McGill University, to discover just what was being done in the way of hail suppression there and whether the techniques being used might be applicable to Canada.

We were very well received in the Soviet Union where we were taken to five of the main hail suppression areas in the country, given the opportunity to talk to the scientists and other workers conducting their hail suppression program, to see their equipment and mode of operation, and be told of the results of their hail suppression work.

We were also permitted to take pictures, all our questions were answered and we were taken to talk to the farmers on whose behalf the hail suppression work is being carried out, in order to learn their evaluation of the program.

In the five areas we visited, all in the vicinity of the Caucasus mountains, 1,940,000 hectares of farm land are being protected against hail. Since one hectare equals approximately 2½ acres, this figure is close to five million acres or 7,800 square miles.

In most of their work, the Russians are using artillery to fire silver iodide shells into hail clouds, but in some areas, rockets are being used instead of guns.

Sixteen hail suppression centres employing about 800 people and covering between 100,000 and 200,000 hectares each, were involved in the areas we visited.

Briefly, the hail suppression technique used in the U.S.S.R. operates in the following manner: Hail is presumed to grow in an "accumulation zone" in the cloud where the liquid water content is very high. The high liquid water content arises because of the vertical air currents reaching a maximum at the level of the accumulation zone and then falling off above that level.

The level of the accumulation zone with respect to the freezing level is very critical, since if it is too warm there will be no hail and if it is too cold there will likewise be no hail.

But if the accumulation zone is in the 0 to -20 degrees C level, hail can grow very rapidly. Zones of high liquid water content are identifiable on radar, and the U.S.S.R. technique uses this property.

In a highly refined technique, using radars at two wavelengths (3.2 cm and 10cm) they claim that by comparing the signal returned from the accumulation zone by the two radars they are able to make accurate positive identification of the presence of hail.

In actual practice, however, they are finding it more economical to identify the potential hail zone by means of 10 cm radar only. The identification of hail is less positive with only one radar, but the two-radar system is much more costly.

When potential hail has been identified by radar in the 0 to -20°C level in a cloud, the coordinates of the hail centre and its elevation are passed by radio or telephone to the gun or guns within range of the hail centre and they fire silver iodide shells to burst in the hail centre of the cloud between -6 and -10 degrees C. One hundred grams of silver iodide are contained in each shell, which, on bursting, provides 1015 crystals in the atmosphere per cubic kilometre to serve as potential hail nuclei. The addition of artificial hail nuclei to the cloud means that many hailstones compete for the liquid water present in the cloud instead of the few hailstones naturally formed. The result is that the hailstones formed are much smaller and melt before reaching the ground.

As many as thirty silver iodide shells may be fired into an individual storm over a period of one or two hours or it may be necessary to fire only one. It is claimed that the effect of firing the silver iodide shell into the cloud is usually noticeable on radar within a few minutes.

Individual storm studies were presented showing how hailstorms approaching the protected area ceased hailing upon being seeded and resumed hailing again after seeding had been stopped.

Other studies showed storms which were broken up by a single shell and never resumed the production of hail.

Statistics were also presented showing the damage caused by hail in the protected area as compared with an unprotected control area both in years before protection began and in the years since. The statistical evidence indicates a decrease in hail damage under protection by 80 to 100 per cent.

*A 100 millimeter gun and silver iodide shell used for hail suppression in the U.S.S.R.*

Many arguments have been raised against the Soviet theory of hail formation, particularly the development of the accumulation zone, and the statistical analysis does not contain all the features which are desirable in such an evaluation. However, the results shown were very impressive and the scientific community seemed to be thoroughly convinced of the success of the technique.

We also had the opportunity to talk to representatives of the agricultural community in several areas, and found that officials of the Agricultural Administration ranging from Deputy Ministers to local administrators and managers of State Farms were all thoroughly committed to the method and completely convinced of its value and success.

The normal set-up in applying this technique to actual hail suppression is a central station equipped with two radars, which is the control station. The weather situation is monitored continuously, and when hail is forecast, the radars are turned on and watched continually for the development of hail echoes.

Each control centre covers a radius of approximately 40 km and is surrounded by 5 to 7 guns. Each gun covers a radius of 10 km, with the gun capable of firing a shell to a height of 4.5 km and to a distance of about 13 km.

The shells are set to explode by a timing device on the shell which explodes them at the appropriate spot in the cloud. A specially designed frangible casing ensures that residual particles will be too small to do any damage on reaching the ground.

In addition to our observation of the Soviet hail suppression activities, Dr. Hitschfeld and I had an opportunity to observe many facets of Soviet life and had many interesting experiences.

We were met at the Moscow international airport by a receptionist and interpreter from the Hydrometeorological Service, who accompanied us during most of our time in Moscow. Here we met Dr. Kiziria, Head of the Weather Modification Department and Mr. Mazlov, Chief of the Foreign Division of the Hydrometeorological Service, who briefed us on the proposed itinerary for our visit and offered to make any special arrangements which we required.

We were also taken for a visit to the famed Moscow Circus, which both of us had missed on its North American tour.

After a short stay in Moscow, we flew by Aeroflot to Mineral'nye Vody, about 1300 km to the Southsoutheast, where we were met by a large delegation from the High Mountain Geophysical Institute including two interpreters and led by the Director of the Institute, Professor G. K. Sulakvelidze, the number one hail expert in the U.S.S.R.

The interpreters were particularly necessary, since neither Dr. Hitschfeld nor I spoke Russian, and very few of our hosts possessed any great facility in English.

As a result, all our talks were conducted through the interpreters, which made communication difficult and greatly lengthened the time required to give and receive ideas. However, the two young ladies who acted as our interpreters were very good in both languages and worked long and hard to ensure the success of our visit.

From Mineral'nye Vody we were flown in a ten-passenger helicopter to Labinsk, one of the main centres of hail suppression in the North Caucasus. Here we spent four days at a field station situated on a hill some 10 or 12 miles from the agricultural town of Labinsk.

A cluster of small buildings consisting of dormitories, cook-house, weather office, briefing room, etc., plus several radars in trailers and three guns sitting on the hill constituted the nerve centre for hail suppression activities in the area.

At Labinsk, we were given briefings on all aspects of the hail suppression work: the theory of hail formation, the theory of suppression, hail forecasting, seeding technique, results of the hail suppression activities to date, experimental work in progress.

We were also shown the radars, briefed on the method of identification of hail in clouds by radar, shown the guns and shells and were given a demonstration of the firing of a silver iodide shell (into clear air).

Since the season of major hail activity in the Caucasus region is in May and June, we were unable to witness an actual hailstorm. However, one cold front did cross the area while we were there and hail was identified by radar about 80 km away, outside the protected area. The hail protection system went into operation, but the cold front passed over the protected areas causing only widely scattered light showers.

*Radar used in detecting hail in the U.S.S.R.'s hail suppression program.*

During the period of our stay at the Labinsk field station, we were also taken to visit two other hail suppression centres nearby, some of the outlying gunsites, and to visit the Labinsk Agricultural Administration and a nearby State Farm. Most of these excursions were accomplished by travelling in two three-passenger helicopters.

After leaving Labinsk, we travelled by bus to the High Mountain Observatory at Terskol where many studies of snow and ice are conducted on the slopes of Mount Elbrus, at 18,468 ft. the highest point in the Caucasus. This is also being developed as a resort area—skiing, hiking, camping, etc., and we rode a ski-lift to the top of Mount Cheget for a breathtaking view of Mount Elbrus. Many vacationers thronged the area, some having arrived by private motor car, but most having been brought in excursion buses.

Another highlight of our trip was our journey by bus through the Caucasus mountains over the Georgian Military Road, an outstanding engineering achievement connecting the North Caucasus with Trans-Caucasus area including the Georgian and Armenian Soviet Socialist Republics.

This road winds through the mountains along sheer cliff faces, across raging torrents of water, through tunnels, and served as an important military artery during the Second World War. All road signs, of course, were in Russian, but we were pleasantly surprised to be met by one in English at the border of Georgia which read "The Gates of Georgia are Open to Our Guests of Good Will".

At Tbilisi, the capital of Georgia, and again in Erevan, the capital of Armenia, we were overwhelmed by the hospitality extended to us and came away with warm feelings of gratitude.

In Georgia, for example, as is apparently the custom, we were escorted to the city limits by our hosts on our departure. There we all dismounted and said our farewells before proceeding on our way.

And when we reached Armenia we were met 75 kilometres outside the capital by the Director of the Hydrometeorological Service and the Deputy Minister of Agriculture of Armenia on the shores of Lake Sevan and were entertained at dinner and taken for a boat cruise on the lake before being escorted into the capital.

Erevan is a very ancient and very proud city, having just celebrated its two thousand seven hundred and fiftieth anniversary. The event has been commemorated by a fountain with 2750 jets. Here we were very close to the border of Turkey and could see the Mount Ararat of biblical fame from our hotel windows.

On Sunday we were taken to visit an old monastery of the Armenian Orthodox Church and found that a church service was being conducted with a goodly number of old and young people in attendance.

Hail suppression activities in Georgia and Armenia are conducted mainly for the protection of grapes, small fruits, tobacco and vegetables, crops with a high economic value. In the North Caucasus region, however, with higher per acre production of grain, the protection is also extended to grain crops. One of the special problems in Armenia was the forecasting of hailstorms which sometimes develop during the night in the Arasat mountains of Turkey and move unexpectedly into Armenia in the early hours of the morning.

We found that there were many similarities between life in the U.S.S.R. and life in Canada, but also many differences. The population of the U.S.S.R. is composed of many ethnic groups, each with its own individual characteristics, just as in Canada. People on the streets in Moscow and other cities are dressed in Western style dress and the appearance of street crowds is thus much the same as in Canada. Bright colours and even some mini-skirts were in evidence. There were many private automobiles on the city streets, as well as taxis and trucks but between cities the highway traffic was composed mostly of trucks.

We were interested to discover that Soviet citizens as well as the foreigner required passports to travel from one part of the country to another. These had to be produced upon making airline reservations and upon checking into a new hotel, but were not required on other occasions.

The weather in Moscow appeared to follow a pattern similar to that experienced in many Canadian cities. It was fine and warm when we arrived there but travelling disturbances produced cool rainy weather during most of the remainder of our stay.

In the Caucasus regions, however, the weather was sunny and warm, getting hotter the farther south we went, till in Armenia daily maximum temperatures were in the 90's all the time we were there. We were advised that except for the occasional shower, this pattern continued throughout the summer.

The taking of photographs from moving vehicles is prohibited in the U.S.S.R., but we were permitted, even encouraged, to take pictures elsewhere, and brought back a number of coloured slides of the hail suppression equipment and installations and the people operating them, as well as shots of spectacular scenery in the Caucasus mountains.

Two of our hosts in the U.S.S.R., Dr. Kiziria and Profesor Sulakvelidze, paid us a return visit in August to study hail and weather modification research in Canada and we were very pleased to have the opportunity to show them what we are doing here, also in some measure to return their hospitality to us while in the U.S.S.R. and to show them some of the beauties of Canada.

# ON DUTY

*by Bryan Goodyer*
*Information Services Division*

Streaking through the sky 30,000 feet above the Pacific Ocean and far above a floor of sun-swept cloud, a jetliner heads for Japan.

A crewmember works with quiet concentration and notes with satisfaction that the aircraft is right on course according to data received from Ocean Station "Papa," 860 nautical miles west of Vancouver.

The "station," a storm-ravaged 10 square miles of ocean, presents a picture quite different from that in the jet's serene crew compartment.

One of the Canadian Coast Guard's new weatherships — it could be either CCGS *Vancouver* or CCGS *Quadra* — is slowly bucking a howling gale, trying to maintain the position from which it serves as a navigational checkpoint for other shipping and for trans-Pacific aviation.

Aboard the ship, scientists and technicians, all well-schooled to working in what is regarded as one of the world's worst weather areas, are going about their tasks as though they were snugly ashore, sending out an almost endless flow of weather, navigational and oceanographic data.

Built at a total cost of nearly $24 million, the two weatherships operate from the Department of Transport's district marine base at Victoria, B.C.

Built and maintained under the supervision of the Shipbuilding Branch (now a part of the new Department of Supply and Services), the Meteorological Branch and the Telecommunications and Electronics Branch, the ships were completed at the yard of Burrard Dry Dock Co. Ltd., North Vancouver.

The *Vancouver* entered service in April 1967, the *Quadra* in October of the same year, replacing the old Canadian Coast Guard weatherships, two ex-frigates, CCGS *St. Catharines* and CCGS *Stonetown* and the old standby ship, *St. Stephen.*

CCGS *Vancouver* and CCGS *Quadra* are the largest ships in the Canadian Coast Guard fleet, each measuring 404 feet, three inches long over all and 50 feet in breadth.

Each has a loaded displacement of 5,605 tons, a range at 14 knots of 8,400 nautical miles plus 2,000 miles reserve and a top speed of 18 knots. This last-

# AT OCEAN STATION 'PAPA'

mentioned statistic becomes important when the ships are called upon, as are all Canadian Coast Guard vessels, to take part in search and rescue operations.

Each vessel is at sea for a period of seven weeks, comprised of one week sailing to and from station and six weeks on station.

Each ship normally has a maximum complement of 100 men, including a meteorological staff of six under a chief meteorological officer, a telecommunications staff of 11 under a chief telecommunications officer and two to five oceanographers depending on the availability of personnel under a chief oceanographer.

Practically all crewmembers have single accommodation that includes a desk, a table, table lamp and berth.

The ships are equipped with officer's and petty officer's lounges, a recreational room, a cinema and a hobby shop. Recreation and hobbies consist of movies twice a week, woodworking, leatherwork, the weaving of rugs, ship modelling and other crafts.

Some of the men paint, others study and the Victoria Public Library supplies a large number of books. Many a thesis has been written on the weatherships by budding oceanographic students.

### Unusual Appearance

Most notable feature of the ships to the casual observer is the great radar dome towering high above each. The dome houses a new type of balloon-tracking radar capable of automatically tracking meteorological balloons up to a height of 100,000 feet, of detecting storms as far away as 200 nautical miles and of keeping track of aircraft within a radius of 70 miles.

For many years, meteorological information has been collected on a volunteer basis by merchant ships travelling the world's sea lanes and reported to meteorological stations ashore for use in preparing forecasts.

Events of the Second World War and the rapid development of international aviation routes after the war made it apparent that a more precise source of such information was needed. Aircraft particularly need upper air data for high altitude operations.

As a member of the International Civil Aviation Organization (ICAO), Canada committed itself to operate jointly with the United States one station on the Atlantic Ocean and one station on the Pacific Ocean.

Between 1947 and 1950, Canada operated one vessel on an alternating basis with the United States on Station "Baker" in the North Atlantic. This operation was not satisfactory economically, however, so Canada took over the complete operation of Station "Papa" on the North Pacific.

The weatherships *Stonetown* and *St. Catharines* (both ex-Royal Canadian Navy frigates) were put into service on Station "Papa" commencing Dec. 1, 1950. These ships continued to man the station, located at 50 degrees North Latitude, 145 degrees West Longitude, until they were replaced by CCGS *Vancouver* and CCGS *Quadra*.

### Surface Weather Program

Both ships are fully-manned and equipped to handle the surface meteorological observations and upper air soundings which must be made each day.

In addition to three anemometers for measuring surface wind, the ships are equipped with pressure instruments that include two precision aneroid barometers, a marine mercury barometer, a three-day marine barograph, and four Stevenson screens.

Each ship is also equipped with the British National Institute of Oceanography's Muirhead wave recorder which has taken much of the guesswork out of determining wave heights and periods.

There can still be a bit of occasional guessing, however, as the crew of the *Quadra* found out during a hurricane on Dec. 1, 1967. The needle on the wind velocity was forced beyond the highest marked limit of 100 miles per hour, and the wave recorder indicator went past its highest marked limit of 60 feet during the storm.

Since Station "Papa" has been manned by Canadian ocean weatherships, with the exception of a few short periods, continuously since 1950, some valuable statistics on various aspects of the weather at this point in the northeastern Pacific have been compiled.

The warmest month seems to be August with a mean temperature of 55.8 degrees Fahrenheit, followed by September with a mean temperature of 55.6 degrees. The coolest month appears to be March (40.5 degrees), followed by February (41.2), January and April (each 41.5). Temperatures rarely exceed 60 degrees (only .3 per cent of all observations), or fall below 32 degrees (0.2 per cent of all observations).

Wind speeds average 20 knots or more from October through March, with November having the highest average wind speed of 25 knots.

The highest sustained wind speed on record was the 100 mph reading already mentioned.

Although a month-by-month analysis of wave heights has not yet been worked out, high waves, in excess of 20 feet, are infrequent, occurring on the average of only 3.4 per cent of the observations in the course of a year.

Low visibilities of less than two nautical miles seem to occur most frequently in August (about 28 per cent of the observations) and least frequently in October (about two per cent of the observations).

### Upper Air Program

A balloon inflation shelter has been designed to accommodate aerological balloons which are capable of reaching an altitude of 100,000 feet or higher. When inflated with helium, these balloons measure eight feet in horizontal diameter and 12 feet in height. Each ship carries about 200 cylinders (57,000 cubic feet) of helium.

Four upper air or rawinsonde ascents are made daily at regular six-hour intervals. The balloon carries aloft a radiosonde instrument which measures the temperature, pressure and relative humidity of the air and transmits this information by radio transmitter to a ground receiver.

The balloon also carries aloft a special target which is followed by a stabilized radar system to obtain speed and direction of the winds at any desired altitudes.

The balloon rises until it bursts, usually at a height of about 100,000 feet, thus terminating the upper air soundings.

### Special Radar Unit

The balloon-tracking radar on these new ships is perhaps the most advanced equipment of this type in the world. It was designed and engineered by the Sperry Gyroscope Co. of New York and is designated as "Wind Finding Radar SP6504." The antennae itself is housed in a spherical plastic shelter comprising the highest component of the ship.

The radar is capable of automatically tracking the balloon and computing the wind directions and speeds every six seconds with a print-out of time, slant range, azimuth, elevation, target height, wind direction and wind speed.

### Oceanographic Studies

In the realm of oceanography, the weather-oceanographic vessels are making an increasingly important contribution, the most extensive series of observations to date having been made at Station "Papa."

The physical oceanographic studies are concerned with the variability of properties in the ocean, its thermal structure, internal wave action, large scale air-sea inter-action and related subjects. It has been found that, far from being a scientifically uninteresting area, the northeast Pacific undergoes physical processes upon which science has just begun to touch.

Biological oceanographic studies have been under way since 1956, including studies governing the living resources of the Northeastern Pacific. Research concerning the relationship between the ocean's production of drifting microscopic plants (phytoplankton) and its production of fish are of major importance to the salmon fishery of the North American West Coast, and to British Columbia in particular.

Investigators from the Pacific Oceanographic Group have been the biggest users of the data, but many scientists from other countries, in particular the United States, Japan and Russia, have examined it intensively. An important user in the United States has been the United States Naval Post-Graduate School at Monterey, California.

Information compiled aboard the weather-oceanographic vessels is being utilized in the classrooms of many universities offering courses in oceanography in Canada, the U.S. and Japan.

It has also been used as a basis by some international bodies to determine whether certain proposed studies should or should not be pursued, the experience gained at Station "Papa" having provided a yardstick by which the possible magnitude of other such undertakings can be measured.

### Aids to Navigation

Although the vessels are commonly referred to as "weatherships," one of their most important functions is that of navigational aid to ships and aircraft, a duty for which they are fitted with Long Range Aid to Navigation (LORAN) equipment to establish their own positions accurately at all times.

A 400-watt radio beacon transmits constantly on medium frequency, a four-letter group indicating the station and its position, based on the grid system of two-letter co-ordinates.

This facility enables any ship or aircraft fitted with direction-finding equipment to obtain a line of position with fairly high accuracy at ranges of several hundred miles.

Ships and aircraft at closer range (14 miles for surface ships, 200 miles for aircraft) can on request be given their precise position by means of radar.

On an average "on station" patrol, more than 500 aircraft are furnished not only with their position, but also their true course and speed and weather conditions at their altitude.

The ships also serve as important communications relays between other vessels with less powerful radio equipment and shore radio stations.

Each vessel is equipped with facsimile radio receiving equipment, by means of which weather maps can be received from the mainland.

*An oceanographer electronically measures the salinity of ocean water samples aboard CCGS Quadra.*

Each has a radio room and a communications and electronic equipment centre with additional automatic transmitters for air-ground and ship-to-ship communication.

High frequency direction-finding equipment is provided and is particularly useful in search and rescue work.

There are three sets of portable emergency communications equipment for use in lifeboats, as well as portable VHF-FN radio telephone units for use in workboats or otherwise as needed.

An amateur radio "Ham" room is also provided on each vessel for the use of radio hobbyists among the crew and is equipped with a one-kilowatt single sideband transmitter.

Fishing equipment also provides a mixture of research and off-hours pleasure.

On bringing in a catch, the seagoing "sportsmen" record the species, its stomach content and other information that is passed on to fisheries research experts.

The ships also keep a log of sightings of sea birds and marine animals such as whales, seals and dolphins, which are forwarded on to appropriate government departments to add to man's knowledge of the world around him.

**Dedicated service**

*Winnipeg*–The death occurred on February 21 of Miss Joan O'Brien who had worked in the Winnipeg Weather Office for 27 years.

Following her graduation with a science degree from the University of Manitoba, Joan joined the Meteorological Service of Canada in 1942. She was one of the first women accepted and trained for professional work as a Meteorological Officer.

Throughout her working career, she was a highly respected and indispensable member of the Winnipeg Weather Office staff. As a result of her dedicated service, she made an outstanding contribution to the efficiency and welfare of the Meteorological employees at Winnipeg Airport in her capacity of Administrative and Technical Assistant to the Officer-in-Charge. In addition, she applied her comprehensive knowledge of meteorology to serve the community and the region at large as a competent climatologist.

## Search for new department symbol

Last year when the Department of Transport promoted a symbol contest, a large number of employees showed a genuine interest in the department by entering the contest and submitting a wide variety of designs. Many of the entries received displayed imagination and originality, but unfortunately, none were quite what was sought for a departmental symbol.

In view of this, it was decided that there would be no winning design and that all entries would be returned to the originators to be retained as their property.

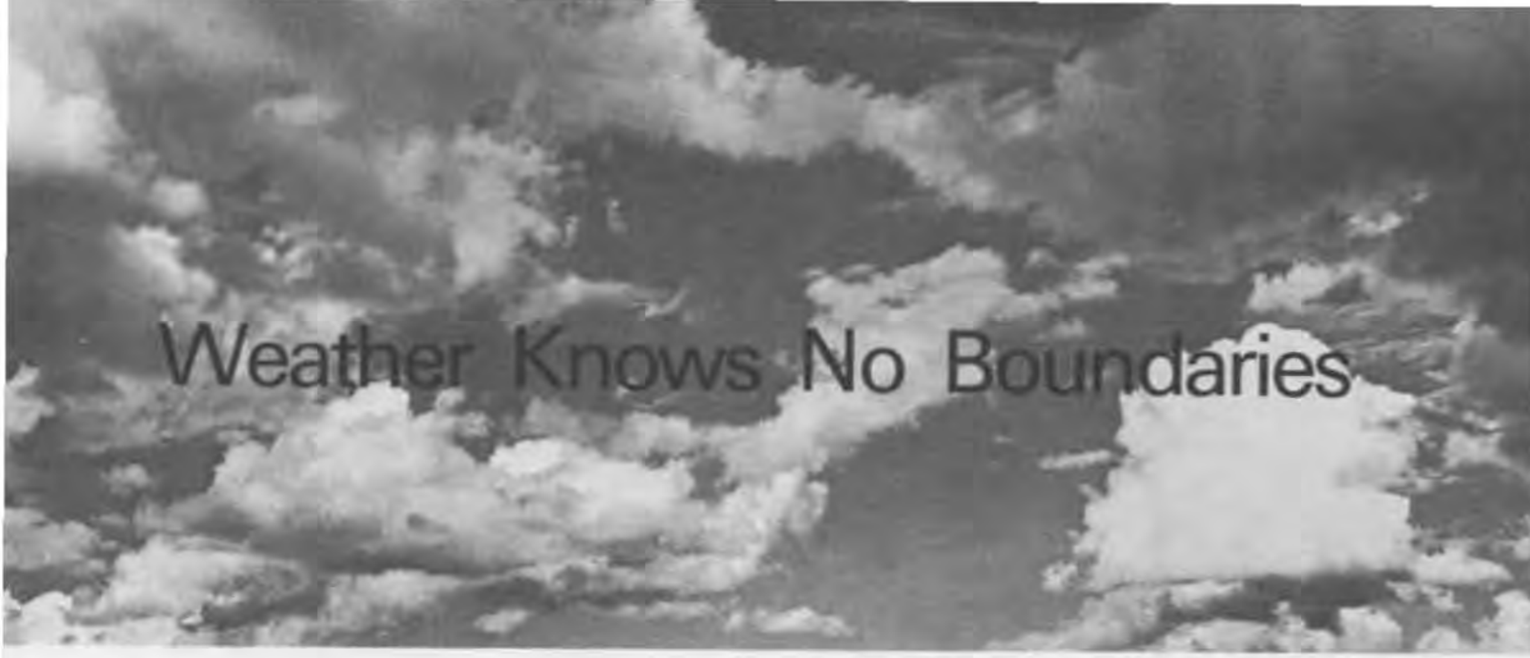
It was the opinion of the Contest Committee that the entry from John S. O'Neill of Willowdale, Ontario, was the best of those received. In appreciation of his efforts it was decided to grant Mr. O'Neill, who is with the Instrument Division of the Meteorological Branch in Toronto, an honorarium of $50.

## Aucun symbole jugé acceptable

Le concours organisé au ministère l'an dernier en vue de trouver un symbole qui illustrerait les buts et initiatives poursuivis par le ministère des Transports a certes suscité beaucoup d'intérêt chez tous les employés. Dans les nombreux projets soumis, on a pu déceler chez le personnel beaucoup d'imagination et d'originalité.

Malheureusement, aucun des dessins présentés ne répondait aux conditions que doit réunir l'emblème d'un ministère. Aucun des dessins n'a donc été choisi et l'on a décidé de les retourner aux participants.

Le jury a cependant jugé que le projet de M. John S. O'Neil, de Willowdale, Ontario, était le mieux conçu. M. O'Neil est employé à la Division des instruments de la Direction de la météorologie. Pour le récompenser de ses efforts, on lui a décerné un montant de $50.



# Weather Knows No Boundaries

*by J. Rogalsky*

As a member of the World Meteorological Organization, an agency of the United Nations, Canada is engaged in a wide variety of international endeavours in the field of meteorology. In addition to the exchange of data and forecasts, special assistance for the improvement of meteorological services has been given to a number of countries through foreign aid programs, and particularly to Commonwealth countries under the Colombo plan.

It has been recognized by international agencies that one of the primary things that can be of assistance to developing countries is the training of professional and technical staff in various disciplines. The Canadian Meteorological Service has gained an enviable reputation in the provision of this type of training service for other countries.

The Climatology Division, at Meteorological Branch Headquarters in Toronto, has pioneered in the field of machine processing of climatological data and is now recognized as one of the leaders in the development of modern methods, systems and techniques for analyzing and archiving climatological data. Several foreign Meteorological Services have selected Canada for the training of their own specialists in the design, development and implementation of climatological data processing systems.

**Technical Aid**

In 1963, under the Special Commonwealth Aid to Africa Program (SCAAP), the Meteorological Branch participated in a substantial program of technical aid to the Nigerian Meteorological Service. After a feasibility survey was completed and the program accepted by the External Aid Office, Canadian made data processing equipment was shipped to Lagos, and Nigerian technical staff were trained in Canada. A Canadian meteorologist went to Nigeria to supervise the installation of the equipment and to get the program started. Four Nigerian meteorologists and technicians have come to Toronto for training periods over the past few years, and periodic correspondence has been carried on with the Nigerian staff regarding their technical problems and progress.

A training program involving V. K. Raghavendra from India under the Colombo plan, and Sampson Masope from Ghana under the WMO Fellowship program, was recently concluded. Basically the purpose of this training program was to familiarize the students with the most modern equipment, techniques, facilities and methods for weather data processing and analysis, and was custom tailored to suit the needs of the participating countries.

The Indian Meteorological Service plans to install a medium scale computer in the near future, and the emphasis for Mr. Raghavendra was therefore in the area of computer operating systems and equipment capabilities. He also became familiar with the most effective programming languages to be used on the current generation of computing equipment.

**Canada and India**

Mr. Raghavendra also found time to engage in some supplementary developmental work to empirically derive sunshine and radiation data using the computer and available historical cloud cover observations. These procedures will be useable in Canada as well as India, and even if only partially applied, Canada will have directly benefited far more than we have invested in this particular program. There were, of course, many other intangible mutual benefits derived in areas of learning, appreciation, tolerance and understanding, which will help in future programs of this kind.

The Ghanaian Meteorological Service will be utilizing a small scale computer located at the University of Ghana on a part-time basis. Their primary applications will involve quality control and tabulation of climatological data. Mr. Masope's training was, therefore, oriented to computer programming with emphasis on the production of tabulations which will be used by the Ghanaian Meteorological Service for routine publications.

Both Mr. Masope and Mr. Raghavendra were presented with certificates indicating successful completion of a technical training course in methods and procedures related to machine processing of climatic data.

The trainees expressed pleasure with the choice of Canada as the host country for their training programme, and the Meteorological Branch is looking forward to continued liaison with the recipient nations.

# Le temps se rit des frontières

*par J. Rogalsky*

A titre de membre de l'Organisation météorologique mondiale, une agence des Nations Unies, le Canada participe à une grande variété de projets internationaux dans le domaine de la météorologie. En plus d'échanger des données et des prévisions météorologiques, il aide tout spécialement à améliorer les services météorologiques de certains pays dans le cadre des programmes d'aide à l'étranger, particulièrement des pays du Commonwealth en vertu du plan Colombo.

Les agences internationales reconnaissent que l'un des meilleurs moyens d'aider les pays du tiers-monde consiste à former leur personnel professionnel et technique des diverses disciplines. Le Service canadien de la météorologie s'est fait une réputation enviable en fournissant ce genre de service à d'autres pays.

La Division de la climatologie, au bureau central de la Direction de la météorologie à Toronto, a fait oeuvre de pionnier dans le domaine du traitement mécanique des données climatologiques et est maintenant reconnue comme l'un des organismes les plus compétents en matière d'établissement de méthodes, de systèmes et de techniques modernes d'analyse et de mise en archives des données climatologiques. Par conséquent, plusieurs services météorologiques étrangers confient au Canada la formation de leurs propres spécialistes de la conception, du perfectionnement et de la mise en oeuvre de systèmes de traitement des données climatologiques.

**Aide technique**

En 1963, la Direction de la météorologie a participé, dans le cadre du Programme spécial du Commonwealth pour l'aide à l'Afrique (SCAAP), à un vaste programme d'aide technique au Service météorologique nigérien. Après étude des possibilités et acceptation du programme par le Bureau de l'aide extérieure, du matériel de traitement des données fabriqué au Canada fut expédié à Lagos et des membres du personnel technique de la Nigéria reçurent leur formation au Canada. Un météorologiste canadien se rendit à la Nigéria pour surveiller l'installation du matériel et pour mettre le programme en oeuvre. Quatre météorologistes et techniciens nigériens ont reçu une formation à Toronto, au cours des dernières années, et une correspondance périodique a été entretenue avec le personnel nigérien au sujet des problèmes et des progrès techniques.

QUE DIT L'ORDINATEUR?—M. J. Rogalsky *et M.* V.K. Raghavendra *vérifient l'exactitude des résultats fournis par l'ordinateur.*

WHAT DOES THE COMPUTER SAY?—J. Rogalsky *and* V.K. Raghavendra *examine the computer output for validity.*

M. V.K. Raghavendra, boursier indien du plan Colombo, et M. Sampson Masope, boursier ghanéen de l'Organisation météorologique mondiale, ont récemment terminé un stage de formation au Canada. Les deux stagiaires devaient essentiellement se familiariser avec l'utilisation des équipements, des techniques, des installations et des méthodes les plus modernes de traitement et d'analyse des données météorologiques. Ces stages ont été conçus de façon à répondre aux besoins particuliers de l'Inde et du Ghana.

Le service météorologique de l'Inde a, en effet, l'intention d'utiliser prochainement un ordinateur de dimensions moyennes. M. Raghavendra a donc reçu des cours plus poussés en informatique. Il connaît maintenant les principaux langages de programmation utilisés dans les ordinateurs de la génération actuelle.

**Coopération indo-canadienne**

M. Raghavendra a également consacré une partie de son temps à des études supplémentaires en vue d'obtenir empiriquement des données sur l'insolation et le rayonnement, à l'aide d'un ordinateur et de données de nébulosité. Cette méthode pourra être utilisée au Canada autant qu'en Inde et, même s'il ne l'utilise que partiellement, le Canada aura tiré de ce programme particulier un profit supérieur aux sommes investies. Il y a, de plus, bien d'autres avantages indirects que les deux pays tireront de ce programme, dans les domaines de la connaissance, de l'appréciation, de la tolérance et de la compréhension, choses très utiles pour les programmes futurs du même genre.

De son côté, le service météorologique du Ghana utilisera bientôt à temps partiel un petit ordinateur installé à l'Université du Ghana et ses premiers travaux porteront sur le contrôle de la qualité et la tabulation des données climatologiques. Le stage de M. Masope a donc porté surtout sur la programmation des ordinateurs et la production de tableaux comme ceux que le service météorologique ghanéen établira pour des publications courantes.

MM. Masope et Raghavendra ont tous deux reçu des diplômes indiquant qu'ils ont terminé avec succès des stages techniques en méthodes et procédures de traitement automatique des données climatologiques.

Les deux stagiaires se sont déclarés très satisfaits d'avoir fait leur stage au Canada. De son côté, la Direction de la météorologie espère maintenir le contact ainsi établi avec l'Inde et le Ghana.