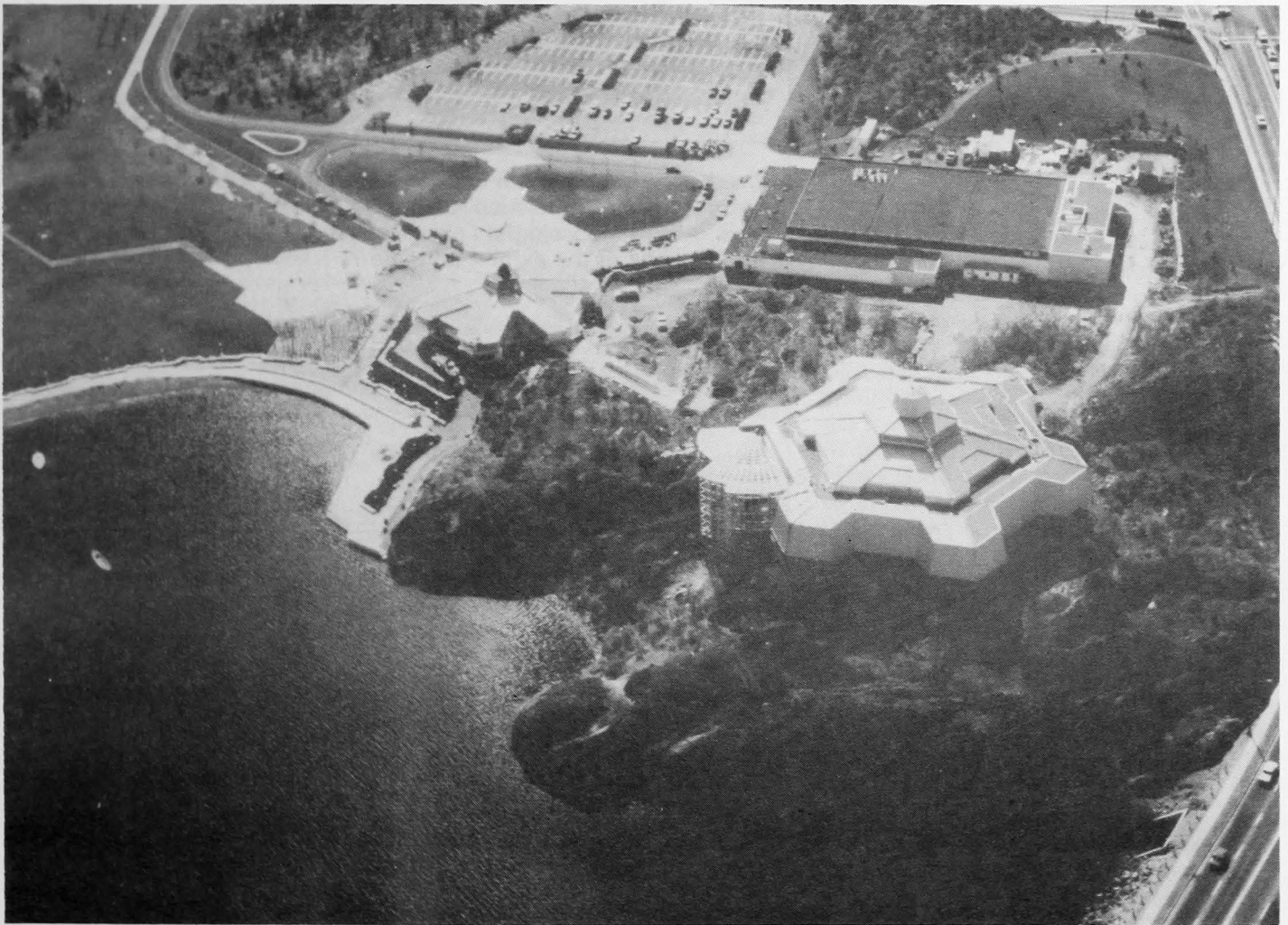


March/April 1985

ZEPHYR



Climate at Science North



Environnement
Canada

Environnement
Canada

National Parks
Centennial



Centenaire des
parcs nationaux

Governor general honors Morley Thomas

At a ceremony held May 1 at Rideau Hall, Governor General Jeanne Sauvé presented the Massey Medal to Morley Thomas, AES historian and former director general of the Canadian Climate Centre.

In the audience were AES personnel, members of Mr. Thomas's family and directors of the Royal Canadian Geographical Society, donors of the prestigious award created by the late Vincent Massey and given annually for outstanding contributions to Geography.

Mr. Thomas is regarded as an eminent climatologist who has added much to Canadian geography through his extensive writings and associations. He is also a winner of the Paterson Medal, Canada's highest meteorological award.

Besides praising Mr. Thomas for his outstanding services, everything from producing Canada's first climate atlas to his work as president of the World Meteorological Organization's technical commission for Climatology, Madame Sauvé (a former Environment Minister) showed her understanding of climate and climate change in her speech and as an aside added that it was fitting that a climatologist should be the one to be honored on such a perfect spring day.

Members of the AES party were impressed by the sumptuousness of the ceremony held in the grand ballroom and followed by a short reception in a nearby drawing room during which all attendees met Madame Sauvé.

Several of the AES members also attended a dinner given to Mr. Thomas by the Royal Geographical Society at the Rideau Club. True to his historians instincts the guest of honor reminded his co-diners that May 1, 1985 was the 114th anniversary of the official funding of the Canadian weather service, originally concerned with climate data rather than weather forecasts. He also told how he had spent part of his day in Ottawa at the National Archives obtaining material for his future book on the history of meteorology in Canada. Lastly he was pleased to show the guests the large, heavy, shiny medal with its inscription praising the recipient's work.

AES members at the Governor General's ceremony (including several spouses) comprised ADMA Jim Bruce,

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Cover: The best weather and climate exhibit in Canada can be seen at Sudbury's new Science North science centre seen here in aerial view. AES meteorologist Lewis Poulin worked there and gives his impressions of the exhibit on page 7.

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Atmospheric Environment Service Service de l'environnement atmosphérique

APDG Gordon Shimizu, CCDG Howard Ferguson, Bob Jones (APEC), and David Phillips (CCAS/D). Other close associates included Gord McKay (now

retired), Dr. Richard Asselin, director general DOE Information and former ADMA Dr. Art Collin.



Governor general Sauvé and Morley Thomas.

**AES
salutes
Parks Canada**

see page 12

AES Staff involved in Revenue Generation

The Minister, Madame Suzanne Blais-Grenier, along with her Cabinet colleagues has challenged AES to increase the level of revenue generated from the sale of AES services. Many AES staff will know that services such as climate information, teletype hookups and computer access have been charged for in the past. AES is now asked to raise approximately \$1.3 million in 1985/86 by increasing existing charges to market value, where necessary, and by introducing charges for the first time on some special services. The alternative is further budget cuts in addition to those announced last fall.

Like many other federal departments in Canada (and meteorological agencies of other countries), AES has been investigating the possibility of charging for some special services. A task force under the chairmanship of Denis Webster has investigated how weather and climate information is used and how users would react to new charges. Considerable progress has been made towards identifying users who benefit economically from AES special services and suitable levels of charges that could be applied.

The principal message to AES personnel can be summarized as follows:

- a) As a first priority, Staff should become familiar with the AES products and services subject to revenue generation within their divisions. A second priority will be to learn about revenue generation plans for AES as a whole.
- b) Personnel communicating with the public on this subject should emphasize that basic weather services will remain "free" to the user. These basic weather services, warnings and forecasts, will continue to be delivered via the mass media, by Weatheradio Canada or via cable TV. Public, marine and aviation forecasts for all areas of Canada will also continue to be "free" to the user. Most people will not be aware that charges will be made for services over and above the "basic services".

c) Charges will be introduced or additional charges levied on the following AES services:

- One-on-one telephone conversations with personnel at AES outlets via telephone or through personal interviews in order to obtain specially tailored weather or climate information.
- Calls for "information-on-demand" through automatic telephone answering devices (either direct charges or through sponsorship arrangements yet to be decided).
- Users who wish to plug into AES computer or telecommunications systems.
- AES publications in general, particularly those of a specialized or more costly nature.
- Photocopies of original documents as well as weather maps and satellite imagery.

In a message to all AES staff on the topic of revenue generation, deputy minister Jacques Gérin said that AES services are worth hundreds of millions of dollars to the Canadian economy and that a recent study on the economic value of weather services indicated that AES services could be worth approximately \$200 million to the construction industry alone.

The process of classifying AES services and defining basic free services was started last November by the AES Revenue Generation Task Force. Also, the task force succeeded in carrying out the most thorough examination of AES cost recovery potential ever undertaken. Its work resulted in a comprehensive plan, presented to the Minister on January 31, 1985. Methods of meeting revenue targets, estimating costs and establishing suitable price levels for the new, chargeable AES services were all part of this plan. A final item was the inclusion of communications plans aimed at keeping AES staff and users well informed of upcoming charges.

The original Revenue Generation Task Force was succeeded by a steering committee and an implementation team. Cost recovery projects are now the concern of a revenue generation coordinating committee.

The committee's final message to AES staff, particularly those who communicate with the public, is as follows:

- Deal with all public and general information users on a "business as usual" basis. People who request special investigations, reports, data or forecasts should be informed that many of these "special" services will be charged for in the future.
- Explain to those enquiring that about 90% of all AES services remain unaffected by the new revenue generation rules.

AES remains in the field of providing basic weather information, especially as it affects the safety, well-being and livelihoods of Canadians. People affected by the new revenue generation rules are a small group of users with requirements for custom-made AES services; for example: consultants, hydro utilities, gas and oil enterprises and construction companies.

It should be noted, that while customers such as these can benefit greatly from weather information, they will expect high quality services when they are charged. All of our staff called for consultation services must ensure responsive and useful forecasts and data are provided promptly and in a form which meets users needs. We are all now marketers of weather information, and quality services must be our continuing goal.

March 1971

One of the snowiest Marches on record in Canada set new extreme snowfall totals at places as far apart as Vancouver, Halifax, Ottawa, London, Montréal, Halifax and Fredericton.

April 28, 1967

Expo '67 opened in Montreal in bright sunny weather, 11.7° temperature, 50 km visibility and winds 19 km/h.

CRAY Update

The CRAY IS which has been in operation at the Canadian Meteorological Centre in Dorval, Que. since late 1983 is scheduled to be replaced with a fast and powerful CRAY XMP in the fall of 1986.

According to Bruce Attfield, director AES Computing and Communications branch, this expanded capability is as a result of the contract approved in 1982 to ensure adequate computing capacity into the 1990's. Mr. Attfield adds, "A final XMP configuration for AES has yet to be determined, but with the installation our objective of 10-day forecasts will become more achievable."

The XMP can be assembled with as many as four central processing units (CPU's) and up to eight million words (64 million bytes) of main memory. Even the largest of these is packaged in the same

size as the current CRAY IS/1300 with a single CPU and one million words of memory.

All of AES's current applications will execute without modification on the XMP. Of course, to take advantage of more than a single CPU, restructuring of programs will be required. Scientists with the Meteorological Services Research Branch are now conceiving the models to use these multi-processing features. A two CPU version would provide better than a 70% throughput benefit to AES. Also to improve performance, CRAY Research is now offering high-speed, random-access, secondary storage in volumes ranging from 64 to 1024 millions of bytes. Data transfer between the Solid State Disk (SSD) and the XMP can occur in bursts at about 10 gigabits per second.



CRAY XMP to replace current model at CMC within a year.

Pilot completes 1000th Sable Island run

by John Merrick

If you were asked to make innumerable trips over a 240 kilometre course that has virtually no scenery or notable distinguishing features, you might be inclined to turn down the request.

Not so for Bob Laidler. In 1971 Bob began flying a specially-equipped twin-engine plane known as a Britten-Norman Islander, on the Halifax-Sable Island route. The company he flew for, IMP Aviation of Halifax, was beginning a long and distinguished association with the AES, Coast Guard, Maritime Telephone & Telegraph (MT & T), CWS; the agencies which maintain a recognized presence on the Island. Bob Laidler's role in this association has been to serve as the lifeline between the Sable Island residents and their mainland sources of food, health services, entertainment and social contact.

Bob's flying career spans the period from Spitfire to high performance jet, but since 1971, the Islander, as it is affectionately known, has served as Bob's primary conveyance. People and cargo are the payloads, of course, and both have displayed a remarkable tendency to be fascinating companions on each 2½ — 3 hour round-trip flight.

People have provided conversation, companionship and knowledge on these flights, while cargo has provided color, drama and sometimes a sense of danger. Bob's passengers have included corporation presidents, ADM's, high riggers, veterinarians, satellite antennae specialists, in addition to all the staff and support persons required to operate the weather and upper air station. His cargo is routinely fresh food and sustenance items, but it is not unusual to be required to carry items such as a Sable Island horse, Christmas trees, emergency supplies of disposable diapers, and bags of fresh horse manure. (The manure is analyzed to yield information on the horses' health and dietary habits.)

Bob Laidler's most significant contribution over this period has not only been in his dedication to a flying career, but in his commitment, on a personal level, to the people who live and work on

(cont'd on page 5)

(cont'd from page 4)



Robert Laidler (left) receives his award from Dick Nelis, Atlantic Region head of weather services.

Sable Island. On his own initiative, he has collected and distributed mail going to and from the Island. On several occasions, he acted as "nanny" for the wife of an AES' OIC who was travelling with two small children and twin infants. (Quite a handful — even for a pilot!) In the days prior to satellite TV, he went out of his way to acquire taped entertainment for island viewers. He has responded cheerfully to late-night, weekend and early morning calls in order to provide flights of an emergency, unscheduled life-support nature, and has fulfilled all these requests in a safe, reliable and conscientious manner.

On 16 April, 1985, in recognition of his 1 000th flight to Sable Island, Bob was the honoured guest at a commemorative ceremony held at the Halifax Airport Inn. In addition to other guests from his company, Coast Guard and MT & T, Bob was honoured by a strong AES presence.

On behalf of the Assistant Deputy Minister, Atmospheric Environment Service, Mr. R. Nelis, A/MAED, presented Bob with a certificate of appreciation and a personal letter, both signed by Mr. Bruce.

This 1 000th flight was one milestone in Bob Laidler's flying career. He was wished a safe and happy future by all his colleagues, as well as by all those whose existence on Sable Island is enhanced by his contribution. On April 17, Bob was once again in the pilot's seat headed for Sable Island, and flight number 2 000.

Mr. Merrick is acting OIC Halifax weather office.

Jacques Bureau

Jacques Bureau, Officer in Charge of the Quebec City Weather Office died of cancer on April 2nd. Mr. Bureau was very well known in the Quebec City area because of his numerous radio and television broadcasts. He came to Quebec City in 1956 and was then the only member of the weather station. He gave the first weather report ever broadcast

over radio in French in Canada and in 1961 began a regular television weather program on Tele 4 channel. Mr. Bureau was also well known in local politics and for many years was mayor or councillor of L'Ancienne-Lorette. He had been in the Canadian weather service for 35 years. Funeral services were held at the Church of L'Ancienne-Lorette on April 8th.

Award of Biometeorology

Eli Mukammel of the Canadian Climate Centre who retired last November was the recent recipient of a Merit Award for his longtime work researching biometeorology. Among his achievements, outlined by ADMA Jim Bruce and Howard Ferguson, director general of the Canadian Climate Centre, were his work on toxics on the shores of Lake Erie which eventually led to an air quality agreement with the United States.

Describing Mr. Mukammel as very much ahead of his time, Mr. Ferguson said that his work on toxic studies of this kind would focus public attention more than ever on the effects of weather and climate on health.

Mention was made that Mr. Mukammel was the author of some 36 scientific publications, and that Jim Bruce

was co-author of the first of these which appeared in the mid-fifties.

Outlining Mukammel's career, Bruce and Ferguson pointed out that he had worked for the British Meteorological Office in both Iraq and Ghana before coming to Canada to work for the Weather Service here in 1956. He stayed with the service until 1967, then joined AES around 1980, (a couple of years after suffering a heart attack) and began his work on biometeorology.

Addressing a crowd of colleagues and friends, gathered in the AES Downsview Headquarters auditorium Mr. Bruce said that Mr. Mukammel was receiving his award for outstanding contributions over a long period.

In his reply Mukammel said that he had done his biometeorological work as his duty to Canada.



Eli Mukammel flanked by Jim Bruce (left) and Howard Ferguson.

A day in the life of an . . .

Instrument calibration technician

Zephyr sent its usual interviewer to learn something about the work of an instrument calibration technician. Here's how Nellie Rochacewich of AES Downsvew answered the questions.

Z: What's the major event on your work schedule this week?

Nellie: Tomorrow, I'm going to calibrate those temperature sensors over there. They are new and have to be checked before being sent out to the field.

Z: What is calibration?

Nellie: Calibration is checking and/or adjusting an instrument's reading against a standard which is traceable to first principles. The World Meteorological Organization sets the accuracies and we make sure the instruments will measure these parameters to that accuracy. In this case calibrations will occur at five degree intervals from -60 to +60 degrees celsius. Over a 120 degree range we obtain 24 calibrating events, each one lasting 15 minutes.



Nellie Rochacewich

Z: Fifteen times twenty-four . . . that means a six hour job, I suppose.

Nellie: Actually it's a full day, but more about that later. In the lab I have three temperature environments — air, oil, and alcohol. The one you see hooked up to a computer there is an air environment, fully automated and digitalized.

Nellie puts a sensor inside the air oven (something like a microwave oven) and activates the computer. The sensor is hooked up to an external gadget like a digital clock that spins red numbers as the sensor's temperature reading rises. Another gadget spinning red numbers shows the difference between the computer's programmed thermal settings and the sensor's.

Nellie: The tolerable difference between this field sensor and the temperature standard should be 0.5 degrees.

Z: When you ship them out to weather stations, how carefully are they packed?

Nellie: You can never be too careful.

Z: Do instruments *ever* become uncalibrated during transit?

Nellie: It *can* happen. If it does, the instrument comes back and I recalibrate it.

Z: Where do all these instruments come from?

Nellie: From all over Canada, wherever there's an AES station. Some come from AES stations in Germany too. Others like these new sensors, come straight from the manufacturer.

Z: How long can a flawed instrument go undetected? For example, could one possibly be the cause of inaccurate forecasts going out over the airwaves?

Nellie: I suppose they could malfunction indefinitely, until someone notices the error. We have field inspectors who routinely inspect the instruments. If they or other station personnel detect a fault they will have it corrected. The error of

one particular instrument would have to be quite significant though. Many parameters are used in forecasting the weather.

Z: Do you keep a record of all calibrations?

Nellie: Every calibrated instrument goes out with my acknowledged endorsement of its accuracy.

Z: Do you index calibrations?

Nellie: In my files, I keep the calibration history of most instruments used by AES. These histories are useful for future reference as to how a particular instrument aged.

Z: Tell me more about the calibration of these new sensors.

Nellie: The sensors I will calibrate tomorrow have to be set as low as -60 degrees Celsius. This means I'll use an alcohol environment. Here's the alcohol bath. Now I just dip the sensors into the alcohol-filled bath. Reminds you a bit of a soda bar container for maraschino cherries, doesn't it?

Z: If a full 15 minutes are needed to change the temperature by five degrees, how do you get away for your coffee breaks?

Nellie: Well, its no breaks for me tomorrow! Once I start calibrating, I stick to my 15 minute readings. The temperatures have to be watched fairly constantly so that you don't overshoot the one you're aiming for. I don't mind this routine. It goes with the territory.

Z: Must you watch the alcohol bath right now?

Nellie: No, I can do anything that doesn't interfere with my calibration tour. To be a good calibration technician you need to be "patience compatible" — that is possess the dogged patience to face any situation. On the whole though my job offers lots of variety.

Z: Do you get out and around?

Nellie: Some calibration work for the AES is now being done in private sector. I have to go out periodically and check the company's set up for calibration and also make sure that the equipment they are using for calibration is in good operating condition.

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Meteorologist's "Sense of Wonder" at Science North

by Lewis Poulin

In June 1984, having gotten leave without pay from AES, I put all my things in my truck and, with a mixture of enthusiasm about my plans and regrets over having to leave Gander, headed off for Sudbury, Ontario. The reason for my trip: to spend six months helping develop the Atmospheric Sciences department at Sudbury's brand-new science centre, Science North.

Science North, which is housed in a building shaped like a giant snowflake, was officially opened by Her Majesty the Queen in October 1984. This event marked the fruition of long efforts to develop and realize the concepts on which the centre is based. Science Centres are becoming more and more common in North American cities, but Science North did not want to be "just another science centre". Years of research were devoted to creating the right atmosphere for visitors. Throughout the building, guides are there to offer them a warm welcome and answer their myriad questions about the wide variety of scientific experiments on display. The whole centre is divided into mini-laboratories where visitors are encouraged to handle the equipment. The subjects dealt with range from biology to geology, from human physiology to computer science, from physics to meteorology and more — in short, there is

something for everyone.

AES contributed most of the funding for the Atmospheric Sciences department, and thanks to AES, Science North now has one of the most complete automated climatological observation stations in Canada.

Visitors to the department get the chance to conduct meteorological experiments, such as manufacturing snow in a deep freeze, with the help of dry ice. Then they may want to try blowing a soap bubble into the freezer, and watch it slowly freeze as it sinks gently in the cold air.

Some days, visitors may chat with special guests. One weekend, our guest was Arjen Verkaik, a photographer who is blind in one eye and has only 10% vision in the other. In the course of his career, he has taken over 7 000 photographs of the sky. His visit thus provides a fine opportunity to interest other photographers in certain aspects of meteorology.

One of the unique features of Science North is that volunteers of all ages are present in the laboratories. All of them have shown a special interest in science and they are encouraged to develop it. All the equipment is at their disposal. In the Atmospheric Sciences department, volunteers with special training monitor

intervals. At minus temperatures, refrigeration is slower and I couldn't do the whole test in one day. Before I go home tonight, I'll turn on the refrigeration and cool the alcohol. Tomorrow I'll need just an hour to reach -60. And that's where the full day comes in, remember? One hour for the final descent to -60, six hours for calibrating and the rest for shut down. Total: 7.5 hours!

During the interview Nellie revealed that she has also written or co-authored detailed test reports such as the Evaluation of the Aero Mechanism Altimeter Setting Indicator or The Evaluation of the OTA Tokyo Aneroid Barometer. The drawings were all done by Nellie herself who before assuming her present occupation was a blueprint draughts-person.



Lewis Poulin (right) with exhibit director Alan Nursall at Viewfax Display Unit.

and maintain the meteorological equipment, and also get the chance to discuss current atmospheric conditions with the resident meteorologist.

Working at Science North, I had the chance to discuss AES's daily forecasts with a surprising variety of people — pilots, fishermen, householders who wanted to know when to water their gardens. These conversations increased my appreciation of the role AES products play in people's daily lives.

One project now under development at Science North is a television program that will specialize in presenting and interpreting weather bulletins. Once the technical problems have been solved, the centre's broad scientific expertise and sophisticated equipment will enable this program to show viewers more about the links between meteorology and other scientific disciplines.

A few years from now, we well may find that the money and effort AES has invested in Science North have helped to establish the best meteorological interpretation office in all North America.

For me, Science North was not only a lesson in organization, but also a place where you were allowed, and even encouraged, to ask questions, and could then try to answer them — a place where you could experience a child's sense of wonder while learning a bit more about the workings of the various components of the environment in which we live.

For further information on Science North you can contact, Alan Nursall head of the Atmosphere Exhibit, at 705-522-3700.

Mr. Poulin is now a meteorologist with the Environmental Studies Division of AES, Downsview.

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Z: How's your lab space here? Are you a bit crowded?

Nellie: I lost some space to the day care centre, actually over half the space. But, I'm comfortable. I don't feel crowded.

Z: What about safety and health hazards?

Nellie: I do a little work with mercury. I get regular physical checkups for that. Nothing to get excited about. I feel quite safe.

Z: Can you calibrate tomorrow's sensors either way — say, from +60 down or from -60 up?

Nellie: No, only from -60 up. If I started at +60, I wouldn't obtain those 15 minute

HUMBOLDT — Grandfather of Canadian Meteorology

We cannot delve into the meteorology of the 1820 and 30s without bumping into the name Humboldt. Just who was Alexander von Humboldt? Today his name is rather obscure, but in his own day (1769-1859), his fame, believe it or not, was exceeded only by Napoleon's. He began his career in his native Germany as a supervisor of mines where his lifelong enthusiasm for geology and geomagnetism was aroused. He ended his activities 70 years later by publishing a major work called *Kosmos* covering the entire field of earth sciences as then known, including the results of Humboldt's own investigations which during his lifetime, he had conducted on a grand scale in an area extending over four continents.

Humboldt was a daring scientific adventurer just as Cortez was a daring military adventurer. From 1799 to 1804 he explored the Orinoco River in Venezuela, spent two years in the rain jungles studying their flora and fauna and thriving on a diet of ground cacao beans. He climbed the Andes mountains in Peru to a height of 6 000 metres — a record he held for the next 30 years. He studied ocean currents off the west coast of South America and was rewarded by having one of them named after him. Today's El Nino, assiduously studied by Canadian climatologists, is precisely in the area of the Humboldt current. All in all Humboldt's curiosity was encyclopaedic and his vision global.

Humboldt never actually came to Canada but he did visit Thomas Jefferson, a fellow scientist enthusiast, in Washington. His real if indirect connection with Canada was geomagnetic and meteorological.

One of Humboldt's original conceptions was the graphic representation of scientific data. To present thermal and air pressure in graphic form, he invented the isobar and the isotherm — in short the weather map.

Humboldt first became interested in graphic representation because of his concern about magnetic storms. Were they of terrestrial or extra-terrestrial origin? Clearly, magnetic readings from

all around the world would be needed in order to solve the problems of geomagnetism — and therefore observatories would have to be set up everywhere to observe and record them.

In 1828 Humboldt organized an international scientific conference and then, in 1829, went to Russia at the invitation of the Czar. He studied geology in the Ural mountains and crossed Siberia to the border of China. On his return, he proposed to the Czar that observatories be set up on Russian territory.

Not obtaining a satisfactory offer from the Czar, Humboldt was struck by an idea. Instead of petitioning various countries around the world, why not petition Great Britain alone as the sun never set on the British dominions. Accordingly in 1836 he wrote a letter to His Royal Highness, the Duke of Sussex, who was then president of the Royal Society, suggesting that Great Britain could fulfill its obligations to international science by providing the world-wide observatories needed. By now, approaching age 70, Humboldt's name was so illustrious that his letter caused a sensation in England and the observatories project was accepted and pursued with determination.

The first result was the building of an observatory in Ireland in 1838. But the global project itself needed much planning. Meetings were held, decisions about organization and discipline had to be made, observatory sites had to be selected, magnetic and meteorological instruments had to be improved to scientific standards, observers had to be trained, funds assigned and much else. When the dust had settled, the result was as follows:

Sites selected were Canada, Van Dieman's Land (Tasmania), St. Helena (Atlantic), and the Cape of Good Hope. (This latter was noted for its magnetic peculiarities.) Responsibility for the project was given to the Army Ordnance Corp who farmed it out to the Royal Artillery. Observers were trained at the newly constructed observatory in Ireland and instruments were quickly improved to standards of reasonable accuracy.



Alexander von Humboldt

Lieutenant C.J.B. Riddell of the Royal Artillery was appointed director of the Canadian observatory. At first he wanted to locate near Montreal (on St. Helen's Island) but on a trip to Quebec in 1839, the nature of the rock formations around Montreal left Riddell to conclude that "St. Helen's Island would not be an eligible situation for the magnetic observatory from the local attraction which has been observed in its immediate vicinity." But "I (Riddell) am, however, of the opinion . . . that Toronto must be free from such influences . . ." And so Toronto got the nod.

In January, 1840, Riddell and three artillerymen and all his instruments arrived in Canada. He presented a letter of introduction to the Governor General who approved a grant of 2½ acres of ground belonging to the University of King's College "about half a mile north of the city of Toronto and 360 yards west of the University buildings." Construction of the observatory buildings began "as soon as the season permitted . . . and completed and possession received in September 1840." (Note that Riddell says "as soon as the season permitted" — not as soon as the weather permitted, as we would say today.)

In all, the observatory complex consisted of five separate buildings — (i) the observatory itself — (ii) a detached building partly sunk in the ground — (iii) an anemometer building — (iv) a small shed "for the inclination circle" — and (v) a barracks for the officer and his three men. The observatory was built of twelve inch logs, rough on the outside and plastered over laths on the inside. The doors and windows were double with a porch for the front door, there was a

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fireplace to burn wood, and "no iron whatsoever was used in the structure, the nails being of copper, and the locks and other fastenings of brass." Riddell continues "The instruments are supported by massive stone pillars, each formed of a single stone about six or seven feet long, imbedded in masonry to a depth of three feet." Riddell and the observatory had come to stay.

Magnetic and meteorological instruments included "a standard thermometer, a wet thermometer, a self-registering thermometer, a delcinometer, a unifilar magnetometer, a transit theodolite . . ." and others.

And so there it was! A "Magnetical and Meteorological Observatory," as far as we know the first of its kind in Canada and perhaps in all of North America.

Towards the end of 1840, Lieutenant Charles Younghusband of the Royal Artillery arrived at the observatory to learn instrument reading and data recording. In 1841 a fourth artilleryman was assigned to the station and in 1841 Riddell had to return to England for health reasons. Lieutenant Lefroy, director of the St. Helena observatory was sent to Canada to replace him. Lefroy immediately embarked on a magnetic survey of northern Canada wherever the Hudson's Bay Company was operating, leaving Younghusband in effective charge in Toronto.

Meanwhile Alexander von Humboldt had gone broke on behalf of the earth sciences. Berlin gave him an appointment in government and he died at age 90 working on the fourth volume of *Kosmos*.

The setting up of the Toronto observatory on Christmas Day 1839 will soon be the occasion of a major sesqui-centennial celebration. But even sooner we will be celebrating the 150th anniversary of Humboldt's great geomagnetic proposal to the British government. In a roundabout sort of way, it probably brought meteorological services to Canada a decade before their time.

March 21, 1980

Heavy rainfalls of 30 to 50 mm fell in eastern Ontario; the swollen Ganaraska River near Port Hope was backed up by an ice jam, causing \$10 M in flood damage.

BOOK REVIEW

The Awakening Earth

by Peter Russell
Ark Paperbacks 228 pages

The idea that the earth is a living organism is not new. The great Leo Tolstoy believed that the earth is alive "in just the same way as my thumbnail is alive". And in the 1920s, the Armenian mystic, G.J. Gurdjieff, ran a famous retreat at Fontainebleau, near Paris, where he taught that the universe is a hierarchy of Intelligent Beings — galaxies, stars, solar systems, planets, earth, and man — somewhat like the military is a hierarchy of higher and lower ranks.

But Peter Russell is no mystic. He is a Cambridge graduate in mathematics, theoretical physics, experimental psychology, and computer science. He doesn't insist that the earth is a living organism, for that has not yet been scientifically established. But he summarizes a vast array of scientific data that tends to suggest that it is. Nor is Russell alone in thinking so. The idea is spreading among his colleagues whom he quotes and borrows concepts from. It may well be that within the next few years the idea that the earth is a living organism will become academically as common as Darwinian evolution.

That the earth is a living organism is Russell's premise. He spends half his book establishing grounds for this premise. He gives the homeostasis argument — the earth's "ability" to maintain an ecosystem over a period of a billion years that is just right for life — the steadiness of the earth's surface temperature — the regulation of the amount of salt in the oceans (two percentage points more "even for a few minutes" and "life in the oceans would have immediately come to an end") — the vital presence of a small quantity of ammonia in the atmosphere which neutralizes "strong sulphuric and nitric acids produced by the natural combination of sulphur and nitrogen compounds with oxygen (thunderstorms, for example, produce tons of nitric acid)" — the existence of the ozone layer without which life would be impossible. — and the stability of the percentage of oxygen in the air (which we all know about).

Russell uses the device of objectivity — that is, looking at the world the way an astronaut in a space satellite sees it. From that vantage point, imagine the rotation of the earth speeded up, like we speed up movies, until each rotation is as rapid as a human pulse beat. "We would see the atmosphere and ocean currents swirling around the planet, circulating nutrients and carrying away waste products . . . we would see vast continents sliding around, bumping into each other, pushing up great mountain chains . . . fine threadlike rivers would swing first one way then another, developing huge meandering loops . . . giant forests and grasslands would move across continents . . . and if we could look inside, we would see an enormous churning current of liquid rock flowing back and forth, sometimes oozing through volcanic pores to supply the minerals essential for life."

The meteorological and climatological ionosphere relates to the earth like fur relates to a cat. Without its fur, a cat would be behaviourally a far different animal — and without the ionosphere, the earth would be an uninhabitable planet.

Is the earth a living organism? — or are all these things just flukes? Russell chooses between alternatives. Like Einstein, he doesn't believe that God plays dice with the universe.

From his premise, Russell argues that humanity "could be on the threshold of an evolutionary leap . . . a leap such as occurs only once in a billion years." Theoretical physics futurizes the immediate first step in this evolutionary leap and tracks successive leaps into the millenia ahead. The last half of *The Awakening Earth* describes the fantastic evolutionary possibilities inherent in the fusion of theoretical physics and experimental psychology.

Russell is presently a lecturer from campus to campus. He is fluent, perspicuous, and persuasive. *The Awakening Earth* is easy and exciting reading. Anybody who is convinced that the cure for our present threatening state of affairs is, as the mystic Gurdjieff said, to "change our style of thinking," may even find this book impressive. After all, when the Baroque masters from Pascal to Gauss were making their great mathematical discoveries, they "couldn't believe their senses" either.

— Jack Gubbins

Zephyr Breezes * * *

Churchill Falls Weather Station, Labrador, has four observers who keep a round-the-clock observing program. They rotate through 12 hour shifts. On January 11, 1983, Charles Daigle, one of the four observers, arrived at the station at 8 am to begin his 12 hour shift. During his shift, the Bedford Nova Scotia regional office informed him that he could not be relieved at the end of his shift. The OIC was hospitalized, the second man had been rushed to the hospital with a severely lacerated arm, and the third man was in travel status and could not be located. "So get yourself an alarm clock, Charlie, and stick in there!" they said. Daigle set his alarm to ring at hourly intervals to make sure he was awake to perform his observing procedures. Regional office had to fly in a technician — Bob Sharples, a former Churchill Falls OIC — to relieve him. When relieved at 12 noon on January 12, 1983, Daigle had completed a marathon 28 hour shift.

It has now been announced that Charles Daigle has been presented with a Merit Award in recognition of his steadfastness to duty.



Award winner Charles Daigle.

The Saskatoon Star Phoenix prints one of the best weather reports we've ever seen. On its front page, a quick two or three word forecast is given illustrated with a cartoon drawn by a young school student, a different student and a different cartoon every day. The cartoon illustrating a forecast for snow depicts a car buried in a snow bank. The forecast for "sunny" shows a huge sun shining on a farmyard dunghill beside an upright pitchfork, with lines representing waves of odour rising from the dunghill. This one was drawn by Dean Katsiris, age 9, of Haultian School. In addition a front page photograph shows students sitting outside on the grass, studying on a "fine spring day". The full weather report takes up half of page two and includes the weather all across Canada with insets for the three Prairie Provinces, plus detailed provincial, continental, foreign and nationwide forecasts, and coverage of all "borders" including North Dakota.

Visitors to AES Downsview Headquarters Building will have an easier time finding both the Information Directorate and the editorial offices of Zephyr magazine. We have moved from the maze of third floor research labs and offices to a fairly accessible spot near the main building entrance. We think you will agree that the new premises are very satisfactory. Drop in and see us at 2S 530.

On March 23rd, the World Meteorological Organization used Weather and Public Safety as its international theme. From among 3 000 severe weather watchers across Canada, AES selected 14 it thought were of unusual interest. One of the 14 was Mrs. Josephine Murray who lives on a 640 acre wheat farm at Glenavon, Saskatchewan, with her husband and son. In addition to being a severe weather watcher she is also a ham radio operator. She says "You need these kinds of hobbies in the prairie isolation." By the way, Mrs. Murray is disabled and confined to a wheel chair.

On one day alone last March, twisters in the United States killed 57 people. But tornadoes for the first three months of 1985 are way down compared for the same period last year . . . 206 last year, only 56 this year. Of course, in the coming months, the tornado count may catch up. It will be interesting to see what the comparison is six months from now. Breezes will keep its eye on the situation and report.

During the coming summer, an award will be given to the staff of the Prince Albert National Park, Saskatchewan, marking 30 years of service the park staff has contributed to the Volunteer Weather Station at Waskesiu Lake. This will also be an occasion for AES to recognize the centennial of Parks Canada which is being celebrated this year.

AES ID gets some weird mail. Somebody, male or female, who chooses to remain kookily anonymous, sent in a Globe and Mail weather map interpolated with incomprehensible scribbles. One scribbling says "Year 1984 had no 365 but only 353 days." If this be information, what are we expected to do with it? — the same as we do with $2 + 2 = 5$?

The following may be of interest to AES thesis, magazine article, or book writers. A firm called Skyart Productions has produced "the most extensive collection of sky photos in the world." Its brochure says that "one picture is worth a thousand formulae" — in some cases, at any rate. But its color photos are indeed spectacular. Skyart services requests for photos of specific meteorological phenomena. If anybody in AES is interested in seeing the brochure, write to Skyart Productions, RR #1, Beamsville, Ontario, L0R 1B0 — or phone (416) 562-5403 and ask for Arjen Verkaik.

Zephyr Breezes * * *

This is a photo of Walter Williams, Central Registry Clerk, AES Atlantic Regional office with his "Sneaker Cake". The cake was presented by staff to Walter before he departed for Boston to run in the Boston Marathon. Walter has been running marathons for the past four years, and Boston will be his tenth complete marathon. He trains by running 70 miles (115 km) per week, weightlifting and some track work. Beverly, Walter's wife, has been running marathons for eight years and will also compete in the Boston Marathon. They are both members of the East Coast Athletic Club and are registered members of the N.S. Track & Field Association. After their time in Boston, the couple plan to run a local marathon, and then off to Europe for a vacation with runs in Paris and



Marathon runner Walter Williams.

Germany. Walter has the distinction of being the first AES employee to run in the Boston Marathon.

★ ★ ★ ★

One of our Downsview communications advisers phoned up to the Inuvik Drum in the Northwest Territories. He advised them that a reception was going to be held to open a vast aircraft hangar at the Inuvik airport, which was going to be of great future benefit not only to AES Ice Reconnaissance but also to commercial aircraft. After informing the editor that local officials, including herself, were to be invited to the ceremony, he casually inquired "You do have a mayor, don't you?" She burst into laughter. "We are a community of three thousand people. Of course we have a mayor!"

Ed Hudson has been at the Beaufort Weather Office since 1977 and OIC since 1980. He was recently honoured with the Public Service Merit Award which carries a small honorarium. The award was presented in recognition of the high quality forecasting and consulting service he has provided to the petroleum

exploration community in the southern Beaufort Sea. It was jointly presented by Bev Burns, Director of AES Western Region and Dr. A.H. MacPherson, DOE Regional director general, on behalf of Jacques Gerin, deputy minister, on January 8, 1985.



Ed Hudson receiving his award

Remember when?

Even today many longtime employees at the AES Downsview headquarters peer anxiously out of the window during a heavy snowstorm. Their secret fear is that road conditions will get so bad, they may be trapped overnight in the building. This happened on April 3-4, 1975 when a freak storm halted all traffic on Dufferin street and sealed off the parking area.

A Toronto Star headline proclaimed, "200 stranded at weather office as nine inch snowfall cripples Metro." AES detainees remember passing a very unusual night: playing cards in board rooms, watching TV in communications rooms, trying to sleep in the Auditorium or bed down on laid flat office wall dividers. By a stroke of good luck there was coffee and sandwiches in the cafeteria most of the night — and enough people willing to serve. Some personnel spent the night at their desks catching up with work. (Unlike March 5, 1985 there was no power outage.) Telephone service was restricted though and many people were unable to phone home to inform their families of their predicament.

Storm cuts power Closes Downsview Headquarters

AES Downsview Headquarters closed down for a day because of a power break during a severe March snowstorm. Hundreds of employees arriving for work during the icy aftermath of a blizzard were turned back at the door and told to spend the day at home. It was the first time in its 14-year history that the building had suffered a total power outage and the

second time it has faced a major weather emergency*.

Reason for the shut-down was that melting snow had seeped through the louvers of the transformer block and badly damaged the iron bars known as buss ducts. This cut the current to the generators and blew two large 34.5 kilovolt fuses. Fifteen electricians worked

feverishly from 5 am March 5 right through until midnight. Their work included shutting down all major power outlets except emergency supply to the satellite data lab and in-house computers; removing the damaged buss ducts and blown fuses and linking about 50 metres of by-pass cable to an emergency generator.

Power was partially restored around midnight. Many AES staff arriving next morning unsure whether they could get back into the building. But they found the current back in their equipment and offices reasonably warm. (Heating had been turned off in the building as a precaution during the power outage.) For the next two weeks or so the building remained on restricted power. For example there was 40-50% delamping, mainly in hallways, making notice boards difficult to read. These "temporary arrangements" allowed the buss ducts and fuses to be repaired and allowed time for a study on how to place a protecting blanket around the louvers in order to prevent a recurrence of snow penetration.

Not everyone went home March 5. Those whose offices had large windows remained for a while to read reports, but were unable to accomplish much real work since typewriters, communications terminals and pencil sharpeners were inoperative. One employee estimated there were at most 35 cars on the parking lot that day. Minus heat and the comforts of the cafeteria, most staff drifted home within an hour or two. Hardest working person in the building was probably Sam Yiannopoulos, Public Works Canada assistant engineer. Called in at 3:30 am Tuesday, he worked a hectic 21 hour shift.

*See item on 10th anniversary of AES building snow-in.



F. Fanaki

"Dammit! Nowhere to read the paper today".

AES salutes Parks Canada

As part of the centennial celebration of Canada's national parks, AES will salute Parks Canada, a companion service of Environment Canada in several ways throughout the year. Included will be broadcasts of Parks Canada messages on Weatheradio Canada and on some cable TV weather channels. Stressing common bonds between the two services,

(cont'd on page 14)

STAFF CHANGES

Promotions/ Appointments

C.B. Adamson (SM) Chief, Program Dev. and Evaluation Branch, APEC, Downsview, Ont.
P.V. Connor (EG-10) Chief, Maintenance Standards Div., ACSM, Downsview, Ont.
C. Dale (EG-1) Met. Tech., WS3, Lytton, B.C.
D. Whyte (EG-5) OIC, WS3, Dease Lake, B.C.
M. Wharton (DA-PRO-3) Computer Operator, ACPO, Downsview, Ont.
K. Hoose (EL-1) Electronics Tech., CAED, Winnipeg, Man.
C. Veinotte (CR-4) Clerk, CAED, Winnipeg, Man.
K. Wowryk (EG-4) U/A Tech., WS1, Hall Beach, N.W.T.
L. Hawley (EG-3) U/A Tech., WS1, Hall Beach, N.W.T.
M. Klepacz (EL-1) Electronics Tech., WO3, Saskatoon, Sask.
I. Ross (EG-4) Met. Tech., PRWC, Winnipeg, Man.
G. Kehler (EG-4) Met. Tech., PRWC, Winnipeg, Man.
R. Benoit (CS-4) Head, Systems Support, CIDS, Dorval, P.Q.
R.L. Berry (MT-7) Head, ACSN/P, Downsview, Ont.
C. Nobert (MT-2) Meteorologist, ARWC, Edmonton, Alta.
D. Mignacca (MT-2) Meteorologist, ARWC, Edmonton, Alta.
S. Horvath (EG-1) Met. Tech., WS3, Slave Lake, Alta.
B. Beaulieu (MT-2) Meteorologist, ARWC, Edmonton, Alta.
Y. Chartier (MT-2) Meteorologist, ARWC, Edmonton, Alta.
J. Thériault (EG-3) U/A Tech., WS1, Kuujuaq, P.Q.
J.R. Thibault (EG-3) U/A Tech., WS1, Maniwaki, P.Q.
V. Turcotte (MT-5) Meteorologist, CMQ, St-Laurent, P.Q.
D. Vigneux (MT-5) Meteorologist, CMQ, St-Laurent, P.Q.
L. Desjardin (MT-2) Met. Dev. Level, CFB, Greenwood, N.S.
R. Bailey (MT-3) Duty Forecaster, CFB, Greenwood, N.S.
J. Broszkowski (MT-2) Met. Dev. Level, CFB, Comox, B.C.
B. Brisebois (MT-2) Met. Dev. Level, CFB, Trenton, Ont.

Temporary or Acting Positions

A. Malinauskas, MOP, ARDG, Downsview, Ont.
R. Tremblay (CM-7) Head Supervisor, Communications, CMQ-QAEM, St-Laurent, P.Q.
G. Lunn (EG-5) OIC, WS3, Cape St. James, B.C.
S. Ventresca (CR-4) Clerk, AFDH, Downsview, Ont.
J. Martire (CR-4) Clerk, AFDH, Downsview, Ont.
L. Tripp (CS-4) Manager, Operations, ACPX, Downsview, Ont.
G. O'Hara (CS-3) Head, Production Services, ACPO, Downsview, Ont.
M. Crawford (SCY-1) Secretary, ACTS, Downsview, Ont.
M. Austerberry (EG-4) Met. Tech., ARQL, Downsview, Ont.
M. Gélinas (EG-7) OIC, WO4, St. Hubert, P.Q.
R. Raddatz (MT-7) Chief, Scientific Services, CAED, Winnipeg, Man.
J. Sawchuk (AS-2) Admin. Officer, CAED, Winnipeg, Man.
T. Rauch (EG-6) Supervisor Instruction Unit, CAED, Winnipeg, Man.
S. D'Amours (EG-3) Communications Development Assignment, PRWC, Winnipeg, Man.
A. Rogers (EG-3) Communications Development Assignment, PRWC, Winnipeg, Man.
R.B. Saunders (MT-7) A/Head Transportation Weather Services, AFWC, Downsview, Ont.
G. Bolduc (EG-5) Pres. Tech., WO4, Sherbrooke, P.Q.
Y. Gagnon, (EG-5) Pres. Tech., QAEWR, Dorval, P.Q.
H. Morin (EG-5) Pres. Tech., WO4, Sherbrooke, P.Q.

Transfers

J. Beal (EG-1) Met. Tech., WS3, Cape Parry, N.W.T.
B. MacNaughton (EG-2) Met. Tech., WS3, Edson, Alta.
J. Patterson (EG-4) U/A Tech., WS2, Cambridge Bay, N.W.T.
L. Suddick (EG-6) Inspector, WO4, Thunder Bay, Ont.

H. Earle (EG-6) Met. Tech., WO4, Terrace, B.C.
J. Burrows (EG-2) Met. Tech., WS1, Cape St. James, B.C.
E. Robilliard (EG-2) Met. Tech., Vancouver, B.C.
C. Dicaire (MT-2) Meteorologist, Vancouver, B.C.
R.L. Penner (MT-5) Meteorologist Shift Supervisor, CFFC, Trenton, Ont.
B. Julien (MT-2) Met. Dev. Level, CFFC, Edmonton, Alta.
R. Betournay (EG-1) U/A Tech., WS1, Hall Beach, N.W.T.
R. Pilotte (EG-2) Met. Tech., WS3, Estevan, Sask.
J. Bird (SCY-2) Secretary, PRWC, Winnipeg, Man.
C. Nobert (MT-2) Meteorologist, ARWC, Edmonton, Alta.
L. Sauvé (EG-2) Met. Tech., WS3, Baie Comeau, P.Q.
A. Beauvais (EG-2) Met. Tech., QAEEO, Mirabel, P.Q.
J.M. Couturier (EG-3) U/A Tech., WS3, Churchill Falls, Nfld.
R. McKay (EG-2) Pres. Tech., WS3, Mount Forest, Ont.
W. Whittaker (EG-2) Pres. Tech., WO4, Kingston, Ont.
D. Daignault (MT-2) Meteorologist, OWC, Toronto, Ont.
C. Cox (EG-2) Pres. Tech., WO4, Ottawa, Ont.
S. Silver (MT-3) Meteorologist, PRWC, Winnipeg, Man.
M. Miller (EL-4) Electronics Tech., CAED, Winnipeg, Man.
A. Schmiedel (EG-2) Met. Observer, WS1, Vancouver Harbour, B.C.
D. Sortland (MT-5) Meteorologist, ALWC, Edmonton, Alta.
L. Grahn (EG-5) OIC, WS2, Whitehorse, Y.T.

Secondment

L. Poulin, WO1, Gander, Nfld. ARPX, Downsview, Ont.
Z. Miller, ACPB, Ottawa, Ont. Ice Branch, Ottawa, Ont.

Leave of Absence

C. Mauer, Edmonton, Alta. LWOP.

STAFF CHANGES

Retirements

H.P. Sanderson, ARQA, Downsview, Ont. Dec. 1984.

R.E. Holland, WO4, Pearson Int'l. Airport, Dec. 1984.

W. Wood, WS3, Slave Lake, Alta, Jan. 1985.

S. Supina, WO4, Calgary, Alta. Jan. 1985.

D.J. Cullen, ACSM, Downsview, Ont., Jan. 1985.

L. Lauzon, WS3, Mount Forest, Ont., Jan. 1985.

L.B. Swansburg, ATWC, Bedford, N.S., Jan. 1985.

P. Schkurka, ACPP, Downsview, Ont., Feb. 1985.

W. Robertson, ARWC, Edmonton Alta. March 1985.

Departures

M. Gladish, WO1, Whitehorse, Y.T.

B. Julien, ALWC, Edmonton, Alta.

B. Cowlthorp, WAED, Edmonton, Alta. — P.S.C.

L. Desjardins, PWC, Vancouver, B.C. — C.F.B. Greenwood, N.S.

M. Beebe, WS3, Estevan, Sask.

K. Nagy, WS3, Lansdowne House, Ont.

D. Tidbury, WS1, Eureka, N.W.T. — TCTI.

D. Jordan, WS3, Cape Parry, N.W.T.

Deaths

A.E. Smith, ACSS, Downsview, Ont., March 1985.

L.A. MacNeill, AFDP, Downsview, Ont. April 1985.

March 6

1983 A severe winter storm with large amounts of rain and freezing rain (28 mm) did millions of dollars damage to southern Manitoba. Thick ice on the runways at Winnipeg Int'l A forced the closing of the airport until the 8th; several large TV towers collapsed.

(cont'd from page 12)

the messages will include slogans like "National Parks and the weather service — partners in Canada's heritage," or "Canada's weather service salutes the National Parks."

In addition the new Parks Canada centennial logo will appear on most AES stationery. (See cover of this magazine). Parks brochures are being distributed from all AES regions and in return, many national parks will display a new severe summer weather hints poster or hand out folders on the same topic to visitors who face violent weather in the outdoors.

During 1985 AES will hand out long service awards to parks employees in at least two national parks who have been collecting weather and climate data on a voluntary basis. The stations are located in Prince Albert National Park (Sask.) and Cape Breton Highlands National Park (N.B.).

A national parks system that began with the opening of Banff in the Rockies in 1885 and now includes 29 national parks, 70 historic parks and nine heritage canals across the country represents a priceless heritage for all Canadians.

March 1974

Three records highlighted this month: Vancouver's greatest precipitation total for March (186 mm) and record high sunshine totals at Halifax (214 hr) and Saint John (180 hr).

March 12

1870 The first of 3 major March snowstorms struck southern Ontario with 23 to 63 cm of snow from Hamilton to Markham. A second storm on the 16th dumped 45 to 63 cm, and a third on the 27th, up to 90 cm.

April 18, 1976

The storm on April 3rd and 4th forced 200 weather service employees to stay overnight at the Headquarters of the AES building in Downsview. Blowing and drifting snow blocked all exits from the parking lot.

April 1976

Easter Sunday temperatures soared to 28° in southern Ontario to be followed eight days later by a 10.2-cm blanket of snow and a windchill of -6°.

All in a day's work

A volunteer shipboard observer, singled out by AES for an award as one of 30 top people engaged in this important meteorological work has written a letter of appreciation to the Assistant Deputy Minister.

The correspondence is interesting because it describes the varied and sometimes adventurous lives led by people who perform meteorological observations aboard ship.

G.R. Plummer, a British-born free-roving observer, received "a magnificent book of photographs" for observations made aboard the "Eastern Moon" during 1982. The actual ceremony took place in Vancouver in June 1983 when Mr. Plummer happened to be aboard the "Fjord Thistle", another AES-recruited ship.

He says he originally did weather observations in 1953 at a shore-based naval station in the U.K. His first long term seaboard weather monitoring was with the Union Castle line 1959-63. He then served aboard a British Post Office cable layer and won an Excellence Award in 1966.

Mr. Plummer has also spent considerable periods doing marine work on land. While serving in a Singapore shipping office he supervised weather observations aboard some British ships there, but failed to secure any awards for the crews. Another long spell on *terra firma* was spent at a container terminal in Europe.

Next Plummer went to the Solomon Islands for five years. "There we taught the islanders the rudiments of meteorology, particularly with respect to cyclones, but submitted no observations," he adds. Plummer says he returned to sea in 1979 as an observer on ships reporting to the Hong Kong Met. Office. Then "by chance" he transferred to ships reporting to Canada.

Of late, however, Plummer has been serving on an auxiliary ship. "The ignominy of it all" he writes, "We haven't even got a barograph, that most useful of instruments." He adds that owing to the time zones he hasn't yet made an observation, but ending on a more optimistic note he says, "The forthcoming passage from Brazil to the far East via South Africa will see my signature in the log book again."