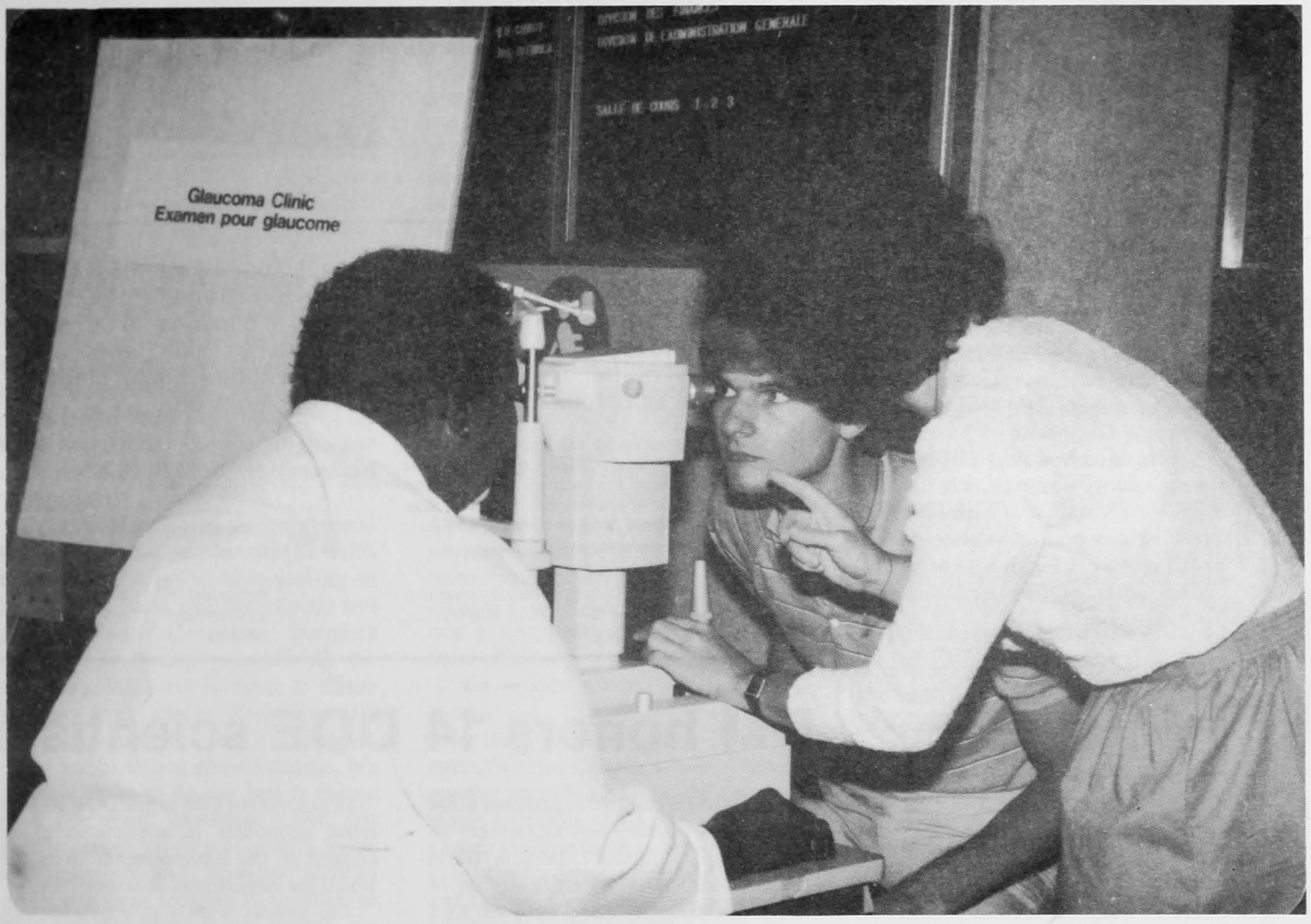
November/December 1984

ZEPHYR



Glaucoma testing: handicap prevention

Environment Canada Environnement Canada

Canada

Papal visit to weather office

During his historic tour of Canada, the Pope made an unscheduled visit to an AES weather office. The location was Yellowknife, N.W.T. and the reason for the stop was, coincidentally, bad weather.

On September 18, His Holiness was scheduled to visit Fort Simpson, N.W.T. but the aircraft was unable to land due to fog reducing visibility below limits.

A landing was made at Yellowknife around 11:00 am for refuelling and to await improvement in the Fort Simpson weather. During the stop, it was decided to use the AES weather office at the airport to prepare a video tape to be shown to the people of Fort Simpson in lieu of the address the Pontiff was scheduled to make there.

According to acting OIC Warren Green, security was extremely tight and the five AES staff who happened to be attending a course on satellite imagery had to stop work for an hour or so while one side of the WO4 was sectioned off for the CBC taping.

Mr. Green said he believed the weather office was chosen because it occupied the most space in the buiding. Because of the security, there was no direct contact between AES staff and the Pontiff.

Mr. Green said he did talk to a Polish bishop in the party who became very interested in weather maps and satellite imagery.

Green said he believed almost all staff saw the Pope and heard him speak. His plane had landed in front of the weather office's "nowcasting" window and there had been a lot of excitement as the Pope and his party ascended the stairs to the weather office.

"We certainly won't forget the occasion in a hurry," says Green.

Staff had the satisfaction of seeing their office on National TV that night when excerpts from the Pope's video tape were aired.

Zephyr Highlights

Cover: Glaucoma tests were part of Handicapped Awareness Days at AES Downsview. The Canadian National Institute for the Blind says glaucoma is one of the leading causes of blindness in Canada. Attempting to prevent future handicaps, assistant Peter Sewell tests the eyes of Department of Health and Welfare nurse Maudry Crichlow as optometrist Dr. Deborah Lowy looks on.

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.

Please address all correspondence regarding this publication to: Zephyr, 4905 Dufferin St., Downsview, Ont., M3H 5T4.

Editor: Gordon Black
(416) 667-4551

Environment Canada / Environnement Canada

Atmospheric Environment Service / Service de l'environnement atmosphérique

DM honors 14 DOE scientists

Some 200 AES employees gathered in the Downsview Auditorium in October to watch deputy minister Jacques Gérin bestow Merit Award Certificates on 14 DOE scientists. Included were six AES scientists and the entire group were honored for their work on the Canada-U.S. Work Group TWO study under the Memorandum of Intent on Transboundary Air Pollution.

In his remarks to the audience, Mr. Gérin said that the awards celebrated the achievements of people who had worked very hard to attain a consensus on acid rain in Canada before dealing with the question on a Canada-U.S. basis. "The strategy adopted covered all angles of the problem and the approach certainly paid off," added Mr. Gérin.

In general the DM urged DOE staff to move cautiously in administering the content of the Environmental Acts for which the department is responsible.

The awards were a rare opportunity for Mr. Gérin to give recognition to DOE personnel on a department-wide basis. Non-AES recipients included Daryl Cowell, Ontario regional director general's office; Dr. Ian Morrison, Canadian Forestry Service; Floyd Elder, Environment Conservation Service; Frank Vena, Environment Protection Service; Roger Lafleur, Energy, Mines & Resources.

Mr. Gérin's Downsview schedule also included a meeting with directors general and other senior executives in the board

(cont'd on page 4)

Jim Bruce's Year-End Message

As we are all aware, Canada's federal deficit is an increasing concern in our country's economic welfare. All agencies of government are expected by both the public and the new government to contribute to reductions in the deficit. For AES this means two things. We have to streamline and reduce some operations to reduce our budget. At the same time we are moving to generate more revenue from weather, climate and ice services.

In recommending to the government the changes that will be needed, AES management is giving high priority to maintaining basic weather, climate and ice services to Canadians, including essential supporting research. At the same time, AES will continue its efforts in the four major Departmental priorities: acid rain, toxic chemicals, water resources and climate change. We are also going to do our best to ensure that our most important asset, our trained people, retain jobs in AES. Some staff members may, however, have to move from one location to another, or one job to another to permit the necessary changes.

The generation of more revenue is a challenge for all of us. We know that weather, climate and ice services are of economic value to many Canadian companies, agencies and individuals. While we already recover more than $30 million per year, we must be inventive in finding ways to recover a little more of those economic benefits. We must do this while ensuring that Canadians have continued access through the media and weatheradio to weather warnings for their safety and to regular weather forecasts. It is the special services, over and above the basic information, for which we must find ways to recover costs and thus generate revenues. This will make some significant changes in how we do business after April 1, 1985, especially in our Weather Offices across the country. A cost recovery system will likely have the benefit of reducing the time our staff must now spend in providing information and advice to those whose need is not great. This should allow more time for staff members to ensure that advice and information meet the special needs of clients with important requirements for services. Clear guidance and direction on the new revenue generation policies will be provided to all staff concerned at least a month in advance of their introduction.

These economic circumstances make the initial major investments needed to implement our Long Term Plan much more difficult for government. However, the plan itself is a way of improving the long term efficiency and effectiveness of AES, and at the same time would generate much work in Canada's high technology industry. It thus appears entirely compatible with several of the new government's major objectives of more efficient government and stimulus to the private sector. We'll keep you posted.

In these times of change let us all remember that Canada's state-of-the-art weather service is one of the country's major economic and social assets. The Service makes it easier for a large number of fishermen, farmers, mariners, aviators and other Canadians to earn their livelihoods, and in a safer manner.

This year we will particularly celebrate the 35th anniversary of the establishment of the furtherest north weather station in the world at Alert, N.W.T. This occasion will remind both our staff and the country of the great value of AES activities in Arctic Canada — in ensuring safety of vital aviation and other activities, in providing northern outposts for research, and for community services, and as a continuing re-affirmation of Canada's Arctic sovereignty.

Let us in the coming year celebrate our achievements, and at the same time work hard together to continue our essential services in a financially responsible, even frugal manner.

Best wishes to all staff and their families for 1985.

Jim Bruce
ADMA

NOTE

At the request of deputy minister Jacques Gérin, Jim Bruce has taken up the post of assistant deputy minister, Corporate Planning (DOE) until March 31, 1985.

During Mr. Bruce's absence on special duties, the post of ADMA is being held by Howard Ferguson, director general of the Canadian Climate Centre.

Up there in New Brunswick the weather can change awfully quick. One time I was watching the trout jump on the lake and a cold squall come down from the north. I walked out on the ice and picked up a fine mess of trout.

— *a Nova Scotia fisherman*

If the dog eats grass, it will rain the next day.

— *Maritime weather belief*

If the cows are lying down in the pasture or field, it's a sign of rain.

— *traditional weather belief*

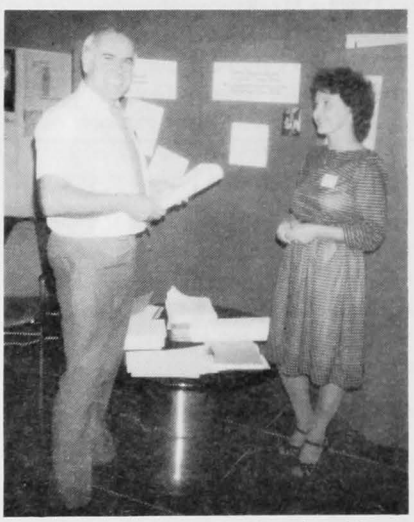
When a cow tries to scratch its ear,
It means a shower is very near;
When it thumps its ribs with its tail,
Look out for thunder, lightning, hail.

— *traditional rhyme*

Welcome urged for working handicapped

October 3 and 4 were two very special days at the AES Downsview headquarters. They marked the first time that the AES community had come together to listen to and communicate with people determined to improve the employment possibilities of the handicapped.

In a filled auditorium, ADMA Jim Bruce, firmly supported the idea of the integration of handicapped persons into the AES workplace. "The handicapped must be included in all open competitions; managers must ensure there is equal employment opportunity for the disadvantaged and employees must make a determined effort to welcome handicapped persons into the work environment," Mr. Bruce said.



Dr. Stan Woronko of the Canadian Climate Centre and Susan Hjelholt (OAP) are seen at the AES Handicapped exhibit.

Dr. Victor Bennett of the Canada Employment and Immigration Commission said the human person was "multi-dimensional" and pointed out that any one of us could become handicapped at any time. Maureen McKinnon shared with us experiences of her work at the enquiry desk at Revenue Canada. Maureen has been blind since birth, a fact which did not deter her from attending public high school and York University from where she obtained a BA in Psychology.

Jan Glover, chairperson of the AES handicapped committee is seen with Dr. Victor Bennett of Canada Employment and Immigration who spoke in the Auditorium and Dave Humphrey, counsellor, Ontario Ministry of Labour Handicapped Employment Program.

There *are* programs available to federal departments to initiate and encourage the employment of the disabled. Michael Harper, Coordinator of Services to Handicapped People at the Public Service Commission outlined some of those programs and voiced his frustrations at departments unwilling to make an effort at employing the disabled.

Following the auditorium presentation and continuing the next day, representatives of a number of associations and the Handicapped Employment Branch of the Ontario Dept. of Labour were available to talk with employees, display technical aids and suggest literature for further reading. Booths had been set up in the lobby and near the cafeteria to facilitate discussion.

In addition, the Canadian National Institute for the Blind (CNIB), displayed and sold crafts made by residents of their Clarkewood Residence, all of whom are blind and many of whom are elderly.

The AES Handicapped Program Committee, which sponsored this two-day event, is optimistic that employees will work at eliminating those obstacles which prevent disabled persons from entering our work environment. Says Jan Glover, chairperson of the AES Handicapped Committee, "We must all ensure that the handicapped share our workplace, share our career aspirations, and share the rewards of labor."

(cont'd from page 2)

room and a wine and cheese party in honor of the award winners.

Shown with Mr. Gérin in the photo below are six AES recipients of the merit awards. (From left to right): Dr. Rod Shaw, head, Federal LRTAP Liaison Office; Howard Ferguson, director general Canadian Climate Centre; Dr. Peter Summers, Air Quality Branch; Dr. Jim Young, director, Air Quality Branch; Marvin Olson, head, Atmospheric Dispersion Division; Mr. Gérin and Dr. Doug Whelpdale, research scientist, Atmospheric Dispersion Division.

Snow like meal,
Snow a great deal;
Snow like feathers,
Softening weather.

— *Helen Creighton, Bluenose Magic Maritime English weather belief*

When a cat washes herself and carries her paw over her ear, it will rain in the next two hours.

— *Nova Scotia weather belief*

The goose and the gander
Begin to meander;
The matter is plain,
They are dancing for rain.

— *Anonymous*

When the swallows fly low there will soon be rain.

— *Nova Scotia weather belief*

Science writers "warm-up" to the Climate

Dr. Kenneth Hare delivering his keynote address to Canadian science writers in the AES Downsview Auditorium.

More than 200 people attended a seminar on Climate Change, November 6, at the AES Downsview building. The conference sponsored by AES and the Canadian Science Writers' Association (CSWA), attracted TV, radio, national newspapers and the scientific press. Also present were government and educational officials, journalism students and a wide scattering of AES personnel.

Keynote speaker at the "Warming up to the Canadian Climate" seminar was Dr. Kenneth Hare, provost of Trinity College, Toronto and chairman of the Canadian Climate Planning Board. He was introduced by ADMA Jim Bruce.

Referring to the Ethiopian drought, Dr. Hare said: "The fool keeps his eye permanently fixed on local events; the wise person knows we live in an inter-dependent world, something also known by skilled Canadian science writers."

Describing "environmental pessimism", he added that the technique is to cry "wolf" half a dozen times with all change seen as an impending disaster. Dr. Hare concluded: "This makes good copy and arresting headlines but society has the capacity to adapt, survive and even profit from the changes in circumstances."

The auditorium remained crowded as highly qualified experts in climate and related fields gave balanced presentations regarding the need to monitor climate change, natural and man-made, and study its socio-economic impacts.

A morning session about climate change, chaired by Howard Ferguson, director general, Canadian Climate Centre, included presentations on Long Term Climate Fluctuations by Dr. Richard Peltier of the University of Toronto; Man-made Effects by Dr. Philip Merilees, director general, Atmospheric Research Directorate; on climate modelling by Dr. George Boer, and on climate prediction by Dr. Stan Woronko, both of the Canadian Climate Centre.

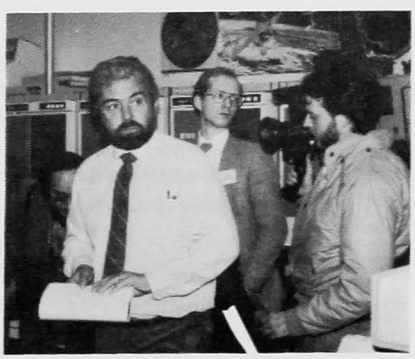
organizers were pleased with the attendance in this outlying part of the city. There were several attractive extras, such as tours of the building, refreshments, live weather presentations and lobby displays on climate impacts and ancient meteorological instruments. Morning and afternoon tours were attended by more than 100 visitors. Popular destinations were the roof-top observatory and solar panel project, the satellite-data labs., the wind-tunnel and the large outside satellite tracking dish. These tours were well rehearsed and the guides attracted attention by holding up their destination signs in the lobby. Science writers not on the tours, sat around in informal discussion or interviewed scientists and other experts.

Despite indifferent weather, the rooftop tour proved to be one of the most popular "get aways" for science writers who spent most of their day in the Auditorium. Dr. Donald McKay of the Climate Centre, with arm raised in the foreground, explains the function of weather instruments used to monitor the roof's solar panels.

An afternoon panel on Climate Impacts chaired by CSWA member, Lydia Dotto, included presentations on Great Lakes water by Howard Ferguson; on increased water demands by Dr. Ralph Pentland, Inland Waters Directorate; on climate change and food production by Dr. John Maybank of the Saskatchewan Research Council; on tree planting by Dr. Doug Pollard, Canadian Forestry Service; on Climate Change and Fisheries by Dr. Alan Longhurst, Department of Fisheries and Oceans; and on Arctic petroleum in the 21st century by Cam O'Rourke of Dome Petroleum.

Over-all comment on the seminar was favourable. AES meteorologists and climatologists were happy to hear a general program, rather than the usual specialized talks, and the media commented that the presentations had been logical and well planned. The

During the proceedings, Bob Morrow, President of CSWA, announced the launching of Science Information Sources, a resource bank of hundreds of scientists willing to provide information to science writers on request. A list of story ideas, based on AES activities, was



On another tour Graeme Morrissey, chief, Aerospace Meteorology Division explains the intricacies of the satellite data laboratory to interested science writers.

(cont'd on page 6)

AES aided Quebec Tall Ships

AES played a busy part in the summer sailing activities commemorating the 450th anniversary of Jacques Cartier's arrival in Canada. Its primary task was to offer weather forecasting services for the safety of those taking part.

Besides emphasizing security, Environment Canada took action to augment its existing weather services, to introduce innovations and to play an educational and presentational role.

AES received the go ahead to open a forecast office in the Old Port of Quebec covering the marine area between Grondines and les Escoumins, a difficult stretch for those attempting to navigate the St. Lawrence River. Increased weather services were provided between June 15 and August 23.

In addition to its regular meteorological activities, AES provided special consultation services to the captains of tall ships, to participants in the Labatt Canada Challenge and other sailing events as well as to recreational sailors.

AES also took part in the "Science et techniques" exhibition in Old Quebec's Grand Marché. The theme of the weather service display was "Meteorology for Everyone". The exhibit emphasized the three main aspects of weather forecasting; data acquisition, data processing and information dissemination.

Also on display was such state-of-the-art equipment as a VHF receiver and an EXTEL printer as well as graphics illustrating the Beaufort scale and the routing of forecasting data — all aids in understanding meteorology. Finally there were information brochures on a range of weather topics.

Visitors could also obtain up-to-date weather maps plus public and marine weather forecasts by dropping in at the nearby weather consultation office.

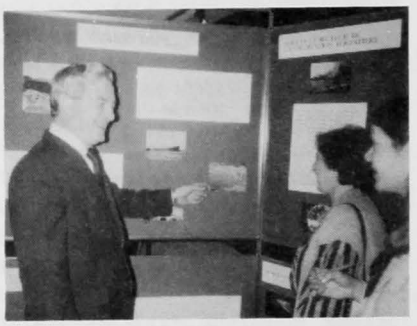
This AES graphics display was part of the "Weather for Everyone" exhibit presented as part of the Environment Canada's commemoration of the 450th anniversary of Jacques Cartier's arrival.

(cont'd from page 5)

prepared as a possible part of these information sources. Mr. Morrow also used the seminar to launch a journalism students' workshop. A number of future science writers from universities and community colleges attended the presentations, then met in an AES classroom for a writing assignment based on the day's experiences.

Reviewing the conference, Mr. Morrow said the seminar was one of the most successful CSWA meetings for some time and had revived the Association's activities in Toronto. "Obviously weather and climate involve and interest everyone," he concluded.

The seminar was organized jointly by the Canadian Climate Centre and Information Directorate.



John Sandilands of the Canadian Climate Centre points out items in the Climatic Impacts display assembled in the lobby to two unidentified delegates.

Bob Morrow, president of the CSWA.

It froze clear down to China,
It froze to the skies above;
At 100 degrees below zero
It froze my logger love.

— *traditional song*

Murphy has a weather eye,
He can tell whene'er he pleases,
Whether it's wet or whether it's dry,
Whether it's hot or whether it freezes.

— *Anonymous*

Little snow, big snow;
Big snow, little snow.

— *traditional folk belief*

Step on a spider and it will rain.

— *traditional folk belief*

Canadian meteorologists test mesoscale at Olympics

After serving at the 1984 Los Angeles Summer Olympics as one of only four non-U.S. meteorologists, Monique Loiselle of Ontario Region Scientific Services, has noted in a report that the area covered, obtained the best mesoscale network data ever seen in North America.

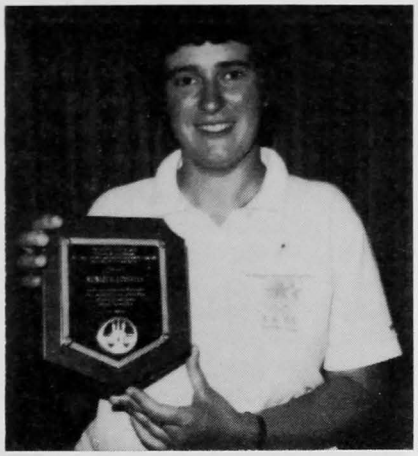
Ms. Loiselle, who served with the Olympia Weather Support Team in Montreal in 1976, says that the four weeks stay in the southern California city was an unforgettable experience. The seven forecasters at the National Weather Service (NWS) station formed a close-knit, "laid-back" team in which everyone participated in meteorological decisions.

Partly due to the good weather (little smog, no storms), the four non-American meteorologists adjusted quickly to U.S. methods. "We were never treated like glorified translators, as I had feared," said Ms. Loiselle.

In a report written to Gerard Gross of the U.S. National Weather Service in Silver Spring, Maryland, Ms. Loiselle adds that the deployment of PAM II (Portable Automated Mesonet) units provided the observational base for frequent weather information for most outdoor venues. The forecasts were well received by print and broadcast media.

Later Ms. Loiselle commented that for Los Angeles 1984, NWS emphasized high technology and data acquisition in order to provide detailed, comprehensive, information on the atmosphere.

Commenting on her visit, Ms. Loiselle said that she usually worked a 5:00 am to 1:00 pm shift — or a 1:00 pm to 9:00 pm shift. She helped issue four forecasts a day, many of them of direct benefit to athletes, from equestrian riders to soccer players.



Monique Loiselle with her U.S. Weather Office Award.

She felt really part of the olympic scene when doing forecasts for the Long Beach yachting events. Boarding a NWS boat, she obtained a close-up view of several major sailing events, and found the experience exhilarating. She watched other events such as the Canadian Women's basketball team and saw awards of several silver medals to Canadians. While at Long Beach, she was able to spend time, after shifts, relaxing on the beach in 35°C sunshine.

From both professional and personal points of view, the weather seems to have been almost perfect.

Summing up her L.A. experience Ms. Loiselle wrote:

"What was done in L.A. was a first and important step toward a more complete mesoscale forecasting system. As the years go by and high-technology keeps improving, mesoscale forecasting will become more and more of an every day reality."

Accompanying Ms. Loiselle on the trip was André LaChapelle, supervisor at the Alberta Weather Centre. (See **Zephyr Breezes,** July-August 1984). Both meteorologists were selected as a result of their bilingual proficiency.

At the games, 74 individual Canadian athletes won either gold, silver or bronze medals.

If the cats get restless and wrestle, there will be a storm.

— *Maritime weather belief*

Agrometeorology theme at Saint-Hyacinthe

AES participated in the summer agricultural show in Saint-Hyacinthe, P.Q. with a booth following an agro-meteorological theme.

The exhibit stressed the availability of Weatheradio services from Montreal and a large map was displayed to allow visitors to find out whether they lived within range of the transmitter.

AES personnel on hand at the booth were able to give regional farmers an excellent idea of ways in which the weather service could assist them in improving farm management techniques.

Isachsen revived for giant fuel lift

In the High Arctic, on Ellef Ringnes Island, the Isachsen weather station stands deserted, its buildings still intact but the paint stripping off, carpets frozen, the plumbing frozen solid, and snow blown in everywhere — a ghost weather station. It was abandoned in 1978 during a former wave of Budget Restraint. And so it stood for six years when suddenly, in 1984, it again heard the shouts of human voices and the clamour of human industry. A crew of men arrived in Isachsen to remove 80 000 gallons* of diesel fuel left behind in the station's storage tanks.

Isachsen is situated equidistant from Eureka, Mould Bay, and Resolute. It was proposed to use the Isachsen 80 000 gallons to refuel Mould Bay. A cost study showed that this could profitably be done by airlift — that is, that two parts of fuel could be delivered to Mould Bay for every one part burned by aircraft in flight and that AES would earn a rebate on its invoice because the aircraft would be burning AES's fuel.

Clearly, the airlift would have to be a winter operation. The Isachsen airstrip would be too soft and muddy in the summer. But as Mould Bay had been refueled in September, 1983, its tanks would not be able to receive the Isachsen fuel until the end of February, 1984. Therefore, the fuel transfer would have to be accomplished in March. Accordingly, contract specifications were worked out, drawn up, and submitted to the Department of Supply and Services and, by mid-February, the matter was settled. Bradley First Air Ltd. would be the contractor and Narwhal Arctic Services the subcontractor.

AES Project Coordinator was Iain Ross.

The layout at Isachsen was simple. The fuel storage tanks were at the station. The airstrip was a kilometre north of the station. At the airstrip were two 5 000 gallon tanks connected by pipeline to the fuel storage tanks at the station. But the pipeline from the storage tanks to the airstrip tanks ran slightly uphill, so a large "pusher" pump had to be connected to the pipeline at the storage tanks to push the fuel up the pipeline and into the airstrip tanks — where a small "pusher" pump housed in a shack on skids would pump it into the aircraft's tanks.

View of Isachsen N.W.T. taken from a bulk fuel storage tank looking south towards the bay.

On March 3, coordinator Ross flew to Resolute Bay and met the Bradley and Narwhal crews. The Bradley crew was to be based at Mould Bay and the Narwhal crew at Isachsen. A charter Twin Otter set Narwhal's Brian Robertson and his four-man crew and their supplies down at Isachsen and a second charter brought in a radio, beacon, the pump, and so forth, and also a radio technician who installed and checked out the radio equipment — and then left.

The Isachsen first week, March 5-12, was marked by several periods of harsh weather — winds of 40 knots and -45 degrees Celsius. The airstrip shack was habitable and, after wiring up a generator, the furnace started at the first attempt. Down in the station, after changing the oil in an abandoned D4 Caterpillar, it started up without much trouble. According to Coordinator Ross, "This vehicle was not shut off for the next three weeks and gave excellent service. The D4 Cat cleared the airstrip, hauled equipment, and hauled fuel to the airstrip. Without it, the entire project might have been impossible."

The pipeline was in good shape and once the seized-solid valves had been heated and thawed out, the airlift commenced. On March 13 Coordinator Ross took off from Resolute with six Bradley personnel, an Arctic Tower equipment operator named Simon Grenier, and much equipment and supplies, stopping off at Isachsen to unload some equipment and to take 1 000 gallons of diesel into the belly and wing tanks of the Hawker-Siddeley 748. This load, and three later ones, drawn from fuel already in the airstrip tanks was full of ice and frequently choked the filter. The fuel from the storage tanks, however, ran without interruption.

But now, the large pump at the storage tanks proved faulty and couldn't pump the fuel up the pipeline. The course of good planning never did run smooth. The crew scouted around, found a 1 000 gallon rectangular tank on a skid and, hauled by the D4 Cat, used it to deliver fuel to the airstrip tanks for 3½ days — until a storm temporarily shut delivery down.

On March 22, the airlift was completed. 51 000 gallons of diesel fuel were delivered to Mould Bay. 22 100 gallons were burned by aircraft in flight. And 1 500 gallons were used or burned at the site.

One last aircraft flew from Resolute to Isachsen. John Goodman of Transport Canada and Ron Harrison, OIC Resolute, made a final inspection. They seized a few serviceable articles still laying around the station — a jack, some tools, a fuel meter, and 18 pails of hydrated lime.

(cont'd on page 9)

A day in the life of a . . .

LRTAP Liaison Officer

8:30 am — As Sue Milburn enters the LRTAP* Liaison Office (LLO) she receives a call from someone in the Assistant Deputy Minister's Office in Ottawa. A sense of urgency is transmitted as the caller explains that an article on acid rain in the morning's Globe & Mail has caught the eye of one of the Minister's aides. A request for background information on the article is made in anticipation of questions in Parliament this afternoon. Sue's first task this morning will be to find out what study the article was referring to and how the quoted figures were found. She will then prepare a briefing note and have it sent to Ottawa before 11:00.

LLO has three major responsibilities: 1) to advise senior government officials on issues relating to the Acid Rain problem and/or Scientific program 2) to coordinate the Federal Government's Acid Rain Scientific Program and 3) to provide the Canadian focus for federal/provincial or International Acid Rain scientific activities. Although Sue's official title is Technical Assistant for LLO, she feels it might be better described as Assistant Program coordinator.

8:45 — After a trip to the AES library to take a copy of the Globe & Mail article, Sue scans it. She thinks she recognizes the figures quoted in the report as being prepared by the Department of Fisheries and Oceans, so she immediately goes to her files, which line three of the four walls in her office, and pulls out a copy of the report. Keeping updated records on the acid rain issue is an important function of LLO.

After taking down some notes from the report, she gets on the phone to the scientists of the Department of Fisheries and Oceans who prepared the report, to ask a number of questions.

With all the necessary information at hand, Sue can now foresee questions that the Minister might be asked in the House and she sets about preparing the briefing note.

9:50 — After dropping off the page-long briefing note to the typist who will transmit the note to Ottawa *via* word processor, she immediately starts to sort

Sue Milburn at work in her file-filled office.

her mail. Five federal departments and numerous other agencies are involved in the acid rain issue. Mail at LLO regularly includes correspondence from one or more of these organizations. For example, today there is a report from the Ontario Government on the feasibility of treating acidified waters with lime. Perusing the report, she remembers to send a copy to a scientist in the Maritimes who is also interested in the subject. Also in the mail is a letter from a student seeking information on the human health effects of acid rain.

10:30 — While Sue is using a dictating machine to draft a letter to the student describing the research on health being pursued by the Department of National Health and Welfare, the typist drops by to say that Sue's briefing note for the Minister has been received in Ottawa.

10:56 — Her supervisor comes in with a request for her to find out what is the status of a tree coring study in the U.S. He also asks how the next draft of the technical annex of the Cabinet submission is progressing.

She replies that she has completed the changes to the technical annex and promises to call her contacts in the U.S. program coordination office regarding the tree coring study.

12:30 pm — After a quick lunch Sue returns to her desk to read a report received in the mail. She receives a call from the LRTAP coordinator for the Canadian Wildlife Service asking about next year's resource levels. Staff in LLO talk often with some of the over 200 scientists and program managers involved in the federal research program.

12:55 — A clerk comes in to remind Sue that she is scheduled to talk at the University at 3:30 that afternoon. She quickly looks over her notes and puts together her slides.

She knows that LLO often gets requests for speakers to address special interest groups, schools, universities and members of the media.

2:23 — As Sue gets ready to leave for the University she receives a call from a man who wishes to know how the acidity of rain falling in Canada is determined. Sue provides the man a brief description of the procedure, then transfers his call to the division in AES responsible for acid rain collection.

(cont'd on page 13)

(cont'd from page 8)

Then they and the Narwhal crew and its equipment departed skyward, giving Isachsen back to its silent Arctic loneliness.

* Normally Zephyr quotes all measurements in metric values; eg. 80 000 gallons equal approximately 360 000 litres. In this case, however, it is felt that most readers can best grasp the epic quality of the story if we retain the original gallon units as supplied by mission coordinator Iain Ross.

If it snows on the new moon, the snow will melt. If it snows on the old moon, it will storm the next day.

— *Maritime weather beliefs*

When the wind is in the north,
Then the wise fisherman goes not forth.

When the wind is in the south,
It blows the bait in the fish's mouth.

When the wind is in the east,
Then the fishing is the least.

When the wind is in the west,
Then the fishing is the best.

— *Edith Fowke, Ring Aro und the Moon*

Zephyr Breezes * * *

After delivering last year's Symons' Memorial Lecture at the Royal Meteorological Society in Bracknell, England, Dr. Warren Godson, now Senior Science Advisor at AES, received a letter from Society president Professor Henry Charnock praising him for his "prestigious lecture of crucial importance" on the Diagnosis and Prognosis of Atmospheric Science Controversies.

Apparently it is unusual to have any discussion after a Symons' lecture, but Dr. Godson's address aroused such strong feelings and widespread interest, it provoked many comments and questions. In addition, the talk promises to become an important reference when it is published in the Society's Quarterly Journal.

★ ★ ★ ★

Zephyr has struck up a friendly relationship with Australia's Bureau of Meteorology. Like AES, the Australian bureau publishes an "in-house" magazine called **Weather News.** ADMA Jim Bruce sent a copy of Zephyr to John Zillman, Australia's Director of Meteorology after the latter had visited Environment Canada as a WMO Bureau invitee early in 1984. In return Dr. Zillman sent AES a copy of Weather News and it is hoped the two magazines will be exchanged regularly.

Incidentally, the June 1984 issue has some interesting beefs: about obsolete 1942 radar "valves" being kept in service and about inferior down being stuffed into the eiderdowns used to keep residents of Canberra warm when chilly winter temperatures dip below 0°C.

★ ★ ★ ★

"The study of the early universe is in many ways much simpler than forecasting the weather," Alan Guth, a physics professor at the Massachusetts Institute of Technology recently told an American scientific conference. Prof. Guth is a pioneer in describing what happened during the first second of the universe's existence. "The early universe did not have all the temperature, wind and land-mass variables which make Earth weather forecasting so difficult." He could have added that the forecast period was also of much shorter duration!

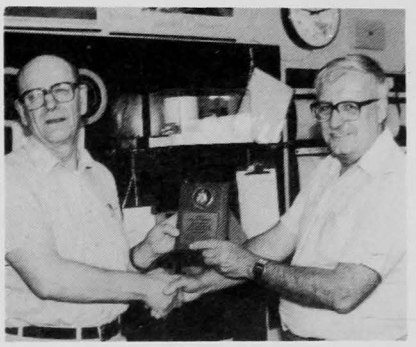
★ ★ ★ ★

Looking ahead to June 1985, it's interesting to note that Montreal will be the scene of four major conferences of concern to meteorologists. They are the 42nd Eastern Snow Conference (June 4-7), the 19th annual conference of the Canadian Meteorological and Oceanographic Society or CMOS (June 11-14), the seventh conference on Numerical Weather Prediction (June 17-19), and the second International Conference on Aviation Weather Systems (June 18-20). Since most of these conferences overlap, AES is considering holding an exhibition of its high technology products at the University of Quebec in Montreal (a common meeting place). Included could be a miniature of the CRAY super-computer, located about 25 kilometres away at the Canadian Meteorological Centre in Dorval, P.Q.

The timing of the four meetings should benefit the travel schedules of AES personnel who will be able to take in more than one conference during their Montreal visit.

★ ★ ★ ★

The picture shows Robert Stark (right), chief of Data Acquisition for Ontario region making one of his last presentations before retiring in October. Mr. Stark worked for 40 years for the federal government, the last 36 with Canada's weather service. During this time he has been a weather forecaster at Gander, Nlfd. and at Edmonton, Alberta. He later worked in the Canadian Climate Centre at Downsview, Ontario and has spent the last five years in his current position. Seen receiving a 25-year service plaque is Roland (Roly) Burbeck, OIC of Atikokan weather station, Ontario.



The Climate Centre has received a polite letter of the old fashioned kind from a Ghanaian teacher. With minor changes the text reads as follows: "I am happy to write you this letter asking about your present condition of health. Mine is normal. Through the name of almighty God, I came across your address and was told about your offering. I will be very happy if you can send me some of your better shirts, picture books, badges and pens. God said in Bible that ask and it shall be given you, seek and you will find."

AES replied by sending pamphlets.

★ ★ ★ ★

"The Weather Channel" is a slick, comprehensive 24-hour-a-day weather program produced in Atlanta, Georgia, that just happens to be popular on a Hamilton, Ontario cable station. "The satellite imagery is good, the radar maps are clear, the overall graphics are excellent" says Hamilton Weather Office OIC Terry Dwyer who wholeheartedly endorses the U.S. show. He adds that he likes the style of the on air presentation people and is impressed by the accuracy, professionalism and over-all quality of the show. The only thing missing is a planned once every 10 minute local weather insert (supplied by the AES Ontario Weather Centre). Apparently there are technical difficulties about running this via Atlanta. But Hamilton Cable TV watchers don't seem to mind this gap. "The overall presentation is so good, viewers can quickly deduce what the Hamilton weather situation will be," says Mr. Dwyer, who adds that the

Zephyr Breezes * * *

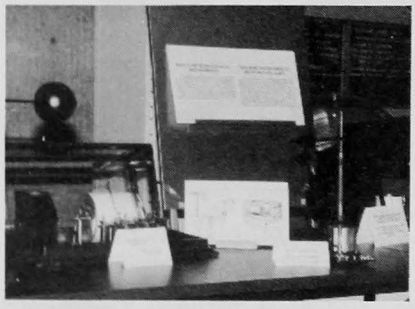
Hamilton channel is possibly the only Canadian cable outlet to carry a "total weather" show.

★ ★ ★ ★

We have received a note simply signed "Your Friendly Weatherman" giving specifications for the construction of an Organic Weather Indicator: Get three stout sticks of equal length, form them into a tripod, and set the tripod firmly on the ground — in your backyard. Now from the apex of the tripod suspend freely in the air a rock tied at the end of a length of string. This clever device indicates the weather as follows: if the rock is swinging, it's windy; if the rock is white, it's snowing; if the rock is wet, it's raining; if it flashes off and on, you're having a thunderstorm; if tiny rocks hit the rock, it's hailing; if you can't see the rock, it's either foggy or pitch black outside; if the rock casts a shadow and is motionless, it's a nice day.

And what if the Organic Indicator isn't there at all? Well, somebody's stolen it.

★ ★ ★ ★



Part of antique instruments display.

Tom Hacking of Measurement Technology Section, Downsview, is the proud custodian of a unique collection of antique weather instruments. Under his guidance the collection consisting of about 25 pieces and spanning more than a century, has been refurbished by some skilled young people under a 1984 Environment 2000 project. Some of the items include a mechanical calculator dating back to 1840, year when modern observations began in Canada, in Toronto, a 1908 anemograph recorder, splayed wind vanes and a 1910 tipping bucket rain recorder. The display has been shown at AES Downsview two or three times — notably for the retirement of International representative Fred Page and during the Canadian Science Writers' Association Climate Change Seminar, November 6. Mr. Hacking says the collection will soon become a travelling exhibit with plans to show it at the Science North science centre in Sudbury and the National Museum in Ottawa.

★ ★ ★ ★

Anthony John Chorney of Selkirk, Manitoba recently told the Edmonton Journal that there would be a mild winter this year in his home province "because bears had been sighted foraging when they should be hibernating." Such statements are typical of the charm of the amateur forecaster. Too bad their *pronunciamentos* can't be programmed into weather computers! By now the prognoses of Blackfoot chiefs should also have been aired. Canadian weather just wouldn't be Canadian weather without them.

★ ★ ★ ★

According to the Bolton Enterprise there are 10 Environment Canada "weathermen" living in Caledon (pop. 250) just north of Toronto. Among them it cites Brian Adamson, Howard Ferguson, Ted Turner, Ed Elliotson, Fred Trow and Don Scott as saying they are attracted to the village because it rains and snows there less than anywhere else in the area. They explain that Caledon lies in a "rain shadow" but as precipitation clouds descend from the northwest towards Toronto they drop their loads over the Niagara escarpment . . . resulting in less rain and snow in Caledon.

Bearing in mind the above, it's probably a safe bet to move to Caledon. You can almost forecast the amount of precipitation there by the number of weathermen who bed down in the village.

★ ★ ★ ★

Here's an interesting note from the Canberra Times by way of Australian Bureau of Meteorology's **Weather News,** (see item above). Mark Twain did not say: "Everyone talks about the weather, etc." The saying was in fact coined by another American journalist, Charles Dudley Warner. A true Twainian remark about the weather (according to the Times article) was a statement made to a New England audience in 1876 that he had counted 136 different kinds of weather in their region in one 24-hour period. For good measure the Canberra editorial quotes 19th century British humorist Jerome K. Jerome: "We shall never be content until each man makes his own weather and keeps it to himself."

The foreman came out to give orders on the ranch — it was at the old Bar U. It was 75 degrees below zero. It was so cold, d'you see, that the words froze in his mouth — and so he broke them off and handed them around so the men could get their orders for the day.

. . . we told him it was so cold last winter that the ice froze in the Upper Hot Springs Swimming Pool. One boy's feet went through the ice, and he got his foot scalded.

— *traditional tall tales, collected in Alberta by Herbert Halpert*

This happened out in the Prairies and it's true. One very hot day, this field that was planted in popcorn, well, it began popping. The ground was so deep in white popcorn that some cattle in the next field thought it was a blizzard and froze to death.

— *traditional tall tale*

STAFF CHANGES

Promotions/ Appointments

N. Parker (MT-6) Meteorologist, SSD, Edmonton, Alta.
M. Jones (EG-4) U/A Tech., WS2, Cambridge Bay, N.W.T.
B. Cowlthorpe (SCY-3) Secretary, WAED, Edmonton, Alta.
B. Thomson (MT-6) Meteorologist, SSD, Edmonton, Alta.
W. Hume (MT-7) Chief, SSD, Edmonton, Alta.
B. Walsh (FI-1) Finance Officer, WAED, Edmonton, Alta.
M. Edwards (EG-4) U/A Tech., WS2, Inuvik, N.W.T.
L.D. Barnaby (EG-2) Met. Tech., WS3, Cape Parry, N.W.T.
S. Morgan (EG-5) Pres. Tech., ARWC, Edmonton, Alta.
J.M. Nicolau (AS-2) French Language Quality Control, AAG, Downsview, Ont.
G. Eddy (CR-3) Clerk, AAGR, Downsview, Ont.;
G. Vigeant (MT-6) Meteorologist, QAES, St-Laurent, P.Q.
K. Lloyd-Walters (EG-5) Pres. Tech., WO3, Yellowknife, N.W.T.
M. Loch (EG-5) Pres. Tech., ARWC, Edmonton, Alta.
Y. Cardinal (MT-2) Meteorologist, ARWC, Edmonton, Alta.
A. St-Denis (CS-1) Programmer, CMCFT, Dorval, P.Q.
C. Rancourt (EG-3) U/A Tech., QAEOU, Kuujjuaq, P.Q.
D. Coulombe (EG-3) U/A Tech., QAEOU, Sept-Iles, P.Q.
D. Tolhurst (EG-6) Met. Tech., WAED, Edmonton, Alta.
W. Kobelka (EG-8) Met. Tech., ARQM, Downsview, Ont.
R.K. Cross (MT-7) Meteorologist, DMETOC, Ottawa, Ont.
J.H. Alexander (MT-7) Head, Prof. Training, ACET, Downsview, Ont.
S.R. Blackwell (MT-6) Instructor, ACET, Downsview, Ont.
S.T. Silver (MT-6) Instructor, ACET, Downsview, Ont.
M. Bonoy (SCY-1) Secretary, ACTS, Downsview, Ont.
S.J. Douglas (CS-1) Programmer, ACRO, Downsview, Ont.
R. Gratton (SCY-2) Secretary, ACPC, Downsview, Ont.
R.W. Plaseski (AS-5) Head, Communications Network Services, ACPN, Downsview, Ont.
R. D'Cruz (CS-3) Senior Programmer Analyst, CIDX, Dorval, P.Q.
E. Ranti (CS-3) Senior Programmer Analyst, CIDX, Dorval, P.Q.
M. Hall (CS-3) Planner, ACPB, Downsview, Ont.
P. Madhavan (CS-2) Programmer, Ice Centre, Ottawa, Ont.
P. Goreczny (EG-5) Ice Tech., Ice Centre, Ottawa, Ont.
L. Poitras (SCY-3) Secretary, ADMA, Downsview, Ont.
G. Paulin (SM) Scientific Program Coordinator, APCO, Ottawa, Ont.
Y. Gendron (MT-4) Meteorologist, CFFC, Edmonton, Alta.
J. Jenkins (DA-PRO-5) Computer Controller, ACPO, Downsview, Ont.

Temporary or Acting Positions

B. Allard (GSFOS-6) Station Cook, WS1, Sachs Harbour, N.W.T.
P. Gillard (ST-SCY-2) Secretary, AFOC, Downsview, Ont.
J. Masterton (PC-3) MOP, AFWC, Downsview, Ont.
R. Stockley (CS-1) Programmer, CMC, Dorval, P.Q.
G. Forbes (EG-4) U/A Tech., WS1, Sable Island, N.S.
W. Scott (EG-5) Pres. Tech., Vancouver, B.C.
G. Gunther (EG-6) Pres. Tech., WO4, Resolute, N.W.T.
M. French (AS-2) Admin. Officer, AAGR, Downsview, Ont.
G. Boissoneau (CR-3) Clerk, AAFA, Downsview, Ont.
J. MacLeod (AS-3) Public Affairs Officer, DOE, Winnipeg, Man.
R. Kerrivan (CR-3) Clerk, ACSL, Downsview, Ont.
J. Martire (CR-3) Clerk, ACSM, Downsview, Ont.
T. Sawchuk (EG-8) Head, Aerological & Special Systems Unit, ACSN, Downsview, Ont.
K.J. Puckett (REM-2) Senior Advisor, LLO/ADMA, Downsview, Ont.
M. LeBlanc (MT-6) Meteorologist, ARQD (MOP), Downsview, Ont.
M. Still (MT-6) Meteorologist, APEC, Downsview, Ont.
G.B. Jelley (MT-6) Policy Analyst, APDG, Ottawa, Ont.
D. Grimes (MT-6) Meteorologist, APDG (MOP), Ottawa, Ont.
K.A. Bishop (AS-1) Special Projects, APEC, Downsview, Ont.
A. Wallace (MT-6) Meteorologist, APEC (MOP), Downsview, Ont.
R. Berry (MT-8) Chief Tech. Training, ACGC, Downsview, Ont.
G. Lavigne (CR-4) Clerk, ACTS, Downsview, Ont.

The moon and the weather
May change together:
But a change in the moon
Does not change the weather.
If we'd no moon at all
(And that may seem strange)
We still should have weather
That's subject to change.

— *Anonymous*

"Twas midnight on the ocean,
Not a streetcar was in sight;
Then sun and moon shone brightly
While it rained all day that night.
And in that summer snowstorm
When the rain flowed just like glass,
A barefoot boy with shoes on
Stood sitting in the grass.

— *nonsense rhyme, collected in Ontario*

To help drum up support for this year's United Way campaign, ADMA Jim Bruce decided to dish out a favorite family recipe to AES employees in the Downsview Building cafeteria. Just a few days before Thanksgiving there was a long line up for bouillabaisse fish soup, a dish of French origin but under Mr. Bruce's supervision, 100 percent Canadian in ingredients. The "soup-in" wasn't a fund raising event as such since all payments went to the CNIB cafeteria as usual. Nevertheless the promotion was a great success in arousing AES and DOE interest in the campaign. According to DOE campaign organizer Joe Boll (director, Administration Division), a record $28 871 was raised by DOE employees for the United Fund in the Toronto area — an increase of 35% over last year. Mr. Bruce in United Way T-shirt is seen serving soup to an anonymous employee. In the background are David Ferguson, head of the United Way campaign for the federal government in the Toronto area (RDG, Veterans Affairs) and (partially obscured) Joe Boll.

Transfers

D. Wood (EG-3) U/A Tech., WS1, Sachs Harbour, N.W.T.
R. Laurence (MT-6) Supervisor, CMCFS, Dorval, P.Q.
C.L. Blackwood (EG-6) Scientific Serv. Tech., WO4, Fredericton, N.B.
J.O. Bursey (MT-6) Meteorologist, MAESP, Bedford, N.S.
O. Lange (MT-3) Meteorologist, PWC, Vancouver, B.C.
R. Campbell (EG-2) Met. Tech., WS3, Vancouver Harbour, B.C.
I. Morrison (EG-2) Met. Tech., WS3, Lytton, B.C.
J. Burrows (EG-2) Met. Tech., WS3, Lytton, B.C.
S.R. Smith (EG-2) Met. Tech., WS3, Cree Lake, Sask.
M. Boulay (EG-1) Met. Tech., QAEOO, Cape Dyer, P.Q.
Y. Pedneault (EG-2) Met. Tech., QAEOO, Dorval, P.Q.
M. Donahue (EG-6) Pres. Tech., WO4, Sudbury, Ont.
D. Wartman (MT-2) Meteorologist, Halifax, N.S.
J. Thériault (EG-1) Met. Tech., QAEOO, Chibougamau, P.Q.
Y. Bélanger (EG-3) U/A Tech., QAEOU, Inukjuak, P.Q.
A. Langlais (EG-3) U/A Tech., QAEOU, Maniwaki, P.Q.
M. Lessard (EG-4) U/A Tech., QAEOU, Frobisher Bay, N.W.T.
L. Lamontagne (EG-4) U/A Tech., QAEOU, Maniwaki, P.Q.
R. Gauthier (EG-6) Met. Tech., QAESC, St-Laurent, P.Q.
L.P. Bernard (EG-6) Pres. Tech., QAEWR, St. Hubert, P.Q.
R. Brannen (EG-6) Pres. Tech., ATWC, Bedford, N.S.
F.S. Porter (MT-6) Meteorologist, WO4, St. John's, Nfld.
M. Labrie (EG-1) Met. Tech., QAEOO, Clyde, N.W.T.
G. Morneau (MT-2) Meteorologist, QAEM — CMQ, St-Laurent, P.Q.
D. Paquette (EG-2) Pres. Tech., WO4, St. Catharines, Ont.
H. Morin (EG-2) Pres. Tech., WO4, Ottawa, Ont.
M. Elie (EG-1) Pres. Tech., WO4, Ottawa, Ont.
J. Collin (EG-1) Pres. Tech., OAEW, Toronto, Ont.
M. Donoghue (EG-5) Pres. Tech., WO4, Sudbury, Ont.
S. Clark (SCY-3) Secretary, AABD, Downsview, Ont.
M. Pender (AS-1) Admin. Officer, ACSM, Downsview, Ont.
R. Landau (CS-2) Computer Communications Officer, ACPN, Downsview, Ont.
L. Lavoie (MT-2) Meteorologist, Greenwood, N.S.
J. Adria (CS-2) Systems Analyst Programmer, Edmonton, Alta.
G. Roussel (MT-3) Meteorologist, Bedford, N.S.
P.J. Bowyer (MT-3) Meteorologist, Bedford, N.S.
W. Arnovitz (MT-3) Duty Forecaster, CFFC, Trenton, Ont.

Departures

K. Rainsforth, WS1, Sachs Harbour, N.W.T.
R. Marcel, WS1, Big Trout Lake, Ont.
P. Goreczny, Resolute, N.W.T. — Ice Branch, Ottawa.
R. Harrison, Resolute, N.W.T. — OAED.
M. Grace, WS1, Eureka, N.W.T.
K.B. Sawyer, Edmonton, Alta.
W. Gilmore, Edmonton, Alta.
P. Schwarzhoff, Edmonton, Alta.
Y. Gendron, Edmonton, Alta.
E. MacDonald, WS3, Vancouver Harbour, B.C.
M. Trépanier, QAEOO, Ste. Agathe, P.Q.
R. Hunden, WS3, Jasper, Alta.
J. Kozlowski, WS2, Norman Wells, N.W.T. Attending University.
G. Stewart, WS3, Pickle Lake, Ont.
S.A. Adams, ATWC, Bedford, N.S.

Dirty days hath September,
April, June and November;
From January up to May,
The rain it raineth every day.
All the rest have thirty-one,
Without a blessed gleam of sun;
And if any of them had two-and-thirty,
They'd be just as wet and twice as dirty.

— *English nonsense rhyme*

(cont'd from page 9)

4:30 — The university session is now over and Sue recalls the group gathered in the lecture hall had been an enthusiastic one. She is pleased that her talk had triggered some informed questions and comments.

When a student had asked whether her office would have a significant effect on finding a solution for acid rain, this was her reply:

"It was the scientific community that first identified the acid rain problem. It is now our responsibility to ensure that the policy makers have the necessary information to address the problem and that a monitoring program is in place to assess the solution."

A young woman had also asked. "I expect that the majority of people you work with are men. Do you find that you do not get as much respect or are hindered because you are a woman?"

Sue remembers her reply: "Being young and a woman in this component of the program is a rarity, but not a hindrance. It is not a women-versus-men field. In most situations these days you gain respect through your knowledge and efforts."

The final questioner had asked her how she felt about working on the acid rain issue. She had replied optimistically: "Acid rain is an interesting subject to be involved in. It is nice to work on something you believe in, on an issue for which you *know* a solution can be found."

* LRTAP — Long Range Transport of Airborne Pollutants

STAFF CHANGES

Leave of Absence

H.C. Martin, LLO/ADMA, Downsview Ont. French Language Training.
S. Malone, Scientific Services, Fredericton, N.B.
D. Bellows, ATWC, Bedford, N.S.
J. Pottier, WO4, Churchill, Man. Educational Leave.

Retirements

A. Smith, CMC, Dorval, P.Q. Sept. 1984.
E. Woodley, Edmonton, Alta. August, 1984.
D. Petznick, WS3, Bissett, Man. Sept. 1984.
R. Catling, WO3, Yellowknife, N.W.T. Oct. 1984.
F. Harvey, WO4, Ottawa, Ont. Nov. 1984.
R. Stark, OAEO, Toronto, Ont. Oct. 1984.
G. Gillingham, Ice Centre, Ottawa, Ont. July, 1984.
G.B. Kennedy, AES/CFWS, St. Hubert, P.Q. Aug. 1984.

Deaths

M. Koroluk, Data Acquisition Inspection, WAED, Oct. 1984.

The Fog comes
on little cat feet.

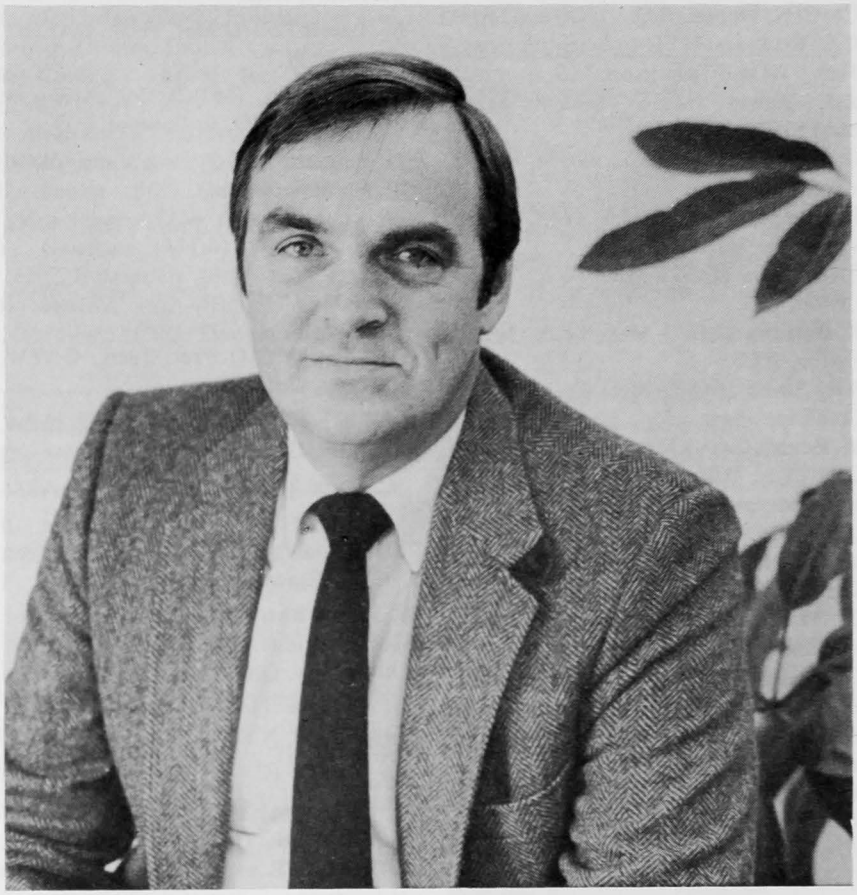
It sits looking
over harbor and city
on silent haunches
and then, moves on.

— *Carl Sandberg*

The Moon's the North Wind's cooky,
He bites it day by day,
Until there's but a rim of scraps
That crumble all away.

— *Vachel Linsday*

New head of computing branch



BRUCE ATTFIELD

Bruce Attfield has been named director of Computing and Communications Services Branch, it was recently announced by Jim Bruce, assistant deputy minister, AES.

Mr. Attfield takes over this post after spending three and a half years as chief of Planning, Computing and Communications Services. During this period he was responsible for the acquisition and installation of the CRAY supercomputer at the Canadian Meteorological Centre in Dorval, P.Q. and for the management of the new Communications Systems project.

Mr. Attfield joined AES in 1981 after serving three years as director, Computer Systems Development branch of Transport Canada. Before that he was in charge of planning and development, computer services for this federal government department.

Earlier posts held by Mr. Attfield include that of head, Data Processing, Health and Welfare Canada; head of client services in the first government Service Bureau and that of systems software specialist for Control Data Canada Ltd.

Mr. Attfield was the first programmer ever hired by the National Research Council and he subsequently installed the first NRC Computation Centre computer. He also installed the first statistical research computer for Agriculture Canada.

He is a past president of the Data Processing Institute, Federal Institute of Management.