

May/June 1981

# ZEPHYR

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Experimenting  
for wind power



Environment  
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**Cover:** Preparing for 2000 AD when wind power will be a significant Canadian energy source, AES scientists conduct wind experiments on Alberta hills. Here Karl Vanek, technician with the Aerospace Meteorology Division, aligns a propeller anemometer atop a 10m tower.

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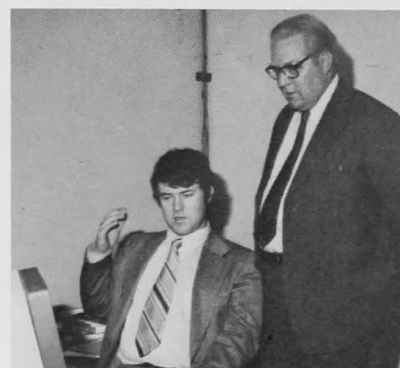
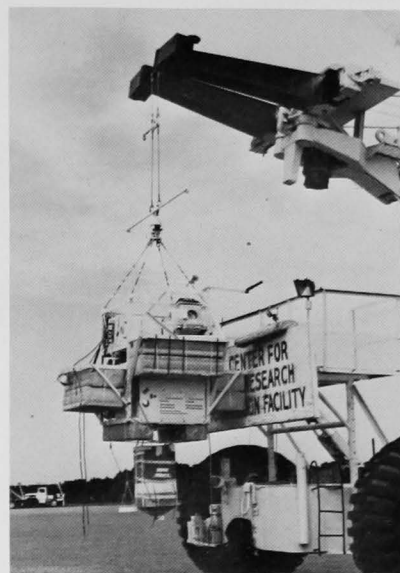


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## Improved weather services for Canadian farmers

A Memorandum of Understanding signed last January between Environment Canada and Agricultural Canada will lead, according to Jim McCulloch, director general Field Services, to improved weather services of direct benefit to Canadian farmers.

Under terms of the agreement signed by Blair Seaborn, deputy minister, Environment Canada and Gaétan Lussier, deputy minister, Agriculture Canada, AES will continue to take into account agricultural requirements in public weather service programs. This includes issuing weather forecasts for today and tomorrow and an outlook for the next three days for the general public, including farmers. Longer range forecasts will be issued when the technology has been proven.

Provincial committees have already been established in three provinces and others are expected shortly to identify the special forecast needs of farmers in their areas. These committees will include representatives of the AES, Agriculture Canada, the provincial departments of agriculture and farmers



*Thanks to the Memorandum of Understanding signed between Environment Canada and Agriculture Canada, this farmer can look forward to improved farm weather forecasts.*

concerned. Provincial resources may be used to obtain additional local observations as required and to assist in the dissemination of forecasts to the farmers.

Proposals are also at hand for AES to issue special forecasts in consultation

with farmers, and subject to the provinces providing additional information. For example the forecasts would cover frost warnings, drying indexes for hay, forecasts for irrigation, spraying of fruit trees and would supply data as required on application of pesticides, fungicides and fertilizers.

Examples of special weather services include frost warnings, drying index for hay, forecasts for irrigation, spraying of fruit trees and data required by farmers to determine the best time for application of herbicides and fertilizers.

Every effort will be made to ensure that weather information is in forms that are readily accessible and understandable to farmers. While information will be made available to Broadcast News, it is expected that AES Weather Offices and Weatheradio will have major roles to play.

Commenting on the agreement, Mr. McCulloch said, "I feel sure joint participation with the provinces and the farm organizations will lead to development of the best possible weather service for farmers in each region of Canada."

## WMO Secretary General visits AES

Professor Aksel Wiin-Nielsen, Secretary General of the World Meteorological Organization, spent a busy day visiting AES Downsview headquarters in March. His activities included lecturing, meeting management and scientific personnel, and touring some of the latest meteorological research and development installations.

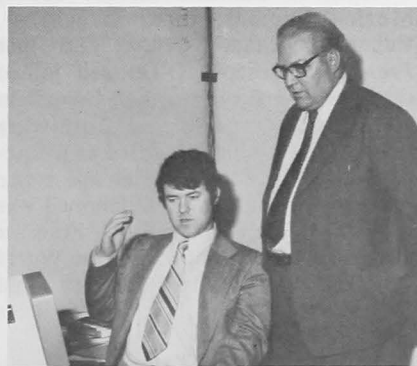
In Canada to present the University of Toronto's Andrew Thomson Memorial Lecture, usually delivered by a world-renowned scientist, Professor Wiin-Nielsen found the time to visit such AES innovations as a weather-programmed Telidon demonstration and the stratospheric pollution laboratories of the Atmospheric Research Directorate, where a demonstration of the new Brewer spectrophotometer was given.

The highlight of Professor Wiin-Nielsen's visit was his lecture on "Wavy Motion" given in the Auditorium and attended by some 150 scientists from AES, the universities, the Canadian Meteorological and Oceanographic Society and the private sector. His present-

ation consisted of a mathematical look at global-scale "blocking" situations, or atmospheric conditions that cause the weather in a region to "stall" or stay the same for several weeks. His study took into account the effects of atmospheric linkage with large terrain features like the Rockies and with surface heat sources and sinks such as oceans or large desert areas. He then applied the theory to the question of climate prediction and change.

The lecture was followed by a lobby reception allowing the WMO Secretary General to meet his audience. The visitor also held a special one and a half hour meeting with AMC members during which such topics as an Atlantic drifting buoy system, an upper air system for the north Pacific and ship-board buoys were discussed.

Prof. Wiin-Nielsen met with scientists concerned with numerical modeling of the atmosphere and lunched in the AES cafeteria with some 15 scientists who had studied under him or worked with him, including those associated with



*Doug Young of the Ontario Weather Centre demonstrates weather applications of Telidon to Professor Aksel Wiin-Nielsen during his visit to AES.*

WMO technical commissions. Finally he met with Al Christie and other staff of the Air Quality and Inter-environmental Research Branch, covering such topics as the LRTAP program, the Toxic Chemicals program, atmospheric chemistry, energy problems and emergencies, with the emphasis maintained on modeling aspects.



## Meteorology, oceanography linked by Memorandum

A new era of co-operation between the long-associated sciences of meteorology and oceanography was ushered in last January with the signing of a memorandum of understanding between AES and the Ocean Sciences and Surveys Branch of the Department of Fisheries and Oceans (OSS).

The memorandum, signed by Jim Bruce ADMA for AES and Gerry Ewing ADM for OSS, recognizes the fact that many processes at the atmosphere/ocean or atmosphere/ice inter-

faces between the two organizations are of mutual interest. For example both OSS and AES are interested in providing similar services, conducting similar research and engaging in joint data processing, information and training programs and are involved in such joint international concerns as sea surface temperature, sea ice, waves, atmosphere-ocean models, icebergs, and storm surges.

Mr. Bruce said that the increasing interest in Canada's offshore renewable

and non-renewable resources, the necessity for establishing environmental design criteria for ships, offshore production facilities and other systems, plus the need to implement atmospheric and oceanic services to support operational use of such systems, all required close co-operation between AES and OSS.

There will be further meetings between the two bodies in the coming months to work out details of the agreed-upon co-operative arrangements.

## Who was Canada's first trained forecaster?

The obituary of an 89-year-old church organist from Schomberg, Ont., published last December in the *Toronto Star* recalled memories of one of Canada's earlier meteorologists. The report said that Mary O'Donnell Hanlon's brother Joseph O'Donnell was "Canada's first trained weather forecaster", that he broadcast on Rogers Radio (CFRB) and that his forecasts rang in at "better than 90 percent accurate."

Asked to comment on the above, Morley Thomas, director general, Canadian Climate Centre said that Frank (not Joseph) O'Donnell joined the Meteorological Service of Canada in 1901 as a clerk, and following on-the-job training, qualified as a forecaster, one of four covering the entire country. He added Mr. O'Donnell was in charge of the Toronto Public Forecast Office until the end of the Second World War and that the three other national forecasters were K.B.Fox, E.B.Chilcott and W.A.Thorn.

Regarding Mr. O'Donnell's radio career, Mr. Thomas added, "I have never heard of any direct radio broadcasts by Meteorological Service people before the war but during the 1930s local radio stations began using our forecasts and CBC began to broadcast "across Canada forecasts" each evening in 1933.

Commenting on Mr. O'Donnell's supposed 90 percent accuracy, Mr. Thomas said, "I have found from annual reports and other documentation over the past century that claims for accuracy usually range between 72 and

84 percent. There has been no standard method of scoring or evaluating forecasts over the decades."

According to Mr. Thomas, Canada's first trained forecaster was actually Sir Frederic Stupart. "In 1871 the 15-year-old Stupart was brought into the office by Professor George Kingston, Director of the Observatory and first director of the new Meteorological Service. Stupart and another youth began

to issue forecasts a few years later...."

Mr. Thomas added Stupart was appointed Director in 1894, and continued to play an active role in weather forecasting until his retirement in 1929.

*Footnote:* Mrs. O'Donnell Hanlon's husband had a somewhat less lucky brush with the elements. As a farmer he was struck by lightning in the 1930s, his team of heavy horses was killed, and he spent his last 20 years as an invalid.

## Ontario volunteer weather observers receive award

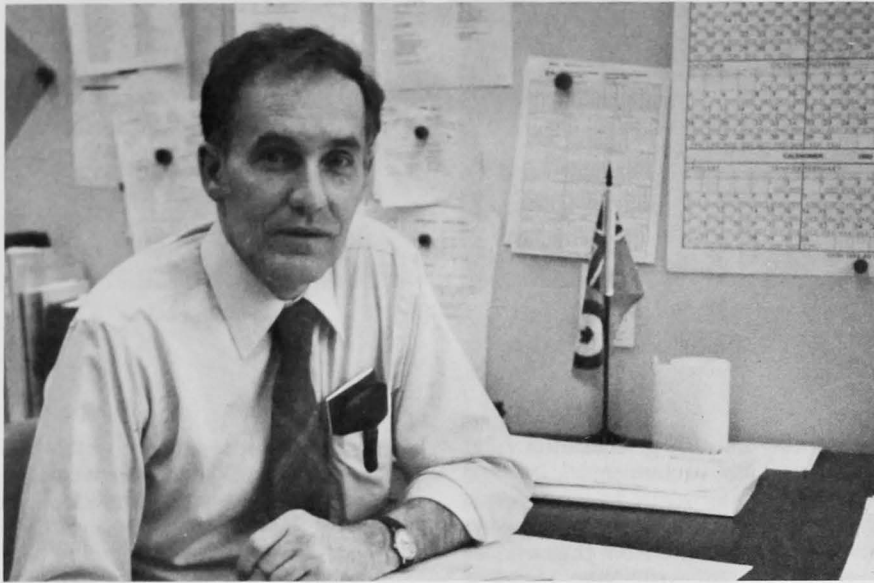
George McPherson, director, Ontario region has announced that the operators of the Brantford Filtration Plant, Brantford, will receive the AES Award of Merit, one of the highest honors for volunteer weather observing, only given to observers with more than 20 continuous years of satisfactory service. In addition to the award certificate, Mr. McPherson said the Brantford station operators would receive an inscribed weather instrument as a token of appreciation and that AES officials would make the presentation at an on-site ceremony.

Certificates of Achievement for more than five years continuous observing will also be awarded to five Ontario volunteers: Carl Kimmett, Lindsay Frost Campus, Lindsay; Thelma Cleary,

Glenburnie; Lillian Lighty, Monetville; Ruth Preston, Proton Station; and John Dunsmorie, Shanty Bay. AES officials hope to visit all the stations to hand out the certificates.

Announcing the awards, Mr. McPherson expressed his appreciation to all 330 Ontario region volunteer observers, most of whom take twice daily temperature and precipitation readings and forward data to regional headquarters for climatological studies in support of commerce, industry, agriculture and legal evidence. "I would like to express my personal thanks to all those volunteers who in pursuit of a hobby or as part of their work, devote some time every day to observing the weather" he added.

## AES contracts met training to McGill in recruiting drive



*Hans Van Leeuwen, chief of the Training, Coordination, Evaluation and Services division (ACRC) has been named head of the national recruiting team.*

In an effort to recruit more meteorologists, AES has announced a one year return to the "old recruiting prerequisites" - dropping the degree in meteorology as a requirement for joining the Service as an MT-1 and offering to send successful applicants on a 9-month paid training course, including an introductory summer theory

course at McGill University, Montreal, Que., and six months of applied and operational meteorology training at AES Downsview headquarters.

The competition is open to both English and French speaking Canadians. The latter will continue to receive a full nine months theoretical and applied meteorological training program at the

University of Quebec at Montreal.

According to Hans Van Leeuwen, chief of Training, Coordination, Evaluation and Services Division (ACRC), and the head of the national recruiting team, the recruiting activities include the distribution of recruitment packages, the display of publicity posters on all Canadian university campuses, and the placing of advertisements in 37 college magazines. By late May, after the selection of 20 successful applicants, the special contracted program at McGill will commence, and those who graduate will start the Meteorologist Operational Course (MOC 3) in August.

Mr. Van Leeuwen says that AES normally needs around 25 - 30 new meteorologists a year to make up for the average attrition rate. "Recently the universities have only been able to supply half that number", he explains.

According to the AES advertisement offering "Careers as Meteorologist", applicants are required to be graduates of a recognized university with at least 3½ courses in physics and 4½ courses in mathematics. During training they would receive a salary of \$13,195 - \$17,610, and after successful training, they would receive \$21,076 and be assigned to forecasting duties at either civil or Canadian Forces Forecast Centres across Canada.

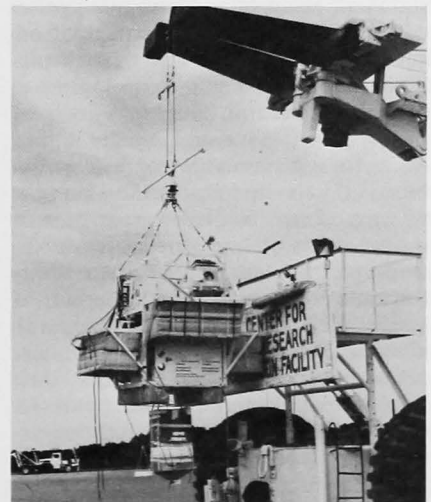
## AES participates in Stratoprobe experiments

The Experimental Studies Division of AES (ARPX) was involved in an international stratospheric balloon comparison experiment last September and October. Project Stratoprobe included the launch of two balloons from the National Scientific Balloon Facility, operated by the National Center for Atmosphere Research at Palestine, Texas. The AES measuring equipment or "payload" was flown at an altitude of around 30,000 meters.

According to Wayne Evans, chief of ARPX, the aim of the project was to compare AES measurements with those taken by the "Laser fluorescence" payload from the NASA-Goddard Space

Flight Center. As part of the stratospheric pollution experiment, ozone, nitric acid, nitric oxide, nitrogen dioxide, methane, hydrochloric acid, water vapor and hydroxyl were measured.

Dr. Evans says preliminary results of the experiment indicate it was a success. Final results are being evaluated. He added that ARPX personnel were taking part in a Federal Aviation Administration water vapor intercomparison experiment April 27 - May 15, also at Palestine, and for the first time, from July 24 until mid-August this year, the AES team will conduct a stratospheric experiment using the National Research Council balloon base at Gimley, Man.



*A 750 kg. payload of assorted AES measuring equipment is swung into place, ready for attachment to a high altitude Stratoprobe balloon at the National Center for Atmospheric Research, Palestine, Texas.*

## From technician to meteorologist – difficult but rewarding

There are only a dozen or two of them at AES right now, but they are a growing breed, mature, proud and self-confident. They are people who began as technicians or in some other non-professional capacity, but seeking wider challenges, they set out on the long and arduous route of professional self-development. Their task was several years of university study and considerable self sacrifice. Their reward: attainment of a professional rank such as MT-2, and the chance to begin one's career over again with an experience and wisdom most young recruits lack.

Hans Van Leeuwen, chief of the Training Co-ordination, Evaluation and Services Division (Downsview) is happy about these "in-house" professional trainees. "Our mature AES trainees are especially strong in character and stability" he says "and have many other advantages over entrants straight from university." He admits that the new prerequisites, requiring meteorologists to have graduated in math/physics and meteorology, have not made it any easier for aspiring AES technicians, but he says the service helps out in a number of ways. For example, it grants one or more years leave of absence to employees to enable them to study full-time at university, pays the cost of books and tuition, provides them with work assignments during the summer season, pays half salaries during their final year and will sometimes transfer them to the city where the right university courses are being offered. (Only four Canadian universities provide undergraduate meteorology programs at present). Successful candidates are then put on the very practical Meteorologists Operational Course (MOC) which succeeds in bridging the gap between

theoretical university education and operational job requirements.

Today, of the 20 to 25 new meteorologists taken on by AES annually, perhaps only two are from the ranks of technicians, but Mr. Van Leeuwen detects a growing trend towards this sort of recruitment. He says the typical AES technical recruit probably has one or more years of university, then drops out for a variety of reasons. He may have had seven or eight years experience as a technician, some of it in remote weather stations. He says the desire for career advancement is usually the spur that makes the already experienced employee take the plunge and make the sacrifices on the road to professional self-development.

While he admits taking time off to study at university can be a hardship, he is pleased to note an interesting new development in the area of on-the-job training. This is the use of correspondence courses to obtain a B.Sc. undergraduate degree meeting AES requirements in mathematics and physics. "In the past correspondence courses were available, but they lacked both the substance and the quantity for a total degree program." He now sees the correspondence courses offered by the University of Waterloo (Ontario) as offering a highly efficient means for professional advancement. He says the mathematics and physics courses are excellent, and while they unfortunately have no meteorology course at present, they offer more than sufficient material in the other related sciences. Mr. Van Leeuwen thinks Waterloo's correspondence program is ideal for personnel stationed in remote areas, since they cause the minimum of disruption in work schedules and allow trainees the

greatest freedom of study.

The 20-25 AES employees who have taken the professional self-development route have a number of varied backgrounds:

**John Mullock's** mature training experience is very contemporary since he has recently completed an MOC 2 course at Downsview leading to a posting as an MT-2 at the Gander Weather Office (Nfld).

He went to Ottawa in 1972 to take advanced meteorological and presentation courses enabling him to become a presentation technician at Inuvik, N.W.T. In 1974 he transferred to Edmonton to become an operations technician at the Arctic Weather Centre.

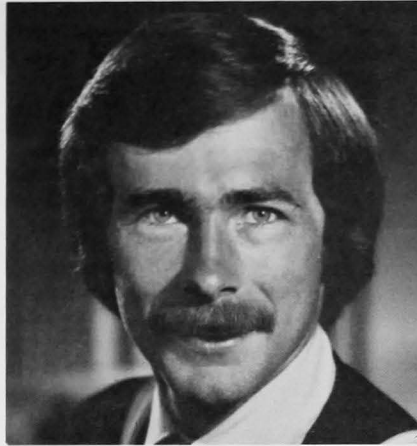
In 1976 Mr. Mullock made a major decision. He decided to go to university and study full time for four years at the University of Alberta, majoring in physics. Agreeing to this, AES paid the cost of his tuition fees and books, and during his final year, half his salary. He also held summer positions as an AES presentation technician attached to the Regional Fire Centre, Fort Smith, NWT where he supplied tailored weather information for forest control operations.

Mr. Mullock says he went to university as an experienced employee because he felt as an EG 6 that he had peaked in his career at the age of 27. "Despite the hard work required, I preferred to go to college and train to become a meteorologist, even if it meant starting at the bottom of the heap again." After four years intensive study he obtained his B.Sc. at the University of Alberta in specialized physics and meteorology and rounded out his operation training with MOC in Downsview





*John Mullock*



*Stu McNair*



*Ken Devine*

last winter.

For the immediate future Mr. Mullock looks forward to becoming a duty forecaster, but further along the road he might decide to specialize. Since he had the experience in his summer job, he says he might like to concentrate on forest fire meteorology. He also is considering the possibility of obtaining his M.Sc. in meteorology. "Not having a family gave me greater freedom to accomplish what I set out to do."

**Stu McNair** joined the predecessor of AES in 1968 and took the advanced meteorology course for technicians in Ottawa in 1971. He started as a met. observer in his home province of Quebec. Then he was posted to Cape Dyer, NWT and was OIC there for six months. He was also a technical plotter in the Montreal office until winning a competition to work in the satellite data lab in Toronto headquarters in 1971. Then for 2½ years he was instructor of a Met Tech course in Ottawa, similar to the one he had taken there three years earlier.

In 1974 after going to Toronto as a biometeorological research technician, he made the biggest decision of his career - to attend university. He enrolled for B.Sc. night classes in physics at York University and for four years he assisted with research at AES during the day and did university studies at night. Then in 1978 after transferring to the Energy and Industrial Applications Section in the Canadian Climate Centre, he heard about a new AES policy of granting educational leave for technicians. His section arranged for him to obtain educational leave to do full time studies at York. He had already completed four years as a night student and needed two

full semesters to get his degree. He also received book and tuition payments, plus half salary from AES during these studies. Despite this official help, Mr. McNair says he found full-time studies arduous, especially since his son was born around that time. Although he had the required degree, he did not have a sufficient number of courses in meteorology. So he spent a summer studying some theoretical meteorological subjects under guidance by AES Training Branch, and finally topped off his preparations by taking the MOC No. 1.

In the spring of 1980 he was appointed an MT-2 and posted to Gander. Commenting on his mature training, Mr. McNair says he feels he has certain advantages over professional colleagues who had joined AES with purely academic backgrounds. "My 10 years technical experience in the field taught me an enormous amount about how various AES services are related. I understand weather operations and I have benefitted from my research background."

He says he is glad he has at last discovered what he really wants to do. "Later I would like to join a scientific support unit", he adds. But he hesitates when realizing this might require more study. "My family commitments make this difficult right now", he says.

With 20 years experience **Ken Devine** can count himself a veteran of Canadian weather services. He spent his early years as an aerological observer up north and acted as OIC in Fort Chimo and Nitchequon. Later he went to Downsview to assist in climatological research and helped out on hydrometeorological projects. Finally he spent around 3 years as a senior electronics

technician at HQ Instrument Branch. While working there he managed to take some university physics courses in the evenings. After several years part-time study, he got around to completing his degree in physics.

By that time Mr. Devine had decided to become a meteorologist. In 1971 it was still possible for employees to round out their studies by taking the AES B.Sc. Meteorologist Course. Mr. Devine did this, and managed to come 5th out of a class of 28 which included several M.Sc. graduates.

After qualifying as a meteorologist, Mr. Devine spent four years as a forecaster with the Department of National Defence. He is now an MT-6 with responsibility for the Aerological Data Reduction System (ADRES). He believes he has found his niche in meteorological research, and keeps on top of his job through widespread reading. He doubts he will do much further formal studying in the near future since it involves too much financial and other strain.

Mr. Devine says one of the advantages of mature training is that it enables him to understand the problems of the "average guy" up and down the line. In other words he can deal with people at all levels and does not feel the urge, like some purely academic recruits, to "lord it over" non-professional staff. Finally, Mr. Devine believes his later training has enabled him to get a much quicker grasp of practical weather applications. "I can stand back and see problems as a whole. Perhaps my technical background makes me see the trees rather than the forest at times, but I believe my experience and late professional training have given me the best of both worlds as far as AES is concerned." □

## Wind flow over hills – The Kettles Hill experiment

by Hans Teunissen

During the month of February, 1981, a team of eight AES scientists and technicians carried out an elaborate experiment involving the measurement of wind and turbulence structure over an isolated hill on a farm near Pincher Creek, Alberta. The experiment was carried out as part of the AES Wind Energy Program and was aimed at obtaining a set of full-scale measurements over a hill which could be compared with previous predictions made by AES wind tunnel and mathematical

models of such a flow. (In this way, the reliability of these modelling techniques can be assessed and improvements made where appropriate).

The hill investigated was dubbed "Kettles Hill" in honor of its owner and was identified after an extensive search of the entire country for a hill with the desired characteristics. It is about 100 meters high and has fairly gentle gradients of about 10 to 20%. These are desired to ensure that the wind flows smoothly over all parts of the surface, or

in scientific terms, to avoid flow separation. The upstream terrain is fairly flat and smooth and, above all, the hill is located in a generally windy area, thus making it ideal for an experiment of this type.

For purposes of wind measurement, a set of eleven 10 meter towers and ten 3 meter towers was erected at strategic locations on the hill. Various types of anemometers were mounted on each tower, including cups, vanes, propellers and a very sensitive and accurate sonic



Karl Vanek and Peter Taylor perform an instrument inspection while Jim Salmon looks on. The Alberta Government Telephones microwave tower located near the summit of Kettles Hill, can be seen in the background.

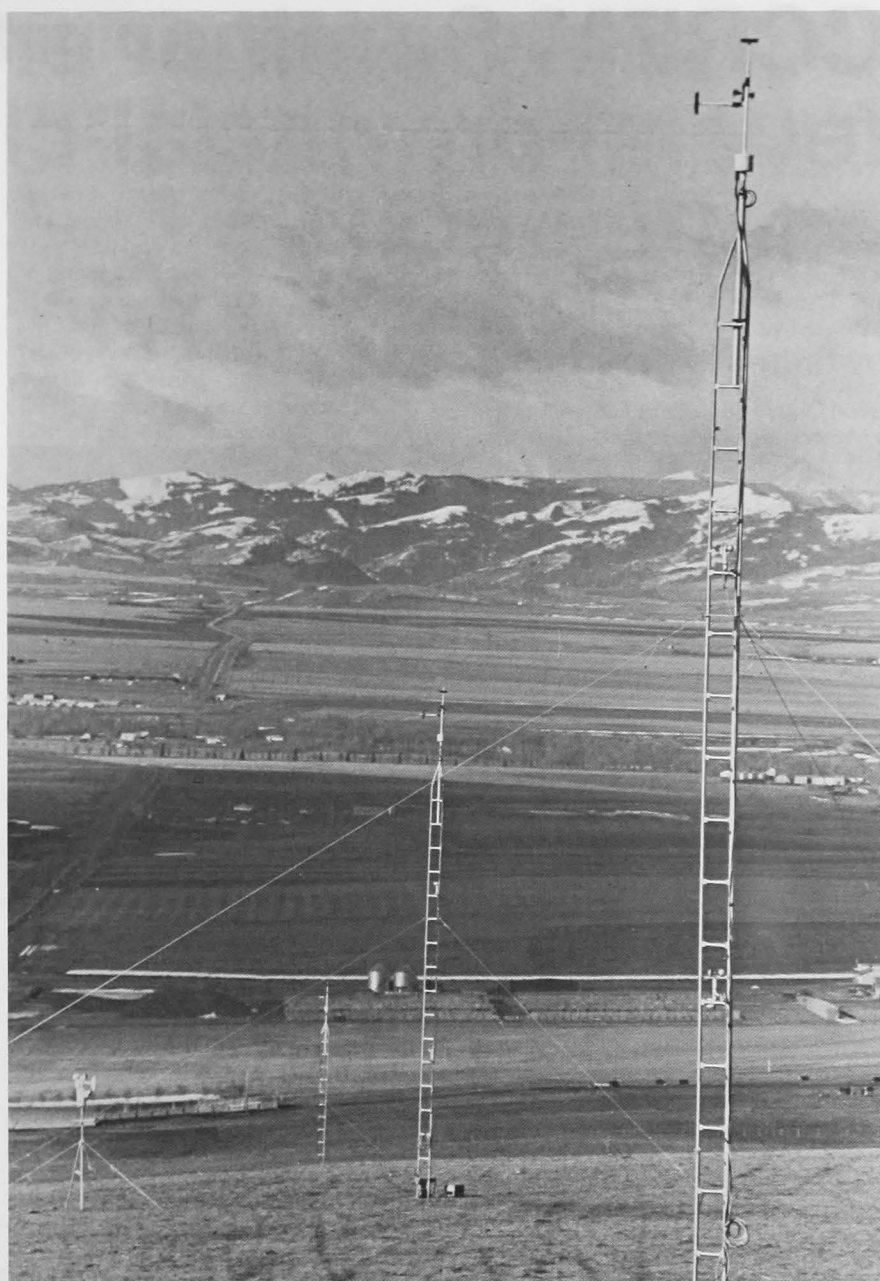


anemometer. The 3 meter towers were easily moveable and could therefore be arranged in different patterns during the various periods of intensive measurement. Most of the data were recorded on magnetic tape for analysis on a transportable computer which was taken to the site and for later analysis at AES Downsview. Smoke bombs and streamers were also used to search for flow separations at various locations on the hill, in a manner similar to that used in wind tunnel studies. Meteorological reference information was obtained from the Pincher Creek and Lethbridge Weather Offices, which provided much assistance throughout the entire experiment.

The choice of a hill located in the foothills of the Rocky Mountains in an attempt to ensure windy conditions was certainly a good one. Chinook conditions prevailed during almost the entire two-week measurement period. Steady westerly winds of 50 - 60 km/hr were the norm, and gusts of over 120 km/hr were observed (along with flying bits of anemometer, on occasion!). This of course made the 2 meter steel anchors used for the small instrumentation trailer located on the summit of the hill both necessary and comforting to those of us who were "riding out" such conditions inside it! It also ensured that we were able to obtain nearly all the measurements we wanted. The data obtained are currently undergoing detailed analysis, and results so far are very encouraging.

In addition to improving our basic understanding of flow in complex terrain, results of this work will have direct application in areas such as wind energy and the study of the forces exerted on structures by the wind. For example, an increase of 30% in the wind speed over the hill, which is typical of that observed on Kettles Hill, produces an increase of over 120% in the available wind power at the site. It also produces an increase of nearly 70% in the wind force exerted on any structure placed on the hill-top, such as a building or a windmill, and hence is very important from the structural loading standpoint.

The ability to accurately predict such speed-ups using wind tunnel or mathematical models will assist in the selection of optimum sites for windmills, for example, as well as in estimating the wind loads on them. An immediate application in this connection is the joint National Research Council/Hydro Quebec project, "Aeolus", in which a large 3.8 megawatt vertical axis ("eggbeater" style) windmill will be



*A view of some of the instrumented towers looking westward toward the Rocky Mountains from Kettles Hill, Pincher Creek, Alberta. Photo courtesy of the Lethbridge Herald.*

erected at an as yet undertermined site in Quebec. AES is assisting in the site selection for this windmill, which will be the largest of its kind in the world.

The Kettles Hill experiment was a joint project between the ARQL and ARMA divisions of the Atmospheric Research Directorate and was coordinated by Dr. Bob Mickle. It is a predecessor to a similar experiment planned in the Outer Hebrides in cooperation with an international group of scientists. The latter experiment will

take place in the sheep pastures of Scotland rather than the cow pastures of Alberta, where we may have to watch our step more often, but with less disastrous consequences! Such difficulties notwithstanding, it is hoped that the experiment in Scotland will turn out to be as successful as the Kettles Hill project has been. □

*Dr. Teunissen is a research scientist in the Aerospace Meteorology Division of AES.*

## CCREM Seminar encourages federal-provincial climate cooperation

by Brett Maxwell

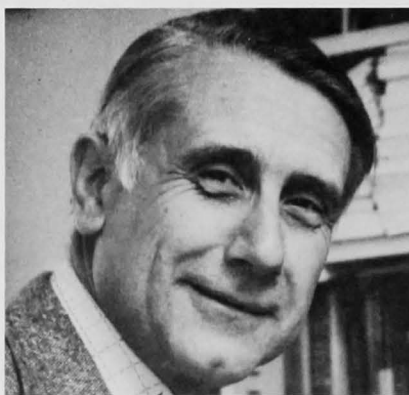
The impact of climate change and variability on environmental and resource management in Canada was the theme of a seminar held in Regina March 17-19 and organized by the AES Canadian Climate Centre. Sponsored by the Canadian Council of Resource and Environment Ministers (CCREM), the seminar brought together John Roberts, federal Minister of the Environment (and president of CCREM for 1980-81), seven provincial ministers, 10 deputy ministers and some 80 federal and provincial policy advisors and scientists.

The seminar was designed to provide an opportunity for the provinces to outline their perceptions of the impacts of climate on their economies and how to deal with this.

Telling his audience that Canadians had come to expect a relatively stable climate, Mr. Roberts continued "we have built our economy and infrastructure on the assumption of continued stability. If the assessment and prediction of climatologists are correct, then all governments will have to review many of our policies and priorities." Quoting climatologists' reports that we had experienced 30 years of unusually stable climate ending around 1972, Mr. Roberts said, "The world is now returning to more normal, far more variable conditions and this implies a much greater variation in climate than many of us have experienced in our lifetime."

Dr. Kenneth Hare of Trinity College Toronto and chairman of the Canadian Climate Planning Board, said the build-up of carbon dioxide was one of the many factors that may be contributing to the creation of permanent shifts in climate.

Dr. Will Kellogg of the U.S. National Center for Atmospheric Research said mathematical models of world wide weather patterns indicate that areas in the centre of continents will probably get hotter while coastal areas may become wetter as the world's average



*Dr. Kenneth Hare of Trinity College, Toronto and chairman of the Canadian Climate Planning Board, was one of the speakers at the CCREM Seminar in Regina.*

temperature rises. These models suggest that the southern portions of the Prairie provinces could become much drier than they are now. Dr. John Maybank of the Saskatchewan Research Council commented, "A warming trend sounds good to someone from the Prairies but it could mean that prime land may no longer be suitable for some crops. Some fish species would die out while power use could go up for air conditioning."

Morley Thomas, director general of the Canadian Climate Centre called on the provinces to join in the Canadian Climate Program, designed as "a cooperative federal-provincial initiative to monitor, predict, and assist Canadians in adapting their activities to our climate." He stressed the need for federal-provincial cooperation in developing and implementing sound, complementary policies and programs to understand climate better, and said making constructive use of this knowledge was essential.

In order to explore ways to promote cooperation and to improve the application of climate knowledge, discussion groups at the seminar considered the impact of climate change and variability on the environment, forestry, recreation, oceans and fisheries, agri-

culture, water resources, and industry in Canada. Their most significant conclusion was endorsement of the concept of a cooperative national Canadian Climate Program.

Other important conclusions were:

- a desire by a number of provinces to be involved in Climate Program activities such as the planning and implementation of observational networks, the establishment of national observing and archiving standards for climatological data and the creation of regional or provincial climate advisory committees;
- the necessity of improving awareness, availability and analysis of climatological data to meet the needs of users throughout the country.
- developing a capability to predict climate on varying time scales of 30 days and longer as a priority task for AES.
- the need to improve understanding of how the environment and economies respond to climate change.
- the desirability of stimulating private sector capability to provide meteorological and climatological consultative services in Canada.

A report on seminar conclusions and recommendations will be presented to the September meeting of the Canadian Council of Resource and Environment Ministers to consider follow-up action on a national scale.

Blair Seaborn, deputy minister, Environment Canada and chairman of the CCREM Coordinating Committee commented, "Many participants said the seminar was a stimulating and valuable experience and marked a further important step in the development of a truly national Canadian Climate Program." □

*Mr. Maxwell is a provincial affairs advisor in the Corporate Planning Group, Environment Canada and is currently on secondment to the Canadian Climate Centre.*

## New Central Region director named



Mike Balshaw

Mike Balshaw has been appointed director of AES Central Region after some 17 years with Canadian weather services, most of it in his native Manitoba. This includes the previous four years as officer-in-charge, Prairie Weather Centre.

Mr. Balshaw also spent five years with AES headquarters Training Branch in Downsview and from 1975 to 1976 served as acting chief, Professional Development Division. He also held the post of chief instructor with the division and was responsible for setting up forecasting and computing workshops for field meteorologists.

On joining the weather service in 1964, Mr. Balshaw served as met. officer, Canadian Forces Base, Winnipeg. Starting at the Prairie Weather Centre in 1967, he worked as an analyst-prognostician involved in the development of the first regional computer. Prior to that he had done research with the Alberta Hail Studies project which included photogrammetric measurement of convective storms.

He obtained a B.Sc. from the University of Manitoba in 1964 and went on to obtain his M.Sc. in Meteorology from McGill University in 1967.

## AES gives popular computer courses

One of the more popular courses given by AES Training Branch is the two and a half week Computer Applications Course, a basic introduction to the FORTRAN IV computer language and use and application of the HP 21MX-E computer for meteorologists and technicians in the field. This year, according to course director, Trevor White (ACGH) four CACs are being given, and with six to eight trainees per course, this means some 30 AES personnel will become familiar with on-the-job computer applications in 1981.



Taking part in CAC 81-1, conducted January 6-23 are seated left to right, Ken Stewart (Canadian Forces Forecasting Centre, Edmonton), Charlie Wendell (Canadian Forces Weather Office, Trenton), John Phillips (CCC, Downsview), Don Green (Yukon Weather Office), Keith Puckett (ARD Downsview) and Roch Rivard (Newfoundland Weather Office). Standing at the back are course director Trevor White (left) and Steve Stokes (instructor).

## LRTAP reorganization

Because of the much enlarged Federal Long Range Transport of Air Pollutants (LRTAP) program, ADMA Jim Bruce has announced a reorganization of its Scientific Program Office. It has now been split into two: a LRTAP Liaison Office, headed by Hans Martin, and an office of LRTAP Scientific Coordination, headed by Peter Summers.

Reporting directly to Mr. Bruce, the Liaison Office will advise on liaison and financial aspects of the LRTAP program to senior management and elected officials, the media, other publics and parliamentary committees. It will organize conference and workshops, prepare newsletters, reference

documents and other reports.

The scientific coordination office, reporting to Howard Ferguson, director Air Quality and Inter-Environmental Research Branch, will ensure inter-departmental coordination of scientific efforts, advise the joint LRTAP committee on the adequacy and relevance of the scientific program, and coordinate scientific monitoring at the international and federal-provincial levels.

Mr. Bruce has urged both offices "to work very closely together to make this arrangement work effectively." Commenting on the reorganization, Bill Hart, assistant to Dr. Martin, said the restructuring was both necessary and

useful, since AES is the lead agency for the entire Federal LRTAP program. He added that it would mean a staff expansion to a total of eight person years between the two offices, and that this would help relieve the enormous workload placed upon AES particularly since the expansion of the Federal "Acid Rain" Program to \$41 million over the next four years.

Dr. Summers has confirmed that his office has expanded to add a professional and an extra clerk. He says the new arrangement is working well, and that there is close cooperation between his and the LRTAP Liaison Office.



# DEPARTMENTS

## WOMEN ON THE MOVE

### Promotion ends happy stay in Alberta



Mireille LeBlanc

For meteorologist Mireille LeBlanc an enjoyable stay in Alberta has been cut short by a promotion. After working at the Alberta Weather Centre as an operational forecaster (MT-3) for less than a year, Mrs. LeBlanc has now won

a competition for the position of training instructor (MT-6), Professional Development, Training Branch, Downsview.

Although born and educated in Montreal (she has a B.Sc. in Physics from the University of Montreal), she developed a strong liking for Western Canada during her stay. "I am a little disappointed that I was not able to remain in Alberta a bit longer", says Mrs. LeBlanc, "but this promotion is too good an opportunity to turn down. I am looking forward to teaching, and of course not having to work shifts will be a pleasant change too." She adds that she has had some experience teaching high school and also gave a two-month climatology course for AES trainees in 1978.

Mrs. LeBlanc attributes her meteorology career to her desire to work in the area of applied physics. She explains

that when she was first looking for a job she found out that AES was hiring meteorological trainees, and that furthermore the training was being offered in Montreal in French. "Since meteorology employs many of the same principles as physics", she continues, "I applied for the job and was accepted. I was in the second group of French-speaking meteorologists to graduate." She adds that since then she has also earned her M.Sc. in meteorology from McGill University (Montreal).

Mrs. LeBlanc has decided that meteorology is an excellent career choice for a person of her background, because it's an area of study "you can really get your teeth into."

Looking ahead, Mrs. LeBlanc sees great personal benefits in improving her administrative skills, and she intends to do this by picking up a master's degree in business administration at university in the evening.

Mrs. LeBlanc says that she has found many challenges while working for AES, and she adds "I intend to stay with the service as long as new ones keep arising."

## BOOK REVIEW

### New Energy Sources for Today – The Renewable Energy Handbook

Richard Fine, Douglas Hart,  
Joe Umanetz, Bruce McCallum.  
Tutor Press, Toronto, Canada, 1978. pp. 239,  
Paperback only.

*Reviewed by Rick Berry*

This is another excellent publication from the Pollution Probe Foundation and was edited by members of the Energy Probe Project. It is written by Canadians, for Canadians, and is intended for groups and individuals across Canada who are concerned about energy issues. The authors are very well qualified to discuss the subject material, having taught courses in renewable energy exploitation at technical institutes or own companies operating in this field in Canada.

The first half of the book presents a broad overview of the major forms of renewable energy and the associated technology. These range from the common topics such as wind, solar, and biomass energy conversion to the more

esoteric areas of ocean thermal and geothermal technologies. The level of detail is sufficient to give the reader a good understanding of how and where the energy is converted and copious illustrations help to drive home the concepts. The authors take a strong "soft-energy path" view point and try to emphasize the total energy flow concept when discussing other exploitation of renewable resources.

The second half of the book is intended for the enthusiast who wants to construct a solar collector (for space heat or water heating), wind power generator, or who is contemplating making extensive use of wood for heating purposes. The detail provided is sufficient to permit a good handyman



to embark on a project in these areas. There are several excellent annotated bibliographies for those interested in delving further into most of the subject areas covered by the book. Also included is a comprehensive listing of companies across Canada who market wind, solar, and biomass energy conversion equipment plus consulting advice for those who want more expert advice in this area.

There are a few points on which the book can be seriously faulted. An index should have been included and a better editing would have caught some glaring oversights (one figure was not even printed in this edition). More emphasis could have been placed on the impact of climate on the exploitation of renewable energy forms since this is often the limiting factor in many regions of Canada. The only area where the book is noticeably out of date is in the area of wind energy conversion on a commercial scale. Several such projects which were only planned in 1977-78 have since been completed. However, these previous items do not in anyway detract from the readability or the usefulness of the book.

*Mr. Berry is with the Energy Applications and Impact Unit, Canadian Climate Centre, Downsview.*

# Ice Forecasting Central opens its doors

A small but active, seven day a week operation was the scene on January 23 of an open house that gave visitors a glimpse of the complex work carried out by the department's ice forecasting unit.

Ice Forecasting Central, tucked away in a corner of a downtown Ottawa office building since relocation from Halifax in 1971, provides a constant stream of information on ice conditions in Canada's coastal waters, in both winter and summer. This information is vital to many activities such as fisheries, shipping, marine surveillance, offshore exploration, meteorological needs and coastal and harbor activities.

The open house attracted more than 60 people from several departments including Energy, Mines and Resources, National Defence, Fisheries and Oceans, Environment, Transport, and Indian and Northern Affairs. Deputy minister, Blair Seaborn, headed the DOE contingent and Jim Bruce, AES assistant

deputy minister gave a presentation. He was followed by Don Smith, director general of Central Services, Bill Markham, director Ice Branch, and Alex Beaton, chief of Ice Central.

After the briefings visitors were given a tour of the office facilities, including the centre's forecast operations room where daily ice charts are produced, the computer system where a variety of data analyses take place, and the communications room where transmissions from ice reconnaissance aircraft, satellites and ship and shore reports are received and ice forecasts relayed to users.

There was also a display by the Ice Climatological and Application Division featuring archival data paper, film and magnetic tapes as well as the new Arctic Ice Atlas. Information was provided on lectures and training on ice-related topics, as well as research and consultation services available from this division.



*Bill Markham, director, Ice Branch, Central Services Directorate, is seen giving a slide presentation to participants at the Ice Forecasting Central's open house.*

## Jaan Kruus appointed director Data Acquisition Services Branch



*Dr. Jaan Kruus*

Jaan Kruus has been appointed director Data Acquisition Services Branch. For more than a decade he has held positions with Environment Canada, first in a technical position and then as an analyst contributing to long-term plans integrating space technology with data acquisition systems.

For the past year he held the position of Chief, Network Planning and Standards Division of Central Services Directorate. In this position he was responsible for the Division's planning and development activities leading to the "best mix" of observational systems and the establishment of standards,

observation procedures and data requirements of AES. His present job will give him still wider responsibilities in this area.

Dr. Kruus obtained a Bachelor of Applied Science degree in engineering physics from the University of Toronto in 1959 and a Ph.D in electrical engineering, specializing in instrumentation and control from the University of Illinois. He has taught electrical engineering at Queen's University and the University of Ottawa. He is a member of the Association of Professional Engineers of Ontario and the Institute of Electrical and Electronic Engineers. He joined the federal government in 1969 as head of the Instrumentation Section, Water Resources Branch, Department of Energy Mines & Resources.

## Joe Gleason and Bob Bedwell retire from Central Region

Over 120 friends and colleagues attended a farewell luncheon held at the Marlborough Inn in January in honor of Joe and Joyce Gleason, and Bob and June Bedwell. Joe Gleason, regional superintendent of Technical Services, and Bob Bedwell, chief surface inspector, retired last December after long and commendable careers with AES.

*Joe Gleason (left) receives a Certificate of Service from Central Region's Dale Henry.*



Dale Henry, regional chief, Weather Services, brought warm wishes on behalf of the regional director and presented the retirees with official Certificates of Service.

Mark Hacksley, acting regional chief, Data Acquisition, briefly outlined the careers of Mr. Gleason and Mr. Bedwell. He noted that both men entered the meteorological service after war service with the navy, Mr. Bedwell in 1945 and Mr. Gleason in 1947. On behalf of all their friends and colleagues, both within and outside of AES, Mr. Hacksley presented each of the retirees with a pair of binoculars and an electronic fish locator.

# DEPARTMENTS

## Phil Aber named director, Training Branch



*Phil Aber*

Philip Aber is the new director, Training Branch, AES Downsview. His appointment follows 23 years with Canadian meteorological services as a weather forecaster and administrator, the former

including duties at DND offices across Canada and with the Canadian Armed Forces in Europe.

He joined the Training Branch in 1970 as an instructor, and starting in 1973, assumed management positions in the Central Services Directorate, Administration Branch and Instruments Branch. In 1975 he was appointed chief, User Requirements Division, Field Services and in 1977 became superintendent, General Weather Services, Ontario Region. Since January 1979 he

has held the position of acting director, Training Branch and his present position became effective in January 1981.

Mr. Aber graduated from McGill University in 1958 with a B.Sc. degree and returned to this university to obtain his M.Sc. in meteorology in 1968. He is a member of the Canadian Meteorological and Oceanographic Society, the American Meteorological Society and the Institute of Public Administration of Canada.

## Morey Gorback, Eric Paget retire in January

A retirement party was held for Morey Gorback, regional meteorological instructor and Eric Paget, superintendent - Weather Office Standards, both of AES Pacific Region. The turnout was excellent with about 100 people attending.

Regional director, Jack Mathieson, lauded both careers and made presentations. The same evening, Frank Williams, chief of Weather Services, presented 25 year plaques to Bob Bitcon, Harold Bush, Harvey Raynor, Roy Koch and Earl Zilkie.

## STAFF CHANGES

### Promotions/ Appointments

- L. Armstrong (SCY-2) Secretary, CCAS, Downsview, Ont.
- R. Gilbert (MT-6) Meteorologist, QAED, Dorval, Que.
- D. Mitchell (EG-3) U/A Tech. WS1, Trout Lake, Ont.
- D. Roberts (EG-6) Officer-in-Charge, WO4, Fort Nelson, B.C.
- N. Rollinson (EG-5) Pres. & Obs. Tech. W03, Yellowknife, N.W.T.
- W. Hume (MT-7) OIC Special Projects Office, Edmonton, Alta.

### Transfers

- R. Arsenault (EG-ESS-2) Technician, Charlo, N.B.
- P. Chadwick (MT-3) Meteorologist, CFFC, North Bay, Ont.
- M. Dube (EG-1) Technician, QAEOO, Cape Dyer, N.W.T.
- A. Fergusson (MT-2) Meteorologist, WC1, Edmonton, Alta.
- W.S. Foster (MT-2) Meteorologist, Gander, Nfld.
- D. Harvey (EG-1) Technician, QAEOO, Mirabel, Que.
- R.J. Lee (MT-6) Meteorologist, ADED, Ottawa, Ont.

- J.E. Mullock (MT-2) Meteorologist, Gander, Nfld.
- D. Petrunik (EG-5) Pres. & Obs. Tech. WO4, Edmonton, Alta.

### Temporary or Acting Positions

- P. Bier (SCY-2) Secretary, ACEC, Training Branch, Downsview, Ont.
- D. Law (EG-8) Superintendent, Stat. Operations, WAED, Edmonton, Alta.

### Retirements

- A. Laatsch, WS3, Pincher Creek, Alta. December 1980.

### Departures from AES

- J. Closter, WO1, Whitehorse, Yukon to Sec. of State, Whitehorse, Y.T.
- D. Crossley, CAED to Dept. of Fisheries & Oceans, Frobisher Bay, N.W.T.
- R. Jemison, WS1, Resolute, N.W.T.
- M. Jette, Programmer to Transport Canada, Dorval, Que.
- J.Y. Lapierre, WMO, Geneva, Switzerland, Leave of absence.
- M. Loch, WS1, Trout Lake, Ont.

- A.M. Malkiewicz, Ontario Weather Centre, Toronto, Ont.
- L. Mo, ARQA to Ministry of Environment, Ontario.
- D.C. Newell, WS1, Alert, N.W.T.
- I. Stach, WS1, Resolute, N.W.T.
- M. Steffanick, WS1, Trout Lake, Ont.
- J. Steinhart, Information Directorate, Downsview, Ont.
- S. Tally, WC1, Edmonton, Alta. to DOE Personnel, Edmonton.
- D. Whelpdale, ARQT to Norwegian Instit. of Air Research, Norway.

Promotions, appointments, transfers, temporary or acting positions sections provide information on new postings including location. Only temporary or acting positions which involve a change of location are listed. Retirements and departures indicate the last posting.

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