

January/February 1985

ZEPHYR



1985

The Calendar story, page 4



Environment
Canada

Environnement
Canada

Canada

Alert has High Arctic birthday

April 1985 marks the 35th anniversary of the establishment of the Alert High Arctic weather station. The Alert site, at the northern tip of North America only 600 km from the pole, was discovered by an ice cutter and helicopter in 1948 and the first party of station and maintenance personnel landed there on Easter Sunday, 1950. A cycle of airlifts flew in the station's supplies and equipment from Thule, Greenland.

From the beginning, Alert was not only a weather station but a small hive of scientific projects. Many of these were carried out by AES personnel and scientists from private, academic and other government departments. They began arriving to conduct "transient projects" almost as soon as the station opened in "virgin scientific territory". Since the establishment of Alert and the other High Arctic weather stations, an immense amount of scientific information has been gathered and Alert is the scene of new experiments on applications of lasers to meteorology and on Arctic haze.

Alert was the last of the five High Arctic stations to be set up. In May or June, an award-presenting ceremony as part of the annual inspection tour will be staged at Alert to mark this final anniversary of a unique series.

Zephyr Highlights

News	2-5
Features	6-12
How to write a Zephyr article	6
Weather services aid North's economy	7
A day in the life: Reference librarian	8
The Facts on Arctic Haze	9
Zephyr Breezes	10-11
Staff changes	13-14

Cover: This unlikely coat of arms forms the cover of a highly successful AES publication: the 1985 Weather Trivia Calendar. For the story behind this novel and useful compendium of weather and climate facts see page 4. Also see items from the calendar scattered throughout the magazine.

Zephyr is a periodical publication for employees of the Atmospheric Environment Service, Environment Canada. It is produced for the Atmospheric Environment Service by the Information Directorate of Environment Canada.

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Atmospheric Environment Service Service de l'environnement atmosphérique

First woman electronics technician graduates

The Atmospheric Environment Service now has its first Female electronics technician. Mary Klepacz, formerly from Edmonton, completed ADRES/GMD (Upper Air) training at Downsview on February 5 and returned to Central Region for posting to Saskatoon, where she will work with one other electronics technician and two inspectors at the Saskatoon Inspection office. With Saskatoon as her base, Ms. Klepacz will travel to the High Arctic Weather Stations where she will be responsible for ADRES, communications, and various other electronics systems essential to the operation of these key stations in the AES aerological network. Her three-month tour will take her to Resolute Bay, Eureka, Mould Bay and Alert.

Mary completed an electronics course at the Northern Alberta Institute of

Technology (NATE) at Edmonton. She then worked for a year at the SED Systems Company in Saskatoon, where she was responsible for the testing of a ground satellite system being developed for Brazil.

Asked why she chose a career in electronics, Mary replied that she thought that it would be extremely interesting, and recent leaps in electronic technology would offer tremendous opportunities. When the AES position became available she looked forward to the unusual opportunity for Arctic experience.

The Klepacz family name had been familiar to people in all parts of Canada for over two decades. Her father, Jim Klepacz worked in the AES Headquarters Maintenance Division for over a decade before taking the new post of Supervisor, Electronics Maintenance for the Western

Region in the seventies. He continues in that role in Edmonton at present.



Bob Saunders, acting director of Weather Services, Field Services Directorate, presents Mary Klepacz with a certificate for graduating from the Electronics Technician's course at AES Downsview headquarters.

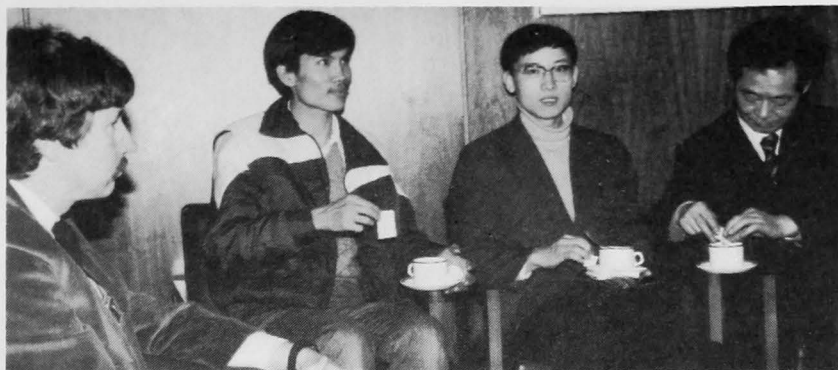
AES-China contacts on the increase

Contacts between AES personnel and their meteorological equivalents in China have grown considerably over the past 18 months. Visits have been made on every level from radar technician to administrator of a major service. And it is clear that both countries have benefited from the exchanges, either because of technological transfer or because of valuable experiences offered for working or meeting in countries vastly different in population and economic scale.

The current phase started in January 1984 when Zou Jingmeng, director general of the Chinese State Meteorological Administration and Second Vice President of the World Meteorological (WMO) visited AES and held talks with other WMO officials belonging to the UN agency's Bureau, meeting in Canada for the first time. In return, ADMA Jim Bruce visited China in February 1985 for another Bureau meeting and also to tour Chinese meteorological installations as the guest of Zou Jingmeng.

Another high level visit to Canada, at least partly to do with meteorology, was the arrival this February at AES Downsview Headquarters of three managers from the Chinese Civil Aviation Authority, headed by Zhu Minguang national project director for the United Nations Development Program.

At a reception at AES Downsview, acting ADMA Howard Ferguson presented two Civil Aviation Authority trainees, Song Qinghua of Beijing and Ye Dong Cheng of Guangzhou (Canton) with certificates of achievement commemorating eight months training with AES.



Earle Robinson, head, Information Technology, AES Downsview (left) is seen with trainees Song Quighua of Beijing and Dong Cheng of Guanzhou (centre) and Shi Bin of the Chinese Aviation Authority (right) during a reception held to honor a three-man Chinese delegation visiting both AES and the International Civil Aviation Organization in Montreal. The trainees received awards.

According to Earle Robinson, head of Information Technology for Data Acquisition Branch, the two trainees had been thoroughly trained in all pertinent aspects of development and operation of automatic weather stations, or to put it in Mr. Robinson's words, "They were given enough software and hardware training to enable them to design and construct their own automatic weather stations in accordance with their local needs or to modify them if necessary to suit future configurations."

Mr. Robinson added that the two trainees were so adept at their training opportunities, they managed to keep on schedule for the entire course and covered all planned weather parameters. In addition to their stay at AES, the trainees made a two week visit to Sweden for special training on the Runaway Visual Range Computer System (ASEA). They also received two weeks of training at AES on the Laser ceilometer (ASEA).

According to Mr. Robinson the Guangzhou airport automatic station would be the most complex in China, costly in China.



From left to right, Yan Wei, Chen Hong Yao, Wang Ping, Zhan Chuan Yang approach the end of their year of training and familiarisation with AES before heading back to meteorological institutes in Beijing and the province of Jiang.

January 1827

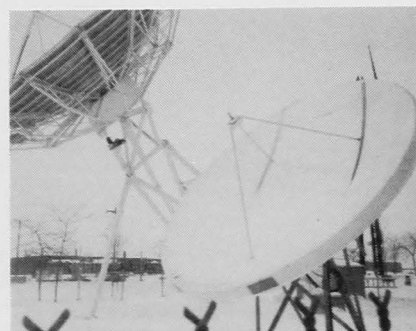
"The sleighing was never better in this part of the country than it is at present . . . and people in York . . . are determined to enjoy it with a vengeance by driving over every foot passenger that comes their way."

— Canadian Freeman Newspaper

January 1935

The wettest month on record for Vancouver and Victoria, 524.5 mm and 358.9 mm, respectively.

The photograph (right) shows the new five metre satellite dish that has been added to the large 10 metre dish outside the Downsview building. The large dish was built in Toronto in 1976 and receives imagery from the GOES EAST geostationary satellite. The small dish is the latest high technology from the U.S. More powerful, it receives both GOES EAST and automated weather station data via satellite bounce-off. The larger dish will be modified up to the power of the new one, and then will be used for research, and obtaining data from research satellites. The smaller dish will be used for day-to-day operations. Another dish mounted in a radome on the Downsview roof receives data from the NOAA polar satellite orbiting and a third dish will soon be added to the two on the ground.



AES weather calendar a success

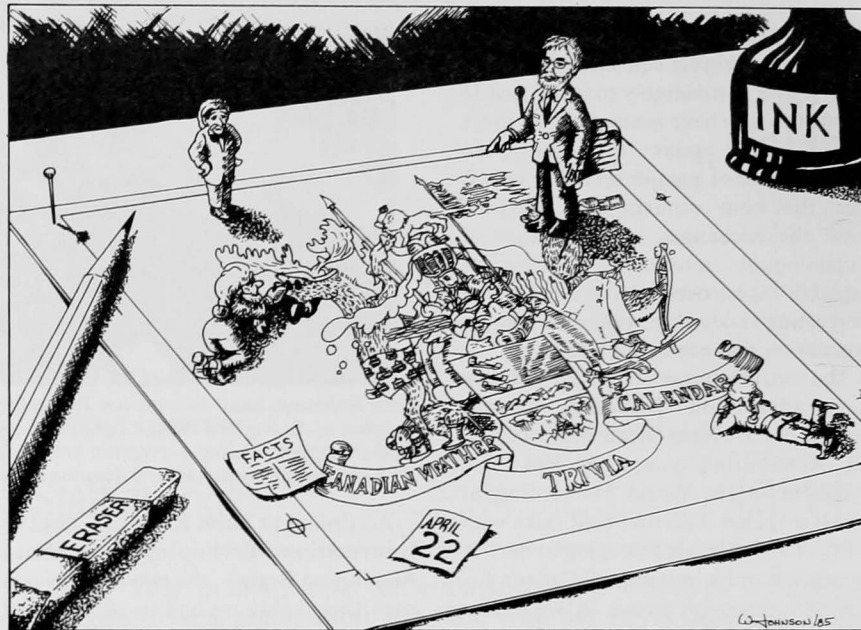
In 1954 Hurricane Hazel hit southern Ontario with disastrous floods, extensive property damage and a score of lives lost. Now, thanks to a fascinating new calendar, AES staff and volunteer observers can view such cataclysmic events more objectively, and even with a touch of pride at sharing Canada's meteorological history.

The calendar in question is the 1985 Canadian Weather Trivia Calendar, produced by AES and given to the weather service's many volunteers as a gesture of appreciation. It has also been sold to AES staff for a nominal fee and distributed to the media as information. The calendar has received considerable praise and no one is happier than David Phillips, superintendent, Developmental Climatology Section, Canadian Climate Centre, Downsview.

Mr. Phillips dreamed up, researched and wrote the entire calendar. He says he first got the idea for producing a calendar in 1983. He had originally planned to issue a book of weather lists, but then realized people would absorb far more information if it was served to them gradually day by day. Also by that time the Canadian game, Trivial Pursuit was all the rage and Phillips hit on the idea of filling his calendar with more than 600 weather facts, many of them serious but mostly presented in a light, easy-to-digest vein.

While admitting weather events often tend to be unpleasant, Phillips thinks that most people mellow when seeing flash floods, avalanches, tornadoes or deep freezes in the reflected glow of history. He says he spent months poring over history books, news clippings, climate, Canada Dateline and above all *Meteorological Milestones*, a book of historical weather facts compiled by Morley Thomas, former director general of the Canadian Climate Centre.

Since the calendar is historical, Phillips says he was frequently faced with a choice of events on the same day. He often selected the most dramatic but tried above all to achieve regional balance. And the calendar is certainly full of startling events — everything from the day (March 30, 1848) when an ice jam stopped Niagara Falls or the sinking of the Titanic after colliding with an iceberg off Newfoundland in April 1912; to more



Pencil, ink, erasers and elf-like helpers are all props for David Phillips (top right) to give life to the Weather Trivia Calendar in this imaginative animation studio scene dreamed up by cartoonist Bill Johnson of the Canadian Climate Centre.

recent events like the Valentine Day 1982 sinking of the Ocean Ranger oil rig or the September 2, 1984 tornado that struck London, Ont. damaging 600 homes and injuring 30 people.

The earliest calendar event is a 1604 reference to Champlain becoming snowbound in New Brunswick in October and the most amazing, a listing for Livingstone Ranger Station, Alta. for June 29, 1963 when 111.8 cm of snow fell in 24 hours, the second greatest one-day snowfall ever recorded in Canada.

Phillips says not all Calendar events are bad. It mentions Marilyn Bell's historic swim across Lake Ontario when she enjoyed gentle 15 km/h winds, 12 km visibility and zero precipitation.

Other favorite listings of his are the severe snowstorm of April 3-4, 1975 when 200 weather service employees were forced to stay overnight in the AES Downsview building or the August 27, 1883 mention of the Krakatao (Sumatra) volcano that caused unusual colored suns and moons around the world for months, even years. One event that didn't make the calendar was Pierre Trudeau's famous walk in an Ottawa snowstorm prior to his resignation as prime minister. It occurred on February 29, a date appearing in the calendar only once in four years.

The calendar also shines with its intriguing photographs and its eye-catching, irreverent cover. Phillips marvels that the latter was approved by top management. It includes such items as a tattered, upside down Canadian flag a panting moose with eyeshade, dark glasses and maple leaf shorts and a booteed beaver wearing a headset.

The 1985 calendar had a limited, 10 000 copy trial run. Of these, about 2 300 went out as gifts to AES weather observers; another 3 000 to Canada's severe weather watch volunteers and 2 000 to media as an information tool. Some 5 000 calendars were also sold to AES staff at a nominal \$1 fee. Apparently staff copies were snapped up by everyone from skilled meteorologists to office cleaners and were used for everything from Christmas stocking stuffers to aids in preparing synoptic weather forecasts. Nearly all AES personnel praised the calendar and distribution was as strong in the AES regions as in Downsview.

(cont'd on page 5)

January 17

1974 Canada's greatest 1-day snowfall: 118.1 cm at Lakelse BC.

Roy Lee retires



ROY LEE

Roy Lee has retired after more than 36 years service with AES. On January 3, 1985 about a hundred people gathered at an AES Downsview reception to celebrate the occasion with Roy and his wife Jennie. In the past decade Roy has served as Director of the Finance and Administration branch and most recently as Director of Human Resources at AES Headquarters in Downsview.

Roy joined the Service in the summer of 1948 after obtaining an M.A. in Applied Mathematics at the University of Toronto. During 1948-49 he was a member of the first post war M.A. meteorological course given by the University of Toronto and the Service. He then served as a forecaster in Gander for three years before returning to Toronto Meteorological Branch Headquarters in 1952 as Research Meteorologist. Here he pioneered work on the Arctic stratos-

pheric jet stream and was awarded the Royal Meteorological Society's First Canadian Darton Prize (1954-55) and the Canadian President's Prize (1956).

Between 1958 and 1970, Roy was a member of the Training Branch staff. As Supervisor of Field Training, he organized refresher courses at Headquarters and at workshops held in the Regions. At the same time, he lectured to those studying toward an M.A. in meteorology at the University of Toronto. Roy then served as Chief of User Requirements in Field Services, a position now known as Chief, Weather Services.

Between 1975 and 1982, Roy served on a task force to determine what support services the newly created Regional Directors General of Environment would require. As well, Roy and Ray Fichaud undertook a study into the role of AES in 1990. The study led to three further studies which form the basis for the Long Term Plan for Weather Services. On completion of one study dealing with longer-term human resources issues, Roy did a similar study for Parks Canada.

During the Downsview reception, former ADMA, Reg Noble, former Canadian Climate Centre Director General, Morley Thomas and current Director General of Central Services Jim McCulloch recalled many of the highlights of Roy's career and brought greetings from friends and colleagues.

Throughout his career, Roy stayed very active in church and other community affairs.

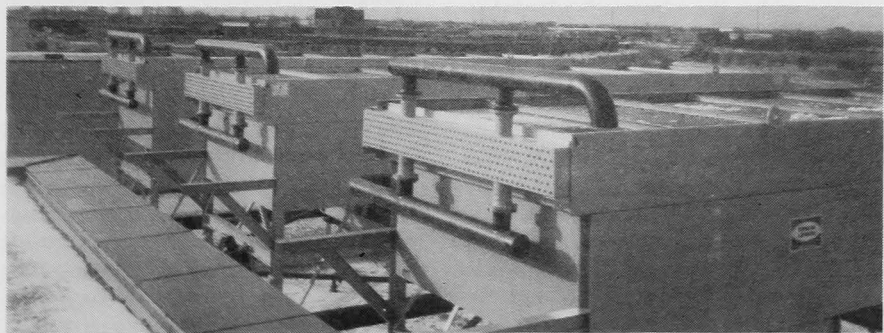
(cont'd from page 4)

Volunteers wrote to Phillips saying that the calendar was the greatest weather gift they had ever received. One observer said he had spent three whole days reading the calendar from end to end. In addition, Phillips has received thank you notes from as far away as Auckland, New Zealand and from the World Meteorological Organization in Geneva.

Several enthusiastic letters came from Canadian academics saying that calendar quotes would brighten up their lectures. One lecturer said he would put the calendar in the bathroom, the "place of honor" in his cottage.

Encouraged by the response, Phillips hopes to have a new re-edited 1986 calendar out by October, possibly with a wider distribution. He feels the re-edit is

Aquifer



necessary because nothing is so stale as last year's calendar. On the other hand he feels that now might be the right time to produce an official almanac, standard



The photo above shows the final drilling of a well for the new Aquifer heating and air conditioning system being installed by Public Works Canada in the AES Downsview building; and (below) the three new installed water tanks on the building's roof. Water under the AES Downsview site is large enough to be called a lake. Two wells have been bored. One well will pump up cold water for summer air conditioning which will then enter the roof tanks for heating and then be flushed into the second well. In winter, the hot water in the second well will be pumped up to heat the building, be blown cold dry in the winter air, and flushed back into the first well. The two wells will act in tandem to provide summer cooling and winter heat. The project's funding has been completed and the project will be operational this summer and, according to tests, will cut heating and air conditioning expenses by 80%.

reference work for meteorologists, journalists and — compulsive weather trivia fans.

FEATURES

How to write a ZEPHYR article

As you probably know, ZEPHYR gives full coverage to AES as a service and places special emphasis on the goals, activities and achievements of its employees. It also likes to receive staff-contributed material.

If you have been thinking of writing an article or short item for this magazine but are not sure how to proceed, here is some advice in question and answer form.

What kind of articles do you need?

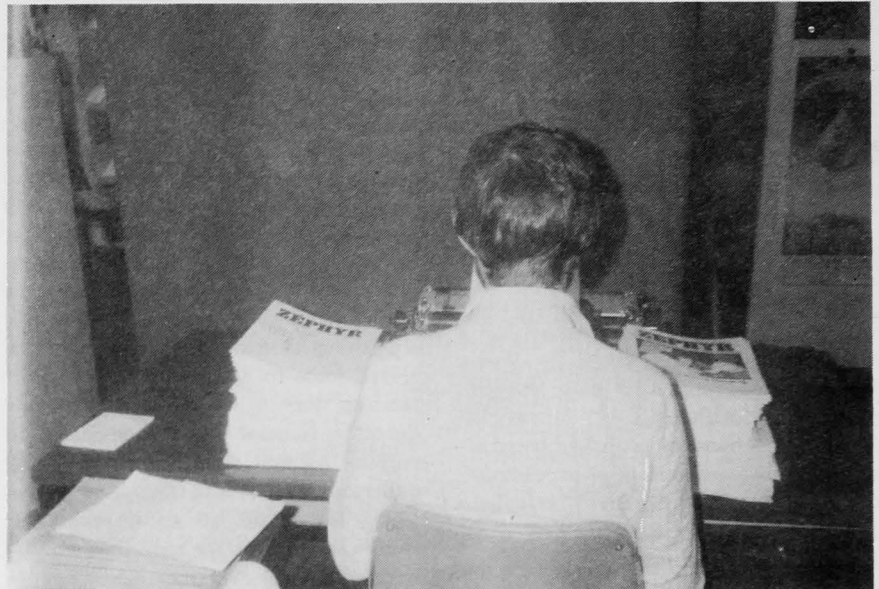
You can write about anything from an unusual work project to a major summer or winter storm. Articles about people are preferable to items that resemble glorified job descriptions. In general there is a tendency for writers to be a bit too detailed and technical. Items that describe personal experiences on or off the job in a down-to-earth, anecdotal way are preferable to stodgy formula pieces. Remember, in addition to feature articles, we need short news items, brief, light *Zephyr Breezes* submissions and last but not least, book reviews.

What is the right length for a ZEPHYR article?

Three double spaced typed pages (about 800 words) is the maximum in most cases. If you are sending a news item or a single event, a page or so is enough. Never assume that if you write a long article we will publish it in installments. Competing needs for space usually rule this out. We cannot undertake to edit down very long articles. It is best to keep your article short and concise.

What about style and composition?

Begin with a short interesting lead that tells the reader something about the subject of the article as a whole. Write brief, easy to read paragraphs and sentences. As far as possible, write in plain, everyday language. If you have to use technical terms, be sure to explain them. For example, if you mention *truth testing* of a stratospheric modelling experiment, say right away this means you are measuring the modelling against actual physical data collected from the atmosphere. Liven up your article with a few quotes and anecdotes. You do not really need a summing-up paragraph but you could end on a thoughtful or even humorous note.



Should I query you before writing the article?

If you have a suggestion, by all means write or give us a call. On the other hand you *could* take a chance and submit a completed article. In fact we have no objections to your doing this. All too often someone comes up with a bright idea but never actually carries it out. We are prepared to be surprised by the finished package.

Must I type the article?

Well, it's preferable, but not essential. If you decide to write by hand, keep your script clear and legible, penning all names or special terms in bold capitals. Remember, the eight hundred word article, when handwritten may take up to five or six pages depending on size of paper, characters etc.

Do you need photographs?

Yes, definitely, especially those that illustrate your article in an interesting, graphic way. Make sure you include people as well as things (name them correctly from left to right giving first as well as surnames). Our preference is for good black and white glossy pictures, but clear color photographs will do. Sometimes we use photos without an article with all the information contained in a short caption. Revelant news or feature photos are preferable to "art" pictures, but it all depends on space.

Do you run humor articles?

Yes, if they are short, funny and not too "local" in interest. Occasionally we reject humor because it is in poor taste or it simply does not make us laugh. Humorous verse is also a possibility if kept short and pithy and there is always a need for the well drawn, relevant cartoon.

Do you need articles on travel or hobbies?

Yes, if they are original, compact and well-written. Photo illustrations are almost a must here. Very short details about AES employees' spare time activities are often included in our *Zephyr Breezes* column. You are welcome to contribute.

What about book reviews?

We need these quite urgently. Subjects of books to be reviewed are almost unlimited and you are encouraged to take an original approach. There is one small point to remember though: a copy of the reviewed book should be in the Downsview reference library. This allows others to read the book after they have read your review. If you have a review suggestion, please call (416) 667-4551.

(cont'd on page 7)

February 1980

Halifax set a record of 23 consecutive days with sub-zero temperatures from January 24 to February 15.

Weather service aids North's economy

by Joe Kotylak

Weather has an impact on most economic activities and nowhere is weather information more important than in the north.

Many activities are geared to accommodate the north's harsh and extreme weather conditions.

When compared to other economic endeavors, the mining industry is perhaps one of the least sensitive to weather conditions.

Mining is dependent on transportation — land, air and water — and these are affected by weather, so planning operations with weather information in mind can have substantial economic benefits.

The weather service of Canada — Atmospheric Environment Service, Environment Canada — is responsible for providing weather reports and forecasts to the people of Canada.

Presence of the service in the north dates back to at least 1875 when arrangements were made for taking weather observations from Fort Simpson. Over the past century involvement has steadily increased and the service is now represented in all parts of the Territories.

Task of the Atmospheric Environment Service is to take weather observations, use them to produce weather forecasts, and communicate these data and

information to the general public and other users.

A network of surface and upper air weather observing stations is operated throughout the north, including several stations in the High Arctic. These 20 stations dot the tundra and rugged expanse of northern Canada.

WEATHER FORECASTS AID SERVICES

Flight service stations of Transport Canada, and the Arctic community airports of the territorial governments, also take observations to support the weather service program.

The flight service stations are located at larger communities in the north and include such places as Watson Lake in the Yukon Territory and Norman Wells and Coppermine in the Northwest Territories. Weather observations are taken at the smaller Arctic community airports such as Old Crow, Fort McPherson and Spence Bay.

Weather forecasts, upon which we all depend to one degree or another, are produced for the north by weather forecasters located in Whitehorse and Edmonton. The Yukon Weather Forecast Centre prepares public and aviation forecasts for the Yukon whereas the

Arctic Weather Forecast Centre prepares forecasts for the entire Northwest Territories.

These offices, operating on a 24-hour basis, currently support human activities in the north with a full range of forecast products.

Aviation interests have available regular area and aerodrome forecasts detailing expected weather conditions. Forecasts for the general public are routinely prepared for the more populated parts of the territories, namely the communities around Great Slave Lake, the Mackenzie Valley, the mainland coast from Tuktoyaktuk to Paulatuk and the west coast of Hudson Bay.

Additional forecasts are provided to the communities of Coppermine, Cambridge Bay, Baker Lake, Coral Harbour, Cape Dorset and Frobisher Bay.

In addition to radio, weather broadcasts are televised via the ANIK satellite to northern communities.

During the shipping season a marine forecast and weather warning program is undertaken which covers all navigable waters within Arctic Canada in addition to Great Slave Lake. A warning service is provided for the Mackenzie River. This information is distributed through Transport Canada marine aeradio stations.

In the larger northern communities of Yellowknife, Resolute, Inuvik and Frobisher there are weather offices with specially trained staff who provide a personalized weather information service to a myriad of weather-sensitive users.

WEATHER-SENSITIVE USERS

The Canadian weather service also has a responsibility to operate an ice data acquisition and information program for the Arctic.

Two specially equipped Lockheed *Electra* aircraft, with trained ice observers, make routine reconnaissance flights during the shipping and offshore drilling season. Characteristics and movements of the ice are charted and this information is disseminated via radio-facsimile and teletype.

Many of the ice breakers and drilling rigs have receiving equipment permitting

(cont'd from page 6)

Do you need regular correspondents?

Definitely. ZEPHYR would like to set up a country-wide network of contributors hailing from all regions. If you feel you could send in at least one news item or feature per issue, please contact us right away. Items submitted can be very brief.

Name some of the "faults" committed by ZEPHYR contributors.

1. Articles tend to be too long and repetitive. 2. Submissions contain too many unexplained technical terms. 3. People's names contain too many initials, not enough first names; Owen Jones looks far better than Mr. O.W.P. Jones. 4. Too many articles are on "outside subjects" and do not give sufficient mention to AES. 5. There aren't enough anecdotes.

6. There aren't enough direct quotes using quotation marks. 7. The following words are used too often: "data", "results", "experimental", "systems", "digital", "output", "input", "mode", "network".

Do you publish letters to the editor?

Yes, but please keep them short and to the point. Another place where we run employees' opinions on various topics is in *Future Forum*. So far we have covered the environment, computers and future implications of satellite receiving stations. People at all levels have responded to this feature.

Do you need contributions urgently?

Yes, the number of ZEPHYR submissions has dropped off recently. We need your assistance NOW to help revive interest. Good luck with your article!

(cont'd on page 14)

A day in the life of a . . .

Reference librarian

Each day as she enters her office at the AES Downsview library, the reference librarian's desk has a different look. Sometimes it is filled with information requests from yesterday or even from last week. On other days it is totally clear, which means of course there is no work outstanding.

On a typical morning she may spot an enquiry received late yesterday afternoon. It seeks information on the number of male and female births since the year 1600 for various European countries. The request is related to a study someone is making of the effects of sun spots. It is a mind-boggling question but she does not worry. As a skilled reference librarian she takes these "brain twisters" in her stride. The thought occurs though, that the question may be unanswerable. Does information, going back that far, actually exist?

A much easier question is phoned in later. "Is there an article by Flint on phenology?" She writes the question down on a paper form. The caller explains that he remembers having read the article several years before. He has forgotten the exact title but needs it to quote in a thesis he is writing. No, he does not remember Flint's initials either.

She decides to deal with the request immediately. She has a clue — phenology! Accordingly, she selects a reference book and arrives at the hunch that Flint is a certain H.L. Flint. She drifts silently across wall-to-wall carpeting to her computer cubicle. It is a friendly computer. It prints "Hello, I am ready." She consults lists of key numbers tacked up on the wall, taps a number out on the computer keyboard, then asks "? E AU= Flint HL." The computer prints out 24 Flints, among them H.L. with the number 5. She asks for these five titles, and extracts from among them "Phenology and Genecology of Woody Plants," with the name and date of publication.

She gets on the phone, calls back. Is this what you are looking for? "Yes, thank you, you are a genius!" She writes "done" on the form and files it.

Another request is phoned in. "I am looking for references on the use of Markov chain models of precipitation

published since 1970." Fortunately words like "Markov", chain and precipitation are leads she can follow through indexes and abstracts both manual and on line to reach her destination.

Requests for information range from routine matters she has dealt with before, to requests that are unique and involve prolonged scouting around. Some are expedited by computer and others require cross-referencing back and forth between rows of books in the stacks. The answer to a question like "What is the annual average number of frost-free days in Ormstown, Quebec," is probably somewhere among all those books and pamphlets. If it is there, she will find it. Throughout the day, she moves unceasingly among the stacks.

Information requests originate both from within AES and from outside. Outside callers are mostly students. An Ontario College of Art student is doing a "design climate" of Chile and wants material help. A grade 9 student is doing a school project on volcanoes, so the reference librarian sends him some "popular" material on this topic. Outside calls often relate to current news. For example, there are occasional requests for Ethiopian rainfall data.

Not all requests are related to meteorology. As a rule an "alien" question like "Can you give me information about left and right brain behaviour in adults," is answered if possible by the reference librarian, provided it comes from within AES — but not necessarily from an outsider.

Some requests can be answered only by contacting outside reference centres. A caller mentions a title in Polish published in Gdansk. He wants to know if it has ever been translated. The librarian phones the Translation Services at the Canadian Institute for Scientific and Technical Information. A week later CISTI calls back and says no.

Information requests do not come in at a steady rate. Sometimes it rains, sometimes it pours, but the librarian does, from time to time, get completely caught up.

Week by week she scans the periodicals like — *Weatherwise*, or the *Bulletin of the American Meteorological Society*, — for

new book titles, book reviews or interesting articles she can clip and add to her files. The librarian finds it expeditious to keep fat files on frequently requested topics, such as hurricanes, tornadoes, volcanic eruptions, earthquakes or on future threats like the "greenhouse" effect or nuclear winter.

Naturally she receives lots of mail. For instance she gets a letter from CFB Baden-Soellingen, West Germany, containing the first page of an article. The writer would like a photocopy of the entire piece. The subject is ice surveillance; he is teaching himself to be an ice observer. After some digging, she is able to write back and assure him that the one page he sent is in fact the entire article. But she mails him a selection of material on ice observing and invites him to ask her for more if necessary.

When she has time she produces bibliographies. Under "Nuclear War and Climate: A Bibliography," she will list titles, authors, names and dates of publication, titles — the complete bibliographic citation.

A librarian receives a Masters degree in library science. For the reference librarian, the computer, the phone, the book stacks, and relevant periodicals are the tools of her profession. Beyond training and tools, she has a network of know-how and spontaneous mental processes that cannot be data-banked or filed in a cabinet. All in all the work requires some rare qualities.

Asked to define the tasks of a reference librarian, our interviewee might reply as follows: she is like somebody in a big city who goes around looking for certain places. She does not know in advance exactly where these places are but will know when she sees them. One place may be a mere block away, another within a 10 block area. Sometimes she may have to check every street in the city. But by being "street-wise", playing hunches and following impulses, she by-passes dead-ends and reaches her goal.

(Zephyr wishes to thank Lilita Stripnieks for supplying information about her job as a reference librarian.)

The facts on Arctic haze

Historically, the Arctic has been perceived as having clean air and many an explorer has remarked on the ability to see enormous distances across the tundra. This clarity has been the undoing of travelers in the Arctic, as apparently nearby mountain ridges have turned out to be not merely 15 km off, but 150 km or more away.

Man-made pollution reaching the Arctic from the Soviet Union, Europe, and to a lesser extent, North America is adversely affecting the climate of the Northern Hemisphere.

This pollution, originally observed because it reduced visibility, has been labeled: Arctic Haze.

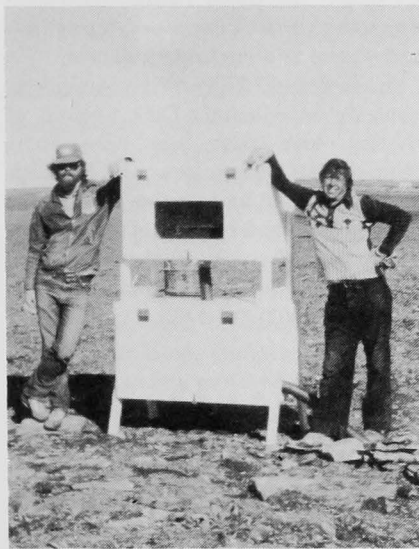
Although scientific research on the subject is very recent and still in progress, our understanding of the chemistry of the polar atmosphere has progressed remarkably in the last five years.

When the air is clear, one can theoretically see as far as 200 kilometres (125 miles) through the atmosphere. But when haze is heavy in the Arctic, visibility is often reduced to 30 kilometres (18 miles) or less. This haze was, in fact, first detected by pilots who reported that visibility was sometimes reduced to less than 20 km in the spring, even when no adverse weather was noted.

In the past five years our view of the Arctic as a clean, unpolluted environment has been drastically altered. Levels of suspended particles, originating from industrial activities further south, were found to be 20 to 40 times higher in winter than in summer. In winter the weekly average concentration of sulfate, a major component of the particles, is 2 to 4 micrograms per cubic metre of air while in summer it drops to 0.1 micrograms.

There is no historical record of Arctic haze levels but scientists believe it has paralleled the production rate of pollutants at mid-latitude (30 to 50 degrees N.); that is, rising rapidly in this century. Certainly its occurrence has only been seriously studied in very recent years. Prior to 1977 very little was known about its extent, its sources, its composition, its pathways, its ultimate fate and deleterious effects.

Recently atmospheric measurements by Americans, Canadians, Norwegians and Danes have confirmed the existence of the haze in winter. Since the publication of such research, the phenomenon has received increasing attention. Scientists are now beginning to better understand that its effects may be highly significant and threatening.



AES scientific team members Peter Gunst (left) and Joe Kovelick are seen at the Alert High Arctic Station working on the aerosol chemistry sampler — a key part of the Arctic haze monitoring project.

SOURCES AND CHEMISTRY

Prevailing winds pick up the pollution particles and carry them north in the Arctic air mass. For meteorological reasons, the main pathway of polar pollution is from European and Soviet Union sources, toward the north and northeast. Since most North American pollution is generated in the eastern part of the continent and blows eastward in the prevailing westerly winds, it does not greatly influence Arctic air quality.

In early winter, the Arctic air mass does not extend into Europe. Consequently, Soviet Union sources are expected to be the dominant sources. It is only in late winter and early spring that European sources play an important role.

In the atmosphere the haze occurs as an aerosol — fine liquid or minute solid

particles — containing roughly one-third sulfate compounds, one-third to one-half soot and hydrocarbons. The remainder is natural oceanic and soil material. Other pollutants are seen in minute amounts.

Sulfate suspended in air as particles consists of sulfuric acid and ammonium. The latter is produced when sulfuric acid reacts with ammonia. Soot seen in the aerosol is produced from combustion of fossil fuels such as oil, coal and wood.

Sulfate concentrations measured in the haze are about 10 times lower than in highly populated areas in eastern Canada and the U.S. Correspondingly, the levels of acidity in Arctic snow are expected to be no worse than one tenth of the levels seen in eastern Canada.

This would suggest that the pH (the acidity/alkaline scale) of snow in the Arctic should be greater (less acidic) on average than 4.9. Measurements to date have confirmed this.

EFFECTS & MONITORING

There are currently three major potential effects of the haze. These are, in decreasing order of severity:

- 1) **Climate modification.** A slight warming of the air in the Arctic during



This is a partial view of Mould Bay, another High Arctic station involved in Arctic Haze experiments.

(cont'd on page 12)

FEATURES

Zephyr Breezes * * *

Some glossy and highly informative meteorological brochures are being produced by the DOE Pacific Region Information Office. Most impressive is a four color brochure on the Automated Shipboard Meteorological Program (ASAP) showing AES equipment aboard a Japanese car carrier in the Pacific. Also eye-catching is a five-page folder called Weather Satellites and the Weather Service and another on acid rain containing a sensationally detailed map of environmental hot spots in British Columbia. Finally, our colleagues in DOE have produced an education Kit called Weather that is full of innovative hints such as twinning schools in different regions for weather information exchanges or studying meteorological folklore in almanacs. AES fact sheets are included in this kit. Credit for these excellent publications should go to Paul Mitchell, Regional Information Officer and his ID team.

★ ★ ★ ★



Who says that weather service personnel working in large administrative buildings are isolated from the weather? This snow-packed view of one of the inner courtyards of the AES Downsview headquarters building reminded many staff of the wintry conditions outside.

Invitations are going out to a reunion this summer of "all those who ever plotted a mean map or drafted a sure-fire forecast." Celebrating the 75th anniversary of the Royal Canadian Navy, the Naval Weather Service of Canada will hold a get together of old comrades and their wives in Halifax 28 — 30 June. Activities will include viewing of the Atlantic Ships Assembly, the Naval Tattoo, individual ship tours, education sessions, "up spirits" and several laid on dinners/dances.

In a newsletter to prospective attendees, publicity coordinator, Dick Crowell of Halifax says there has been some difficulty contacting those who have left the Service, and he asks that news of the reunion be spread by word of mouth. Mr. Crowell's address is: 69 Rankin Drive, Lower Sackville, Nova Scotia, B4C 3A7. Telephone (902) 865-5183.

★ ★ ★ ★

Morley Thomas, now serving as official AES historian, sends us this gem about how Prof. G.T. Kingston, first Canadian head of the Toronto Weather Observatory, attempted to hire one T. Reynolds as "computer" (observer and orderly) at the observatory in September 1856.

Apparently, Kingston laid down a number of hiring rules such as: "You will be on duty eight hours on five days each week, four hours on half holy days and three or four hours on alternate Sundays: the exact time for going and coming being such as I may from time to time direct."

"The scale of remuneration will be for a working day including holy days and half holy days — 6s.3d (about \$1.50). For attendance on Sundays 6d per hour (about 12 cents). For extra attendance on working days per hour — 6d. When absent for sickness or with leave a deduction will be made of 5d per hour. A deduction of 1s.3d per hour will be made for late attendance or absence without leave. You will be required to bring me each Monday an account of your time during the preceding week (from Sunday to Saturday) kept according to the annexed form."

Apparently things didn't work out. Reynolds was suspended on October 9 and fired November 6, 1856.

★ ★ ★ ★

With more than six months service as assistant secretary general of the World Meteorological Organization under his belt Don Smith has been acting true to form as the UN agency's number one trouble shooter in technical and scientific matters. He is based in Geneva where he and his wife Kit are comfortably ensconced in the "servants quarters" of a 300-year old house that belonged to Napoleon's wife, the Empress Josephine. However, he has been on official missions to Nairobi, Kenya and the Centre for Medium Range Forecasting in Reading, England. Not long after starting work for the WMO on Labor Day 1984, he found himself back in Ottawa on his very first mission. "I found myself spending the usual one and a half days per week in the federal capital," he joked.

★ ★ ★ ★

Lionel Haughn of Atlantic Region Weather Services sends us a picture from the Gander (Nfld.) *Banner* showing a large highway sign that reads: "CAUTION, wind warning: winds in this area have been recorded to gust up to 200 km/h. If any difficulty is experienced in operating your vehicle, you are advised to stop until wind subsides."

The picture caption adds: "Highway signs on the Trans-Canada Highway are helpful aids to the motoring public, especially as they drive towards Port aux Basques where heavy winds swoop down from the mountains. Take notice of what this particular sign has to say as regards a warning. Many a tractor-trailer rig has been blown off the road in this area."

★ ★ ★ ★

Southam business writer Don McGillivray compares the language of economists and weather forecasters. He urges, "gloomsters

Zephyr Breezes * * *



Another fool who tried to outrun a cold front.

When Steve Hardaker, supervisor of surface stations observers for Ontario Region produces his twice yearly *Climate Comments* news letter he tries to brighten things up for his hard working army of climate station volunteers by including a small sprinkling of weather cartoons. For example he republishes "Frank and Ernest" or "Nestlings" strips when they deal with meteorological themes. Last Fall he published an anonymous drawing of an irate consumer on the phone to the

weather office complaining "I've just shovelled 10 centimetres of partly sunny outa my driveway." Now Steve has discovered some genuine local talent. William Shane Kampella does observation work on contract for AES out of Geraldton, Ontario. One day he would like to be a professional cartoonist. Meanwhile we are printing one of his own "Kamptoons" to help make him a little better known nationally.

and doomsters who expect winter for the next few months to take a lesson from the more cheerful folk who do economic forecasting."

An economic statement like: "We are not in recession and we are not going into recession," might inspire meteorologists to say "We are not in winter and we are not going into winter." Another, claiming: "There are no signs of recession . . . just slower and healthier growth," might inspire the following: "Despite a lot of viewing with alarm, there are no signs of winter. The recent drop in temperature is just a transition to cooler climate." A third statement on investors' fears of the economy growing too rapidly one season and too slowly the next, translates weatherwise into: "Last summer it was too hot. We consider the current preoccupation with cold weather to be a passing phase."

Claiming that recessions are caused by the methods used to prevent them, McGillivray hints that winter is "caused"

by such things as harvesting grain and storing firewood. "If we do not try to get ready for winter, it will not come." But when winter arrives anyway, he suggests we reply: "Oh yes, winter did come, but it is just about over now. We see signs of spring everywhere."

★ ★ ★ ★

Word has reached us that Toronto area Port Meteorological officer Geoff Meek has been granted honorary life membership of the Toronto Marine Club.

At the annual meeting of the club on January 18, Geoff who has already served as president of this prestigious shipgoing group, received a scroll acknowledging "his many years of dedication, time and effort".

Mr. Meek has been Ontario region Port Meteorological officer for more than 20 years and has been a member of the Marine Club right from the start.

February 1

1893 Saskatoon records its all-time lowest temperature: -50.0° .

February 3

1947 Lowest temperature ever officially recorded in Canada: -64° at Snag YT; also a North American record.

February 4

1970 The oil tanker ARROW, carrying a cargo of 108,000 barrels of Bunker C fuel oil, went aground on Cerebrus Rock in Chedabucto Bay, NS. Winds at Canso were above 53 km/h from the south.

February 5

1923 Temperature of -54.4° at Doucet was the lowest ever recorded in Québec.

February 7

1881 Winnipeg's greatest snowstorm winds down; five-day snowfall total exceeded 70 cm.

February 8

1979 From the 8th to the 17th a severe blizzard confined residents of Frobisher Bay NWT indoors; -40° temperatures and 100 km/h wind gusts made outdoor activities extremely hazardous.

February 9

1913 A great procession of 15 to 100 meteors flashed across the northwestern sky for about 3 minutes around 2100 hr. visible from Saskatchewan to Bermuda.

February 13

1979 A massive avalanche near Roger's Pass BC buried CP track in 7 m of snow, damaged a bridge and caused traffic chaos; 7 skiers were killed in an avalanche near Golden BC.

February 14

1982 World's largest oil rig *Ocean Ranger* sank off Newfoundland with the loss of 84 lives and at a cost of \$60 M; maximum wind was estimated at 145 km/h and highest wave at 21 m.

FEATURES



This sign puts Alert squarely on the map as the world's most northerly meteorological post as this High Arctic weather station approaches its 35th anniversary. The remote HAWS outpost is ideal for carrying out Arctic haze experiments.

(cont'd from page 9)

the months of March, April and May has been predicted from computer models of sunlight absorption by haze. Even though slight, changes in Arctic air temperatures over areas as vast as the polar region can affect weather patterns in the Northern Hemisphere. This effect may be the most serious, and careful assessments are now being made.

- 2) **Acidification of land and water ecosystems.** Since levels of acidity are expected to be tenfold lower than those in eastern Canada, this is of less concern than climate modification. However, acid-sensitive areas in the Canadian north are being documented and the effects estimated.
- 3) **Degradation of visibility.** This is the most obvious and symptomatic effect of Arctic air pollution. Aesthetically, the reduction of visibility is undesirable. But there is little evidence yet to show that air pollution has been hazardous to air navigation in the Arctic.

Since 1979, Canada has been involved in an international Arctic air monitoring study with the United States, Norway, Denmark and, more recently, Iceland. Our participation is through the Atmospheric Environment Service (AES) of Environment Canada that operates a three-station air quality network at

Mould Bay, Alert and Igloolik, Northwest Territories. Much of our present understanding of Arctic air pollution in Canada has been attained from information provided by this network.

In addition, intensive research studies have been undertaken. In 1982 at Igloolik, Northwest Territories, Environment Canada conducted a sampling study by aircraft to measure the vertical distribution of the haze and characteristics of particles.

In the spring of 1983 we carried out joint studies by aircraft with the United States and Norway for a program called the Arctic Gas and Aerosol Sampling Program (AGASP).

FUTURE ACTIVITIES

Canada will continue to participate in international studies. In May 1984, Canada hosted the Third International Symposium on Arctic Air Chemistry. Reports of current research on the origin and effects of Arctic air pollution presented there should more clearly define the problem of Arctic haze. It may initiate an international effort to curb this potentially threatening polar problem.

In any case, it will widen the collective knowledge of those studying the phenomenon, assisting the embryo research that has been initiated in Canada and elsewhere.

February 15

1979 Coldest on record at Eureka NWT: -55.3° and the coldest month ever: -47.9° — also a North American record low monthly mean. For 17 consecutive days the temperature was below -45°.

February 16

1959 "Worst ever" snowstorm in Newfoundland claimed six lives, left 70,000 without heat and light, and blocked roads with 5-m drifts.

February 23

1984 Lester B Pearson Airport at Toronto recorded a maximum temperature at 14.9°, the highest for any February day in Toronto's 144 years of recorded weather history.

February 25

1961 Montreal area suffered one of the most damaging ice storms in its history. Wires, heavily loaded with 3 to 6 cm of ice, snapped in winds of 90 km/h with gusts to 115 km/h; storm damage exceeded \$7 M.

February 1916

Victoria's greatest one-day snowfall amounted to 53.3 cm; snowdrifts exceeded 175 cm along the coast to Nanaimo. Streets were clogged with cars and stalled transit; fire department used horsedrawn wagons. February snowfall amounted to 117 cm.

February 1947

A series of blizzards from Jan 30th to Feb 8th crippled southern Saskatchewan. For 10 days all highways into Regina were blocked. Railway officials declared conditions the worst in Canadian rail history. One train buried in snowdrift 1-km long and 8-m deep.

February 1979

Last total solar eclipse viewable in North America until August 21, 2017 tracked across Hudson Bay, northern Quebec and Newfoundland. Good viewing weather in the West but not in southwestern Ontario.

STAFF CHANGES

Promotions/ Appointments

J. Abraham (MT-6) Meteorologist, Halifax, N.S.
A. Lemyre (EG-1) Met. Tech., QAEOO, Chibougamau, P.Q.
D. St-André (EG-1) Met. Tech., QAEOO, Dorval, P.Q.
M. Party (EG-1) Met. Tech., QAEOO, Mirabel, P.Q.
L. Tailleux (EG-1) Met. Tech., QAEOO, Ste-Agathe, P.Q.
A.M. Purves (EG-8) Head, Instr. Services Section, ACSS, Downsview, Ont.
R. Schwartz (CS-2) Programmer/Analyst, CMCOD, Dorval, P.Q.
I. Loughheed (EG-7) OIC, WO4, Fort Nelson, B.C.
C. Quinn (EG-6) OIC, WS1, Big Trout Lake, Ont.
M. Lapalme (EG-5) Pres. Tech., WO4, Sudbury, Ont.
G. Trudeau (MT-2) Meteorologist, ALWC, Edmonton, Alta.
P. Bourgouin (MT-2) Meteorologist, ARWC, Edmonton, Alta.
R. Blais (MT-2) Meteorologist, ALWC, Edmonton, Alta.
T. Carrieres (MT-5) Meteorologist, ARMS, Downsview, Ont.
R. Lalbeharry (DA-PRO-3) Operations Control Oper., ARMA, Downsview, Ont.
J. Wilk (EG-4) U/A Tech., WS1, Sachs Harbour, N.W.T.
S. Schmidt (EG-4) U/A Tech., WS2, Cambridge Bay, N.W.T.
M. Crashaw (EG-6) Met. Tech., CMCFF, Dorval, P.Q.
P. Dillistone (MT-6) Meteorologist, CFB, Winnipeg, Man.
P. Delannoy (MT-6) Meteorologist, CFB, St. Hubert, P.Q.
R. Colpitts (MT-6) Meteorologist, DMETOC, Ottawa, Ont.
D. Quinn (MT-4) Meteorologist, CFB, Winnipeg, Man.
Y. Gervais (EG-6) OIC, QAEOU, Kuujuaq, P.Q.
M. Malépart (EG-5) OIC, QAEOU, Nitchequon, P.Q.
M. Elie (EG-1) Met. Tech., QAEOO, Dorval, P.Q.
M. Pierce (EG-7) OIC, WO4, Winnipeg, Man.
P. Dyrda (CR-4) Clerk, CAED, Winnipeg, Man.
M. Gatin (EG-4) U/A Tech., WS1, Hall Beach, N.W.T.

Temporary or Acting Positions

M. Wharton (DA-PRO-3) Computer Operator, ACPO, Downsview, Ont.
J.O. Bursey (MT-7) Meteorologist, MAED, Bedford, N.S.
J. Young (OCE-2) Composing Equipment, APEC, Downsview, Ont.
P. Ducharme (SM) Sr. Policy Analyst, APDG, Ottawa, Ont.
D. Jordan (EG-2) Met. Tech., WS3, Cape Parry, N.W.T.
R. Klakowich (EG-2) Met. Tech., WS3, Cambridge Bay, N.W.T.
B. Kelly (AS-3) Program Officer, LLO/ADMA, Downsview, Ont.
R.E. Mickle (RES-2) Acting Chief, ARQT, Downsview, Ont.
M. Beland (SM) Chief, Numerical Prediction Research Division, ARMN, Dorval, P.Q.
H. Wilkinson (EG-5) Pres. Tech., WO4, Fort Nelson, B.C.
R. Gillespie (EG-4) OIC, WO4, Churchill, Man.

Transfers

D. Coulombe (EG-3) UA/Tech., QAEOU, Inukjuak, P.Q.
M. Zavada (EG-4) UA/Tech., QAEOU, Nitchequon, P.Q.
D. Dockendorff (MT-7) Chief, Data Acquisition, OAED, Toronto, Ont.
B. Duguay (EG-6) Pres. Tech., WO4, Goose, Nfld.
J. How (EG-2) Met. Tech., WS3, Lytton, B.C.
R. Campbell (EG-2) Met. Tech., WS3, Cape St. James, B.C.
G. Lunn (EG-2) Met. Tech., WS3, Lytton, B.C.
J. Durham-Reid (EG-2) Met. Tech., WS3, Vancouver Harbour, B.C.
J. Bowling (EG-2) Met. Tech., WO4, Fort Nelson, B.C.
K. Kehler (EG-4) Met. Tech., PRWC, Winnipeg, Man.
V. Jarvi (EG-5) OIC, WS3, Cree Lake, Sask.
B. Wilhelm (EG-5) Pres. Tech., WO4, Hamilton, Ont.
D. Paquette (EG-2) Met. Tech., WO4, St. Catharines, Ont.
H. Pankratz (EG-6) Inspection & Training Officer, WAED, Edmonton, Alta.

G. Ledrew (EG-2) Met. Tech., WS3, Jasper, Alta.
W. Romanko (EG-4) U/A Tech., WS2, Norman Wells, N.W.T.
P. Minvielle (EG-2) Met. Tech., WS3, Slave Lake, Alta.
L. Barnaby (EG-2) Met. Tech., WS3, Fort Reliance, N.W.T.
D. Ker (EG-6) Met. Tech., ARQL, Downsview, Ont.
J. Pedro (RES-2) Research Scientist, ARQL, Downsview, Ont.
J. Mullock (MT-3) Meteorologist, PWC, Vancouver, B.C.
E. Taylor (MT-5) Meteorologist, PWC, Vancouver, B.C.
J. Mayo (EG-4) U/A Tech., WS2, Cambridge Bay, N.W.T.
T. Chen (MT-2) Meteorologist, ALWC, Edmonton, Alta.
G. Corriveau (MT-3) Meteorologist, CFB, Edmonton, Alta.
H. Murray (MT-3) Meteorologist, CFB, Edmonton, Alta.
D. Bancroft (MT-4) Meteorologist, CFB, Esquimalt, B.C.
K. Re De Kopp (MT-3) Meteorologist, CFB, Portage la Prairie, Man.
L. Boulay (MT-2) Meteorologist, CFB, Greenwood, N.S.
K. Stewart (MT-5) Meteorologist, CFB, Edmonton, Alta.
J. Charest (MT-3) Meteorologist, CFB, Moose Jaw, Sask.
C. Brien (EG-6) Pres. Tech., QAERW, Val d'Or, P.Q.
J. Pelletier (EG-6) Met. Tech., QAERW, Montreal, P.Q.
J.Y. Rancourt (EG-6) Pres. Tech., QAERW, Frobisher Bay, N.W.T.
J. Richard (EG-6) Pres. Tech., QAERW, Mirabel, P.Q.
A. Gergey (MT-3) Meteorologist, ATWC, Bedford, N.S.
S.R. Blackwell (MT-6) Instructor, ACET, Downsview, Ont.
S.T. Silver (MT-6) Instructor, ACET, Downsview, Ont.
S. Douglas (CS-1) Programmer, ACRO, Downsview, Ont.
P.V. Connor (EG-9) Chief of Maintenance, ACSM, Downsview, Ont.

Secondment

J.R. Gagnon, AFWC, Downsview, Ont. to CATA — Canadian Air Transportation Administration, Ottawa, Ont.

STAFF CHANGES

Retirements

C.B. Sigurdson, PRWC, Winnipeg, Man. Nov. 1984.

N. Taylor, CFB, Winnipeg, Man. Nov. 1984.

Y. Tessier, QAEM (CMQ), Montreal, P.Q. Dec. 1984.

Leave of Absence

R. Audet, ATWC, Bedford, N.S. — Laval University.

Special Project Assignment

H.E. Turner, ARQT, Downsview, Ont. Project Assignment, University of Toronto.

Departures

J.L. Paré, QAEOU, Kuujuaq, P.Q.

W.J. Kronister, ACPO, Downsview, Ont.

D. McDermid, WS3, Lytton, B.C.

S. Cho, ACPS, Downsview, Ont.

R. Fleischmann, LLO/ADMA, Downsview, Ont. to Indian and Northern Affairs, Toronto, Ont.

B. Diehl, PWC, Vancouver, B.C.

W. Laidlaw, ALWC, Edmonton, Alta.

Deaths

H. Tibbetts, Goose, Nfld. Nov. 1984.

January 24

1958 An incredible Arctic mild spell occurred with temperatures at Alert (0.0°), Eureka (-1.1°), Isachsen (-3.9°) and Resolute (-5.0°); higher than any temperatures ever reported previously during the six months from November to April, inclusive.



A 25 year Long Service Award was recently presented to Peter Wilms (right), officer-in-charge Hope (B.C.) Weather Station by Dr. Kirk Dawson, regional director, Pacific Region (centre) and Dave Phillips, chief, Data Acquisition.

January 20

1935 Taste of winter for Vancouver when the temperature dipped to -15.6° and snow exceeded 40 cm. A mild spell and rain followed, causing the Forum and other roofs to collapse.

January 23

1935 Ontario's lowest temperature ever: -58.3° at Iroquois Falls.

January 28

1870 The ship *City of Boston* sailed from Halifax and disappeared during a storm with 191 passengers aboard.

January 29

1977 Southern Ontario was in the grip of a 3-day storm (28th to 31st) described as the "worst winter storm in memory". The 10-cm snowfalls whipped by 100 km/h winds piled into huge drifts, isolating communities in the Niagara Peninsula for days.

January 1982

Severe wind chill across Ontario as -40° cold and gusty winds produced dangerous conditions; exposed flesh freezes within 30 sec; heavy snowfalls closed roads in ski country.

(cont'd from page 7)

them to obtain up-to-date ice coverage information to aid them in navigating the ice-infested waters.

Communications systems are being upgraded by taking advantage of the technologies of computer communications and satellites. In this way weather information will be transmitted effectively and reliably to places where it is needed.

Striving to provide a level of weather service which will meet the needs of people living and working in the north, the Atmospheric Environment Service's long-time involvement in northern activities, and the dedication of the staff at weather offices and stations, underpins the continuing role of the *Weatherman* in the north.

Joe Kotylak is chief of weather services, Western Arctic and Alberta.

(Reprinted from the Northern Miner, April 1984).