

# ZEPHYR



Environment  
Canada

Environnement  
Canada

Atmospheric Environment Service  
Service de l'environnement  
atmosphérique

FEBRUARY-MARCH 1989

## Atmospheric Research Centre Opened at Egbert, Ontario

More than 500 people attended opening day ceremonies October 28 at the brand new Centre for Atmospheric Research Experiments (C.A.R.E.), inaugurated by the Hon. Doug Lewis, then minister of State, Treasury Board and Minister of State, Deputy House Leader.

The new research centre located at Egbert, Ontario, about 85 km northwest of Toronto, will help AES scientists measure atmospheric change and track transboundary pollution.

The official part of the ceremony was held in a large basement room in the solid glass and

concrete three-storey building, located in the heart of rural southern Ontario. As a red-coated RCMP officer stood at attention, an audience of about 80 sang "O Canada".

This was followed by an introduction of the speakers by master of ceremonies, Dr. Jim Young, director of Air Quality and Inter-Environmental Research Branch. First speaker was ADMA Howard Ferguson.

Mr. Ferguson told his audience that the Egbert location had been chosen as a regionally representative site for measuring the atmosphere of southern Ontario. He added that due to

the changing atmosphere, the Station for Atmospheric Experiments, located at Woodbridge, Ontario between 1963 and 1987, had become less useful for monitoring air quality due to rapid urban growth and was therefore less regionally representative. "By this we mean that most of southern Ontario is made up of open countryside and small towns and since the impact of the changing atmosphere will be, on average, most pronounced in these rural areas, we have chosen to place our 'watchdog research station' at Egbert."

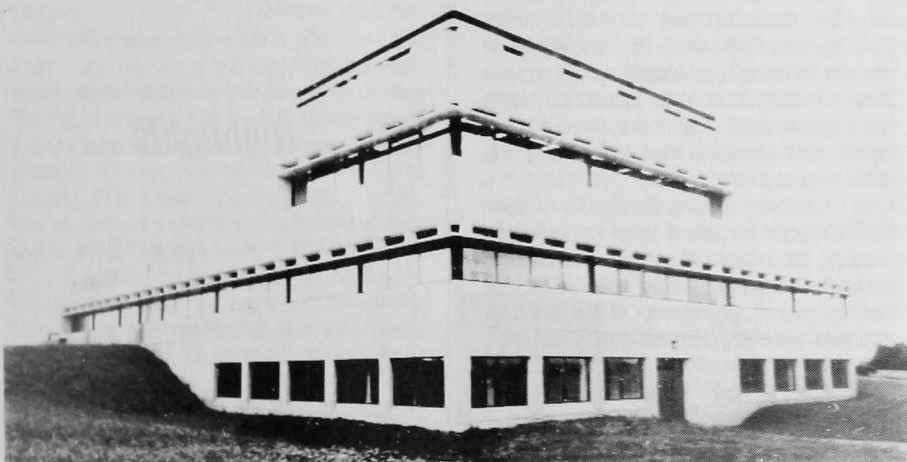
Mr. Lewis told attendees that in addition to monitoring air quality, the Centre will soon be expanded to enable scientists to study the effects of climate change on water and forests. "Here in Egbert, scientists will develop technologies that will keep Canada in the forefront of atmospheric research", he added.

Mr. Lewis went on to say that the C.A.R.E. facility would help to provide the information needed to achieve what the World Commission on Environment and Development (Brundtland Commission) calls "sustainable development", that is, development that meets the economic needs of the people of the world without bankrupting the environment in the process.

In a short speech, Charlie Pridham, reeve of Essa Township reaffirmed the municipality's commitment not to encourage development that might pollute the rural atmosphere of Egbert.

The ceremony ended with the unveiling of

cont'd page 4



The new three-storey CARE building at Egbert, Ontario, has facilities for a dozen or more different atmospheric research projects.

## AES Atmosphere Experts Receive Patterson Medal

At a ceremony held in Concord, Ont. on October 27, two AES scientists were awarded the Patterson Medal, the highest distinction in Canadian meteorology.

Gordon A. McKay, a veteran climatologist and meteorologist and former director of Climate Applications in the Canadian Climate Centre and Dr. Douglas M. Whelpdale, a global pollution expert, currently employed with Modelling and Integration Research Division, Atmospheric Research Directorate, Downsview, were honored at a banquet hosted by AES and the Canadian Meteorological and Ocean-

ographic Society (CMOS).

Presenting the awards, ADMA Howard Ferguson said that Gordon McKay had for many years contributed extensively to international meteorology and climatology and had a "remarkable and unique standing in United States climate circles." A few years ago he had played a lead role in a Science Council program called Living with Climate Change and was a dynamic force behind the Canadian Climate Program long before it had a name and was accepted by the Federal Government.

Mr. Ferguson added that Mr. McKay, a

former CMOS president, recipient of American Meteorological Society and Royal Meteorological Society awards and contributor to many technical books and publications, "is a most worthy recipient of the Patterson Medal."

(Mr. McKay retired from AES in 1984 but during 1987-88 served as secretary of the World Conference on the Changing Atmosphere, organized by AES.)

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Canada

## Increased AES Support for Education Leave

During 1989-90 AES will further increase its financial support for Education Leave in the areas of computer studies and management and administrative studies.

In a memorandum sent to all AES employees, ADMA Howard Ferguson says that due to implementation of the AES strategic plan, there is a greater need for increased education and cross-training, particularly for employees in the technical category. The assistant deputy minister adds, "In recognition of this requirement, I decided last year that the Service would increase its financial support to

staff selected for Education Leave. It was gratifying to note the substantial increase in the number of employees who applied and were accepted for the program."

The memorandum lists the programs for which employees can be granted Education Leave with financial support: Meteorology undergraduate degree and certificate/diploma program; Computer Science degree or certificate; Management and Administrative studies; M.Sc. in Atmospheric Science; M.Sc. in Oceanography; Technical studies and Ph.D studies.

Summarizing the objectives of the program, Mr. Ferguson, concludes "It is AES policy to encourage employees to participate in education, training and development activities in order to meet Service needs as well as the career aspirations of employees."

There are only a few days left before closure of this year's applications. The memorandum says that submissions with Directors' recommendations must reach AES Downsview by March 31, 1989.



**AES and Hewlett Packard (HP) staff and their associates gather round as Andy McCullough, weather presentation technician, Windsor Weather Office (seated foreground) demonstrates the marvels of the new Multi Purpose Display Station (MPDS). The demonstration was part of a reception and media event organized by HP, makers of the MPDS hardware, at AES Downsview Headquarters to mark the launching of MPDS and its installation in some 70 weather offices across the country. Left to right are HP executives Ross Marsden and Malcolm Gissing, ADMA Howard Ferguson, Gordon Black, AES Communications Directorate, John Schneider, AES/MPDS Project manager and David Taylor, president, Selena/Northwest Digital Research, manufacturer of the MPDS software. Not shown in the picture is Bruce Atfield, director, AES Computing and Telecommunications Services, who acted as master of ceremonies.**

## SAFETY FIRST

When you work at a desk job at Downsview, it is difficult to imagine all the types of safety hazards that could exist at our High Arctic Weather Stations. This is especially so for those of us in administrative jobs who have never travelled or worked in the far North. Thus it was with much interest that I travelled to the Canadian Arctic as part of the November planning team from central Region. I wanted to examine for myself the safety hazards that were present in the Arctic, make recommendations for improvements, and brief the OICs on legislative changes that have occurred recently in the area of safety.

I had been reading Safety Officer John Keefe's reports for several years without really grasping the essence of safety in the North. A friend of mine even remarked to me before I left that it would be nice to work in the Arctic for awhile to "get away from it all, relax, and catch up on reading and writing". So, what safety and health hazards could there possibly be in a warm, cozy northern station?

Let me tell you, there are plenty of hazards. I was jolted into reality when the pilot of our charter explained the safety features of the twin Otter that would provide our transportation over the next 5 days. The phrase "survival kit" made me realize that northern travel was unlike a comfortable 40 minute hop to Ottawa. An emergency landing would not generate swarms of fire, police and ambulance personnel. There was nothing down below but hundreds of miles of cold, mountainous, uninhabited terrain.

I was beginning to understand the truth of safety in the North. An accident, no matter how trivial, is of potential gravity, given the isolation and lack of support agencies. There is a greater reliance on one's colleagues for support and assistance than might be found in the south. Employees must be able to react quickly and correctly to all emergencies; there might not be a second chance.

Those who work in the far North have a healthy respect for the environment, the climate and the wildlife. Yes, the wildlife. That friendly

fox could be rabid, and the polar bear ambling by might turn and charge. A poster at Alert reminds one about "Safety in Polar Bear Country". Having seen this, I certainly didn't get out of the truck when we photographed the bear at Resolute Bay.

The men and women who run our weather offices in the North deserve our admiration and respect. They are far from home relying on the information we provide them, information which could be the difference between life and death. We have to get it right, so that their lives are not placed in jeopardy.

Jan Glover

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## ZEPHYR

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# Changing Role for AES at the Suffield Research Base

by Bill Clink

The Suffield Experimental Station in south-eastern Alberta, now known as Defence Research Establishment Suffield, was in the news fairly recently in connection with some alleged chemical warfare activities. But as far as AES is concerned, the real story from this military research base is that, for the first time, the Weather Service will no longer second personnel to the station. Instead, DND is taking over this important meteorological function. Scientific support to the Suffield mission will continue, however, through the Canadian Forces weather services, made up of over 100 meteorologists seconded to DND from AES.

Over the years, the Suffield station had maintained a relatively low profile, and it is not generally known that AES, and the Meteorological Branch of the Department of Transport before it, has maintained a presence at the station since its establishment in 1941. Several generations of meteorologists and technicians have been seconded there from weather offices across Canada, but in April, 1989, this 48-year connection will end, as the DOE personnel stationed there will become full-fledged employees of the Department of National Defence.

It all started early in 1941, after the fall of France and the loss of the joint English/French experimental station in the Sahara for testing the use of chemicals in warfare. Britain lacked the space necessary for doing this work on their crowded islands, so the search turned to Canada. After a detailed survey, a 2000 sq.km. site at Suffield was chosen partly because it would disrupt agriculture least.

A team of 10 British scientists arrived in the spring of 1941 and operations began that summer. By fall buildings sprang up to house the scientists. Supplies arrived from England and work began in earnest.

Meteorology, especially on the meso- and micro-scale, was vital to the operations and the subsequent analysis of test data. The Met



*Long-time OIC Ken Styles of AES is seen working at the weather briefing desk, Suffield, Alberta.*

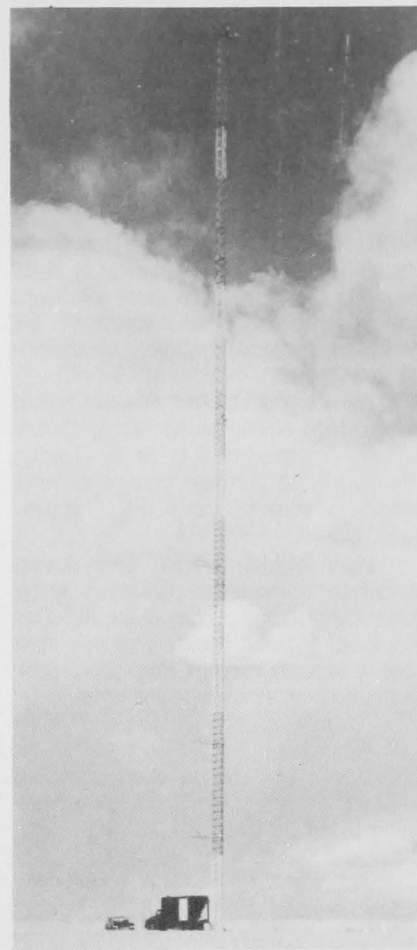
Service assigned Campbell Tait as meteorologist, Ken M. Korven as met officer and Ross Armstrong as a met tech that same fall. E. L. Deacon, scientist from Britain, helped develop the meteorological services. Later, the Met. Service, (or AES) seconded other met officers such as Walter Halina in 1944 and Jack Kermode in 1950. Ole Johnson went to Suffield as a meteorologist in 1944, becoming the anchor behind the field operations for 30 years. Others came and went, but Ken Styles, arriving as a met tech in 1953, remains as OIC, having now served AES for over 46 years.

By the end of the war, 584 people were working at Suffield. There were sections for chemistry, offensive munitions, physiology, and physics and meteorology. Research spread beyond chemical weapons. Ballistic and bombing trials took advantage of the open spaces. Designed for the often bitterly cold weather were experiments and developments in flame warfare and the generation of smoke screens. Many a 40-below day found Ole Johnson out observing the performance of smoke screens from a portable lean-to to shield him from the perishing wind.

After the war the emphasis turned to the defensive aspects of chemical and biological warfare. The efficient application of insecticides was studied and later applied to control the spruce budworm in eastern forests. Entomological experiments around Suffield created a mosquito-free zone for many years. Later the need to simulate atomic blasts led to large explosions using up to 450 tonnes of TNT at a time. All of these activities were strongly dependent upon the state of the atmosphere and on the skills of the meteorological staff.

Some of these AES people did their own research on meso- and micro-scale turbulence and on the diffusion of gases and particles in the lower atmosphere, and developed instruments and computation systems for these purposes.

Many long-time Suffield personnel, whether civilian or military, recall the primitive living conditions and isolation of the early days. For example, water was too scarce for bathing and the custom was to go to Medicine Hat, 30 miles away and bathe for 50 cents in a hotel where baths were rented separately. Only later was a pipeline run to the South Saskatchewan River and a sewage lagoon placed to the west of the station. On occasion, the roads would be closed by drifting snow and an airlift was operated by the RCAF for key personnel. Buses were known to be "lost" on route for as long as 20 hours. In spring the roads would become nearly impassible and convoys were formed for what could be a mud-laden four-hour trip to and from residences in Medicine Hat. Gradually the Crown village of Ralston appeared, acquiring a community center, complete with groceries, a swimming pool, a bowling alley, a barbershop,



*This 93-metre tower in Suffield, Alberta has long been used for weather research and for atmospheric diffusion experiments.*

and a hairdresser and the roads to Medicine Hat were paved.

Nowadays, there is a new Suffield, a new generation of people has turned to more advanced technical work. For example, they have developed improved medical treatments and operating procedures for activities in chemically and biologically contaminated environments and their engineering expertise now concentrates on computer systems to monitor the performance of weapons. Other work of note has been the development of methods for the detection of mine fields and for improvements in vehicle operations in the Arctic. This is the new Suffield, new people, new programs, new visions, good roads and even better weather!

Mr. Clink, a former weather officer at Suffield, has just retired from AES Downsview, after holding the post of chief, Technical Support Division for the past 10 years.

Research Centre cont'd.

two plaques, one to commemorate the opening of C.A.R.E., the other to honor the memory of the late Max Woodhead, scientist and builder of the centre's Remote Sensing Laboratory, a "visionary" who foresaw the opportunities offered by C.A.R.E. for the expansion of AES's important work. Mrs. Woodhead was present to receive a copy of the plaque.

The rest of the day was taken up with tours of the facility, of interest to everyone, from visiting scientists and government officials to a busload of gifted public school children.

Some of the main areas on display included the Canadian Climate Centre Laboratory, where scientists Barry Goodison and John Metcalfe demonstrated experiments to study the interaction of the atmosphere with crops and forests as well as the installation of the World Meteorological Organization precipitation reference station.

Phil Raczynski and Terry Allsopp explained the operation of the Ontario Region Climate Station — measurement of air temperature, precipitation, rate of rainfall, evaporation, wind, hours of sunshine, radiation and depth of snow on the ground.

Larry Wiggins and Bill Clink demonstrated some instruments developed by the Applied Engineering Section of the AES Data Acquisition Systems Branch, especially those used to remotely measure atmospheric parameters such as temperature and winds.

Al Wiebe guided visitors around the Air Chemistry Laboratory, showing them how the lab supported the analysis of photochemical oxidants, nitrogen and sulphur compounds, aerosols and hydrocarbons, all measured at the site.

Jim Arnold, Joe Kovalick and Wes Kobelka demonstrated the Air Quality Monitoring Laboratory where new instrumentation to



**Dr. Wayne Evans (right) demonstrates the Brewer Spectrometer to the principal speakers at the CARE opening last November. The Hon. Doug Lewis and ADMA Howard Ferguson.**

support the Canada-wide acid rain network is developed. The vertical profile experiment to study change of temperature, humidity, winds and ozone in the lower levels of the atmosphere was shown, as were the Clean Air Sampling Facility instruments where air pollution is monitored for intercomparison of different atmospheric chemicals.

Ray Hoff and Frank Froude conducted tours of the Electro-Optics Research Laboratory where lasers are used to study atmospheric aerosols, SO<sub>2</sub> and ozone. They also demonstrated vertical profiling equipment used to measure temperature, winds and ozone in the atmosphere by monitoring a free floating

balloon with sensors attached.

Lastly, Wayne Evans, Jim Kerr and Dave Barton showed visitors around the Solar Radiation Observatory where solar radiation properties of the atmosphere and stratospheric ozone are measured.

The day-long open house was also notable for the number of local residents who dropped by including farmers who looked in after their day's work was done. The visitors even included someone who claimed to have been born in the farmhouse that occupied the site of the current C.A.R.E. facility. The farmhouse was dismantled prior to building the new Centre.

Patterson Medal cont'd.

Referring to Dr. Doug Whelpdale's award, Mr. Ferguson said that this leading scientist, who has been with AES since 1970, was responsible for initiating the DOE Long Range Transport of Air Pollutants Program and had served on numerous international bodies including the European Monitoring and Evaluation Program (EMEP) Steering Committee, and the Canada-USA Bilateral Research Consultation Group on acid rain. He is also external reviewer for the US and European acid rain programs and holds a cross appointment with the Institute for Environmental Studies at the University of Toronto.

Mentioning that Dr. Whelpdale had recently been selected by the Executive Council of the World Meteorological Organization to chair the EC Panel of Experts/CAS Working Group on Environmental Pollution and Atmospheric Chemistry, Mr. Ferguson added, "It is a rare and extremely valuable scientist who can cut across disciplinary lines to achieve progress in environmental science".

The awards banquet also included an address by distinguished Climatologist, university leader and recipient of the 33rd World



**Principals at the AES/CMOS banquet, left to right, Dr. Doug Whelpdale, Patterson Medal winner; Dr. Kenneth Hare, guest speaker; Ev Wilson, m.c.; Gordon McKay, Patterson Medal winner and Howard Ferguson, official host and presenter of the awards.**

Meteorological Prize, Dr. F. Kenneth Hare on the subject of Climate Change. (Dr. Hare will be awarded the IMO Prize in a special ceremony during the 41st session of the WMO Executive Council, in Geneva on June 12, 1989).

Master of Ceremonies was Ms. Ev Wilson, president of the Toronto Chapter of CMOS.

# THE "AES QUIZ"



Nearly 18 months ago Zephyr ran a general knowledge quiz on the ins and outs of Environment Canada, challenging AES employees to find out how well informed they were on the Department as a whole. As a sequel, we now run a similar quiz on AES. Since many of the subjects are "closer to home", we suspect most readers will find this questionnaire a little easier than the DOE one.

Check a/, b/ or c/ and compare with the answers on page 7.

- When was the Atmospheric Environment Service established?  
a/1871 b/1958 c/1971
- How many AES weather radar stations are there across Canada?  
a/14 b/22 c/48
- Who was the first weather service director to be appointed assistant deputy minister?  
a/Reg Noble b/John Patterson  
c/Jim Bruce
- Some 200 employees were trapped overnight in the AES Downsview Headquarters building by a sudden, unexpected snow-storm. When did this occur?  
a/February 29, 1972 b/April 3, 1975  
c/March 27, 1980

- AES currently has four High Arctic Weather Stations (HAWS), performing both meteorological observations and scientific research. Which one of these is not a HAWS station.  
a/Mould Bay b/Eureka c/Iqaluit
- In June 1988 AES organized the World Conference on the Changing Atmosphere. How many prime ministers attended?  
a/5 b/2 c/1
- How many weather offices (WO4s) does AES have in its national network as of February 1989?  
a/41 b/64 c/81
- Under the AES Strategic Plan, which region plans to have a fully operational Weather Service Office by 1991?  
a/Pacific Region b/Ontario Region  
c/Atlantic Region
- Approximately how many enquiries for weather information did Canadians make in 1987?  
a/19 million b/26 million c/31 million
- AES recently opened a major new installation called C.A.R.E. What is it?  
a/an advanced new day care centre  
b/a new, computerized accounting, resource and expenditure system,  
c/a centre for atmospheric research experiments.

- In what year did the earliest weather event mentioned in the 1989 Canadian Weather Trivia Calendar occur?  
a/1900 b/1867 c/1578
- Approximately how many meteorologists were employed by AES in 1988?  
a/450 b/620 c/930
- When did Canada become a member of the United Nations World Meteorological Organization (WMO)?  
a/1891 b/1950 c/1971
- How much federal funding did Professor George Kingston of the University of Toronto receive in 1871 to start Canada's national weather service?  
a/\$5,000 b/\$35,000 c/\$150,000
- How high have AES instruments been sent up to measure stratospheric pollution?  
a/5 km. b/55 km. c/300 km.



**Henry Hengeveld receives an AES Merit Award from Nancy Cutler, acting director general, Canadian Climate Centre. Mr. Hengeveld received the award in recognition of his major contribution to the World Conference on the Changing Atmosphere, held in Toronto last June. In late 1988 he returned to his previous position as advisor, Carbon Dioxide Related Matters.**

## CIRRUS

High, white patches of cloud composed of ice crystals, found at altitudes of 6,000 meters or higher. Fine and delicate in appearance, their shape and texture are often described as looking like mares' tails. In forecasts they are referred to as high cloud.

# Lasers and Telescopes Show How Pesticides Drift

by Pippa B. Wysong

When one hears the term 'pesticide drift', the words vortices, clouds, lasers and computer simulations don't usually come to mind. Yet all these things are exactly what Dr. Bob Mickle thinks about in his work with pesticide drift.

Bob is a research scientist with AES in Downsview. He first developed an interest in pesticide drift in 1982 when he began investigations with a group in New Brunswick. They were looking at how spraying should be done against the spruce budworm. Members in the group included researchers from the National Research Council, the University of New Brunswick, the Research and Productivity Council of New Brunswick and AES.

Over a period of four years, the team looked at numerous aspects of pesticide spraying including what effects the aircraft may have on the way the pesticide falls; the types of aircraft used; how high planes should be flown over a forest canopy; the effects of meteorology and what time of day spraying should be done.

"Meteorology can play an important role on how far the spray drifts away," Bob says, and asks "Should one spray very early in the morning in conditions which are 'stable', or should one spray when the air becomes a little more turbulent?"

The experiment did show that early morning situations were not the best to spray in. That was quite a change in thinking. The researchers also found that smaller droplets should be used to get the spray into the forest canopy. The smaller the drops for spraying trees, the more likely they are to deposit in the foliage where the bugs are, and not just fall through to the ground.

Still, Bob and the rest of the team could never be sure how the spray would drift beyond the target location. Once spray is released from the plane, the cloud it forms is quickly broken up and dispersed. "You physically cannot see it after a few seconds," Bob explains.

How could the path of the spray be observed? Bob Mickle with co-researchers Ray Hoff and Frank Froude, thought of a way the problem could be overcome by using a laser and telescope assembly. The ARAL was born and the design of the device was worked out.

ARAL, or the AES Rapid Acquisition Lidar System, uses already existing LIDAR (Light Detection and Ranging) technology in a new way.

The LIDAR sends pulses of light out to the spray cloud, which are then reflected back from the cloud droplets. How far the spray cloud is from the laser source is determined by the length of time it takes for the light pulse to go out and come back.

More than that, by using the ARAL, researchers can actually map the shape of the cloud, how it is dispersing and where it is drifting. The laser sends out 10 pulses per second and scans a vertical slice of the spray cloud within six seconds. A single pulse from the laser is 10 billionths of a second long.



**The key to the successful Pesticide Drift experiment is this AES Rapid Acquisition Lidar system (ARAL) mounted on the back of a truck. By using ARAL, research scientists, Dr. Bob Mickle, Dr. Ray Hoff and Frank Froude are able to map the shape of a cloud and show where it is drifting.**

In its present experimental form, the ARAL is mounted in the back of a truck. The truck itself is usually parked about two km away from the spray site. The 35 cm. long laser is mounted on a cradle along with a 35 cm. telescope. When the laser is fired into the cloud the cradle is tipped up and down about five degrees so a vertical profile of the cloud can be attained. The telescope catches the light that is reflected back.

"The motion of the laser and acquisition of the data is controlled by a micro-computer," says Bob.

The rapidity of the scanning allows researchers to map what the cloud is doing. Data from each scan is later fed into a computer

where the information can be easily manipulated. Graphics are used to make a visual model of the cloud — a real bonus to researchers who are studying clouds of pesticide that are invisible. During trials in New Brunswick, a non-toxic simulant spray with a red colouring was used. The red dye enabled the researchers to videotape the clouds of spray so it could be compared with the ARAL data. Information from ARAL was excellent and the device was able to monitor spray clouds under light wind conditions for up to nine minutes after the aircraft passed by.

Knowing the mechanics of pesticide drift is very important for both environmental and economic reasons. When spray drifts away from the target area, it can kill sensitive vegetation, pollute water supplies, and get into the food chain. To applicators, spray that drifts means wasted money — both in terms of the spray that is lost and the target that doesn't get enough spray.

Some of the preliminary results of the ARAL tests show that pesticide drift is not a trivial problem. According to Bob, 60-70% of fine-drop spray can drift away from the target site. "Those are large, large numbers, yet those are the realities of spraying today." ARAL tests have also shown that the aircraft used to do the spraying can significantly effect where the spray ends up going. During flight the aircraft creates wing tip vortices which trap the spray cloud. These vortices can move quickly downwards carrying the pesticide into the forest. However, the ARAL has revealed situations where one vortex moves upwards carrying spray above the aircraft thus causing more drift while the other moves down towards the ground.

Knowing this, applicators can alter the way they spray. "One suggestion is if you are in a sensitive area (such as near a river), turn off the booms on the downwind side of the aircraft, until you're further away," Bob says. "That way, less spray will end up off target."

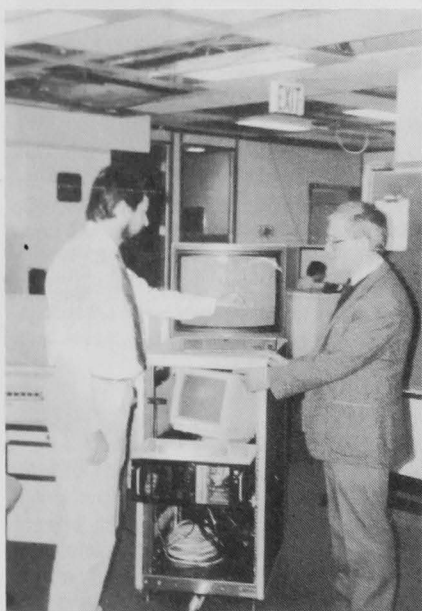
By using a device such as ARAL to study pesticide drift, applicators may eventually be able to use less spray. If people know where the spray is going and why, they can change their spray tactics so more of the pesticide is on-target. Less spray means a significant savings to the applicator and less pesticide contaminating the surrounding environment.

Ms. Wysong is a freelance science writer

## B.C.'s Lower Mainland Weather Office has Larger Role, New Premises

The Vancouver Weather Office, formerly located at the international airport, moved into town last summer and is occupying space on the same floor of the building that houses the Pacific Weather Centre. With improved facilities, the W04 has now been renamed the Lower Mainland Weather Office (LMWO)

The new name signifies that the Weather Office services a far greater area than Greater Vancouver. In fact its coverage area extends from Whistler Mountain in the North to the U.S. border in the south and from the coastline in the west to Hope in the east. Thanks to the use now



**Will Hayward, superintendent of stations, AES Pacific Region (right) and shift supervisor Robert Rowson, examine the Video Network in the new, high-tech, Lower Mainland Weather Office. Among other things the equipment displays satellite imagery, supplies current weather forecasts and locates lightning strikes.**

made of state-of-the-art weather radar, lightning detection equipment and weather satellite "loops", LMWO can carry out such tasks as issue weather reports to ski enthusiasts, give out farm weather bulletins, report on probable highway conditions in snow-prone areas, and monitor lightning strikes for the forestry industry.

Comments Will Hayward, the former officer-in-charge of LMWO, "Our new facilities

enable us to tailor our weather product to a wide variety of publics. We can achieve considerably more than we did over at the airport. For example we now have ample studio space available for our radio broadcasts. We can also update cable TV weather forecasts and provide special services to four local radio stations, including KLYN in Washington State, frequently listened to by Canadian farmers".

The move has brought a number of in-service advantages to the W04. These include more rational use of space. (They no longer have to share a room with Transport Canada); they have more windows for viewing the weather directly; LMWO staff are now able to deal directly with meteorologists at the Weather Centre, thus speeding up vital consultations, especially during severe weather and, finally, duty staff can now use the Weather Centre's library and cafeteria.

During the busiest periods (in the daytime), the LMWO has three people on duty, including the shift supervisor, a weather service specialist and a media briefer. According to Will Hayward, the move affords some overall savings in person years.

All in all, the move seems to have pleased almost everyone. Arrival of the LMWO has not cramped the operations of the Pacific Weather Centre and, equally important, LMWO personnel no longer regard themselves as "the forgotten people".



**Ian Hamilton, shift supervisor, Canadian Forces Forecast Centre, Trenton, receives a 25-year Public Service Award from Col. C. G. Diamond base commander, during a recent ceremony.**



## QUIZ ANSWERS

1. AES replaced the old Meteorological Branch of the Department, of Transport (later known as the Canadian Meteorological Service) when Environment Canada was created in 1971.
2. 14
3. Reg Noble, ADM from 1971 to 1977.
4. April 3, 1975.
5. Iqaluit (formerly Frobisher Bay) is not a High Arctic Weather Station. The two other HAWS stations are Resolute and Alert.
6. 2; Prime minister Brian Mulroney and Mrs. Gro Harlem Brundtland, prime minister of Norway.
7. 64
8. AES Pacific Region (the other regions will have test bed stations)
9. 31 million.
10. C.A.R.E., located at Egbert, Ontario, stands for Centre for Atmospheric Research Experiments.
11. 1578. From the journal of Martin Frobisher (July 26), complaining about an unseasonable summer of snow and bitter cold.
12. 620
13. Canada became a founding member of WMO on July 20, 1950. However, it had first participated in an international meteorological congress in Paris in 1896.
14. \$5,000 (It was worth considerably more in those days).
15. 300 km. We are referring to Canadian astronaut Marc Garneau's taking the Sunphotometer aboard the U.S. Space Shuttle Challenger in 1984.



**Nicole Landry**  
*Weather Services Specialist*

She is from Cap Pele, New Brunswick. She has been employed with Atmospheric Environment Services for over 8 years. Nicole is a graduate of l'Universite de Moncton.



**Bill Bourque**  
*Officer in Charge*

Bill is a Moncton native who attended University of North Carolina. He joined the Canadian Weather Services after returning to Canada in 1967. Bill has had previous postings in Northwest Territories, Labrador and Ottawa.



**Roger Price**  
*Weather Specialist*

Roger is originally from Upper Hainsville, N.B. He has attended Atlantic Baptist College in Moncton. Roger has been stationed in numerous locations including Campbellton, Churchill Falls and Goose Bay.



**Pierre (Peter) Gaudet**

Peter is from Memramcook and has attended the N.B. Community College. He has been stationed in Goose Bay, Labrador and Montreal previously.

## Radio station praises Moncton Weather Office

Moncton, New Brunswick radio station CKCW has long prided itself on its ability to provide lively, accurate weather forecasts. For some years this media outlet was fortunate enough to obtain weather presentations from a "selected few" AES briefers, including OIC Bill Bourque, who has served with the Canadian Weather Service since 1967. More recently, however, increased work loads at the weather office meant that radio stations had to talk to whoever happened to be available at the time and sometimes even obtained busy lines.

For a change of pace, CKCW decided for a while to subscribe to a private U.S. weather service located in Portland, Maine. Their weatherman was an entertaining on-air performer but frequently got things wrong.



**Sylvain Boutot**  
*Weather Services Specialist*

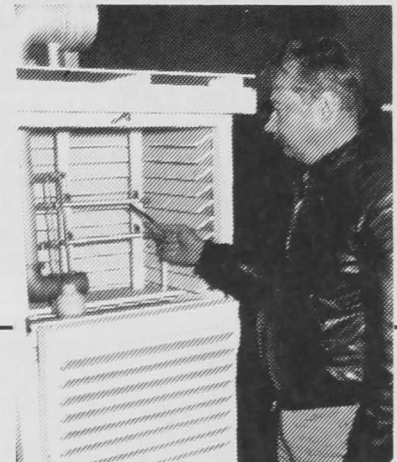
Sylvain is originally from Baker Lake, New Brunswick. He has been employed with Atmospheric Environment Service since 1981 and has had previous postings in the Northwest Territories, Newfoundland and Labrador.

For instance, when AES accurately issued a heavy snow warning, the independent forecaster predicted "just a few snow flurries." In addition, listeners found the Portland voice rather remote and missed the accustomed hometown Moncton weather commentaries.

CKCW then switched back to the Moncton weather office and to the experienced voices of AES presentation technicians. (By now all the AES voices sounded good). CKCW was so delighted, they decided to salute AES by taking out a large ad in the Moncton Times-Transcript newspaper. They hired local Austin Studios to photograph all eight AES employees so that they could be included in the ad. Comments Bourque, "In all my experience I've never seen a radio station praise us so warmly. Usually AES is taken for granted".

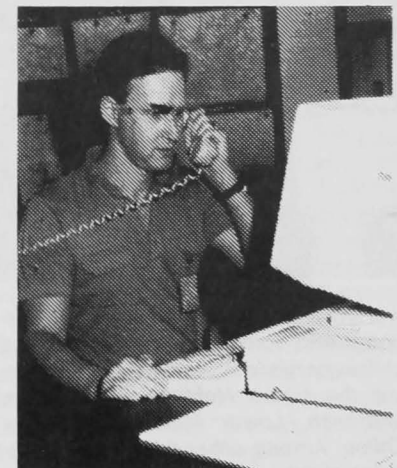
### CUMULUS (TOWERING)

Cauliflower-shaped clouds associated with showery-type precipitation. They may appear to be tall and towering or tall and broad, and can be either isolated or grow from lower lines or decks of cloud.



**Dave Fyffe**  
*Weather Service Specialist*

Dave is originally from Cornhill, New Brunswick and has worked with the Canadian Weather Service since 1964. Dave has worked in the Canadian Arctic and Newfoundland as well as Sydney, N.S., Saint John, Fredericton.



**Bernard Duguay**  
*Weather Service Specialist*

Bernard is originally from Lemeque, N.B. He started his career with the Atmospheric Environment Service in 1982. Bernard has worked in the Northwest Territories, Sable Island, and Labrador.

### CYCLONE

In the Northern Hemisphere, a closed counter-clockwise movement of air — known as a circulation — around a low pressure centre; usually called a low. The term is frequently misused to describe a tornado.



# BOOK REVIEW

Thinking the Unthinkable by Lydia Dotto  
 Calgary Institute for the Humanities  
 Wilfrid Laurier University Press 1988  
 reviewed by Lewis Poulin

In August 1987, 45 thinkers assembled at the University of Calgary to discuss Civilization and Rapid Climate Change. Using current scientific evidence and reviewing historic disasters, they pondered on how could we better prepare ourselves for another upcoming environmental disaster, i.e., "Climate Change". Lydia Dotto's 73 page booklet is a summary of their disturbing multidisciplinary discussions.

Is it too far fetched to call climate change an environmental disaster? The myriad of environmental concerns we are experiencing tell us that our biosphere is quite ill as we head towards "environmental burnout". Our chemicals are attacking our ozone layer, our atmosphere is warming, our trees are being killed by our rain, our water quality is deteriorating.

So what did they learn? Optimum recovery from disasters occurs if only a segment of society is affected by that disaster. The healthy segment can come to the rescue of the affected one, the recent Armenian earthquake for example. As well, they concluded that complexity in social systems and structures is not advantageous during catastrophic times. They remind us of how the simple hunter-gatherer societies persisted for so long because these small units could travel to wherever abundance brought them.

We must also be aware, they tell us, that physical changes in our environment(s) could induce a collective stress on society, which in the end, could be our greatest danger. As the environment becomes harsher, the old "every one for themselves" motto would come into play creating havoc in our complex societies.

What could help a society cope with stress-induced disasters? Diversity both human and economic, multiplicity of basic production skills and a healthy independence from global structures. Sounds familiar to Mother Nature's strength in diversity approach for the biosphere.

How to prevent apathy? Realize that your disaster is here now. Your scientists, who by the way don't have all the answers, will monitor your ecosystems and report on their progress. Teachers and the media must ignite public emotion into a prevention mentality, one that demands, and expects, changes from the political process.

This booklet is really an introduction for the denouement which begins after you have finished reading it. The climax is up to you.

"Sometimes to wake me up I think I need a bomb

But there's so many around me now my mind is numb!"

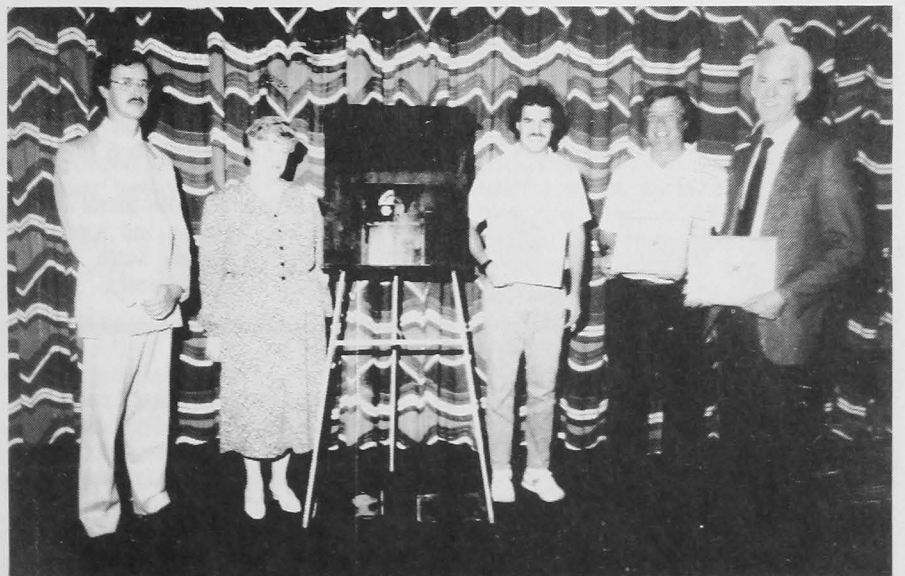


**Environment minister Lucien Bouchard, paid a short visit to AES Downsview Headquarters on December 23. He is seen here shaking hands with Nancy Cutler, acting director general, Canadian Climate Centre, watched by the following onlookers, left to right, Dr. Geneviève Sainte-Marie, deputy minister, Dr. Hans Martin, senior advisor, Federal LRTAP Liaison Office, Claude Boucher, minister's chief of staff, and Pierre Martel, director general, Policy, Planning and Assessment.**

## Correction

In the Christmas issue of Zephyr, we ran a photograph in connection with the new Air Quality All Seasons Research Award. Due to circumstances beyond our control, the English caption on the photograph contained a number

of errors in the spelling of people's names as well as in other words. We greatly regret these errors and have decided to run both photograph and caption again in English and French.



**On the left of the picture are Dr. Jim Young, director, Air Quality and Inter-Environmental Research Branch and Mrs. F. Fanaki, widow of Dr. Fouad Fanaki, who was present for the unveiling of a plaque honoring her husband. On the right side are the three All Seasons Award Winners: Don Faulkner, Joe Kovalick and Dr. Doug Whelpdale.**

# ZEPHYR BREEZES

Dr. Neil Trivett, atmospheric research scientist, based at AES Downsview, has sent us a lively, 4000-word report on day-to-day living in West Germany, where he has been working for the past nine months, carrying out greenhouse gases research in collaboration with German environmental and university authorities. Unfortunately, the account is a mite too long to reprint in Zephyr, so we are simply excerpting a paragraph describing Neil's culinary skills:

"Last weekend I had promised to make a tourtiere. We decided to have the party in the garden. So, after a short night due to the bowling party, I got up to start cooking the meat filling. The tourtiere turned out to be quite good. I had to be a little creative since I could not find mace or sage in the supermarkets here. Sage is grown in gardens, so I got some from a friend. But mace was not available. Then the pie crust. The one in the (cook) book had used only butter. That's like making shortbread. It was a refrigerator crust. Trying to roll it out was impossible. And, of course, their pie plates are very different. Much deeper and bigger around, so I did not have enough pastry. Oh well!! We made the shells at another friend's place and then took the rest to the garden. There I put the filling in the shell and tried to make the top. Frustrating; makes you realize how much skill it takes. We had quite a feast in the garden, we had about 12 people to dinner. Everyone loved the tourtiere and the salad that I made",



Dr. Neil Trivett



*Jean Degaust, who works in the AES Inter-governmental Affairs Office, Downsview, displays a WMO World Weather watch.*

A watch is now available that commemorates the 25th anniversary of the World Meteorological Organization's World Weather Watch — a program that coordinates vital meteorological observations from around the globe. Naturally, this Swiss-made timepiece is called a World Weather watch! Specially designed for WMO, the dial replaces the numbers with weather-map symbols; eg. - 12 o'clock, "fog with some visible sky"; three o'clock, "precipitation sighted"; six o'clock "squalls" and so on.

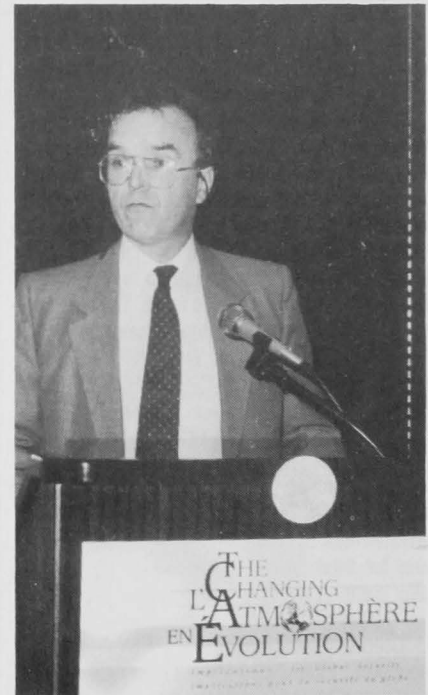
The watch's dark blue dial gives it a highly attractive look and word is that any member of AES can own one by writing away to the WMO in Geneva, Switzerland. The address is The World Meteorological Organization, 41 Giuseppe Motta, Case postale No. 5, CH-1211, Geneva 20, Switzerland.

If you enclose an international money order for \$38.00 Canadian and specifically mention the World Weather watch, delivery should only take a couple of weeks.

Meteorology in the Service of Aviation has been chosen by the World Meteorological Organization as its 1989 theme for "WMO Day", celebrated internationally each year on March 23.

Since Canada has played a major role this century in the development of both meteorology and aviation, AES officials have been busy planning some key events to tie in with the Day. The chief Canadian project involves setting up a display at the

Dr. Hans Martin, senior advisor to the Federal Long Range Transport of Pollutants Office (LLO) scored very high on the quotability scale in 1988. First he got front page treatment in the Globe and Mail's Quote of the Day last spring when he said, "We have been conquering nature for 200 years. Now we have to realize that we are beating it to death. The economic system is dangerously out of date when dealing with the environment". Then, on December 30, when this same newspaper published its selection of annual quotations, Dr. Martin's quote headed the list. This certainly makes the statement of AES's number one acid rain expert the quote of the Year.



Dr. Hans Martin

National Aviation Museum in Ottawa. For a period of four days or more the public is getting an opportunity to see the latest equipment used in aviation weather forecasting as well as a chance to see modern pilot briefing sessions in action. The high tech demonstrations are supplemented by display boards telling the WMO story.

More details of Canada's WMO activities will be included in the next issue of Zephyr.

# Globe-trotting Ralph Seeks Place in Teddy Bear Hall of Fame

About nine months ago, Earl Zilke, officer-in-charge at Prince George, B.C. Weather Office was given the task of getting rid of Ralph, his seven-year-old granddaughter's four-foot high teddy bear.

Apparently none of the Zilke family had enough room at home to house the huge, stuffed animal; so at that time Ralph seemed headed straight for a large garbage dump near the airport, where Mr. Zilke works.

As Ralph was being driven to his final Valhalla, he happened to be spotted by some baggage handlers, who had the bright idea of disposing of Ralph in a different way; by putting him on a plane to Vancouver.

Soon Ralph was speeding across the Pacific to Honolulu, Sydney, Australia, Singapore and Bombay on a number of different airlines. The further he went, the more he was admired. Before long people started pinning badges, hats, travel bags, pennants, good luck messages and other mementos to his dark blue dungarees. His early journeys had been made in the baggage compartment, but Ralph was soon given seats in first class.

Ralph arrived back in Prince George on September 4 "in time for school". Not only had he been to the Far East, he had also managed to



**OIC Earl Zilke and much-travelled teddy bear Ralph, both going into retirement.**

take in Moscow, Warsaw, Frankfurt, London, Amsterdam, Rio de Janeiro, Buenos Aires, New York and Los Angeles.

For several months the globe-girdling bear

was Prince George's number one celebrity. He was "interviewed" on radio and local TV and was sent on a cross-Canada tour where he appeared at baseball and hockey games, elementary schools, libraries and children's hospitals.

Travels finally over, Ralph now occupies a place of honor near the Weather Office. But there is a snag, Earl Zike has just taken retirement after 35 years with the weather service. He is moving to southern B.C. and won't be able to take the bear with him. The problem is: what to do with Ralph?

The idea of dumping him now would be unthinkable. He has had his portrait painted by a professional artist, has made guest appearances in geography classes and has even become the "hero" of an illustrated primary grade text book. His best hope for an honorable retirement would be to accept an offer by a woman from Saltspring near Vancouver to add Ralph to her extensive teddy bear collection.

Meanwhile Earl Zilke is starting to enjoy a well-earned rest, fishing and golfing. He also intends to do some travelling . . . to California and the Dominican Republic. "But", confesses Earl, "I'll never be the world traveller Ralph has become".

## It's Raining Cats and Dogs (and snakes and lizards and...)

It's surprising, actually, that it has never really rained cats and dogs, because at one time or another it has rained just about everything else. Over the years there have been numerous reports of rain containing insects, fish, frogs, birds, and other creatures. Here are some of the more bizarre incidents which have been recorded.

In 1843 an alligator was reported to have fallen during a thunderstorm in Charleston, South Carolina.

In December 1857 a shower of live lizards was reported in Montreal.

On January 15, 1877, large numbers of snakes were found on the unpaved streets of a new section of Memphis, Tennessee, after a heavy rainstorm.

On June 27, 1901, hundreds of little fish fell during a heavy rain at Tillers Ferry, South Carolina.

On October 14, 1934, at Red Creek, BC, it rained tiny beetles intermittently for three hours.

On June 16, 1939, hundreds of tiny frogs fell in a heavy rain shower at Trowbridge, England.

In November 1973, at Stuttgart, Arkansas, a number of large, ice-encrusted ducks came crashing out of the sky during a hailstorm.

These are only a few of hundreds of such incidents that have been recorded. Although some of them may be suspect, many have been well documented.

The most likely explanation for these events is that the creatures have been vacuumed up and transported to their destinations by whirlwinds or tornadoes. In some cases, though, other processes may have been involved. The Memphis snakes, for example, probably didn't collect any frequent flyer bonus points! It is more likely that they were flooded out of their dens by the heavy rains.

In the case of bird falls, the question is not how the birds got into the air but what brought them down. Thunderstorms or tornadoes are the most obvious culprits. The Arkansas ducks apparently got caught in the updrafts of a particularly violent thunderstorm and iced up like hailstones. In another incident, geese in England were killed by sudden decompression when they ran into a tornado-bearing cold front. More than a hundred of them fell to earth with the rain.

from the Canadian  
Weather Trivia Calendar, 1989

# CHANGEMENT DE PERSONNEL / STAFF CHANGES

## Nominations/Avancements Appointments/Promotions

H. Allard (EX-2) Directeur/Director, CMCD, Dorval, Qc/Que.

E.R. Adamson (MT-6) Mèt. établissement des programmes/Program Dev. Meteorologist, Downsview, Ont.

D. McCulloch (MT-6) Météorologiste/Meteorologist, AWAC, Downsview, Ont.

J. Gallant (FI-2) Chef, gestion financière/Head, Financial Management, AWFH, Downsview, Ont.

G. Coulombe (EG-6) Techn. en prés./Pres. Tech., BM4/WO4, Val d'Or, Qc/Que.

B. Cole (EG-5) Techn. en prés./Pres. Tech., BM4/WO4, Inuvik, T.N.-O./N.W.T.

P. Rose (EG-1) Techn. en mét./Met. Tech., SM3/WS3, Cape Parry, T.N.-O./N.W.T.

A. Chir (EG-8) Chef services mét./Supt. Weather Services, Ontario Region, Toronto, Ont.

A.R. Kellie (SM) Chef développement/Chief Development, CMCO, Dorval, Qc/Que.

P. Dubreuil (SM) Chef exploitation/Chief Operations, CMCF, Dorval, Qc/Que.

V. Abdel Malak (SCY-2) Secrétaire/Secretary, St-Laurent, Qc/Que.

K. Perry (AS-1) Agent d'administration/Admin. Officer, PAEA, Vancouver, C.-B./B.C.

B. Lohnes (EG-6) Inspecteur en mét./Met. Inspector, PAEO, Vancouver, C.-B./B.C.

J. Mravnik (EG-6) Agent inspection et normes de surface/Surface Inspection & Standards Officer, CAEOI, BM3/WO3, Saskatoon, Sask.

B. Aftanas (CS-4) Chef informatique/Chief Informatics, CAEI, Winnipeg, Man.

D.B. Clarke (MT-3) Prénionniste de service/Duty Forecaster, CFOW, CFB, Greenwood, N.-É./N.S.

H. Murray (MT-3) Prénionniste de service/Duty Forecaster, CFOW, CFB, Comox, C.-B./B.C.

B.J. Konzelman (MT-4) Instructeur en mét./Met. Instructor, CFSMET, Winnipeg, Man.

D.J. Yip (MT-6) Services d'expl./SSO Operation Svcs. DMETOC, Ottawa, Ont.

G. Fournier (MT-5) Formation en mét./SO Met. Training, 14 Training Gr. Winnipeg, Man.

C.H. Carter (FI-4) Chef des finances/Chief of Finance, AAF, Downsview, Ont.

L. Mattice (FI-1) Agent financier/Financial Officer, AAFS, Downsview, Ont.

C. Marchand (MT-3) Météorologiste/Meteorologist, Bedford, N.-É./N.S.

R. Perron (MT-3) Météorologiste/Meteorologist, Bedford, N.-É./N.S.

B.R. Thomas (MT-3) Météorologiste/Meteorologist, BM4/WO4, Gander, T.-N./Nfld.

J.C. Mayo (EG-6) Techn. en prés./Pres. Tech., BM4/WO4, St. John's, T.-N./Nfld.

B. Whiffon (MT-5) Météorologiste/Meteorologist, BM4/WO4, Gander, T.-N./Nfld.

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## Mutations/Transfers

B. Brisbois (MT-5) Météorologiste/Meteorologist, PWC, Vancouver, C.-B./B.C.

I. Lougheed (EG-7) Responsable/OIC, BM4/WO4, Fort Nelson, C.-B./B.C.

J.M. Couturier (EG-6) Spéc. service mét./Weather Service Specialist, Dorval, Qc/Que.

E. Niniowsky (CR-4) Commis/Clerk, WAED, Edmonton, Alb./Alta.

K. Buerfeind (EG) Techn. en mét./Met. Tech., Edmonton, Alb./Alta.

J. Sowiak (EG) Techn. en mét./Met. Tech., SM3/WS3, Slave Lake, Alb./Alta.

B. Forsyth (EG-2) Techn. en mét./Met. Tech., SM3/WS3, Fort Reliance T.N.-O./N.W.T.

P. Montambault (MT-3) Météorologiste/Meteorologist, Edmonton, Alb./Alta.

R. Deajardins (EG-6) Techn. en prés./Pres. Tech., BM4/WO4, Iqaluit, T.N.-O./N.W.T.

T. Ostry (MT-6) Météorologiste/Meteorologist, CAEMO, Winnipeg, Man.

G.L. Inglis (MT-3) Prénionniste de service/Duty Forecaster, CFFC, CFB, Comox, C.-B./B.C.

D.L. DeLadurantaye (MT-3) Prénionniste de service/Duty Forecaster, CFFC, CFB, Trenton, Ont.

B. Wiens (MT-2) Niv. perf. mét./Met. Dev. Level, CF Metoc, Halifax, N.-É./N.S.

P. Schwarzoff (MT-2) Niv. perf. mét./Met. Dev. Level, CF Metoc, Halifax, N.-É./N.S.

C. Old (MT-2) Niv. perf. mét./Met. Dev. Level, CFFC, CFB, Edmonton, Alb./Alta.

N. Ek (MT-2) Niv. perf. mét./Met. Dev. Level, CFFC, CFB, Edmonton, Alb./Alta.

R. Cripps (MT-2) Niv. perf. mét./Met. Dev. Level, CFFC, CFB, Edmonton, Alb./Alta.

S. Desormeaux (MT-2) Niv. perf. mét./Met. Dev. Level, CFFC, CFB, Trenton, Ont.

D. McCollor (MT-3) Prénionniste de service/Duty Forecaster, CFOW, CFB, Comox, C.-B./B.C.

A. Pankratz (MT-3) Instr. en mét. de base/Base Met. Instructor, CFB, Moose Jaw, Sask.

M.E. Still (MT-6) Chef, services qualité de l'air, bureau de liaison/Head, Air Quality Services, Liaison Office, ARQS, Downsview, Ont.

A. Langlais (EG-6) Techn. en prés./Pres. Tech., BM4/WO4, Val d'Or, Qc/Que.

J. Richard (EG-6) Techn. en prés./Pres. Tech., BM4/WO4, St-Hubert, Qc/Que.

J. Shaw (EG-4) Techn. en mét./Met. Tech., SM3/WS3, Churchill Falls, T.-N./Nfld.

M. LaJoie (MT-2) Niv. perf. mét./Met. Dev. Level, Winnipeg, Man.

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### **Postes temporaires ou intérimaires/ Temporary or Acting Positions**

W. Pugsley (EX) directeur, mét. et océanographie/Director, Met. and Oceanography, DMETOC, Ottawa, Ont.

R.L. Milo Affectation P.I.G./MOP Assignment, AABD, Downsview, Ont.

B. Brunet (CF-4) Commis/Clerk, QAEP, St-Laurent, Qc/Que.

M. Montpetit (CR-4) Commis/Clerk, QAEP, St-Laurent, Qc/Que.

M. Ferland (CR-4) Commis/Clerk, QAEP, St-Laurent, Qc/Que.

S. Gervais (CR-4) Commis/Clerk, QAEP, St-Laurent, Qc/Que.

L. Collin (CS-1) Programmeur/Programmer, QAEP, St-Laurent, Qc/Que.

D. Gaudreau (CR-4) Commis/Clerk, QAEP, St-Laurent, Qc/Que.

L. Lepage (AS-2) Agent d'administration/Admin. Officer, QAEP, St-Laurent, Qc/Que.

G. Grignon (FI-2) Agent financier/Financial Officer, St-Laurent, Qc/Que.

R. Veillette (AS-1) Agent d'administration/Admin. Officer, St-Laurent, Qc/Que.

J. Paquet (EG-6) Techn. en prés./Pres. Tech., Dorval, Qc/Que.

C. Brown (EG-1) Techn. en mét./Met. Tech., SM3/WS3, Lytton, C.-B./B.C.

B. Kirkpatrick (EG-8) Chef expl. station/Supt. Station Operations, Ontario Region, Toronto, Ont.

M. Gravel (CS-1) Programmeur/Programmer, CMCA, Dorval, Qc/Que.

L. Bergeron (CS-1) Programmeur/Programmer, CMCFA, Dorval, Qc/Que.

C. Morrith (SCY-2) Secrétaire/Secretary, CMCF, Dorval, Qc/Que.

M. Malepart (EG-7) Inspecteur Station aérologie/U/A Stn. Inspector, St-Laurent, Qc/Que.

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D. Quinn (MT-6) Commandant école de mét./Commandant, School of Met., Winnipeg, Man.

B. Brodie (SM) Chef, Plan., besoins et formation/Supt. Plan. Rqmt. and Training, DMETOC, Ottawa, Ont.

B. Boughton (MT-5) Chef, instr. en mét./Chief Met. Instructor, CFSMET, Winnipeg, Man.

M. Olson (SM) Chef/Chief, ARQI, Downsview, Ont.

R. Elliott (EG-5) Techn. en prés./Pres. Tech., BM4/WO4, Gander, T.-N./Nfld.

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### **Départs/Departures**

Y. Chung, ARQI, Downsview, Ont.

P.A. Taylor, ARQI, Downsview, Ont. à/to York University, Toronto, Ont.

C. Masse, CMQ/QAEM, St-Laurent, Qc/Que.

D. Girard, QAEO, St-Laurent, Qc/Que.

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### **Détachements/Secondment**

K. Kemp, QAEP, St-Laurent, Qc/Que. à/to Travaux publics Canada/Public Works Canada, Montréal, Qc/Que.

R. Habak, QAEP, St-Laurent, Qc/Que. au/to SEA/AES, Downsview, Ont.

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### **Retraites/Retirements**

W. Maruk, BM4/WO4, Prince George, C.-B./B.C., juin/June, 1988

S. Freake, MAEN, BM4/WO4, Gander, T.-N./Nfld., oct./Oct., 1988

J.C. Van Leeuwen, ACTR, Downsview, Ont. oct./Oct., 1988

W. Lawrynuik, QAEDD, Toronto, Ont., oct./Oct., 1988

G. De Repentigny, CMQ/QAEM, St-Laurent, Qc/Que., oct./Oct., 1988

K. McCulloch, CAEOD, The Pas, Man., oct./Oct., 1988

P. Cara, Fichier central, Direction régionale/Central file, QAED, St-Laurent, Qc/Que., oct./Oct., 1988

H. Karl, SSD, Vancouver, C.-B./B.C., nov./Nov., 1988

P. Chirka, CARE, Egbert, Ont., déc./Dec., 1988

R. Koch, BM4/WO4, Port Hardy, C.-B./B.C., déc./Dec., 1988

W.L. Clink, ACSL, Downsview, Ont., janv./Jan., 1989

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### **Décès/Deaths**

D. Kurowski, WAED, Edmonton, Alb./Alta., juill./July, 1988