

March/April 1981

ZEPHYR

**Keeping the human touch at the
weather office**



Environment
Canada

Environnement
Canada

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COVER: Despite the on-rush of modern technology, the simplicity of a human hand circling a storm centre on a map still symbolizes everyday activity at a Canadian Weather Office.

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



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Zephyr is liked by most AES employees

As promised in our last issue, we are now able to give you more detailed results of the Zephyr questionnaire sent out in our July-August, 1980 issue.

331 replies were received from a total of 2331 AES employees, which amounts to nearly 15 percent, a good normal response. An encouraging 74 percent of respondents said they liked Zephyr's content and organization, and a resounding 81 percent said they liked its design and format. Readers said they liked the News and Features sections almost equally (63 versus 61 percent), whereas 51 percent said they liked Departments.

Just to illustrate how generally positive the response was, the survey found that only one percent of readers were uninterested in Zephyr with a further one percent being uninterested in *any* kind of employee publication. Only six percent wanted any changes in design or format, and while 15 percent sought some changes in the content and organization of Zephyr, only two percent expressed active dislike.

77 percent of respondents said they had seen all issues of Zephyr over the past year, while 10 percent said they had seen none. 45 percent of respondents reported they received a personnel copy of Zephyr and 22 percent took it home. Only 11

percent said their families read it however. One last encouraging fact: 85 percent of our sample said they read all or most of Zephyr.

Of all replies received, 137 were from meteorologists, 104 from met. techs., 21 from regional head offices, and 76 from other regional offices.

About 43 percent of respondents were managers or supervisors, the rest staff. The main categories of respondents all answered in approximately the same way. Meteorologists and managers in general did get to see more copies of Zephyr though. More than 85 percent of both groups said they had seen *all* the copies.

The small number of responding administration staff tended to be somewhat critical. 11 percent of them said they were uninterested in Zephyr and would prefer a different kind of employee publication. As a group they also tended to dislike the Departments section, only 23 percent of them voting *for*. 22 percent of them also said they read little or none of Zephyr, high for our sample. And finally, secretaries and clerical staff almost all said they saw every issue of Zephyr.

Regarding the comments and suggestions part of the questionnaire at the end,

about 100 people took the time to reply. There were lots of lively comments, some helpful and constructive, some humorous or fanciful and some downright critical.

Useful comments included suggestions about including a letters-to-the-editor section, a regional news column, an ongoing series about the work and structure of the various sub-divisions of AES or DOE, publishing articles on isolated weather stations, stories about "ordinary" employees, or new scientific discoveries. Other suggestions were for an editorial page, a debate section, a cartoon, a meteorological crossword, or a want ad column offering sales of used meteorological equipment for personal use.

More general suggestions were for more frequent appearances of Zephyr (currently it is bimonthly), stricter adherence to publishing dates and avoidance of stale news, for more humor, color and "pizzaz" and for a clearer, more accurate presentation of the staff changes section (with "from" positions included as well as "to" positions). Isolated suggestions included printing French and English articles side by side, including ready-punched holes for easy ring binder filling, and last but not least, producing a stand up centre-piece of the man or woman of the year! □

Warm humid air triggers migraines says AES report

The Canadian Climate Centre has now completed its 18 month study on the effects of weather on migraine headaches in southwestern Ontario. One of its principal conclusions is that weather aggravates migraines which are triggered by several other causes, some psychological.

CCC Report No. 80-7, prepared by Alan Nursall and David Phillips advises those who suffer from migraines and who wish to take precautions when weather conditions are unfavorable, to keep an eye on wind direction. It says winds coming from a southerly direction in the Toronto area correlate well with both unfavorable weather conditions and the incidence of migraines. The worst migraines in this region occur when warm humid air blows from the south together with rapidly changing unstable weather and falling barometric pressures.

Other factors correlating with the onset of a migraine attack are high humidex readings and glare from snow on bright sunny days.

The study involved participation of 130 adults, and was conducted in co-operation with the Migraine Foundation.

Commenting on the report, David Phillips said that he foresaw the day when climatologists and duty weather forecasters incorporated health-related weather information into their field studies and daily weather forecasts. Those with further questions on the weather-migraine study were asked to contact David Phillips of the Canadian Climate Centre of Environment Canada in Toronto at (416) 667-4630. □

actual Ontario summer storm and a photofacsimile of the GOES satellite were two of the new AES exhibits at the popular Toronto International Boat Show which took place this year between January 9 and 18. Other displays included a marine circuit teletype, a weatheradio and some striking panels illustrating such subjects as the Beaufort Scale of Sea and seiche oscillations on the Great Lakes.

AES cooperated with Ocean Sciences & Surveys (Dept. of Fisheries and Oceans) for the show, and it was its 12th successive year of participation.

The AES booth was manned by members of the regional headquarters, the Ontario Weather Centre, the Toronto Weather Office and three retirees who returned specially for the exhibition. Some 20,000 pamphlets were distributed and Geoffrey Meek, Ontario Region port meteorological officer commented "The show was a success. I am especially grateful to the Cloud Physics Research Division for lending the radar and to the retirees for all their efforts." □

AES has new exhibits at the Boat Show

A radar display with playback of an

Revisiting Meteorology, Jim Bruce sees a challenging future

Addressing a crowded seminar at the Downsview auditorium January 13, assistant deputy minister Jim Bruce gave some impressions of his six months reacquaintance with AES after a 13-year absence.

He praised the service for its fine pool of scientific and managerial talent, its enthusiastic staff, its excellent research, its progress in computer development, its valuable ice, climatic and applied meteorology programs, its vigorous international activities, its ability to provide increased information to the public and its dynamic air quality, ozone layer and long range transport of air pollutant programs. "Person for person, and dollar for dollar" said Mr. Bruce, "I suspect that we're the best atmospheric service in the world."

ADMA also expressed some concerns however: that there was now no national objective means of determining forecast accuracy or of learning what types of information had the most positive effect on forecast quality, due to absence of a national forecast verification system; that recruitment and education of professional meteorologists had dropped off; that little air quality work was being done in the regions so that AES had limited ability to deal with toxic chemicals on a national scale.

Mr. Bruce said that on rejoining the service he had noted the tremendous information explosion . . . the huge amount of guidance material, hemispheric, national and regional, now available to the forecaster, who also had to absorb data from weather radar, satellite image and ice/snow cover observations.

All this made ADMA worry whether AES had systemized enough of these new data sources and guidance materials, and whether lack of objective measures of forecast success prevented knowing which types of information had the most positive impact on forecast quality. He spoke of the importance of high performance by all presentation technicians because these staff members were "our front line marketing people." He also said better working relations must be worked out with the media in order to improve marketing "our truly valuable forecast and current data products."

Mr. Bruce said changes in the forecast system would "hopefully" include acqui-

sition of a new vector computer. Scientists in the Research Directorate had already devised a new generation of numerical models that awaited this huge increase in computing capability. "I am confident" he said "that in a year or two we will be able to achieve a higher level of reliability in computer forecast charts and begin to produce useful weather element forecasts by computer."

ADMA added that the Canadian Climate Program would also use the new vector computer. This would allow scientists to run extremely complex circulation models enabling them to predict longer term climate, and to estimate the climatic effects of increased CO₂ in the atmosphere.

Mr. Bruce said the Canadian Climate Program's long term goals, linked to the World Climate program, were being finalized by a Board chaired by University of Toronto Professor Ken Hare and at a major federal-provincial seminar in March. Basically the objectives would be to determine the impact of man's activities on climate, especially effects of increased atmospheric CO₂ and chlorofluorocarbons, to improve the application of climatic information to economic activities such as energy, water resources, agriculture, forestry, construction and transportation, and to develop climate prediction capability. Mr. Bruce also emphasized offshore exploitation of hydrocarbons and added that weather, ice and sea state forecasts were essential support services for these programs. He said the ice program would soon acquire a second Sideways Looking Airborne Radar (SLAR) for aircraft ice reconnaissance. He also said an iceberg forecast service off Labrador and the east coast was now needed, and that the ice program requirements would eventually lead to acquisition of a Canadian marine ice reconnaissance satellite.

Another topic covered by ADMA was air quality. He said that the department's current priority programs were in the area of LRTAP/acid rain and on toxic chemicals, and that AES was the "lead agency" for scientific studies and coordinator of all federal research on acid rain. Added Mr. Bruce, "We must be responsible for pulling together the results of research in the whole \$40-50 million federal program, combining it with results from elsewhere and feeding it into negotiation of a Canada-US Air Quality

agreement."

ADMA said that toxic chemicals posed one of the most difficult environmental challenges, and that a serious shortcoming was the department's inability to cope on a national scale with atmospheric transport and deposition. "But what we do know has us worried", he said. "PCBs in Lake Superior fish exceed levels fit for human consumption, and the only significant source is the atmosphere." Toxics would be the centrepiece of the department's environmental protection strategy for the 80s but ADMA warned, "We have the legacy of past neglect to deal with. AES must play a much more active role."

Mr. Bruce said another priority was to achieve greater self-sufficiency in meeting Canadian energy needs, and AES would be particularly involved in solar and wind energy research. But according to ADMA the ultimate environmental constraint on fossil fuel consumption would probably emerge from research on CO₂ and its impact on climate.

Viewing AES in a world context, Mr. Bruce said that it was up to the service to discharge Canada's responsibility as custodian of a major share of the "global commons", that is the earth's atmosphere.

Employees wishing to obtain the complete copy of Mr. Bruce's speech should contact Miss Bernice Sherman in the ADMA's Downsview office, telephone (416) 667-4774. □



ADMA Jim Bruce revisiting meteorology.

Morley Thomas attends Asian climate conference

Morley Thomas, director general of the Canadian Climate Centre participated in the Technical Conference on Climate for Asia and the Western Pacific in Guangzhou, China, December 15-20 and presented a paper on "The Nature and Scope of Climate Applications" on behalf of the WMO Technical Commission for Climatology and Applications of Meteorology.

Mr. Thomas reports that some 100 delegates attended, 22 from China and 70 more from 19 other countries, the World Meteorological Organization Secretariat and technical commissions and other international bodies. Over the five days some 35 papers were presented and the main subjects dealt with were climate applications, climate change history and climate modelling. In addition, panel discussions led to reports on data, applications including water and energy, food, socio-economic impacts and modelling. Comments Mr. Thomas, "Information in the reports is not new, but it is hoped that it will serve as guideline material for the national weather services of Asia, especially in developing their climate programs."

Mr. Thomas also reported that a draft statement, agreed in part that "Since climate is a major factor in food production, water availability and the effective use of energy resources, this influence becomes more apparent as the demand for food, water and energy approaches the limit of availability."

A number of national "needs" were cited and the conference appealed to governments in Asia and the West Pacific to facilitate close cooperation between meteorologists and other professionals, develop cooperative projects, take advantage of knowledge of climate influences, encourage research and development, inform and educate people, facilitate better data assimilation, improve national training programs and ensure the availability of adequate experience.

The conference also appealed to UN specialized agencies and other international bodies to increase assistance to

governments so that application of climate knowledge be improved.

Special events for delegates included visits to weather stations, communes, universities, a "cultural park", plus banquets and performances by a youth acrobatic group. Commented Mr. Thomas, "As in western countries applied meteorology and climatology have not been given too much attention in past decades in Asia, but there are signs that this is changing." He added, "I found the Chinese to be extremely friendly and courteous." □



Meeting with Morley Thomas at the conference are Zhu Rui-Zhao, an applied climatologist (centre) and Cheng Chun-Shu, deputy director, both of the Chinese central Meteorological Bureau Peking. In the background is G.F. Popov of the Food and Agriculture organization in Rome.

John Roberts and Gordon McKay address AAAS

Environment Minister John Roberts delivered a major address on "Bridging the Frontiers of Science and Public Policy" to some 3,000 delegates at the American Association for the Advancement of Science convention held in Toronto January 3-8.

He immediately reminded his audiences that he "wore two hats in Cabinet" ---Minister for Science and Technology, and Minister of the Environment. Then quickly he added, "In my latter capacity I have become increasingly conscious of the risks associated with the exploitation in technology of scientific advance." By way of example he mentioned Dioxins, "the most powerful poison known to humanity", and Acid Rain (12 million tons of its component chemicals were dumped as precipitation on Eastern Canada every year).

Mr. Roberts said that the Canadian government's acid rain research budget had been increased by \$41 million over the next four years. Then he told his audience that "pollutants do not respect

international boundaries" and that "at least half the problem stems from sources outside our jurisdiction." Then he warned, "In our obsession with cheaper energy and the conversion of coal for energy needs in the United States, and without the implementation of environmental safeguards, we risk meeting short term energy objectives at long term costs which are staggering."

Gordon McKay, director of the Climatological Applications Branch, Canadian Climate Centre, delivered two papers. On "Climate Change and Energy Use" he advised that atmospheric carbon dioxide was increasing at a scale of one percent over three years, principally as a result of the increasing consumption of fossil fuels, and added "present energy projections indicate", that "atmospheric levels of CO₂ may double by late in the next century causing significant increases in temperatures and changes in precipitation pattern." He explained that over the long run this would greatly alter agriculture, the locations of forests and permafrost, and the extent of Arctic sea ice. Warming

would generally be seen as beneficial as energy costs depress our GNP, Mr. McKay added. He was assisted in the paper by Terry Allsopp, EARP coordinator, Downsview.

Addressing the AAAS on the changing vulnerability of agriculture to climate Mr. McKay illustrated how personal vulnerability had decreased while the overall cost to society had greatly increased. Within Ontario and the Prairies, the earliest settlers underwent extreme hardship due to drought and cold, but diversification of agriculture, new technology urbanization and industrialization and insurance had removed the great personal vulnerability. Industry now dominated the Ontario economy. Agriculture was still dominant over much of the West, where competition for water and high energy costs were increasing vulnerability. "Impact studies for the Plains are needed to assist governments in planning for future serious droughts which are inevitable", Mr. McKay added. He was assisted in the paper by Dan Williams of the Application and Impact Division. □

FEATURES

Keep those calls and letters coming



Bernie Yorke (left) and Don Gullett both handle a large volume of public telephone calls at the Climatological Information Unit (CCAS) at AES Downsview. Any queries they are unable to answer, they quickly refer to other government offices.

Nine million customers a year can't be wrong, they call AES for weather information. Scores of other people with questions on every imaginable subject, from garbage collections to UFOs do not know who to call to obtain answers to their queries, so inevitably they turn to AES.

AES offices dot the country from St. John's, Nfld., to Victoria, B.C., and often spell Government to thousands of local residents who do not differentiate too clearly between the various levels.

You can hardly blame people for not being able to decide which problems fall under which jurisdiction, municipal, provincial or federal. Just accept the fact that you will receive many calls on matters that do not directly concern AES, and these could include such "distant" matters as an eclipse of the sun, a falling skylab or a volcanic eruption. This will involve some polite listening, quick thinking and referral of callers as far as humanly possible to the right source.

Of course this is not as simple as it sounds. AES staff often seek guidance on how to handle such calls, find needed resource material or refer questions to the right authorities. All this so affects our reputation, it seems a good idea to pass on some tips.

Creating a good impression

It is easier said than done, but remember to be patient and pleasant. If you give the caller your total attention, and don't sound

bored or annoyed, you create good will and avoid offending people who may be making their first and only call to Environment Canada. The way a call is handled will make a lasting impression, good or bad. Also don't forget every Canadian has a right to deal with the government in English or French.

Since the majority of people contacting AES have problems they want solved, it is wise to put callers on the road to a solution by providing information directly, or by referring them to an expert or appropriate agency. Every person with an enquiry has a right to such treatment, even if the call seems frivolous.

People who call with questions concerning Environment Canada could be offered a choice of either phoning the referral directly or of having this person phone them back. If the caller chooses the second, you should arrange the call. Your offer is important since some people phone AES offices because they cannot afford to call Ottawa or other distant centres. Of course this cannot be done in offices outside the government's intercity phone system.

When your referral is to an outside agency, you should ask the caller to phone or write directly.

The ideal type of referral includes the agency's name, a telephone number, and the name of an expert. Telling someone that the matter is not our concern and to try elsewhere, creates the wrong impres-

sion. Suggesting an alternative shows concern. To handle questions well and provide good referrals requires planning ahead and preparing answers to the most common queries. Compiling a list of phone numbers and obtaining some handy reference material is a good start.

Telephone style

Deciding the style you will use to answer the phone needs some thought. It is best to say "Environment Canada" or the name of your unit, and add your name, e.g. "Environment Canada, Miss Roy speaking." If answering for someone else, the style goes something like, "Environment Canada, Mr. Richard's office, Miss Roy speaking."

An important point about recording a message on a codaphone is to make it clear that the phone rings through to a human at the end of the announcement. Some people hang up because they do not want a recorded weather report. They have a complaint, or require some detailed information, and are angry because they cannot get through.

If you are busy when a call arrives, why don't you take the telephone number and phone back as soon as possible. Letting people know when you will call shows courtesy and prevents you having to make repeat calls.

17327
RE 1500-3
DEC 3 A.M.
1976-1977

Mr. J. G. Yorke
3rd Avenue, Ward 10, Etobicoke, Ontario, M3J 2V3

To whom it may concern,
I would like to request the following publications. Please
publications will cause my Dr. I. class in the study of the
causes of weather & the importance of weather &c. If you have
any other available publications I would appreciate your
providing a suitable quantity. Also, if you had a list of publications
that are available through your department I would appreciate
a copy. Thank you for your co-operation
Yours truly
M. G. G.

Mr. J. G. Yorke
3rd Avenue, Ward 10, Etobicoke, Ontario, M3J 2V3

① Canadian Meteorological
Museum - M.R. Lewis → single copy
② Cloud Chart → class set (35)
③ Weather Kit → class set (35)
④ Weather Maps for Students
- 7 maps (HE 0043-700 6) → class set (35)

Not all letters received at AES offices are as precise or as neatly penned as the sample reproduced here. But whatever their quality, all public communications should be dealt with as promptly and as courteously as humanly possible.

If a person is asked for by name, but happens to be absent, it is better to say he is away from his desk or on leave, or out on business, rather than explaining he is sick or on his coffee break.

If the person requested is tied up for only a minute, give the caller the choice of being called back or being put on hold. A hold decision requires you to come back on the line every 30 seconds and tell the caller he has not been forgotten. Try to avoid asking the caller whether he can hold, then clicking the hold button before he has had time to answer. It is even worse if he is calling long distance. When people phone in from out of town, it's wiser to call them back personally, or offer an explanation if that's impossible.

Take some time to familiarize yourself with office telephone equipment. This way you will run less risk of cutting someone off inadvertently, and losing a friend for life.

Then there's the question of respecting anonymity, precious to people who feel rather shy about calling a government office. Of course you must ask callers to identify themselves when you need their address to send them publications, but screening calls to no purpose is wrong. If you must know who is on the line, say "May I say who's calling" rather than "What is your name?"

When taking addresses, it's a good idea to obtain the phone number so that if there is a delay in shipment, you can phone to tell them of the hold up.

After a caller has explained what he wants, it pays off to repeat the request back to him. Why negate all your good intentions, when a little double checking could prevent mistakes?

Be careful not to let answers to questions contain information you are uncertain about. Some calls may be from people collecting evidence for arguments against neighbors or other agencies, so it's important to offer facts, not speculation.

Letters and walk-in requests

Ninety percent of all AES enquiries arrive by telephone so rightly we talk about this method of enquiry at great length, but the same degree of courtesy and common sense applies to letters and walk-in requests. Answering letters promptly and in a personalized manner cannot fail to create a good impression.

If your receptionist knows of your upcoming appointments, she can greet the visitor by saying, "Hello Mrs. Martin, Mr. Richard is expecting you." If the meeting is unavoidably delayed, Mrs. Martin should be told how long she has to wait. It goes without saying that reception areas should be neat and display a selection of AES and Environment Canada publications.

A final word

The above advice is just that — advice. In reality each caller and each situation is different, so that you will often rely on common sense to provide the answers you need. All we ask is that you bring credit to the department.

Handy telephone numbers

Telephone numbers to give a caller when referring him to another agency, vary from region to region. The following is a list of

possible enquiry subjects with the appropriate federal information numbers in Ottawa marked beside them.

It is hoped these will start you off in your research and help you obtain the right information either locally or from the national sources. It is important that each office generates a corresponding local list so that callers in a region can, wherever possible, be referred to local sources. If you can suggest any new categories to be added, we would appreciate it.

One highly recommended source is *An index to Government of Canada programs and services available to the public in Canada*. (DSS catalogue No. CPI4/1979, but now being revised). Last listed price was \$17.50 □

TOPIC	FEDERAL AGENCY	NATIONAL OR CENTRAL TELEPHONE NUMBER	
Environmental matters			
general information	Environment Canada other than AES	Hull	997-6555
climatic data	Canadian Climate Centre	Toronto	667-4614
parks	Parks Canada (pubs. & information)	Hull	997-0088
wildlife*	Canadian Wildlife Service (pubs)	Hull	997-1095
forestry*	Canadian Forestry Service (pubs)	Hull	997-2800
land*	Lands Directorate (pubs)	Hull	997-2800
inland waters*	Inland Waters (pubs)	Hull	997-2601
environmental protection*	EPS general (pubs)	Hull	997-2800
air pollution*	EPS air pollution directorate	Hull	997-0284
car exhausts*	EPS air pollution technology (pubs)	Ottawa	998-9592
water pollution*	EPS water pollution control (pubs)	Hull	997-1220
recycling projects*	EPS	Hull	997-3212
Radiation health hazards	Health & Welfare Canada	Ottawa	998-3624
Consumer protection	Consumer & Corporate Affairs	Ottawa	997-4210
Earthquakes	Energy Mines and Resources	Ottawa	995-5558
Energy conservation	Energy Mines and Resources	1 800	267-9563
Furnace conversion grants	Energy Mines and Resources	1 800	267-9563
Insulation grants	CHIP	Montreal	341-1511
Fisheries matters	Fisheries and Oceans Canada	Ottawa	995-2041
Maps	Canada Map Office (EMR)	Ottawa	998-3865
Public service employment	Public Service Commission	Ottawa	966-5010
Sunrise/sunset times & solar angles	National Research Council	Ottawa	966-9345

For Jay Anderson Meteorology and Astronomy cover the same sky

For Jay Anderson of Prairie Weather Centre, meteorology and astronomy go together. While on duty as an MT3 specializing in satellite data he says he gets many calls not only about tomorrow's weather but asking him to explain "strange objects" in the sky. These can be anything from a new visitation of Halley's comet to the ultra-bright presence of the planet Venus before sunrise.

Mr. Anderson is not surprised at the public's curiosity. He says he originally studied astronomy at the University of British Columbia and this led to a career in meteorology (starting part-time in the Vancouver weather office). "Meteorology deals with the nearer part of the sky", he says, and astronomy with the more distant parts. It makes sense that people should regard them as a single entity."

Actually outer space queries form only a small part of Mr. Anderson's workload. He spends most of his time as a star gazer at home in his backyard observatory, in the West Charleswood district of Winnipeg, or out in the country with his sophisticated eight inch catadioptric telescope. Here he can indulge in his real passion — taking photographs of galaxies, nebulae and other objects in deep space.

As an example of his work he brings out some black and white photographs of the spiralling, "dusty" Andromeda galaxy, some 2½ million light years away but clearly captured in the prints. "I much prefer photographing the sky to simply observing it", says Mr. Anderson who sometimes spends over an hour on a single exposure.

In 1975 he says he spotted an exploding star or Nova while observing the Cygnus constellation from the Okanagan Valley, B.C. "I had tremendous luck", he says, "but I can hardly be called the discoverer of the Nova, since a couple of hundred other astronomers claimed they saw it at

the same time." Another of Mr. Anderson's specialities are solar eclipses. He was so involved in the major Manitoba eclipse of February 1979, and wrote a climatological pamphlet on it for AES. He is keeping close tabs on the next two important eclipses — Siberia in July 1981 and Indonesia in 1983, and would like to attend either or both if he can spare the time. Another field that fascinates him is comets. "We're due for a major visitation any time now", he adds.

Mr. Anderson says he is less interested in observing individual stars, or in tracking such deep space enigmas as pulsars, quasars or black holes. Even the exciting moons of Saturn come out as mere pin-pricks of light for the earthbound astronomer. "I prefer catching the broad sweep of galaxies, and making a permanent record of the sky", he says.

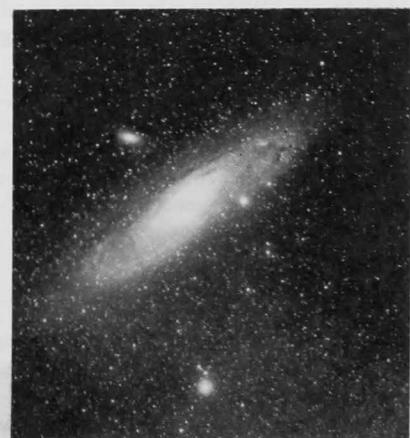
As an astronomer-meteorologist Mr. Anderson has a professional interest in the solar system — especially in the fact that all the planets except Mercury and Pluto have an atmosphere. He believes his astronomical training got him his job on the satellites, and his ability to use them to capture photos of the moon on

GOES satellite pictures led him to perform a novel sidelight experiment in measuring lunar temperature in collaboration with a British colleague.

Despite this Mr. Anderson regards himself as just another amateur astronomer. He doesn't use his home observatory very much since he prefers to be out in a field on a clear (not too cold) night photographing the mysterious universe. He admits it's a loner's hobby, and he wouldn't have it any other way, since a crowd would disturb the accuracy of his photography. Despite his solitude, Mr. Anderson says he gives talks to local clubs and schools, and occasionally has a middle grade class over to view his telescope.

In the not too distant future Mr. Anderson hopes to buy a "giant" 25 inch telescope at a cost of around \$25,000, and he expects to build a new observatory some 25 miles north west of Winnipeg where the terrain is more open and skies are darker.

For an amateur Jay Anderson has come a long way. But he shrugs it all off, saying, "There are still another ten thousand galaxies for me to photograph." □



Jay Anderson of Prairie Weather Centre is seen standing in his home-made observatory, located in the backyard of his Winnipeg residence. The photo on the right is the "neighboring" Andromeda galaxy, some 2.5 million light years away, and obtained by means of an extremely slow time exposure.

A day on the job in the Weather Office

by Eric Stanzeleit

6:10 a.m., it's warm in bed and it would be nice to stay there, especially today. A moment to collect a few thoughts, a moment to reflect back on yesterday's forecasts — today it should snow and blow. A quick look out of the bedroom window — it's good news — already the winds are strengthening out of the southeast and visibilities, even in the pro-

last evening's radio and television weather broadcasts and the one hundred thousand people in the listening area of Southwestern Manitoba were all looking for the same snow and the same strong winds.

On the nine mile drive to work at the Brandon Airport Weather Office, my mind reviews yesterday's synoptic fea-

low pressure cell, that did not quite exist yesterday, moving into the Western Dakotas. Snow and blowing snow from this system, I visualize, will have now spread into Portage and north of Dauphin.

The flight service specialist on the night shift has all the incoming forecasts and weather reports neatly filed. A quick glance through the latter and 7:00 a.m. weather reports indicate the storm is well on its way. A quick read through the area forecasts from Edmonton to Toronto confirm the mental synoptic picture and a scan through the public forecasts indicate we are on track — storm warnings are in effect.

It's a quick scan through because at exactly 8:00 a.m. CKLO Radio will be phoning for the first of its three regularly scheduled weather broadcasts of the day. This one will be on tape and will parallel a live broadcast on the CKX AM/FM, the other popular Brandon station, at the precise moment of 8:11 a.m. BBM ratings over the past several years show that this is a peak audience time for both stations. Our 3 to 5 minute broadcasts must be accurate and detailed as many a day's plans will be based on them. Hundreds of salesmen who gravitate out of this hub city will change their travel plans today. Trips to Winnipeg down the stormy Trans Canada Highway will be cancelled. Cattle buyers from the big meat processing companies will stay home because of cancelled auction sales. City workers and the



Eric Stanzeleit, monitors the teletype traffic.

tected river valley city of Brandon, are showing signs of deterioration. "Good, it's snowing", I mumble to my wife. "What's good about that?" she says. Without answering I am already thinking about the charter flight that was scheduled to head 200 miles north for Swan River and that was cancelled because of the forecast of bad weather. Three doctors and several nurses changed their work day because of it, not to mention all the cancelled business appointments. I also think of the Grade 5 class from Linden Lanes School that had planned to visit the Planetarium and the Pan-Am Pool in Winnipeg today and had changed their travel plans as well. I would be seeing many of these students in the hockey arena later in the week and the barbs of a bad forecast and a cancelled fun trip would be sharp. "Where was that storm, Mr. Stanzeleit?"

Today we were right though, a last minute telephone conversation with the public forecaster in Winnipeg late yesterday afternoon had confirmed local suspicions of a pending storm. A twelve hour advance warning had already gone out in

tures. By the time of the 7:30 arrival at the office I can already picture the intense



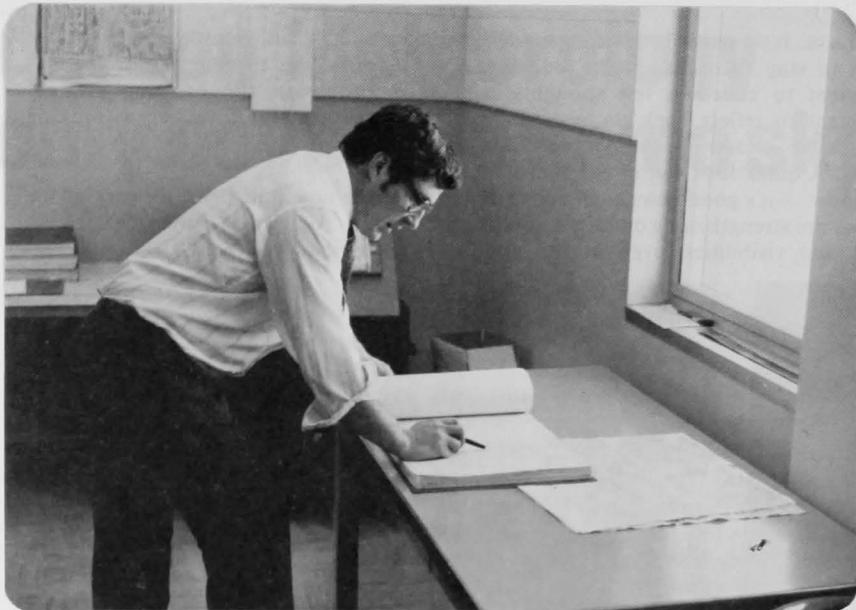
Holds a map discussion.

FEATURES

Provincial Department of Highways will be holding back crews to work later tonight and tomorrow if the storm clears.

The next three hours will be the busiest of the day. Plotting and analysing a local surface weather map to pinpoint frontal positions and cloud and precipitation areas will take an hour or more. A study of the upper winds, a couple of tephigrams and the national weather facsimile charts will use up another 45 minutes. A phone call to the public forecaster in Winnipeg to confirm the accuracy of the spectral prognostic charts and to exchange ideas on the upcoming regional public forecasts will consume more time. In between the phone will ring. On this day, the superintendents of the numerous school bus divisions will all attempt to reach the Weather Office for more detail on the forecast and the storm. Some, in the Boissevain — Deloraine areas nearest to the storm centre, will not run buses, while further north in the Russell and Neepawa areas, where the storm's activities will not reach their full intensity until late in the afternoon, the buses will run. Hundreds of rural schools will open or close on this advice. Forecast information will be exchanged for actual weather reports as call after call comes in from the RCMP dispatch centres, and Greyhound and Grey Goose bus terminals, the outlying subdivisions of the Department of Highways and the dozen or more active flying clubs this office serves.

By 11:00 a.m. work will start on the detailed noon radio weather broadcasts. All of the available information including both forecast and actual weather conditions for an area within a radius of 150 kilometers will be compressed and condensed into a 5 minute radio broadcast. This broadcast will be heard, as it is every day at 12:10 p.m., on any one of four radio stations, in city homes, rural farm houses, car radios and in the offices of many weather orientated businesses. Dozens of coaches and managers of hockey leagues will make personal decisions as to whether they will proceed with or cancel travel plans for upcoming evening games. Virtually thousands of hockey players from Pee Wee to adults will be affected by these decisions. Jack Brockest, owner of the Western Hockey League's Wheat Kings and his concession staff will be expecting a big drop in the evening crowd. Foremen from City and Municipal Works Departments will begin assembling snow clearing crews to start work after midnight on the strength that the storm is ending.



Investigates office records.

By one o'clock the heaviest work load is over. A careful watch is maintained in the event that the storm changes intensity and direction. Individual weather requests continue to filter in to confirm the forecasts but there is now time to maintain weather and climatological records and to answer the day's mail. A request comes in for a school tour of the Weather Office in two weeks time and a service club wants to know if we can send a representative to speak to its members next month.

By 3:00 p.m. it's business as usual — two more radio broadcasts to be prepared and recorded. These will be aired shortly after 5:00 p.m. to catch the homeward bound rush hour traffic. They will confirm that the storm is in fact going to end during the night and that tomorrow will be clear and cold. The television map and script are prepared and delivered to the local station in time for the six o'clock news, weather and sports. The evening shift is briefed and ready for work. At last I can go home — but not for long. I am scheduled to give a three hour evening class in aviation meteorology starting at 7:00 p.m. in the Brandon Flying Club hangar. There won't be many of the regular 20 students there, but the die-hards will be, and so will their instructor.

It's 6:10 a.m. — the sky is clear, it's cold and the storm is over. A feeling of relief steals over me. I will have few criticisms when the Junior "B" Hockey team

that I happen to coach face the Elkhorn Canadians in Brandon's Keystone arena tonight. □

Eric Stanzeleit is a presentation technician at the Brandon, Weather Office, Central Region.

In the above article, Eric Stanzeleit gives some excellent personal reactions to working in a weather office. Last summer's Zephyr questionnaire revealed a fair number of reader requests for more individualized articles. Accordingly Zephyr hopes to run a new one-page feature called DATELINE PERSONAL. If you would like to write about your job (even if it is only marginally related to meteorology), describe some climatological or environmental experience at home or on vacation, or express some forthright opinions on anything from the long-term effects of automatic weather stations to dealing with acid rain, just sit down and type out about three pages of double-spaced copy. Make it interesting, use the first person, express yourself simply and non-technically and send us a photo. These are surefire ways of breaking into DATELINE PERSONAL. □

Training branch may give meteorology courses for scientists

A popular AES training course: Introductory Descriptive Meteorology (IDM), given once or twice yearly at AES Downsvew headquarters, is currently being re-evaluated.

A questionnaire went out in December to some 80 AES managers asking them to assess the usefulness of the training for their staff and to suggest possible changes to be incorporated in future courses. An accompanying memorandum signed by Philip Aber, director, Training branch, said that the current IDM course attempted to satisfy the requirements of both scientific and administrative staff, "whereas as two distinct courses would now seem to be required." The memo added that an AES Training Sub-committee meeting October 22 had approved in principle that all scientific and technological staff acquire a minimum level of meteorological knowledge.

Trevor White of the Co-ordination and Development Section, organizer of the course, said there was now a greater need than ever to have scientific staff familiarize themselves with basic meteorology. "For example", he said, "there are chemists who have recently joined AES in connection with the Long Range Transport of Air Pollutants program (LRTAP) who could benefit greatly from taking a revised IDM course." But he added that replies from directors about splitting the course in two were so far inconclusive. "Giving courses on two levels would be rather difficult at present. For one thing we would have to devote more staff to the project. (Currently the IDM course has two instructors).

Mr. White reported most managers as saying the course was valuable for their staff because it enabled them to relate more effectively both to their work and with other employees. He thought the present content of the course was "about right" pending major re-organization.

The current 76 hour course, extending half days over a five week period is descriptive, and contains no mathematical equations. The course is divided into lectures, laboratory exercises, tours, map

discussions and weather observing.

Looking back on five years successful operation of the course, Mr. White said, "We are proud of the fact that we have given some 150 AES employees a sound introduction to meteorology." He added that staff members who wished to be nominated for the course should try to convince their supervisors that this type of training would increase their work effectiveness and be beneficial to AES as a whole. □



Graduates and instructors of last year's IDM meteorology course (September 8 - October 17) are front row left to right: Desrene Paige (ACRP), Lynne Pepin (AIA), Olga Kowal (ARQA), Lynda McCallum (Instructor-Met Tech ACRT), Myrna Headley (AFOC), Lynda Smith (CCRN), Dorothy Neale (executive assistant to ADMA, Ottawa). Back row, left to right: Russel Crook (AFFS), John Keefe (AAG), Mike Duffy (ARMS), Aldo Missio (Instructor), Trevor White (Course director).

BOOK REVIEW

World Water Balance and Water Resources of the Earth by V.I. Korzun, (Editor-in-Chief), English Translation by United Nations Education, Scientific and Cultural Organization 1978, published by UNESCO Press, 7, Place de Fontenoy, 75700 Paris, printed by Gidrometeoizdat, Leningrad 1978.

Reviewed by Paul Louie.

This monograph is the result of investigations on the water balance and the water resources of the earth by Soviet scientists within the International Hydrological Decade (IHD) program. The IHD, which ended in 1974, was launched in 1965 at the thirteenth session of the General Conference of UNESCO. One of the objec-

tives of the IHD was to advance the knowledge of scientific hydrology by promoting international co-operation. The compilation of this monograph was certainly in keeping with this objective. The National (IHD) Committee of 45 countries contributed data for this monograph resulting in a total data base of 50,000 meteorological stations and over 18,000 hydrometric stations. Also of great importance is the extensive use made of the new information from various countries as a direct result of the implementation of the IHD program. The resulting monograph provides not only basic information on the hydrography, water balance and water resources of the earth on a global scale but also specifically for Europe, Asia, Africa, North America, South America, Australia, Antarctica and the North Polar regions, on their largest

lakes and reservoirs and the world oceans. It also examines the processes involved and the principal laws governing the hydrological cycle of the whole earth.

The amount of information contained in this monograph is monumental. The main text contains 663 pages with 201 tables and a bibliography listing 882 references. Accompanying this text is an Atlas consisting of 65 map sheets which show the spatial and annual distribution of the major hydrometeorological elements. An explanatory text in the form of a 38 page pamphlet is provided with the Atlas. This explanatory text contains an excellent description of the methodological basis of the data processing and map plotting as well as a summary of the scientific conclusions from the results of the Atlas contents.

The primary advantage of this present

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work had over previous (pre IHD) world water balance attempts is the increased data base available, particularly for countries and regions for which little was previously known with respect to hydro-meteorological information. Wherever possible, the water balances presented in this work were based on the independent determination of the individual balance components of evapotranspiration, and runoff. Another important improvement is the recognition of the fact that gauge precipitation measurements underestimate the actual precipitation falling on the ground surface and consequently all precipitation data were corrected for wind, gauge wetting and evaporation errors.

The resulting water balances presented by this work give the total annual global precipitation, numerically equal to the global evaporation, to be 1,120 mm or 577,000 km³. This value is 10 to 38 percent higher than previous estimates due mainly to the introduction of corrections to the measured precipitation data. The estimate for total annual runoff from land to the oceans, which included the direct ground water discharge into the oceans and glacial runoff, is 315 mm or 47,000 km³ and this is 11 percent higher than previous estimates. The fact that the three balance components of precipita-

tion, evapotranspiration and runoff were, as much as possible determined independently, did result in discrepancies in the water balance. Generally, the major portion of the land water balance was co-ordinated within \pm 10 percent and within \pm 20 percent in mountainous regions. The discrepancy values for all the water balances presented are tabulated in the main text. This provides the user of these data a much better appreciation of the uncertainties involved. In other works where the balances are forced by computing one component as a residual, these uncertainties are not as apparent.

In summary, the global water balances presented by this work do not introduce any radical changes in the conceptions that resulted from previous Soviet investigations but they do differ substantially from the balance values in works of investigators from other countries. However, this work was based on the most up-to-date and comprehensive data set and its methodologies are well documented. This work should prove to be a valuable reference for those specialists engaged in water balance computations and water resource development and conservation. □

Mr. Louie is Superintendent, Hydrometeorological Projects Section, Hydrometeorology Division, Canadian Climate Centre.

"Mission Possible" graduates at Cornwall



A course in Advanced Meteorology (CMA 80-2) was given in French at the Meteorology Training Centre, Transport Canada Training Institute, Cornwall, Ont. between August 26 and October 29, 1980. Students and instructors are seen from left to right: Pierre Lacroix (instructor), Guy Bouchard (Québec), Robert Perron (instructor), Gene Drapeau (instructor), Denis Dubuc (Québec), Joseph Klemka (Canadian Coast Guard), Serge-André Gauthier (Québec), Michael Baltazar (Canadian Meteorological Centre), Normand Michaud (instructor), Doug Teach (superintendent, Meteorology Training Centre), Gilles Babin (instructor).

Thirteen employees get long service awards



Thirteen employees received long service awards from assistant deputy minister Jim Bruce at a special presentation in the AES Downsview Auditorium January 28.

Mr. Bruce told the recipients, all of whom have had more than 25 years experience with the federal government, that they qualified not only for long service awards, but also for "good service awards." ADMA who first joined the public service as a meteorologist in 1948, compared the budget, working conditions, and operations of the fifties with those of today, and noted considerable changes. The award winners, each of whom received a crested plaque, were also addressed by Morley Thomas, director general of the Canadian Climate Centre. □

After the ceremony, Long Service Award Winners posed with ADMA, Jim Bruce in the front lobby of the AES Downsview headquarters. Front row left to right Mr. Bruce, Anne Fedurco, Ann Rice, Jackie Blackburn, Josie Giometelo, June Zapp, Ed Birch. Back row left to right Bernie Yorke, Ron Crowe, Wilf Green, Neil MacPhail, Bob Wilson, Al Christie, Mac Knapton. Award winners not present at the ceremony were: Henry Fiennes-Clinton, Gabriel Dagenais, Réal Gagnon, and Gunther Sachau.

WOMEN ON THE MOVE

Evelyn Wilson appointed new EOW convenor

Evelyn Wilson has been appointed convenor of AES Equal Opportunities for Women (EOW) for a two-year term, effective February 2.

Mrs. Wilson has worked in the Air Quality and Inter-Environmental Research Branch at AES Downsview for the past two years, and was formerly an operational meteorologist with experience at the Alberta, Arctic and Ontario weather centres. She says she looks forward to a challenging and innovative term co-ordinating EOW's Action Plan.

Mrs. Wilson plans to give top priority to two items: completing the establishment of the federal government's first in-house daycare centre near the AES Downsview headquarters, and launching a series of major career development seminars scheduled to begin at 4905 Dufferin Street some time in May. "I hope attendance at the two-hour one day a week sessions will be high", she adds.

Another project Mrs. Wilson will promote is the setting up by late spring of an

EOW library to be located if possible in the AES main library.

The convenor says it is too early for her to judge what progress has been made in career opportunities for AES women, and she doesn't know which areas offer the most promise over the short term. But she has begun to evaluate the situation and would have more to say on the subject in the near future. "All I know right now", she says, "is that I am optimistic about career possibilities for AES women over the next decade."

Mrs. Wilson is aware of the careers situation for women with a science background: at the moment, out of 581 AES meteorologists only 27 were women. But more women were now taking science courses at university (she herself has a Math and Physics major from the University of Toronto) and more graduates or prospective graduates were becoming aware of opportunities for women in meteorology.

Looking forward to her term as convenor, Mrs. Wilson says she hopes to further development of the entire EOW program in a highly positive way, "since success will depend very much on our attitudes." □



Evelyn Wilson

Gloria Miller

Gloria Miller, training development specialist at AES Downsview headquarters died February 18, after a brief illness.

Mrs. Miller came to work for AES as a librarian in 1970 and was instrumental in establishing the system under which the library now operates.

An interest in people led Mrs. Miller to a new career as staffing officer with the Ontario Area Personnel office in 1977. In 1980 she became responsible for Training and Development.

Mrs. Miller was born and educated in Niagara Falls, Ont. She obtained a Bachelor of Arts degree from Brock University, St. Catharines and later went on to get her Master of Library Science from the University of Western Ontario.

Mrs. Miller was enthusiastic and dedicated to her work with the department but above all else she was a mother.

She leaves six-year-old twin sons, Hugh Gordon and Andrew Malcolm and is survived by her mother Dorothy Follett of Niagara Falls and dearest love Réal Gagnon. □

AES thanks Abbey for 75-years of climate service

AES does not often get a chance to thank its network of some 2000 volunteer climate observers from all parts of Canada.



Left to right in the St. Peter's Abbey plaque presentation ceremony are Abbot Jerome Weber, Mark Hacksley Assistant Chief, Data Acquisition, Central Region Winnipeg; Ken Leek, Inspector Saskatoon weather office and Brother Oswald King, keeper of the records.

But last October 21 a special ceremony was held at St. Peter's Abbey, Muenster, Sask. to commemorate 75 years of continuous weather recording by monks making meticulous daily observations. The occasion was marked by the handing over of a plaque and the book, "Birds of North America" by Glen Loates to Abbot Jerome Weber and Brother Oswald King (keeper of the weather records). Mark Hacksley (Acting Chief of Data Acquisition, Central Region) and Ken Leek, Inspector, Saskatoon weather office, made the presentations.

Slim black volumes containing daily weather statistics dating back to January 4, 1904 are preserved at the Abbey, and there is a notation that on that date the minimum temperature was -23C and the maximum -17C. Mr. Leek said that it was rare for one family or organization to be involved in climatological observations on one site for as long as 75 years. □



Gloria Miller

DEPARTMENTS

Ellery Rustine Withers Cullins

Rusty Cullins, one of the AES Atlantic Region's most popular Officers-in-Charge was killed in a plane crash on January 19, 1981, while on duty 150 km from Goose Bay, Labrador. Rusty started his career with AES in 1973 at the Maritimes Weather Office. He transferred to the Goose Bay Weather Office as a weather observer in 1974. He completed his tour of duty in 1976 and transferred back to Maritimes

Weather Office. After completing his advanced Met and Presentation courses in 1977, he transferred back to Goose Bay as a Presentation Technician. Rusty was active in the community of Goose Bay and was an avid skier and camper. He was concerned about the environment of the north as Labrador was his second home. He became OIC of the Goose Bay Weather Office in July 1978, and held that position until his untimely death at the age of 32.

He is survived by his wife, Paulette and three children, Sarah 9, Melanie 4, and Benjamin 2. □

STAFF CHANGES

Promotions/ Appointments

P.G. Aber (MT-9) Meteorologist, Director, Training Branch, ACTD, Downsview, Ont.

J. Alexander (MT-6) Instructor, Training Branch, Downsview, Ont.

V. Anderson (CR-2) Clerk, AAL, Downsview, Ont.

B.W. Attfield (CS-5) Computer Sciences, Chief, Computer Planning Division, ACPD, Downsview, Ont.

C.R. Bowman (EG-3) U/A Tech. WSI, Hall Beach, N.W.T.

R.T. Bowser (EG-3) U/A Tech. WSI, Mould Bay, N.W.T.

C.J. Brennan (EG-3) U/A Tech. WSI, Eureka, N.W.T.

A.L. Casey (AS-3) MAED, Bedford, N.S.

T. Dame (AS-3) Supv. Climate Contract Stns., Central Region, Winnipeg, Man.

D. Dockendorff (MT-6) Meteorologist, ACNP, Downsview, Ont.

R. Gilbert (MT-6) Meteorologist, SSD, St-Laurent, P.Q.

R.L. Jones (AS-7) ADED, Ottawa, Ont.

L. Kiely (SCY-3) Secretary, CCDG, Downsview, Ont.

R.H. King (EG-6) OIC, Weather Office, St. Catharines, Ont.

J. Kruus (MT-9) Meteorologist, Director, Data Acquisition Services Branch, AIBD, Downsview, Ont.

M. Lemaire (SCY-2) Secretary, CCAI, Downsview, Ont.

F.J. Lemire (MT-9) Meteorologist, Director, CMC, Dorval, P.Q.

P.A. Lachapelle (MT-6) Meteorologist, Shift Supvr. Arctic W.C. Edmonton, Alta.

A. McDonald (MT-6) Instructor, Training Branch, Downsview, Ont.

N. Michaud (MT-5) Meteorologist, Ice Forecaster, Ice Central, Ottawa, Ont.

J. Mills (MT-8) Meteorologist, Chief, Forecast Operations, WAED, Edmonton, Alta.

D.D. Morrison (EG-3) U/A Tech, WSI, Hall Beach, N.W.T.

J. Mraunik (EG-3) U/A Tech. WSI, Resolute, N.W.T.

D. Mudry (MT-7) Meteorologist, Chief, Ice Climatology and Applications, Ice Central, Ottawa, Ont.

D.M. Pollock (MT-8) Meteorologist, Supt. Operational Services, DMETOC, Ottawa, Ont.

B. Rabinovitch (ST-SCY-2), Secretary, ACPD, Downsview, Ont.

E. Robinson (MT-7) Meteorologist, AIDI, Downsview, Ont.

C.L. Smith (EG-3) U/A Tech. WSI, Resolute, N.W.T.

U. Telle (AS-3) Admin. Officer, Training Branch, Downsview, Ont.

T.D. Zaporzan (EG-3) U/A Tech. WSI, Baker Lake, N.W.T.

Transfers

D. Bourque (MT-7) Meteorologist, CSD-ACNC, Downsview, Ont.

R. Desjardins (EG-4) Technician, QAEAO, Cape Dyer, P.Q.

J. Gagnon (MT-7) Meteorologist, MOP, ACTD, Downsview, Ont.

D. Harvey (EG-1) Technician, QAEAO, Clyde River, P.Q.

K. MacDonald (MT-6) Meteorologist, ACEI, Downsview, Ont.

L. Neil (MT-2) Meterologist, DND, Comox, B.C.

J.L. Paré (EG-1) Technician, QAEAO, Cape Dyer, P.Q.

R.L. Penner (MT-3) Meteorologist, CFWO, Greenwood, N.S.

D.W. Porter (CS-2) Computer (METOC) N.S.

M.R. Power (MT-3) Meteorologist, DND, Chilliwack, B.C.

W.L. Ranahan (MT-6) Meteorologist, Maritime WO, N.S.

L.E. Welsh (MT-2) Meteorologist, Ontario Weather Centre, Toronto, Ont.

Temporary or Acting Positions

H. Allard (MT-9) Meteorologist, QAED, St-Laurent, P.Q.

J.M.L. Berthelot (EG-8) Supt. Wx Office Standards & Requirements, Toronto, Ont.

R. Bourke (MT-8) Meteorologist, Chief, ACID, Downsview, Ont.

C. Dicenzo (MT-5) Meteorologist, AFPD, Downsview, Ont.

P. Dubreuil (MT-7) Meteorologist, QAES, St-Laurent, P.Q.

P. Ducharme (MT-7) Meteorologist, QAEQ, St-Laurent, P.Q.

D. Dumond (CS-3) Project Leader, ACPD, Downsview, Ont.

J. Douville (EG-6) Technician, QAEQ, St-Laurent, P.Q.

H.M. Humber (AS-4) IMPAC Coordinator, ADED, Ottawa, Ont.

R.J. Lee (MT-6) Meteorologist, Developmental Assignment, ADED, Ottawa, Ont.

J. Vanier (MT-8) Meteorologist, Chief, QAEM, St-Laurent, P.Q.

Departures from AES

A. Bentley, Arctic Weather Centre, to Solicitor General Canada.

J. Blommers, Arctic Weather Centre, to private industry.

B. Byce, A/Chief, Computer Centre, Downsview, Ont.

R.W. Fenn, DMETOC, Ottawa, Ont. to Digital Equipment Ottawa, Ont.

B. Liboiron, QAEQ, St-Laurent, P.Q. to Bell Canada

R.W. Plaseski, ACDA, Downsview, Ont. to Regional Director General's Office, Toronto, Ont.

B.A. Rystephanuk, WSI, Resolute, N.W.T.

R. Thomson, Arctic Weather Centre, Edmonton, Alta. to OSERP-Special Assignment

R. Tillett, WO4, Edmonton International Airport.

S. Trudel, QAEQ, St-Laurent, P.Q.

Deceased

G. Miller, Staffing Officer, OAP. 18 February, 1981.

E.R.W. Cullins, Goose Bay, Labrador. 19 January, 1981.

Retirements

C.J. Stead, DMETOC, Ottawa, Ont. December 1980

J. Simla, CMC, Dorval, P.Q. March 1981