November/December 1981

ZEPHYR

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Canada

NEWS

Parliamentary Secretary Simmons visits AES

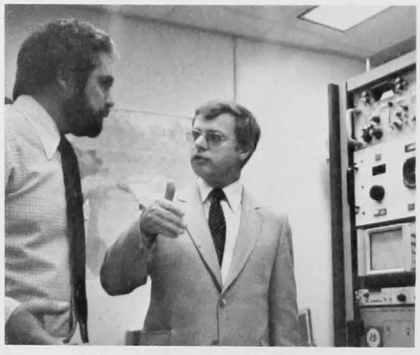
A deep involvement in acid rain and a keen perception of the role of AES in the Canadian government's efforts to combat it was shown by Roger Simmons, Parliamentary Secretary to Environment Minister, John Roberts, and MP for Burin – St. George's, Nfld., when he visited the Downsview location October 1st.

After being met at the airport by Dr. Warren Godson, Director General of the Research Directorate, Mr. Simmons made it clear he was particularly interested in how fallout is related to its source. He was told how a computer model has been developed that makes this possible.

The method of analyzing air samples and the tracks followed by various air pollutants were explained to the visitor by Peter Summers of the LRTAP Scientific Co-ordination office. Dr. Summers told him that while there has been some question about past measurements, there has been no argument about current figures, only about their interpretation.

"This is something I'm glad to hear," said Mr. Simmons, "because the U.S. has been taking pot-shots at our credibility with regard to the Canadian claim that most of our acid rain comes from there."

In addition, Mr. Simmons met Dr. Al Christie for a brief tour of the AES Air Quality research facilities. Finally he was given a tour of the satellite data laboratory by Graeme Morrissey, head of the Aerospace Meteorology Division.



Graeme Morrissey, left, explains some of the operations of the AES satellite data lab to Roger Simmons, MP parliamentary secretary to Environment Minister John Roberts. (Photo by John Lewis)

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Cover: As a forensic climatologist in the AES Ontario Region with some 300 court appearances and 46 homicide cases to his name, Dave Murdoch is no stranger to violence and its instruments. See page 7. (Applied Photo)

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AES merges communications, computing

Because of the interdependence of communications and computing, it has been decided to bring administration of the two functions under one Directorate. Effective October 1, 1981 the Communications Section was transferred from Field Services to Central Services, when it became part of the Computing and Communications Services Branch directed by Dr. Kirk Dawson.

The old communications section of Field Services Directorate (formerly AFFK) is now known as the Communications Management Division and uses the designation of ACPN. The chief, Remo Massaroni, reports to Dr. Dawson.

The Communication Management Division has two main functions: a responsibility for network operations and short term initiatives and assisting in the development of the New Communications System under Bruce Attfield, chief of planning.

Commenting on the reorganization, Dr. Dawson says that communications and data processing now form an integrated system. "In our future Information Systems, a failure in the computer could mean a breakdown in communications, which in turn could mean a breakdown in weather services, unless we plan them properly. Because of this technological integration it makes sense to have communications and computing in the same directorate. In this way a balanced plan can be developed for the New Communications System that meets both today's needs as well as tomorrow's."

One of the strongest backers of the current reorganization was the SPAR Aerospace study into AES communications. Based on this, Larry Campbell, former Director General, AES, Field Services and former Director of Planning, acting on behalf of ADMA, Jim Bruce, made recommendations to senior management on how AES should manage its operational communications system in the next few years.

ADMA's year-end message

In this day and age a government agency must be like Caesar's wife who not only had to be above suspicion, but also *seen* to be above suspicion. In our case, AES must continue to provide improved weather and ice services to Canadians, but we must also be seen to be doing so. This is not a question of self-aggrandizement; rather, it is a matter of effective communication with the special and general publics we serve, modifying our products to be of most value, and in this way maintaining a suitable level of public understanding and support for our programs.

During 1981 we have embarked on some important steps in this direction. A joint Task Force was established with the Radio and TV News Directors' Association to determine how we can work together to provide better weather services to the public. Task Force recommendations will be made shortly to our Minister, the Honourable John Roberts. Several regions now provide Cable-TV weather information for general and specialized users, including those in aviation and agriculture. Better national TV-weather programs are being developed and supported by AES in both French and English. Plans have been made to improve our services, particularly through the media in both official languages, especially to French language communities in Western Canada and the Atlantic, and to English minorities in Quebec.

All of this "marketing" of our services would be of little value if we did not pay increasingly close attention to the quality of the product. This year the senior management of AES has recognized that the least improvement in forecast reliability over the past decade or so, has been in the day-one forecasts. So a special effort in research and development, and in operations, is under way to improve the first-day forecasts and the short-term warnings of severe weather.

On the research front, additional funding has permitted us to consolidate existing programs and increase efforts on weather satellite interpretation techniques, measurements of the life-protecting stratospheric ozone layer, and studies of the long-range transport of airborne pollutants including acid rain and toxic chemicals. These programs, plus expanded work on the carbon dioxide-climate change issue, are putting AES in the forefront of work on the major regional and global environmental problems of our day. Laying the scientific foundation for negotiation of an air quality treaty with the United States is a major responsibility of a number of AES staff members. It has thus been a truly exciting year with many new initiatives, but with an equally strong emphasis on maintaining existing high priority services.

The new year promises to be even more challenging. Major new communications computer, weather radar, satellite readout and ice-observing facilities will be put in place or be in an advanced planning stage. The Canadian Climate Program will be firmly launched. On the management front, we will introduce a more formal work planning process throughout the Service. We are embarking on a major study of the types of personnel AES will require for the next decade to decide upon the training, staff development and recruitment policies we should put in place. And these are only a few of the developments we can foresee for next year.

I look forward to working with you in 1982 to provide even better services to the Canadian public, and in more effective ways. May it be for each of you, a year of useful contributions and of happiness.

Jim Bruce
Assistant Deputy Minister

AES hosts "Chapter meeting" for world climate book

Scientists and climatologists from as far away as New Zealand and Tanzania recently gathered at AES Downsview to discuss chapters of a jointly-authored book they are publishing on the interaction of climate and society.

The meeting, a project of the International Council of Scientific Unions and the Scientific Committee on Problems of the Environment, included presentation and discussion of some 15 chapters over a four-day period.

The Editor, Dr. Robert Kates of the Center for Technology, Environment and Development, Clark University, Massachusetts, commented, "The chapter-by-chapter proceedings are admittedly an unusual way to produce a book, but a volume that aims to make a lasting contribution to the World Climate Impact Program needs maximum opportunities for critical discussion and intra-mural analysis."

The book whose full title is Climate Impact Assessment: Studies of the Interaction of Climate and Society, will be published some time in 1982 by Wiley of New York.

Dr. Kenneth Hare, Provost of Trinity College, University of Toronto, the sole Canadian contributor, gave a presentation on Climate and Climatic Events – Variation and Change, all of which forms the basis of Dr. Hare's particular chapter.

Other "chapter members" came from Mexico, the Federal Republic of Germany, India, Hungary and the United Kingdom.

Host of the meeting on behalf of the Canadian Climate Centre was Dr. Phil Merilees.

Warren Godson urges scientific aid for Third World

Dr. Warren Godson

There is today a "very significant opportunity" for the International Association of Meteorology and Atmospheric Physics (IAMAP) to become involved in support of atmospheric science research in the Third World, and in doing so to complement the activities of the World Meteorological Organization (WMO). This was the opinion of Dr. W.L. Godson, Director General of the AES Research Directorate, expressed in an address in Hamburg, Federal Republic of Germany, in August as president of the IAMAP.

Dr. Godson surveyed atmospheric research and expertise in Third World countries and the involvement of IAMAP. He pointed to an increasing concern for Third World science by the International Council of Scientific Unions (ICSU) within which the Committee for Science and Technology in Developing Countries (COSTED) is the primary focus. Particular attention he said, must be given to geophysics in developing countries.

IAMAP might begin by responding to a request by the International Union of Geodesy and Geophysics (IUGG) to prepare a special monograph on meteorology, he suggested, hopefully with the support of WMO, in order to guide developing countries in programming research, especially that of an applied nature.

He selected a number of topics that could be fruitfully debated at IAMAP assemblies including: educational and research programs; energy problems; environmental protection and WMO activities; the geographical advantages of certain developing countries for particular IAMAP scientific programs; and the technological spin-offs of these activities for Third World countries.

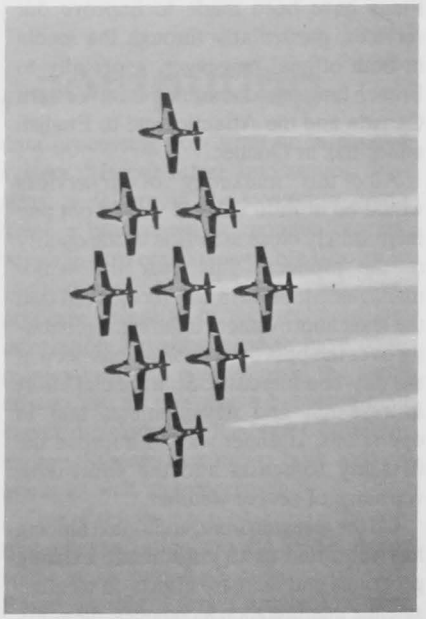
Summing up, Dr. Godson said, "I hope that WMO will recognize the role of IAMAP in fostering scientific development." He then suggested a number of specific actions that IAMAP might take to foster the development of atmospheric research in developing countries, including: holding scientific meetings, symposia, seminars and lecture programs, placing scientists from developing countries on IAMAP commissions and working groups, and encouraging a two-way exchange of senior and junior scientists between developed and developing countries.

Port met officer receives NOAA award

Geoffrey Meek, port meteorological officer, Ontario Region, Atmospheric Environment Service has received a Special Service Award from the U.S. National Oceanic and Atmospheric Administration.

A letter, signed by Richard Hallgren director of the National Weather Service, expresses appreciation for the many significant contributions made by Mr. Meek over the past 15 years. "The Great Lakes weather service provided by our two countries is second to none and a large part of the success of this service can certainly be credited to you because of your personal efforts and dedication," continues the letter.

The National Oceanic and Atmospheric Administration is part of the United States Department of Commerce.



This spectacular picture of the Canadian Armed Forces Snowbirds performing at the Abbotsford B.C. Air Show was taken by AES inspector John Lozanski of Pacific Region. The former Upper Air Technician practices photography as a hobby and has had a great deal of his work accepted for publication. The above photo along with four others were used in the 1980-81 edition of Canada Handbook, published by Statistics Canada.

Even the young plan for retirement

The successful completion in October of two more AES Retirement Planning Seminars has prompted Chris Upton, Training development officer responsible for co-ordinating the courses at Downsview headquarters, to comment on the increased awareness of the need for retirement preparation.

"I can't explain it," said Ms. Upton, who has been running a three times a year program for the past two years, "but even though you have to be at least 45 years of age to attend, I find a lot of younger people getting interested. Perhaps it has something to do with the insecurity of our society."

The two-day courses only accommodate about 25 people but she finds far more than that applying. Those selected to attend are chosen on a points basis, adding years of service to age.

The courses are conducted by Miss Elizabeth Arnott of Staff Relations and Compensation, Environment Canada. Subjects covered include: options and monetary retirement benefits; registered retirement savings plans and other investments; income tax; and "Planning your third career."

"It must be well done," says Ms. Upton, "because we've never had a dissatisfied customer."

She adds that there is no need to call her in advance to arrange a booking because all employees of AES will be circularized when plans for the next course are complete.

Incentive awards

A suggestion calculated to save thousands of dollars per year in the cost of radar targets launched from weather ships on the west coast has resulted in an award of $990 by the Suggestion Award Committee of the Public Service of Canada for eleven AES upper-air technicians. Each received $90 on the recommendation of Dave Phillips, chief of data acquisition for the Pacific Region.

Sharing in the award were: George Livesey, Ronald F. Webber, Dennis H. Engemoen, N. Bruce Middler, Lancelot Mann, Donald Whyte, Philip Hughes, Ole Jacobsen, Bryan J. Webber, Peter Willms, and D.R. Reid.

Suggestion awards are part of the overall Incentive Award Programs which also include merit awards, long-service awards and outstanding-achievement awards.

Love Boat Award

For the sixth consecutive year the P & O cruise ship *Island Princess* has been recognized by the AES for voluntary reporting of weather observations on the high seas. A certificate of achievement was presented to Capt. Philip Jackson by Jack Mathieson, director of the service's Pacific Region. In addition, a book was presented to the ship's library: "Cosmos" by Carl Sagan dealing with the origin of life and matter.

The presentation was made while the 20,000-ton British ship was based in Vancouver for her summer schedule of cruises. The citation expressed departmental appreciation for the "high level of excellence which the ship's officers achieved in conducting a marine weather-observing program under Canadian sponsorship during 1980."

Mr. Mathieson says that due to Canada's limited deep-sea shipping roster, it recruits from 350 to 400 foreign "ships of fortune" annually to take volunteer weather observations, during their voyages. A number of these receive recognition for their contributions to Canada's meteorological program, and use Canadian equipment to make and to send their observations.

The award to the *Island Princess* was a popular one because the ship is the well-known heroine of the TV series "Love Boat" that stars actor Gavin McLeod as captain.

Shown at one of its southern ports of call, the Island Princess has been recognized for the sixth consecutive year for voluntary reporting of weather observations under Canadian auspices.

NEWS

Atlantic racer names Gander – "World's best Weather Office"

A thank you note for efficient information supplied to a Canadian pilot taking part in a recent Paris-New York-Paris race was given prominence on the Gander weather office notice board.

Lucien Cornez of Montreal, flying a Cessna 310, placed 6th among 34 twin-engine planes and wrote an appreciative letter after the race stating: "Our best leg was from Gander to Paris which we flew in 11 hours and 20 minutes, thanks to the absolutely exact wind information we got from your office."

Mr. Cornez continued: "I had been told by many pilots – mainly ferry pilots – that the Gander Weather Office was the best in the world and believe me, from experience, we certainly concur heartily with that judgment."

Stu Porter, the supervising forecaster at Gander, recalls the visit paid by Mr. Cornez before the race. He was one of about a dozen who dropped in to see what information might be available. He attributes the accuracy of the information given Mr. Cornez to his sources, which include ship reports, satellite pictures, the Montreal weather computer and a Russian weather ship located in the Atlantic at 52.5 degrees N and 35.5 degrees W called 'Ocean Station Charlie.'

The Gander weather people took a keen interest in the race, according to Mr. Porter. "We were especially interested in one brave soul who flew from New York to Paris on one engine. As far as we know he made it."

As a result of taking part in a major international experiment in the northeast Pacific 18 months ago, the Canadian Weathership CCGS Vancouver *has had a special plaque struck in its honor. The experiment, known as STREX (Storm Transfer and Response Experiment) sought to obtain a better understanding of the physical processes of the boundary layers of the atmosphere and ocean in mid-latitude storms. Special observational programs were conducted from ships, aircraft and buoys over a two month period. The major shipboard programs were carried out on the* Vancouver, *NOAA's Oceanographer and the Institute of Ocean Science Vessel* Parizeau. *In the picture Jack Mathieson (left), director AES Pacific Region presents the plaque struck by the Executive Committee of STREX, to Captain John Strand of the* Vancouver.

Jack McConkey retires

Jack McConkey, regional communications officer, Ontario region retired October 30 after 44 years of service. He joined the weather service as a typist in 1937 earning the princely sum of $720 a year. He was employed at Malton airport in October 1939, and applied for service with the RCAF during the Second World War. He was turned down, however, because teletypists were then needed as essential workers on civilian weather stations.

After becoming a teletype inspector in 1957, he assumed his present position in October 1968. He was married in May 1943.

A retirement ceremony was held in Mr. McConkey's honor at the AES Downsview cafeteria. About 60 people attended including regional director, George McPherson. Mr. McConkey received a watch as a farewell gift from his colleagues. He was also allowed to keep his old office typewriter.

Brian Pulley

Only nine months before his scheduled retirement from A.E.S. Brian Pulley passed away on September 20, 1981. A technician with Technical Services "I" Program, he had worked in the atmospheric instruments shop since 1962. Before that he was with Canadian Arsenals (Toronto) for 11 years. He was a veteran of the Second World War.

Mr. Pulley's wife died in 1979. He leaves two daughters and a son.

The climatologist in the criminal court

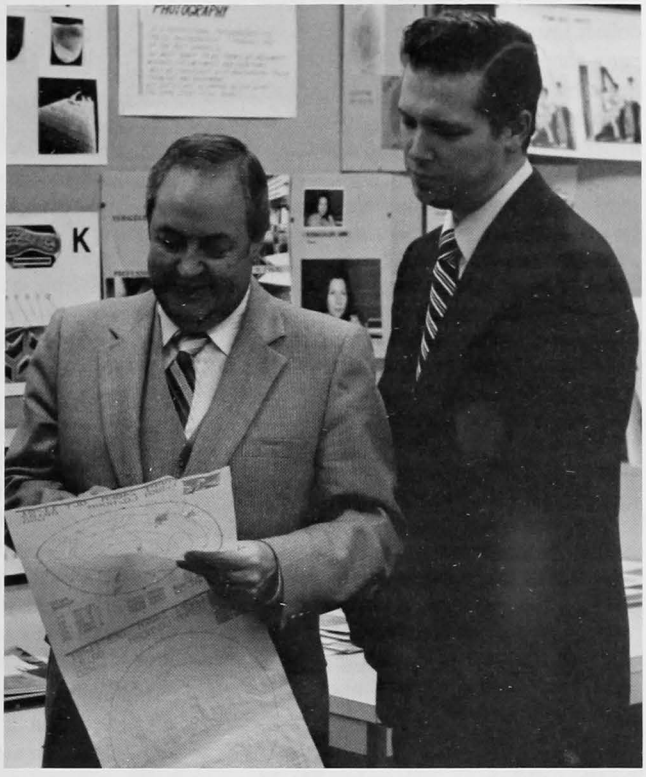
In Brantford, Ont., a man was convicted of killing his stepdaughter, in Sudbury a motorist was fined $1,000 for attempting to pervert the course of justice, in Cobourg a plane crash that killed all six occupants was blamed on the obstinacy of the pilot and in Toronto, Peter Demeter was convicted of arranging for the murder of his wife. In each case and many more, a climatologist played a part.

Dave Murdoch, whose office is located in the Ontario Weather Centre at the Toronto Airport has a rare and sometimes exciting job. He is a forensic climatologist. This means that he spends a good part of his time in court. Fortunately not all though, since some court authorities merely require him to send certified documents to their offices rather than testify under oath.

Mr. Murdoch, who has been with AES and its predecessors for 28 years, specializes in criminal cases that require legal verification as to past weather. Civil cases in the region are handled by a 31-year-veteran, Tom Moyer, the head climatologist at the Ontario Climatological Centre. Mr. Murdoch also handles inquests and enquiries and occasionally assists Mr. Moyer with civil cases.

It was a simple-enough murder case that persuaded police to take Mr. Murdoch under their wing and give him specialized training. A Jamaican maid was found dead in a Toronto park on the night of a rainshower. She had been murdered, and in her purse was found a folded rainhat, still wet on the inside. This was enough to convince a pathologist that she was alive when the rain ended and it gave him important information on the timing of the crime. It was Mr. Murdoch's task to determine the time and place of the rainshower. Armed with this data, police were able to question people in the area about suspicious occurrences, and the murderer was arrested almost immediately.

In fact, police were so impressed, they decided to go to AES for forensic information whenever climate was involved. In Ontario region this meant consulting Dave Murdoch.



Mr. Murdoch is the first person in Canada to teach forensic climatology at a police college. Here he is seen showing a weather radar map to Inspector Elgin Austin of the London Police Department.

"That was in 1973," he recalls. "Until then the witness who had to appear in court was usually someone from the weather office who lacked the ability, or the experience, to spot a process-server coming across the tarmac – or the one who was conscientious enough to give his name to the police or to a lawyer."

This obviously wasn't fair either to AES or the law. Mr. Murdoch had abundant expertise, rounded out by police training and he was ultra-conscientious, so he fell naturally into the job.

Addressed Harvard associates

It's been hard work, but he must enjoy it because he supplements his court chores with frequent speeches before various groups, such as police, lawyers' and research organizations, and teaches courses at police colleges. A highlight of his career was being asked to address the august Harvard Associates in Police Science, meeting for the first time in Canada on the new subject of Forensic Climatology. "It was quite something to find myself with other guests such as the Governor General and the Chief Justice of Ontario," says Mr. Murdoch.

Messrs. Moyer and Murdoch have collegues who do similar work in other provinces, on a part time basis, but they are much less experienced in court work. In fact Mr. Murdoch is the only climatologist in Canada specializing in criminal cases.

Not every case makes news, but all of them require careful searches into climatological records, maps and satellite pictures, so that when Mr. Murdoch gives evidence in court, he does not have to back down under cross-examination, which is sometimes fierce.

The Demeter case was just one of the murder trials at which he has testified, but probably the most notorious. Mr. Murdoch's

role was a minor one. On the day of the murder, Demeter had told his gardener not to come to the house that evening because heavy rain was forecast. Mr. Murdoch was called to testify that the forecast that day was for good weather, which helped convince the jury that Demeter had carefully planned the murder.

A less spectacular case involved a snowmobiler who was frustrated in his effort to collect insurance when the insurance company charged him with deliberately setting fire to his cottage. The man claimed that his snowmobile had accidentally caught fire in a shed and the fire spread to the cottage. But Mr. Murdoch showed that, if this were true, sparks from the shed would have had to fly 63 metres on a very windy day – upwind.

In an incident where no crime was involved, the crash of a light plane near Cobourg in 1980, in which six were killed, was explained when Mr. Murdoch testified at the inquest that advisory warnings of fog, rain and low clouds had been given out before the pilot took off from Trenton to reach a ploughing match near Chatham. This enabled the Coroner to declare that the dead pilot had been negligent.

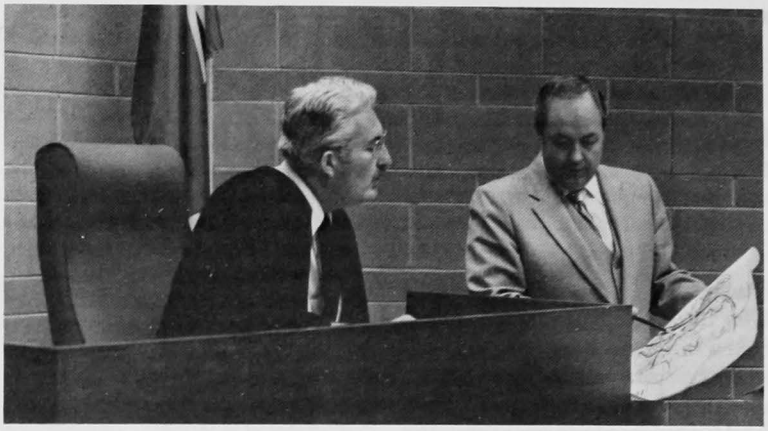
Helped convict child killer

A much more complex case resulted in the conviction of a man for killing his eight-year-old stepdaughter. There was a four-day search leading to discovery of the girl's body in a snowbank. Meanwhile Mr. Murdoch had supplied exact weather information to an expert on hypothermia that enabled him to determine the time of death, for which the killer had no alibi. Comments our forensic expert "I was proud of my involvement in the case. The Crown Attorney told me, that without my particular sort of expertise, the murderer would undoubtedly still be walking around free."

It is not always on the side of the prosecution that Mr. Murdoch testifies. Once he was able to help free a man accused of breaking into the home of a woman who claimed she could identify him because she had seen his face clearly in the moonlight. But there was no moon that night.

"We don't deal in opinion," says Mr. Murdoch, "so it's hard for our evidence to be refuted. We deal mainly in facts – but of course, our opinion is sometimes solicited, and it is presented as such."

Most of the cases involve simple accidents, but meticulous work has to be done to find if there was rain, fog, or freezing precipitation at some road intersection at a certain time on a certain day.



Dave Murdoch is often seen in this pose in the courtroom explaining an expert point to the judge. Actually this is an Aylmer, Ont. Police College simulation with Course Director Harold Tuthill playing the role of his honor.

A suspicious circumstance occurred when three young American women ran into heavy weather and were drowned while canoeing in Georgian Bay.

One of their two canoes with their personal effects could not be found, and police suspected foul play. Mr. Murdoch's expertise was solicited. He studied the winds and the probable currents and told police where the canoe should be found. It was, and the coroner decided that an inquest was not necessary.

One case involved the Ontario Ministry of Natural Resources when a gamewarden suspected that a certain deer had been shot out of season. "We were able to prove it had," says Mr. Murdoch. "The hunters had left the deer hide behind their house, and it was covered with snow. There hadn't been any snow from the time the season had opened."

In another non-criminal affair the culprit was not one but many unsuspecting citizens. A few years ago, in the fall, forestry people asked if Murdoch could possibly find out why there were so many fires across the top of Georgian Bay, between Sudbury and Sault Ste. Marie. Was it because of thunderstorms? No. The weather was fine and summery. Adds Mr. Murdoch: "After further checking, we called in a couple of other ministries and finally we had the answer: it was the beautiful leaves on the trees that were causing the problem!"

"People would be driving along No. 17 Highway staring at the magnificent scenery from the bridges and they'd see a valley full of trees with colorful leaves, and they'd say, "Isn't that beautiful? Let's get some pictures." So they would park their cars at the side of the road, go back and take pictures. Often where they pulled over, there would be tall grass, which would be heated up fiercely by the vehicles' catalytic heaters operating at 700 degrees C. The cars would drive away and the wind would whip the smouldering grass into flame."

An odd case involved a mailman suspected of stealing letters. A quantity was actually found in his home, but he claimed he had just taken them home to dry them out because they had been rained on in his bag. "But," says Mr. Murdoch, "we proved that there had been no rain around his area for several days before or after the postmarked date on the letters."

Satellite picture clinched case

Then there was the occasion when, probably for the first time, a satellite picture was used to clinch a case. It involved a Sudbury motorist, accused of failing to stop at a stop sign. In court he produced a picture which, he said, was taken just after the alleged infraction, showing that the sign had been knocked down. Consequently, he could not have known he should stop.

Mr. Murdoch was called in to testify about the weather, and he was able to produce a satellite picture for the day and time of the offence. It showed that the sky over Sudbury was cloudless. The motorist's picture showed an overcast sky, but later he confessed he took the photo five days later.

Even after a lengthy interview, Mr. Murdoch confesses that he has only brushed the surface of his many and varied experiences which have included 300 court appearances in eight years and involvement in 46 homicides. □

SEASAT inspired new ocean weather probes

by Steven Peteherych

The fact that AES is now participating in major new remote sensing experiments with the NASA/Goddard Space Flight Center in Washington D.C., the Jet Propulsion Laboratory in Los Angeles and UCLA is largely due to Environment Canada's previous involvement in the SEASAT-A project four years ago.

When SEASAT was launched in June 1978, its importance for climate and weather observation was not at first appreciated. The objective was to demonstrate how remote sensing of the oceans could be carried out from space. Living up to its promise as possibly the most sophisticated civilian satellite ever to go into orbit, it produced about 100 days of extremely high quality data until a power failure cut short its life.

Despite its brief operating period, SEASAT must be considered a success as far as AES is concerned. The Canadian service made a major contribution to the U.S.-organized mission. Canadian weather ships (Ocean Station PAPA in the North Pacific) selected special data at SEASAT overpass times for the duration of the mission. The data were used to evaluate performance of the satellite's instruments after completion of the project.

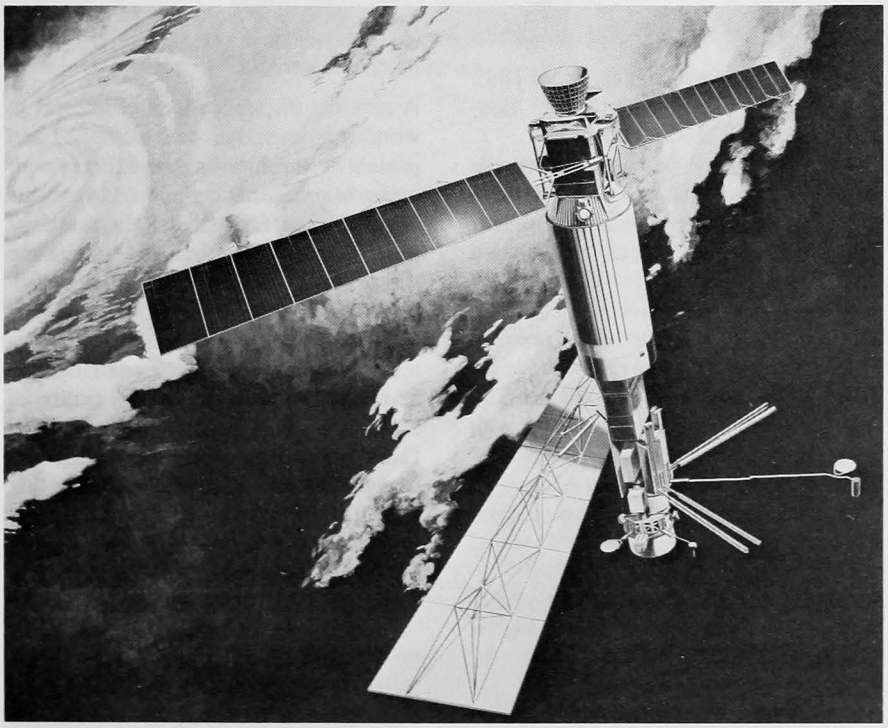
Evaluation is now sufficiently advanced to conclude that overall mission objectives were successful: the sensors worked and made the measurements they were designed for. Future efforts will be directed at assessing the value of these new data, primarily for weather forecasting.

The new joint U.S.-Canadian remote sensing project will be an effort by all participants to assess the impact of SEASAT measured ocean winds on weather forecasting. The experiment will begin in early 1982 and be completed by mid-year.

Looking back at SEASAT, it will be remembered there were four microwave instruments aboard: a Scatterometer, an Altimeter, a Passive Microwave Radiometer and the Synthetic Aperture Radar (SAR).

Had anyone suggested ten years ago that one could make ocean surface wind speed and direction measurements from space with the accuracy required for weather forecasting, they would not have been taken seriously. With its 95% coverage of the ocean every three days, that is precisely what the Scatterometer can do. Major meteorological phenomena can now be pinpointed and their physical characteristics finely defined. For example, SEASAT wind data can reveal the onset of storms sooner than conventional observations.

The Altimeter is a radar that can make measurements of the earth's shape and wave height. It can measure the shape of the earth to an accuracy of about 10cm and ocean wave height to 50 cm. These measurements can be used in a variety of ways. For example they can determine the size of ocean waves, monitor tides and assess ocean swell over the entire globe twice per day. They can detect small ocean eddies and currents. Combining altimeter data with measurements of ocean density would permit the operation of ocean circulation models much like the



SEASAT-A

present atmospheric (weather) circulation models.

The passive microwave radiometer (PMR) has five frequencies, each designed to be sensitive to different characteristics of land, ocean and atmosphere. It can measure sea surface temperature and water vapor and provide ice and snow information.

The Synthetic Apertive Radar (SAR) is the most sophisticated and complex instrument on the spacecraft. It can produce all-weather pictures of the earth to the order of 7 x 20 metres. This is adequate to detect objects such as ships and oil rigs. It has little value for studying the atmosphere, but has tremendous possibilities for observing land, ice and oceans. The data has to undergo time consuming mathematical computation before a picture can be produced. This, along with the fact that it generates about 6,000 times more data for the same area that a NOAA polar orbiting satellite, makes it very costly to use operationally.

Ocean currents carry heat from the equator to northern latitudes. This energy is released to the atmosphere affecting weather and climate. Mainly two types of observations are required to better understand this interaction between ocean and atmosphere. They are the energy transfer at the ocean surface which determines the amount and rate at which energy is released to the atmosphere, and ocean winds, which drive ocean currents, which in turn carry energy northward. Good measurements of ocean winds and sea surface temperatures are essential for a better understanding of how oceans affect weather and climate.

Our understanding of the atmosphere is continuing to improve. This coupled with increasing computer power will lead to the development of atmospheric models which more closely describe the real behavior of the atmosphere. Conventional observations cannot supply the data that will be required for these models. Satellites, on the other hand, do offer a solution to this problem. □

Dr. Peteherych is a research scientist with the Aerospace Meteorology Division of AES.

For fast pay use alpha characters C.O.D.

It isn't easy being a regional chief of Administrative Services. Mervin Tinck who does this job for the AES Pacific Region was recently involved in the "simple" task of supplying $37 worth of photocopy material to the United States Air Force. On submitting his invoice, he received this reply from a Department of Defense official in Cleveland, Ohio:

Gentlemen:

Attached is your invoice number 1892 for $37.80 (Can.) submitted under Contract Number F24604-81-P1335.

We are unable to process your invoice for payment without it being annotated with the applicable shipment number. The shipment number can be obtained from Block 2 of the corresponding Material Inspection and Receiving Report, DD Form 250. Submission of a Form DD 250 is always required when DAR Clause 7-104.62 is cited in the contract. The shipment number will be constructed with seven positions, the first three alpha characters and the last four numerics; e.g., RHN0001. If the shipment is a final shipment, a "Z" character must be added after the numerics; i.e., RHN001Z.

Certain contracts allow the "Fast Pay" procedures under which the requirement for submission of DD Form 250 may be waived. If your contract falls under this category, DAR Clause 7-104.84 will be cited in the contract. However, it is still required that you assign a shipment number to your invoice, constructed as indicated above. In addition, the invoice must bear the legend "Fast Pay – No DD Form 250 Prepared" where it will be clearly visible.

After complying with all of the above, submit your invoice to the payment office cited in your contract.

If you have any questions concerning this matter, please contact the undersigned at (216) 522-5190.

Comments an exhausted Mr. Tinck, "next time we'll have them pay C.O.D." □

WOMEN ON THE MOVE

A new list of publications of interest to working women, has been compiled and posted by the Downsview Library staff under Mary Skinner, chief of library services division. The list, updating one done in 1978, lists 19 books and 11 magazine articles, all concerned with upwardly mobile women and their particular problems.

The list was assembled, from library materials, by a summer student, Huguette Ross, a graduate of the University of Montreal, under the direction of Miss Lilita Stripnieks, reference librarian at Downsview. Miss Stripnieks explains that the list was inspired by the Equal Opportunities for Women Committee "which is promoting management training for women."

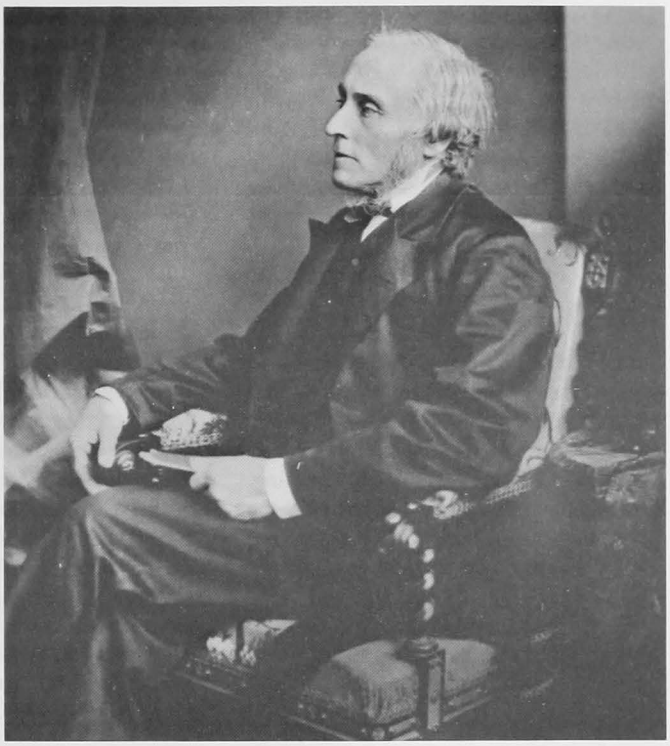
Miss Skinner, who has been with AES for 34 years, says she has seen considerable improvement in the situation for women during that time. "When I came in I was the highest paid woman on the staff," she says. "Now there are numerous professional women and others in scientific disciplines."

The books and articles, all available through the AES library system, primarily give advice on how women can progress into management positions.

Christine Stuart, acting head of facilities management at Downsview, spent some time on the EOW steering committee and believes such publications a help to give women "strategy ideas and attitudes." Herself an example of "Women on the move," having been promoted to her present position a year ago from telecommunications, Ms. Stuart maintains, "Women have to work hard to have a high profile, and they often need a confidence boost as well as ideas on how to start towards a better position. Publications like these can help them to channel their energies."

The first meteorologist. . . cave-man or scientist?

Cave-man



Professor George Kingston.

Who was the first meteorologist? It is doubtful AES staff are losing much sleep over the matter; but for Fouad Fanaki it is different. At work he is a research scientist with the Atmospheric Dispersion Division and during his leisure he is a painter – president of Thornhill, Ontario village artists.

Sometimes his job requires him to give illustrated talks on some very up-to-date subjects such as acid rain or disposal of industrial wastes from nuclear plants. And for these he believes in starting at the beginning. That is how he dreamed up his cave-man drawing: The First Meteorologist.

"It is a primitive, universal idea," says Dr. Fanaki, "an attempt to show early man's fear of the elements." Had he continued his international thinking, he might have added that the ancient Babylonians, Hebrews, Romans and Greeks laid the foundations of modern weather forecasting, even if their methods were sometimes 180 degrees off course.

From a Canadian viewpoint the question alters. The first meteorologist was certainly an Indian or an Inuit. His name, tribe and modus operandi are now totally forgotten, but he was likely a shaman or medicine man. His main weather work was probably rainmaking, not forecasting. But before trying magic to end a drought, he must have been pretty certain it was going to rain anyway. He *had* to be a meteorologist to preserve his credibility.

Most Canadians would seek their first meteorologist in the modern, scientific era. Morley Thomas, Director General of the Canadian Climate Centre, says Canada's first official observatory was set up in Toronto in 1840 under Lieut. C.J.P. Riddell of the Royal Artillery, but he feels Col. Edward Sabine, superintendent of the British Government's world wide observatory system should not be left out. In fact he was the "grandfather of Canadian meteorology." Mr. Thomas's nomination for the title of Canada's first meteorologist goes to Professor George Kingston, who in 1855 was named director of Toronto observatory. For the next 15 years he sparked weather observing all over eastern Canada (even suggesting the use of the electric telegraph for predicting storms). Adds Mr. Thomas, "His background, work and possible lobbying with the government led to a Privy Council authorization of $5000 expenditure. May 1, 1871 saw the true beginning of the federal meteorological service, later to become the Atmospheric Environment Service." □

FEATURES

BOOK REVIEW

Lightning and its Spectrum – An Atlas of Photographs

By L.E. Salanave,
University of Arizona Press,
Tucson, AZ., U.S.A.,
1980. 136 pages
Price: U.S. $25.00 (clothbound).

by Dr. S. Bhartendu

Dr. Leon Salanave, an American scientist well known for his contributions to lightning optics, has produced the first atlas of its kind on lightning. It is an outstanding collection of more than 100 photographs of lightning and its spectra.

The book begins with a chapter on the environment of lightning, that is, clouds. Every observer in the field knows that it is cumulonimbus clouds – large, cauliflower-type clouds with an anvil top – that produce lightning. What may not be widely known, however, is that clouds of volcanic eruptions also give rise to lightning. Dr. Salanave has presented not only the photos of these two cloud systems but also of lightning displays accompanying them.

The second chapter illustrates familiar types of lightning, including magnificent pictures of lightning, from cloud to ground, from one cloud to another, from within the same cloud and from cloud to clear air (air discharge).

Also illustrated are displays of lightning occurring with spacecraft like Apollo 12. The reader will enjoy the beautiful pictures of streak lightning to flat ground, mountains and water, as well as of some air discharges with sheet lightning in the background.

Spectacular pictures of lightning with volcanic eruptions and thermonuclear explosions are presented in Chapter Three. There are several pictures of bead lightning, but none of ball lightning since Dr. Salanave feels that no authentic picture of such a type exists. Convincing evidence that ribbon lightning is due to the effect of crosswinds is presented.

Time-resolved photographs of special forms like continuing current strokes and the tortuous structure of lightning are presented in Chapters Four and Five. Continuing current strokes are those in which electrical current flows and luminosity persists for a relatively long period of time. These allegedly cause forest fires.

Of particular interest to specialists are the lightning spectra presented in Chapter Six. From the first slit spectrum obtained in 1917 to the first fast-time resolution slitless spectrum obtained in 1965, many interesting spectra are illustrated.

Chapter Seven is of interest to all readers, presenting spectacular views of lightning striking a tree and lightning strikes and splatters over the ground. In one instance, lightning had struck a golf course and created a natural Lichtenberg figure (a measure of the electrical current) by scorching the grass – an unusual phenomenon.

The book concludes with a brief glossary of terms and 46 references. Many useful hints on how to photograph different types of lightning and where to get specialized information are provided throughout the text.

This atlas of black-and-white photographs is well worth the price. It will likely remain the only source of spectacular photographs of usual and unusual lightning events for some years to come.

Dr. Bhartendu is a project meteorologist in the Scientific Services Division, Ontario Weather Office, Toronto.

One man's wit aids francophone recruitment

Until two years ago, Normand Guérin did administrative work as OIC, Dorval Weather Office, Montreal. Then for about one year he was assigned to Western Region to participate in a bicultural exchange program. The "cross-cultural" experience so opened Mr. Guérin's eyes, that when the job of recruitment officer for AES francophone technicians outside Quebec came up in 1981, he was considered a natural for the post.

Returning to his home base of Montreal, but working out of Field Services Directorate in Downsview, Mr. Guérin started a whirlwind "door-to-door" Odyssey of more than 60 francophone high schools in four provinces.

Reaching nearly 2000 teenage students in six months, he managed to hand out some 150 application forms leading to eventual hiring of some 16 new recruits, despite the fact that the program was unfamiliar and largely improvised.

Above all he is noted for his bright, informative school presentations, given to just about anyone who will listen. "I may not have received a totally positive response" he says "but at least I have made AES and its bilingual career possibilities known to a large number of schools. This means I will be able to go back next year and obtain many more serious enquiries." He adds that interest has grown since he has been mounting an attractive portable display in school lobbies.

Mr. Guérin's style has been praised by Jim McCulloch, Director General of Field Services, who says he has "a delightfully light and breezy manner of expressing himself." Sometimes the "breeziness" comes out in reports to his Supervisor, Don Barrett. For example he wrote last August at the beginning of the school year: "We are once more at the time of year when children are looking sad and parents happy. I personally feel happy since I will hit the road again to have a wonderful time in exotic places, eat in the very finest restaurants (like school cafeterias) and spend the money I had saved for a summer holiday."

Pointing out the hectic pace of his tours, Mr. Guérin wrote from New Brunswick: "From March 9 to 26, we drove 2600km. I visited 14 schools, made 23 presentations averaging 50 minutes each and I talked to more than 750 grade 11 and 12 students." It was tiring work all right, and in the next paragraph he added: "It's now way past my bed-time and I just cannot think of anything else to say. YAWN! . . ZZ! . . ZZZ! . . ZZZZ!"

His reports also contain colorful asides. For instance: "During this five month period, I have been in huge-modern-glass-covered-cold 'monster' factories, in smaller-warmer-inviting-humanizing institutions (a majority) and in small-decrepit country schools."

Occasionally he is critical of school staff: "I came upon a Jack-in-the-Box counsellor who told me I was supposed to come tomorrow the fifth. I pointed out *today* was the fifth. 'O.K.', he conceded, 'but you are too early. The students won't be ready until 2:30.' I had come at 1:30 as he had asked me."

Referring to an AES questionnaire, answered by 1316 non-Quebec francophone students, he says it is not surprising that 81% said they had never heard of a Met Tech career. "We never really made an effort to supply schools with information," he adds. "There is very little information on meteorological careers. Students only know about them through watching TV weathermen. Many believe it is all map analysis and 'boring' scientific work." Another problem was finding students who had the required background in Physics.

One potential snag did not loom as large as expected: only 13% of the respondents said they opposed working in isolated stations. Comments Mr. Guérin, "I broached the isolation question early in my talks. If the students were still with me after hearing about Arctic alienation, I knew they were *really* interested."

Concludes Mr. Guérin, "I enjoy the work immensely and want to continue making contacts and arousing interest among francophone students, teachers and guidance counsellors for several more seasons. It is a welcome change from being an OIC."

Adds Jim McCulloch, "Normand Guérin has made an excellent start and learned many lessons for the future. He deserves a great deal of credit for the way in which he handled a very difficult task, much of it on instinct alone."

Normand Guérin stands by the portable display unit which he uses to illustrate a met tech's career while on his francophone recruiting drives in French schools across Canada.

But he warns that in the area of francophone recruiting, the institutional and attitudinal barriers are large. "Even with the best of intentions and conscientiousness, it is difficult to move mountains."

According to a recent AES Status Report on official languages, stated goals for francophone representation by 1985 were either an increase of 17 francophones per year or 20 percent francophone participation. □

STAFF CHANGES

Promotions/ Appointments

R. Bedard (EG-1) Observer, QAEOO, Dorval, P.Q.

G. Bolduc (EG-1) Observer, QAEOO, Dorval, P.Q.

A. Bouchard (EG-1) Observer, QAEOO, Chibougamau, P.Q.

G. Brien (EG-3) Observer, QAEOU, Kuujuaq, P.Q.

J. Cantin (ST-OCE3) Word Processor Operator, AAG, Downsview, Ont.

J.M. Couturier (EG-1) Observer, QAEOO, Chibougamau, P.Q.

R. Desjardins (EG-3) Observer, QAEOU, Inoucdjouac, P.Q.

J. Dublin (MT-6) Meteorologist, SSU, Fredericton, N.B.

P. Dupre (EG-7) Supervisor, QAEOI, Quebec, P.Q.

L. Feldman (MT-7) Meteorologist, CMC, Dorval, P.Q.

A.B. Ferguson (EG-6) Pres. Tech. WO4, Halifax Int'l. Airport, N.S.

F. Gagnon (EG-1) Observer, QAEOO, Baie Comeau, P.Q.

K. Gatchel (EG) U/A Tech. WS1, Trout Lake, Ont.

N. Gendron (EG-1) Observer, QAEOO, Mirabel, P.Q.

M. Gladish (EG-5) Pres. Tech. W01, Whitehorse, Y.T.

T.R. Gurdebeke (EG-4) Officer-in-Charge, WS4, Island Lake, Man.

W. Hartman (MT-5) Meteorologist, Alberta Weather Centre, Edmonton, Alta.

A. Henry (EG-3) Observer, QAEOU, Inoucdjouac, P.Q.

Y. Heroux (EG-4) Officer-in-Charge, QAEOO, Clyde River, P.Q.

E.N.E. Holmberg (EG-5) Pres. Tech. W01, Whitehorse, Y.T.

B.S. Hunter (CS-1) Computer Apps. Programmer, Atlantic W.C. Bedford, N.S.

C. Hunter (SCY-2) Secretary, ADED, Ottawa, Ont.

S. Iqbal (EG-6) Res. Tech. ARQT, Downsview, Ont.

A.R. Kellie (MT-7) Meteorologist, CMC, Dorval, P.Q.

L. Lamontagne (EG-3) Observer, QAEOU, Maniwaki, P.Q.

G. Leger (EG-1) Observer, QAEOO, Ste-Agathe, P.Q.

C.J. MacLeod (EG-4) Data Processor, MAED, Bedford, N.S.

S. Martin (EG-1) Observer, QAEOO, Ste-Agathe, P.Q.

S. Melnichuk (EG-7) Res. Tech. ARQT, Downsview, Ont.

STAFF CHANGES

J.L. Pare (EG-3) Observer, QAEOU, Nitchequon, P.Q.
A. Patoine (MT-3) Meteorologist, Quebec W.C. P.Q.
Y. Pedneault (EG-1) Observer, QAEOO, Mirabel, P.Q.
R. Samson (EG-3) Observer, QAEOU, Kuujuaq, P.Q.
R. Street (MT-5) Meteorologist; CCAI, Downsview, Ont.
R. Trafford (CS-2) Programmer Analyst, ARMS, Downsview, Ont.
D. Yates (CS-2) Systems Analyst, W01, Whitehorse, Y.T.

Transfers

D. Aguilar (EG-6) Pres. Tech. Forbisher Bay, N.W.T.
M. Bartzcak (EG-6) Pres. Tech. Dorval, P.Q.
K.A. Bishop (CR-4) Clerk, OAED, Toronto, Ont.
M. Boucher (EG-1) Observer, QAEOO, Mirabel, P.Q.
F.R. Bowkett (MT-8) Meteorologist, AFDH, Downsview, Ont.
G. Chartier (EG-6) Instructor, TCTI, Cornwall, Ont.
D.K. Clark (MT-2) Meteorologist, METOC, Halifax, N.S.
M.D. Conner (CR-3) Clerk, AAG, Downsview, Ont.
R. Gagnon (MT-7) Meteorologist, AFWC, Downsview, Ont.
R. Gillis (EG-6) Officer-in-Charge, Cambridge Bay, N.W.T.
M.C. Howe (EG-5) Pres. Tech. W04, St. John's, Nfld.
R.O. Martinson (EG-6) Officer-in-Charge, Banff, Alta.
D. Matthews (EG-7) Officer-in-Charge, WO4, Moncton, N.B.
D. McDuff (CR-4) Clerk, QAED, St. Laurent, P.Q.
M. Mondoux (EG-7) Officer-in-Charge, Frobisher Bay, N.W.T.
D.D. Morrison (EG-3) Sable Island, N.S.
D. Munson (EG-2) Met. Tech. WS3, Ft. McMurray, Alta.
G. Racicot (EG-1) Observer, QAEOO, Chibougamau, P.Q.
W.G. Richards (MT-3) Meteorologist, WO, Bedford, N.S.
S. Ricketts (MT-4) Meteorologist, W01, Whitehorse, Y.T.
S. Roy (MT-2) Meteorologist, QAED, St. Laurent, P.Q.
K. Schasmin (CR-3) Clerk, AAG, Downsview, Ont.
D.C. Watt (EG-5) Whitehorse, Y.T.

Temporary or Acting Positions

G. Black (IS-3) Communications Advisor, ID, Downsview, (Ont.)
S. Checkwitch (MT-8) Meteorologist, Chief, WAEW, Edmonton, Alta.
K.M. Currie (AS-1) Admin. Officer, ACSM, Downsview, Ont.
P. Dubreuil (MT-6) MOP Project, Downsview, Ont.
M. Forbes (EG-6) Pres. Tech. Moncton, N.B.
J. Gaudet (EG-6) Pres. Tech. W04, Moncton, N.B.
W. Hart (MT-5) Meteorologist, ADEC, Downsview, Ont.
F. Herfst (MT-7) Meteorologist, ADEC, Downsview, Ont.
K. Loogman (ST-SCY4) Secretary, ADMA, Downsview, Ont.
L. Marier (SCY-3) Secretary, ADED, Ottawa, Ont.
L. Mason (ST-OCE-2) Equip. Op. AFDH, Downsview, Ont.
N. Meadows (MT-7) Meteorologist, Officer-in-Charge, Alberta W.C. Edmonton, Alta.
L. Pepin (SCY-3) Secretary, AABD, Downsview, Ont.
L.A. Sarracini (CR-4) Clerk, AFDH, Downsview, Ont.
P. Shalapata (EG-7) Tech. Officer, AFOC, Downsview, Ont.

Departures from AES

L. Armstrong, CCAS, Downsview, Ont.
S. Beswetherick, WS3, Slave Lake, Atla.
M. Blakeman, WS3, Edson, Alta.
H. Bouffard, Forecast Ops. Edmonton, Alta. to W.W. Cross Institute, Edmonton, Alta.
K. Cambell, Forecast Operations, Edmonton, Alta. to private business
J. Dmytriw, AFOC, Downsview, Ont. to DND Winnipeg.
D. Fulcher, WS3, Edson, Alta.
H. Humber, ADED, Ottawa, Ont. to Finance & Admin., Environment Canada
B. Kinsmen, WS3, Ft. McMurray, Alta.
R. Legault, CMC, Dorval, P.Q. to EPS, Montreal.
G. Lemieux, CMC, Dorval, P.Q.
P. Leroux, CMC, Dorval, P.Q.
B. Major, CMC, Dorval, P.Q. to Indian Affairs, Montreal.
K. McDonnell, Arctic W.C. Edmonton, Alta.
G. Montigny, AFFC, Downsview, Ont. to DND, Ottawa, Ont.
S. Overwater, WAED, Edmonton, Alta. to DND Edmonton, Alta.
E. Pollock, AAG, Downsview, Ont. to Transport Canada.
P.L. Proulx, CMC, Dorval, P.Q. to Hydro Quebec.
K. Roth, WS1, Sachs Harbour, N.W.T.
G. Seymour, WAED, Edmonton, Alta. to Parks Canada, Calgary, Alta.
A. Tremblay, Cloud Physics, Downsview, Ont. to McGill University
P. Turmel, QAEA, to Public Service Commission.
N. Vandal, QAEA, to Frobisher Bay, N.W.T.

Retirements

C.J.R. Bernst, WS4, Kindersley, Sask. November 30, 1981.
H. Bredo, Hydrometeorological Office, Calgary, Atla. September, 1981.
V. Droine, WS3, Slave Lake, Alta. September, 1981.
L.W. Hubbert, CMC, Dorval, P.Q. October, 1981.
E.G. Martin, MAED, Bedford, N.S.
J. McCabe, Alberta W.C. Edmonton, Alta. October, 1981.
J.E. McMullen, CMC, Dorval, P.Q. November, 1981.
D.E. Page, CMC, Dorval, P.Q. December, 1981.
J.W. Ring, CMC, Dorval, P.Q. December, 1981.
R. Waddell, W04, Edmonton Int'l. Airport, October, 1981.

Deaths

J. Peach, W04, Gander, Nfld. September 30, 1981.
M.J. Perry, W04, Moncton, N.B. August 12, 1981.
B.E. Pulley, ACSS, Downsview, Ont. September, 1981.

Abbreviations used are:

MT –	meteorologist
EG –	engineering & scientific support
SE-RES –	research scientist
PC –	physical scientist
ES –	economist, sociologist, or statistician
SX –	senior executive
DA-PRO –	data processing
EL –	electronics technologist
ENG –	engineer
GL-VHE	general trades
ST –	secretary
FI –	financial officer