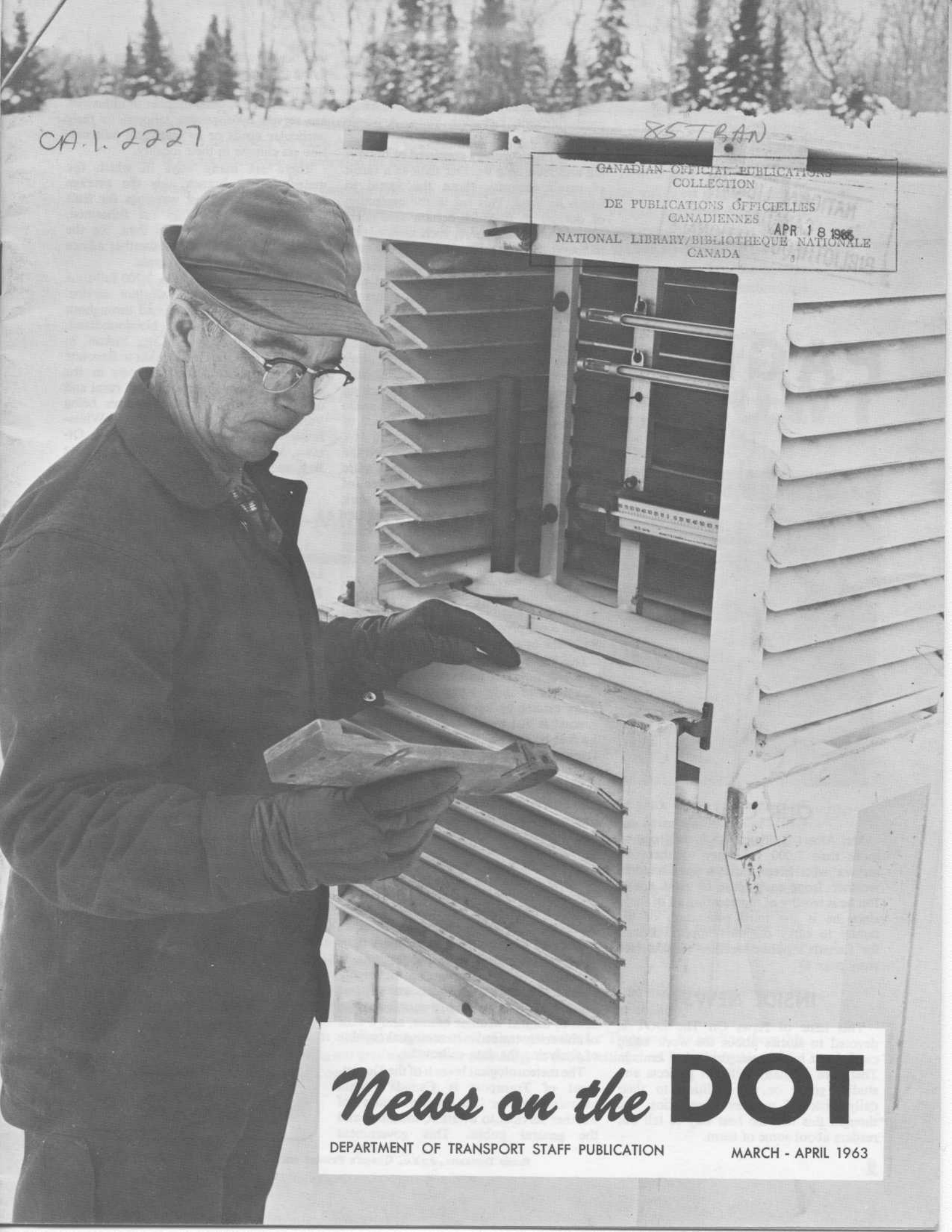

News on the DOT

DEPARTMENT OF TRANSPORT STAFF PUBLICATION

MARCH - APRIL 1963

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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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

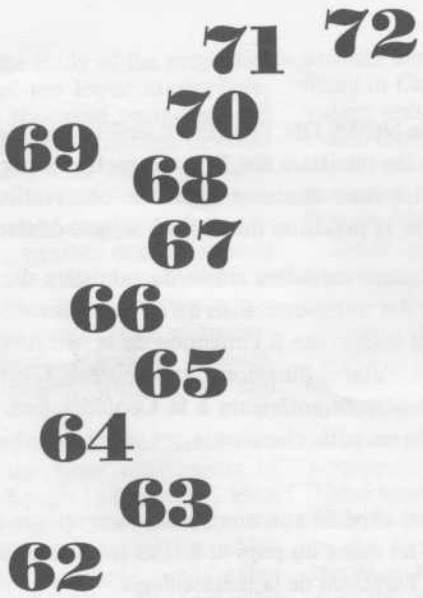
J. R. Baldwin

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.



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.

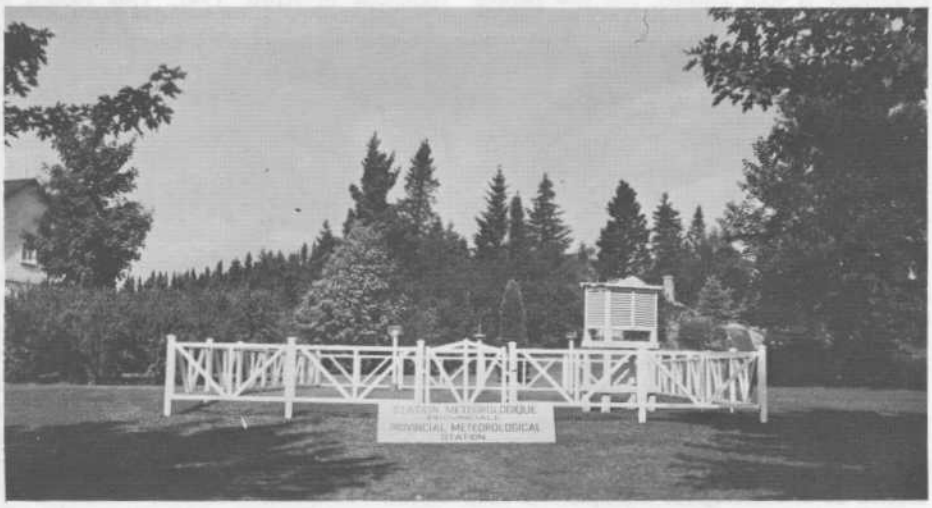
Chaque problème résolu en fait naître un nouveau que doivent résoudre ceux qui font appel, à cette fin, aux données climatologiques.

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.

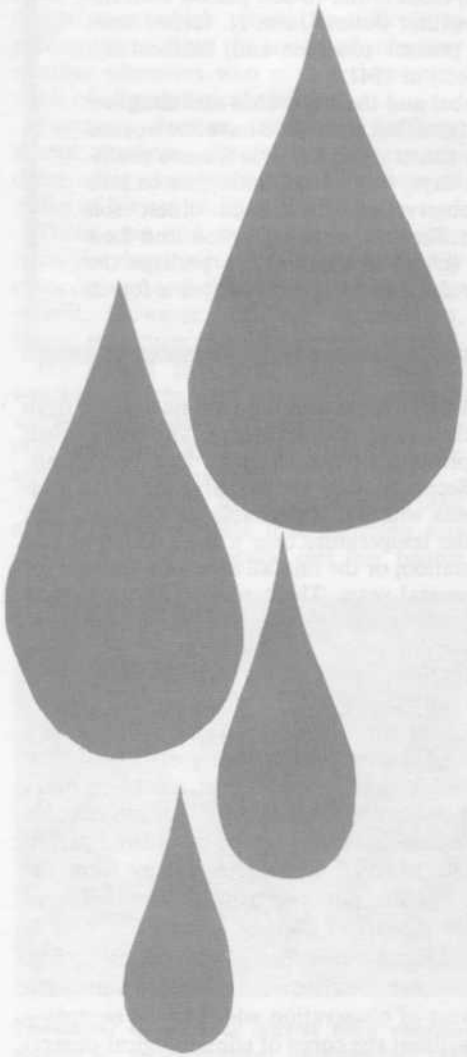
Veteran meteorological technicians inspect the cards suspected of containing errors and examine machine listings where such things as daily precipitation amounts are printed out for all stations according to the dozens of regions in the country. Different control methods are used for different card types. 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 informa-

tion 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.

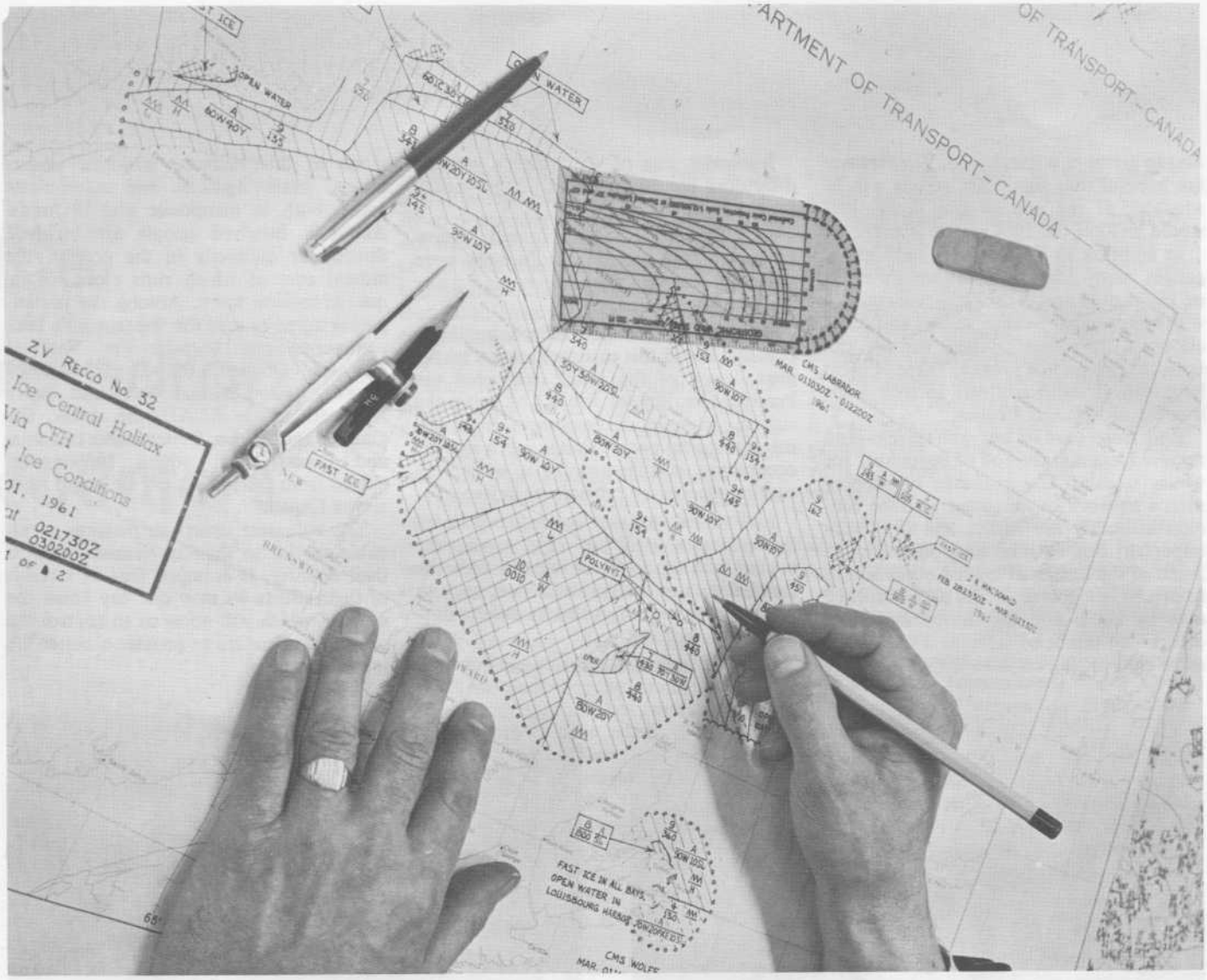
Bad weather is usually accepted philosophically, but in this case there was a scapegoat. Some of the public suspected the Precipitation Physics Project of being the culprit. In spite of assurances from the meteorological people that it was a natural occurrence, it appeared for a while that continuation 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. Microorganisms 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."

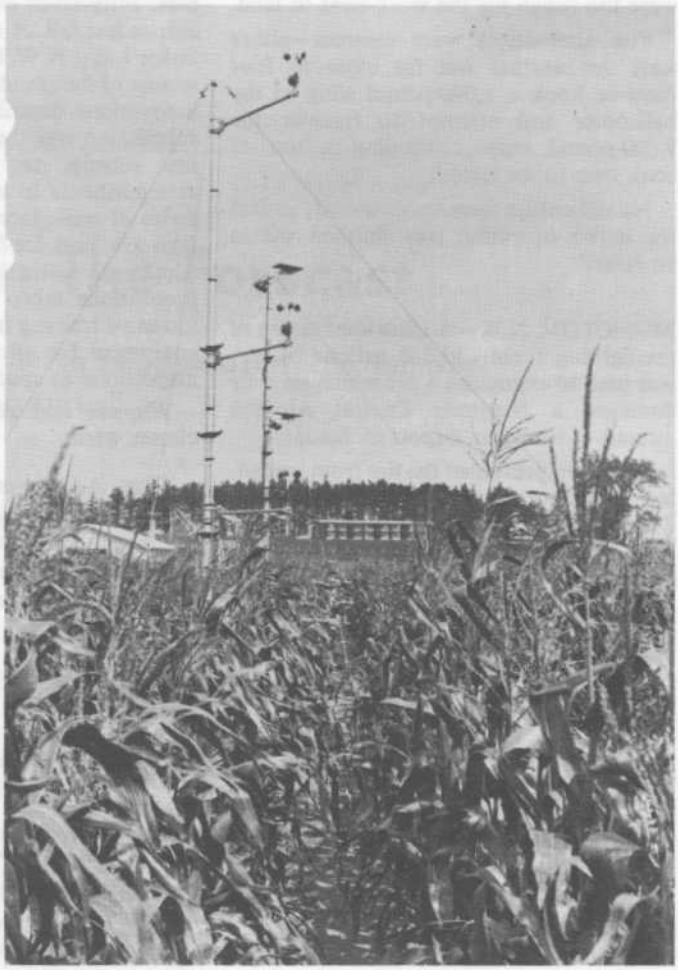
A further research project upon which Mr. Mukammal and his staff are engaged, again in collaboration with the Ontario Research Foundation, is the effect which Lake Erie has on southern Ontario's weather. This study will help them find new regions suitable for growing peaches, as much of the province's 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."

Improve Your Thinking — Think of Improvements

A record number of suggestion awards granted in recent months

J. T. Burns of Dartmouth, N.S. was recently presented with a $100 suggestion award. A supervising clerk at the district marine agency, he recommended that when time permitted Notice to Mariners messages concerning naval exercises be mailed rather than telegraphed to marine radio stations. Although some messages must still be telegraphed to meet required broadcast times, a substantial savings has been realized by mailing most of them.

Another district marine agency supervising clerk—*Miller MacDonald* of Charlottetown, P.E.I.—won an award-in-kind. He pointed out that a combined maintenance and requisition form for reordering supplies for unwatched lights would allow better control over stores supplies and improve management of these sites. He chose a camp stove as his gift.

Harry M. Compton, headquarters' personnel clerk, received two cash awards late in 1962 to add to his Christmas enjoyment. Both awards—a $40 one and a $15 one—were made for suggested form revisions. The larger award was for an amendment to the Group Surgical Medical insurance plan's deduction notice form, while the other was for an amendment to the premium remittance form.

The redesign of these forms has facilitated their movement through the units concerned.

J. O. Martin, a Port Rowan, Ontario, radio operator, can chalk up No. 7 on his suggestion award certificate with the adoption of his latest submission.

Mr. Martin recommended that carbontetrachloride no longer be listed as a cleaning solvent in the Maintenance Manual. The dangers of this fluid had been circulated previously, but since Mr. Martin went one step further—to eliminate its use entirely—he was granted a $10 award-in-kind.

Radio Inspector *S. J. Mellor* of Victoria, B.C., suggested that form 2094 (summary of inspections, examinations and interference work) be amended for more convenient use. His idea was adopted and he chose an electric alarm clock as his award-in-kind.

Air Traffic Controller *G. S. Machum* of Goose Bay, Labrador, recommended that personal files of employees on loan from one region to another include details of the temporary duty—i.e.—efficiency reports and the like. He pointed out that such details could have an effect on promotion. A $15 award-in-kind was made for the suggestion.

A power driver and a camp stove were the award choices of *Lloyd Nelson* when he was informed his submission to the suggestion award plan merited a $30 award.

A radio inspector at Montreal, Mr. Nelson recommended that a letter from field offices be used to amend radio station licenses instead of requiring stations to return licenses for formal amendment. A better service to the public and a reduction in administrative procedures were the outcome of this suggestion.

A relatively simple idea meant $100—less income tax, of course,—in the pocket of *Charles J. McCrea*, a principal clerk at the Prescott Marine Agency.

Mr. McCrea recommended substituting petroleum spirits for turpentine as a paint thinner whenever possible. Petroleum spirits is considerably cheaper than turpentine and it is estimated that its use will save the department nearly a thousand dollars a year.

Lightkeeper *Harold Whalen* of Entrance Isle lightstation, B.C., urged that all lighthouse station dwellings be equipped with hose connections on the discharge end of water service pumps as an additional fire-fighting aid. He was granted a $15 award-in-kind and selected a radar light and a heating pad as his gifts.

With an eye to the future the assistant lightkeeper at Western Head fog alarm station, N.S., *Lawrence Wentzell*, recommended that specifications for concrete towers eliminate the vestibule when an electric beacon light is to be used. He pointed out that in the case of vapour lights such a vestibule prevents a rush of air from entering the tower and affecting the light, but in the case of electric lights this precaution is unnecessary. He received a $15 award-in-kind.

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.

Radio Operator *G. H. Parkinson* of the aeradio station at Graham, Ontario, received a $10 award-in-kind—a camp stove—for drawing attention to an incorrect plumbing installation at the station. His suggestion eliminated the continuous operation of the hot water heater.

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.

A clerk in the Dartmouth Marine Agency, *Harry Farmer*, put forth the idea that the labels on cans of paint, varnish, lacquer and primer designate the proper thinner to use. The suggestion was adopted and tender calls and orders for paints now ask that the manufacturers show this information on the label.

Granted a $25 award, Mr. Farmer chose a "Fixkit" and a set of bathroom scales.

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.

D. J. McLean, a clerk in marine regulations at Headquarters, submitted a set of tables to be used by the staff of the small boat regulations section to save time and increase efficiency. He was granted a $25 award-in-kind and chose a table lighter and an electric alarm clock.

Mechanic *W. J. Henry Trice* of Vancouver air services felt that forms 2487 and 32—weekly reports on unserviceable airport maintenance equipment—should be eliminated since their purpose was duplicated in other reports. This has lightened the workload at many stations so Mr. Trice received two awards-in-kind totalling $25.

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.

Donald J. Smith, a Trent Canal lockmaster at Kirkfield, Ontario, thought that a fabricated steel valve cover plate should replace cast iron plates currently in use. He pointed out that the one-inch steel plates would outlast the cast iron ones by several years. A $30 award was granted to Mr. Smith for this money-saving improvement.

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.

K. F. Landsmann, a Prescott Marine Agency draftsman, urged that smaller, watertight fittings be used on buoys and lanterns. He received a $10 award-in-kind.

Jacques Bastien of Mont Joli, Quebec, is $40 richer for recommending that single rather than double copy roll be used for the teletype at Mont Joli aeradio station where he is a radio technician. It was estimated that yearly savings of $320 would result.

Mr. Bastien chose three items—a power driver, a barometer and a wallet—in place of a cash award.

Radio Technician *David E. Buckler* of Windsor aeradio station suggested that the various forms concerned with flight plans have a line separating proposed and actual times of departure. Three such forms were revised accordingly and the suggestor received a $10 award-in-kind.

George C. Coffin, officer-in-charge at Montreal marine/aeradio station, put forth the idea that distilled water rather than tap water be used in the concentrate for photo copying machines to produce more and better copies.

Tests showed this procedure would be of value only in an office where the machine was not used a great deal and that the overall savings would be minimal. However, since Mr. Coffin's own office could realize some savings he received an electric alarm clock as an award.

A radio operator at Killaloe aeradio station, *W. C. Holliday*, received a $30 cash award for recommending adequate procedures be provided for positive identification of ATC units on the interphone. Study of the matter resulted in the introduction of instructions which eliminate any possible confusion.

Similarly another radio operator received a $30 award for suggesting that Greenwich mean time (G.M.T.) be used in weather broadcasts rather than local standard times.

Hector J. MacLean, Sydney, N.S., pointed out that since G.M.T. is used for most aviation purposes and pilots are familiar with it, its use would standardize the time across the country.

Supervising Clerk *James Lathem* of headquarters' office services suggested that form MN9-5 (revenue received reissuance of Canadian merchant seaman identity certificate) be discontinued.

Because treasury requires monthly revenue reports, it was not possible to eliminate the form entirely, but Mr. Lathem's comments resulted in the discontinuance of duplicate and file copies saving time at field offices and headquarters. Granted a $30 award, he chose a set of TV tables.

Vancouver Engineering Clerk *C. H. Fisher* received a $10 award-in-kind for recommending that advertisements of "notice to tender" refer to required deposits as "certified cheques" rather than "accepted cheques" to eliminate confusion among tenderers. He chose a pen and pencil set.

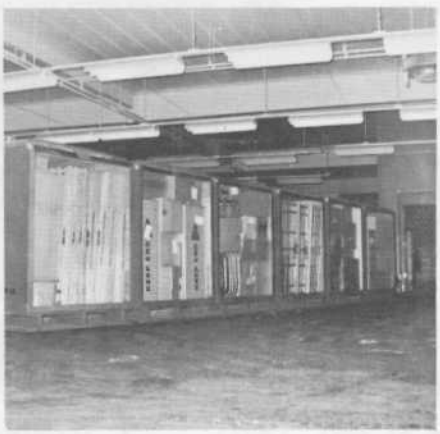
E. Penner, inspector of construction in Vancouver Region, advocated waxing dry levelling rods to enable the sections to slide more easily during cold weather. Since adoption of this suggestion has extended the life of the rods Mr. Penner received a $10 award-in-kind.

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.

This Is What You Should Have Seen

In the November/December issue of News On the DOT we reported that J. O. Girard, a traffic clerk at Montreal International Airport (Dorval), was the recipient of a $310 suggestion award for recommending that specially-designed box pallets be used to ship supplies to the north.

Unfortunately, the picture we ran showed an old-type pallet rather than the one suggested by Mr. Girard. In this photo, we see that the recommended pallet is a closed, rigid container which ensures safe transport of its contents.



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.

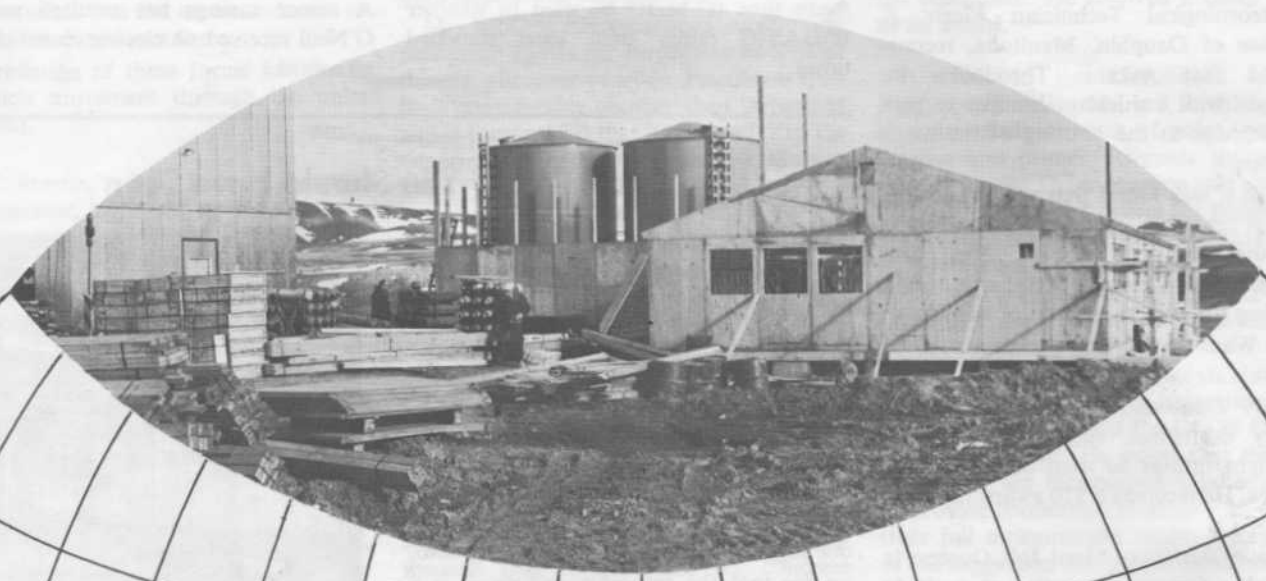
Temporary buildings built in 1950 were intended for a test period of five years only and were no longer adequate. Last May the work crews went in, and by the end of November had completely rebuilt the base.

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 snow-blower, 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.