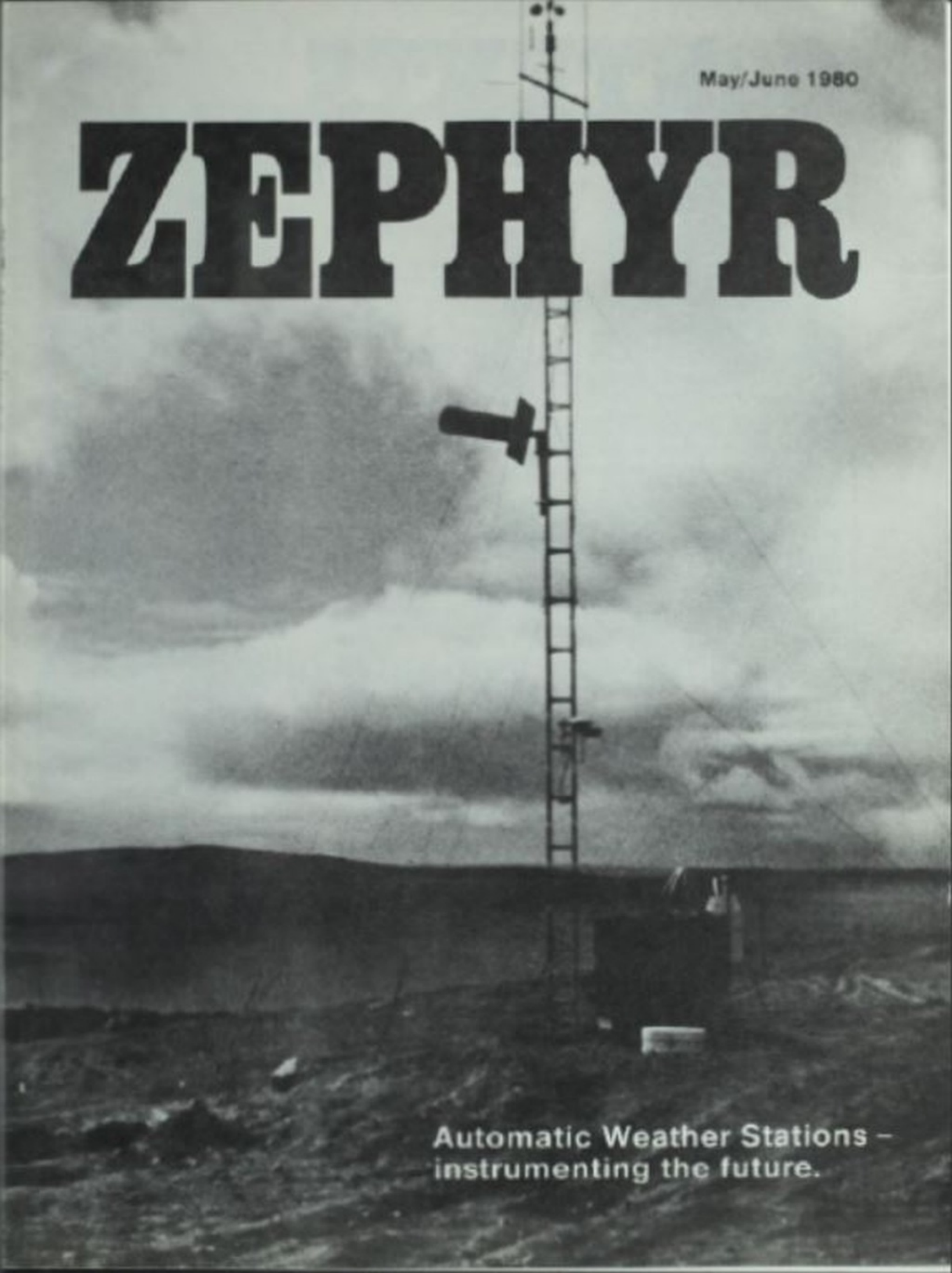
May/June 1980

ZEPHYR



Automatic Weather Stations –
instrumenting the future.

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Cover: The Ennadai Lake MAPS[R] station shows an automatic weather station configuration of an instrument tower, a black instrument box at its base, a white, covered battery storage well just in front of the instrument box, and a precipitation detector behind it.

Zephyr is a periodical publication for employees of the Atmospheric Environment Service, Environment Canada. It is produced for the Atmospheric Environment Service by the Information Directorate of Environment Canada.

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

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Dr. Collin leaves AES

Arthur E. Collin was appointed associate deputy minister of the Department of Energy, Mines and Resources (DEMR) by the Prime Minister on May 15, 1980, effective immediately.

Dr. Collin was assistant deputy minister of AES since August 1977. During his two and a half year term of office with AES, he introduced several important changes in the organization.

- The Canadian Climate Centre was formed in 1978 to bring under one roof all the components of AES dealing with climate and climatic change.
- Economic studies were undertaken of the impact of weather services in the agricultural sector and on marine transportation on the Great Lakes.
- The problem of the Long Range Transport of Air Pollutants (LRTAP) was given high priority with inter-departmental and US-Canada committees actively seeking to solve what is now termed "the biggest environmental problem of the decade."
- The Computing Services Branch was established within the Central Services Directorate to coordinate and plan the services provided by a new computer in Downsview and the existing on in Montreal. This will allow AES to take full advantage of the advances in technology in this field and to raise the level of services offered to users.
- The Instruments Branch was moved to the Central Services Directorate to bring together those elements of AES concerned with the development and planning of observational systems.

Prior to his appointment with AES, Dr. Collin held several posts of increasing importance with the Fisheries Research Board, the Department of Mines and Technical Surveys, the US Air Force, and the Bedford Institute of Oceanography (Nova Scotia).

From 1965 to 1967 he was a scientific advisor with the Department of National Defence and Dominion Hydrographer with DEMR to 1970. Dr. Collin was appointed director general of the Marine Sciences Directorate, DOE, in 1971 and ADM, Ocean and Aquatic Sciences in 1974.

In the interim, and prior to the appointment of a successor to Dr. Collin, Dr. Godson, director general, Atmospheric Research Directorate, will be acting assistant deputy minister.

Weatheradio Winnipeg now on the air

Weatheradio Winnipeg opening ceremonies on April 24, 1980 marked the addition of the sixth station to the growing AES Weatheradio Canada network started in 1977. When opening the station, assistant deputy minister Dr. A.E. Collin stressed the importance of the Weatheradio network in improving weather services, in the rapid dissemination of severe weather warnings, and in facilitating the future provision of weather information in both official languages.

Central Region's director Jack Labelle opened the ceremony by welcoming the over 80 people attending, including representatives from several federal, provincial, and municipal government departments; key user groups; businesses; public utilities; and the media.

Tom Pringle, assistant deputy minister in charge of the Production Division of the Manitoba Department of Agriculture, represented the province. In conveying best wishes from the province, Mr. Pringle said he recognized the importance of up-to-date weather information to agriculture and its benefit to farmers.

Jack Labelle (right) explains details of the new Weatheradio Winnipeg station to Tom Pringle (left) of the province of Manitoba and Dr. Art Collin, assistant deputy minister of AES (centre).

A Winnipeg journalist checks out the Weatheradio Canada broadcast at the Winnipeg opening.

NEWS

Mississauga thanks AES

The city of Mississauga has presented AES with a certificate of appreciation for the special weather services provided during the Mississauga train derailment, November 10-16, 1979. In a covering letter mayor Hazel McCallion expressed the gratitude of the Mississauga council to the AES staff who participated in the Mississauga operations stating that they are a "credit to themselves as well as your organization." The certificate now hangs in the Ontario Weather Centre.

AES at CMOS

The Canadian Meteorological and Oceanographic Society annual meeting held in Toronto May 22-27, was a bigger event than usual because of visiting American scientists attending the concurrently held American Geophysical Union congress.

AES professionals presented 16 papers at sessions which ranged from atmospheric chemistry to weather forecasting. Papers such as those by John Spagnol from the Pacific Weather Centre, and by Ken Jones and Gary Machnee from the Prairie Weather Centre demonstrated AES's commitment to undertake research on local weather forecasting problems where they occur. George McPherson, Director of the Ontario Region, who presided over one of the sessions expressed the view that "the undertaking of research throughout AES points to a healthy situation for the organization."

Computer Services Branch formed

The high priority AES gives to increasing its computing power has resulted in the formation of the Computer Services Branch, and the appointment of Dr. Kirk Dawson to act as its new director. The new branch has three parts: the computer facilities at Dorval, those at Downsview, and a planning section.

Dr. Dawson comes to AES from the Public Service Commission, where he was director of computer services. He feels that the primary objective is to ensure that AES gets the maximum benefit from its expenditures on computing. The new structure will allow for better coordination of the two computing centres, which have different types of computers. This will ensure that computing work is done on the most appropriate machine.

Another objective is to improve the communications systems to allow regional researchers better access to the two facilities.

Dr. Dawson will be working out of the Fontaine building in Hull.

Canadian Science Writers meet at AES

Two major AES areas of research, acid rain and CO_2-caused climatic change, were featured prominently at the annual meeting of the Canadian Science Writers' Association held at AES Downsview, April 14-16. The meeting brought leading Canadian science writers and broadcasters representing major national and local media to the AES building and exposed them to the work of AES. Total attendance was about 80.

In his welcoming remarks, assistant deputy minister Dr. A.E. Collin noted that the science oriented media play a vital role in keeping public interest groups conversant with the facts needed for their participation in the political decision making process. He also noted that media have a vital role in creating the public support required by governments to cope with problems like climatic change and the depletion of the ozone layer which have not yet become visible.

Other AES speakers included Dr. Hans Martin, manager of the LRTAP Program Office; Gord McBean, chief of the Boundary-layer Research Division; Dr. Phil Merilees, CCC Chief Scientist; and Gord McKay director of the CCC Climatological Applications Branch. Among other notable speakers was Dr. H. Parrott, Ontario's Environment Minister.

A display of tethersonde ballon and atmospheric dispersion measuring instruments by the Air Quality and Interenvioronmental Research Branch, which filled the lobby, drew the work of the branch to the attention of the media.

AES personnel were invited to attend the three-day conference, and took advantage of the opportunity to observe the media in action and to meet with them.

The conference resulted in substantial media coverage of AES programs.

Ontario's Environment Minister Dr. Harry Parrott addresses meeting of Canadian Science Writers' Association at their annual meeting at AES Downsview auditorium.

MAPS[R] now on the map

December 11, 1979 marked the start of a new era in data collection, when the computer program required to translate data from the latest generation of automatic weather stations became operational, and the readings obtained automatically from five isolated locations were fed for the first time into the working forecast data base.

The five locations – Thelon River and Ennadai Lake, N.W.T., Border and Lake Eon, Que., and Caribou Island, Ont. – all have the new Canadian designed MAPS[R] automatic weather stations. MAPS[R] is the registered trademark of Bristol Aerospace Ltd. of Winnipeg, and stands for Modular Aquisition Processing System.

Unlike the older MARS I and II automatic stations which depend on the availability of power and communications land lines, MAPS[R] was developed for locations where land lines are not available. Transmission, therefore is by radio, and power must be generated on the spot.

Power sources for MAPS[R] are limited to solar and wind energy: the five stations mentioned use solar energy, while an early ice floe station used wind. Batteries are required to sustain the stations in the absence of sunlight or wind, and this means the stations must operate on low currents.

Low power availability has several consequences on the design of the station. Present instruments for measuring visibility and cloud cover require too much power and thus are missing from MAPS[R] stations. But the more important consequence of low power is that direct ground to ground radio transmission is not reliable.

Oddly enough, the way to overcome this problem is to relay the information via satellite. Fortunately, the United States makes available its Geostationary Operational Environmental Satellite (GOES) for this purpose at no cost. The United States Environmental Satellite Service has allocated a few minutes of each hour's GOES capacity to AES. But each MAPS[R] transmission must be limited in time and must conform to the satellite's code, which differs from that used for the normal transmission of data on the AES network. These differences necessitated the recently implemented computer translation. Until the computer program was implemented, data from MAPS[R] had not been useable in real time.

Another problem that had to be overcome was that of keeping the electronics warm enough to allow them to function in even the worst Arctic location. Again, because of power limitations, warming must be passive. Jim McTaggart-Cowan, while with the Instruments Branch, solved this problem by applying the old idea of the thermosyphon. Buried deep in the ground, a copper pipe will transfer heat from the warmer ground to the colder instrument box, keeping it a nice, toasty -20°C.

Needless to say, getting the thermosyphon deep into the ground in isolated locations isn't easy. Gunther Sachau of the Instruments Branch is the person charged with the installation of the MAPS[R] stations. He shares the work with regional technicians, who will eventually take over maintenance. Sometimes he gets lucky, and the installation occurs at a location which has a small bulldozer.

Floating weather stations

Accurate weather forecasts are so important to CANMAR, a company undertaking oil drilling operations in the Beaufort Sea, that is purchases its own automatic weather stations and has hired AES personnel to help install them and to prepare special forecasts. Since CANMAR may have to suspend drilling operations in the face of storms and ice, the company has found it worth its while to employ AES services every summer since 1976.

As the CANMAR helicopter lifted off from the ice floe, Bill Hart photographed the newly installed floating automatic weather station and the location device to its left.

The MAPS[R] instrument box sits on an insulated cylindrical column containing the thermosyphon, which passively draws heat from the ground to keep the electronics at an operational temperature.

Other locations with no pre-existing facilities mean flying in every last bit of equipment. Digging is then done by gas-powered bit, pick and shovel. Several days work means living in pup tents and plastic lean-tos improvised to allow a meal without the constant layer of insects. But discomfort is one thing, the danger quite another, and it's real. Mr. Sachau was once missing in action while installing a MAPS[R] (see opposite page).

Obviously, the trips to automated weather stations can be expensive. Jerry Musil, MAPS[R] project leader with the Instruments Branch points out, "a battery terminal, which corrodes and shuts down operation of the station, may take only five minutes to repair, but it may cost $5000 to get there to do it." His job is to examine the reliability of the methods or equipment the supplier is proposing. Mr. Musil is credited with several modifications to the MAPS[R] design. Such work continues in his group as Leif Hansen now analyses data received from MAPS[R] to permit further improvements.

Mr. Musil and Jan Skalski of Instruments Branch have developed a portable set of instruments to test automatic stations. The testing devices have such features as "power up timers," a type of push-button switch which turns itself off to prevent batteries from running down, a major inconvenience in the Arctic.

But Mr. Musil has gone one step further. After Mr. Sachau went missing, Mr. Musil developed the "red box" at Mr. Sachau's urging. The box can generate nine numbers, each standing for an emergency message. When the box is plugged into the barometric MAPS[R] coupler, the emergency message is sent during that few seconds each hour when the station turns on to signal the satellite. Thus, AES staff will be just that much safer.

Floating weather stations (continued)

The CANMAR automatic stations are installed on Beaufort Sea ice floes to give some indication of weather coming from the sea. Since the stations float, generally into Soviet territory, location devices must be placed on the ice with the stations. As the stations float off, the data's value becomes limited, so batteries are used to power the observations and transmission since a longer term source of power is not necessary.

The stations are simpler than those used elsewhere by AES and only measure pressure, wind speed and direction. Nonetheless, the data is fed into the overall national data base by AES staff manning the Beaufort weather office at Tuktoyaktuk.

Last summer's station was installed by Bill Hart of the Arctic Weather Center in Edmonton and a representative of a private company. They helicoptered to pack ice 400 km north of Tuktoyaktuk. The first step was to drill a hole 2.5 m into the dark blue-purple ice which fortunately was over 2.5 m thick.

Bill Hart reports, "Both of us worked with one eye looking for polar bears, not trusting their hospitality or helping hand." But the potential of meeting a polar bear may have been a help after all. They had the station unloaded, assembled, and frozen into place in the record time of less than two hours.

There are other concerns about automatic weather stations. Ken Asmus was OIC at Ennadai Lake when it closed. He is now working out of Edmonton as an inspector. He has mixed feelings about automatic weather stations. "I feel that more automated stations will mean fewer jobs for met technicians placing limitations on careers," he said. On the other hand, he realizes that it is also difficult to staff isolated stations.

He notes, "remote manned stations like Ennadai Lake also serve other functions, such as providing shelter to those passing through the region." He notes that local users protested the closing. Among them were local pilots, mining and oil company employees, and other federal government agencies.

Nonetheless, he thinks the idea of automated stations is great if used to fill in the gaps in the observational network. Great, that is, if some of the technical limitations can be overcome.

What are the limitations? As mentioned, not all variables are observed. Also, according to Mr. Musil, although the electronics have proved themselves to be reliable, sensors do fail and it may be months before they can be repaired or replaced. Sometimes the sensors themselves have limitations. The relative humidity sensor now employed uses a human hair which fails in dry weather, and a mechanical linkage which can freeze. The atmospheric pressure sensor used in MAPS^R is temperature dependent, non-linear, and thereby not interchangeable with those from other stations without complicated recalibrations.

The MAPS^R automatic weather station tower holds two unconventional pieces of equipment; a cylindrical antenna for broadcasting data to a geostationary satellite and, above it, a square plate holding the several circular solar energy cells which power the station.

Missing in action

Gunther Sachau is a cautious man. As the man responsible for installing MAPS^R automatic weather stations in usually remote locations for the Instruments Branch, he has learned to come prepared for most any contingency.

But when, in 1978, the commercial airline which had taken him to Churchill lost the collar which insulates the system's thermosyphon and he had to make a return trip to the Thelon River MAPS^R site for its installation, he saw no cause for concern.

After all, it was a straight-forward enough matter: four hours to fly in, four hours to install the collar and instruments box, and four hours to fly back. Hardly reason to take sleeping bags and extra food.

Coming back, however, the aircraft encountered unexpected headwinds. Suddenly warning lights flashed that only ten minutes of fuel remained. The pilot reckoned they were only 30 miles from Churchill, but decided to descend to search out an emergency landing spot rather than try to make it back. He found a suitable body of water, radioed his position, landed on what could best be described as a puddle, and decided to wait till another company plane came to get them.

The two pilots, plus Gunther Sachau and Ed Higham, a Central Region inspector, spent the chill late October night in the cold aluminum body of the aircraft. The next morning when they tried to send another radio call for help, they found the radio battery had gone dead. They passed the day exploring the area, looking for something other than their unpalatable dried food, but ceased when they spotted two adult black bears.

There wasn't much point to exploration anyway since, although the plane carried shotgun shells, the shotgun itself was missing. They limited their activity to boiling the bug laden water of their puddle and came to the realization that there was no way to walk out.

No plane arrived for them that day. They had to wait until someone found their red plane sitting on a small body of water – one of thousands surrounding them and effectively blocking any surface escape route.

To overcome such problems AES is working on the development of new sensors such as a solid state atmospheric pressure gauge and laser cloud detectors. Even so, there are still things that a human observer can do better than an instrument.

Whatever their present imperfections, automatic weather stations are here to stay. Right now, MARS stations total 39 – half at manned locations. Those at manned stations are used to supplement human observers after hours and on weekends. Manned observations get priority since they are more complete.

MAPS^R stations have been used for some stations that were isolated or closed down for reasons of economy. MAPS^R stations on the Pacific rim are to be tested as part of the replacement for Ocean Station PAPA. If they and the system of floating buoys prove adequate, then PAPA can be retired saving AES about $3 million in the first year alone.

Another seven MAPS^R stations remain to be purchased under a current agreement. Their deployment is now under review by Ron Miller and Griffith Toole of Field Services.

But AES intends to move on to the next generation of automatic weather stations as quickly as possible. Roy Bourke of Central Services chairs a committee which has already drafted the specifications for the station which is to follow MAPS^R and has moved on to begin development.

Dave Colwell of Field Services, who has been considering the policy and manpower implications of the next generation station, says, "The upcoming automated station is being designed so that AES staff can work with it as an observer/machine partnership. The procedure AES now uses relies on observers working with tools, and we regard the automated stations as just a more sophisticated tool."

"One example of the long range value of this tool is at flight service stations or joint presentation offices where the priority of staff duties means that the taking of observations must sometimes be ignored. A properly designed observer-machine operation would reduce the staff time required for observations or provide a basic set of automatic observations when staff is unavailable for monitoring. The reserve capabilities will assure the quality of observations."

"In the end, the changes should make the observer's job much more interesting."

The upcoming system, which is as yet unnamed, should incorporate several advances. The drawing board version will have much more advanced electronics, including micro-processors to undertake on-site processing and to allow observer-machine interaction, the ability to transmit either to geostationary or polar orbiting satellites or by land line, and additional sensors to measure parameters related to ceilings, visibility, and types of precipitation. On top of all this, the system will be much more versatile in its deployment configuration and will cost less. What it still lacks is a delivery date. Hopefully it will be sometime during 1983. □

Missing in action (continued)

That night it was back to that refrigerator of an airplane. The first day, the pilot had been confident that they would be found and thus had not set up the Emergency Location Transmitter (ELT). The second day Sachau decided it was time. He found, however, that the ELT had corroded batteries.

Ed Higham managed to clean it up and rig it with flashlight batteries. Within the hour an Air Canada plane passing over a hundred miles away had noted their location and shortly after a wheeled plane had spotted them but could not land. The pilot dropped a radio transmitter, and it was then that they learned they were 90 miles from Churchill, not the 30 the pilot had reckoned. They also found out that their last radio message had been garbled because they were so low.

That ELT had probably kept them from becoming the casualties their families already thought they were.

They were told that a rescue plane would pick them up in an hour. The same wheeled spotter plane circled, but then had to inform them that the pontoon plane had engine troubles and would only be able to get to them the next day.

In the excitement of having been found, they forgot to ask for sleeping bags.

Gunther Sachau says, "I now check every piece of equipment in any plane which we charter even if the pilot things I'm crazy. I also take enough supplies for a week even if I'm only going for a few hours."

It can take a week to install an automated weather station. Sleeping quarters at Thelon River consisted of pup tents but. . .

. . .the need for a messhall was not anticipated. The constant swarm of blackflies necessitated the hasty construction of one.

Glimpses of China

by Archie Asbridge

The Great Wall near Pataling

The World Meteorological Organization (WMO) through its technical co-operation program often searches for specialists around the world to provide expertise to nations who request it. Occasionally, Canadian expertise is sought and AES is pleased to give it.

Over the last year or so, there was a good deal of interest from China and the Far East. Three AES employees, specialists in their fields, travelled thousands of kilometres to provide training and assistance to China and Mongolia.

In this issue, and in following ones, Zephyr will feature articles describing the experiences of AES scientists in these exotic areas.

A request to modernize and recalibrate a couple of ozone spectrophotometers is not too unusual for the staff of the Experimental Studies Division at AES Headquarters, but it creates a lot of interest when it is learned that the instruments have been sitting unused in China for about twelve years. What made it even more attractive,was that the request included an invitation to visit Peking to help get an observing program started.

That, essentially, was the start of some work which we were asked to do in the summer of 1979 on behalf of the World Meteorological Organization (WMO), and which led to my visit to China in late November after we had completed the recalibration of one of the instruments in Toronto.

A thirty-five hour journey from Toronto to Peking via Zurich, Athens and Bombay does not generate too much enthusiasm with which to commence a visit. A night view of Peking from the air is quite dull

when compared with the well lit cities of Canada, but it was a most welcome sight after the long flight. The usual tiresome job of customs and health clearance was thankfully speeded up by my hosts from the Academy Sinica,and within an hour I was settled in at the Peking Hotel.

Twelve hours of sleep and a good breakfast restored me to the point where I was ready to tackle some work, only to be informed that my first day in Peking should be spent resting. My presence, however, was requested at a reception to be given at noon in my honor, by the Academy. Held at the famous Roast Peking Duck Restaurant, it was a truly unforgettable experience. The Director of the Institute of Atmospheric Physics, Professor Yeh Tu-Zheng, and his staff, gave me a very warm welcome. A traditional Chinese meal followed. The specialty, of course, was roast duck but the array of extra dishes seemed endless, as were the toasts. After a while I wondered how many parts of a duck can be eaten and was soon informed that the real delicacy, the tongue, had been saved for me, the guest of honour! Well, after having already eaten parts of the feet, I tackled the tongue without too much difficulty. The reception was followed by a three hour tour of the Forbidden City and my so called 'day of rest' turned out to be a very pleasant introduction to China.

My work was carried out at a small observatory in the town of Shiangher, about 70 kilometres east of Peking. This meant an early rise each morning, since the journey by car took up to 90 minutes. The volume of traffic and its variety, rather than the state of the road, accounted for the long travel time.

The work consisted of installing the ozone spectrophotometer and teaching a staff of three observers how to operate it. Work progressed at a comfortable pace, and any potential language problems were overcome with the help of Wang Minghsing, a scientist from the Academy who interpreted without hesitation.

The staff expressed their eagerness and enthusiasm with a constant flow of questions. As I was not used to speaking so extensively, my voice suffered. But frequent cups of hot jasmine tea helped me get through the day.

Lunch hour at Shiangher would have satisfied a discerning gourmet. As there are no cafes or restaurants in that part of rural China, arrangements had been made to have lunch at the county hostel in the town. The hostel serves as a local government seat and is rather large. The manager, who had not entertained foreign visitors before, did not know what to provide. To get around the problem, he seemed to serve everything available: chicken, beef, pork, duck, fresh water fish, soups, rice, various vegetables and several salt water items which included a sponglike fungus contained in most soups. There was sufficient food to feed ten people (but I was assured that the leftovers would not be wasted).

Although the car ride to and from the observatory was time consuming, it gave me a chance to see the farming country. The coastal plain is extremely flat. Trucks, tractors, mule and donkey carts, hand carts and wheelbarrows frequently moved the earth from place to place, presumably to achieve this flatness that will give the best results for the extensive irrigation systems in that area.

The winter wheat had been planted in October and was well sprouted by late November. It is harvested in late spring or early summer, at which time corn is sown. A common sight in December is to see people of all ages sitting in the farmyards rubbing the corn cobs with a small tool to release the kernels, while some winnow the accumulated pile to separate the chaff. The corn stalks had previously been bundled and stacked against the outer walls of most rural dwellings to serve as a windbreak and probably for use as fuel as the winter progressed.

The small town of Shiangher did not have any noticeable industry, but once a week was the gathering place for thousands of peasant farmers who had goods for sale or exchange. One particular morning we were stopped by police about five miles from the town and given and escort the rest of the way to the observatory. It was market day and it took us 40 minutes to reach the observatory, the escort car incessantly blowing the horn ahead of us. The two lane road became increasingly congested with vechicles, bicycles, people and animals. An ingenious way of getting a live pig to market is to strap it on the carrier seat of a bicycle, upside-down, though the cyclist usually had some difficulty keeping his balance as the pig struggles, its four feet in the air. The main streets of the town served as the marketplace, and I felt somewhat embarrassed at the confusion we created in trying to reach the observatory.

The extreme tidiness of the countryside in rural China is impressive. The roads are usually elevated a few feet above the level of the land and invariably have trees planted very uniformly on each side. The trunks are whitewashed from the base up to about five feet. It appeared that every mile of road was walked each day by peasants with hand carts cleaning up manure and fallen branches. There was no litter anywhere.

In sharp contrast to the simple slow-paced lifestyle of rural China, Peking presents a bustling appearance. Nobody seems to know the population, but estimates range from seven to nine million. Peking seems to be less sprawling than Toronto. Apart from several majestic looking government buildings and museums the city is rather drab, but my impressions were probably influenced by the lack of vegetation and greenery at that time of year.

Familiar features such as plazas and gas stations are seldom seen, with shops being concentrated in just a few areas. The lack of neon lighting was very obvious and, apart from the names on the store fronts, there seemed to be no advertising. One sees little but row upon row of small-brick dwellings and low-rise apartment blocks, with concentrations of factories in certain areas. The city was blanketed in smog during my visit, with early morning visibility sometimes at about two hundred yards, and little better than a few miles by afternoon. About one person in four wore a gauze mask over the mouth and nose.

The major traffic arteries were very wide, and facilitated the endless flow of cyclists. Apart from commercial vehicles, most of the cars on the street were taxis; but it is not possible to flag one down. To get a cab, you must phone a depot to arrange for one, or be at one of the major hotels with a depot office. This is the law.

It took me a few days to figure out how the traffic system works in Peking. The main avenue is wide enough for four lanes each way, with the two lanes closest to each curb limited to bicycles, leaving two lanes each way near the centre for vehicles. There are two solid white lines down the centre of the avenue, but you are allowed to cross them to overtake slower traffic. Actually, you have the use of the whole road to jockey for position when the traffic light turns green! It becomes a mad dash to the next traffic light, the only stipulation being that you must be on the proper side of the double white line when you get there. The horn blowing is incessant,

since it is mandatory when overtaking another vehicle.

The City of Peking offers some fine attractions for visitors, especially historical sites. The Emperor's Palace, also known as the Forbidden City, is a major attraction situated in the heart of the city and covers many acres. It is probably the best example of chinese architecture in its original, undisturbed setting.

The Summer Palace on the northwest outskirts of the city is equally impressive, standing on the edge of a lake receding northwards on the side of a steep hill. Both palaces are perfect examples of geometric layout, with buildings and archways separated by hundreds of feet in perfect alignment.

Tien An Men square is next to the Forbidden City, and the difference between the old and the new China can be seen by a turn of the head. Standing in the middle of the square is like being in the middle of a wheatfield, since it must be a quarter of a mile long and almost as wide. It is not unusual to see a million people gather in the square on a national holiday.

A trip to the Great Wall was the highlight of my visit to China. The journey by car northwards from Peking lasted about ninety minutes and took us through farm country for about thirty miles before reaching the foothills. My visit was to the Pataling area, where the wall is well maintained. When I reached the Wall, I was overwhelmed by the lay-out and total picture as my eyes followed the course across steep mountainsides and deep valleys. A close inspection of the structural design left me marvelling at the workmanship and the engineering feat accomplished centuries ago. The main walls are constructed of cut stone blocks tightly set and measuring about two by three feet, and are wide enough to accommodate eight foot-soldiers walking abreast. Turreted watch towers occur every few hundred yards, and were used to warn of impending attack by bonfires.

Shiangher Observatory – Back row: (left to right) Wang Yang, Archie Asbridge, Wei Ding-wen, Wang Ming-hsing. Front row: Yhe Wei-chuo, Chao Yan-liang, Yang Siu-fen.

A short detour on the return journey from the Great Wall led us to the tomb of the 10th Emperor of the Ming Dynasty, located at the start of the foothills. The tomb was opened in 1958, and is believed to be one of thirteen in that area. Buried deep in the ground, its layout is similar to the palaces in Peking. A mystery still surrounds the manner in which the huge stone entrance doors were closed from within at the time of entombment. The archaeologists took about three months to figure out how to open the doors,mostly because a heavy stone pillar had been leaned against the doors on the inside.

A stay in Peking would not be complete without a trip to the opera. I was fortunate to see two of them, one based on an old traditional story and the other extolling the virtues of contemporary life. Wang Ming-hsing kept me informed of the story lines, but, even if I had not understood the words, it would still have been great entertainment just to see the colorful sets and costumes, and the acrobatics which comprise a fair amount of the show.

My only source of information about contemporary life in China was from Wang. He had recently spent a year studying in England and was fully aware of our different lifestyles. He considered himself fortunate to have a dwelling consisting of two bedrooms and a kitchen, where he lived with his wife and son. His rent was about three dollars a month, and his only complaint was that the family had to share a common bath house and toilet facility with others on the street. His wife worked full-time, as is prevalent in China. This meant that their son had to live with grandparents, and that they could see him only twice a week.

Wang had the option of going to work by bus or bicycle, but preferred the half hour bike ride. (After seeing the problems of trying to get aboard a bus at rush hour I could understand his preference.)

It is difficult to compare wage structures. A factory worker, it seems, earns forty or fifty dollars a month, and needs three months' salary to purchase a bicycle.

A first visit to Peking and the surrounding area does not make one an expert on China, but it certainly creates the desire to see and understand more of the complexities of such a large nation. The eleven days I spent there were some of the busiest of my life, not so much because of the work that had to be done, but largely because of the activities my hosts had planned. The hospitality extended to me was unostentatious yet generous and beyond all expectations. I am indeed very grateful to have had the chance to make such a visit. □

Archie Asbridge is an ozone instructor in the Experimental Studies Division, Atmospheric Research Directoriate, Downsview, Ont.

Women on the move

Marlene Phillips gets management training

Marlene Phillips (ARQA), is one of the first women to be selected to participate in the AES Management Orientation Program (MOP) in October 1979.

Dr. Phillips is currently working in the Ontario Regional Office on a number of projects including studies of the weather and climatological networks in the region. Through this and other assignments, she will gain a broad knowledge of the various components of AES, its development and planning policies. Exposed to middle and senior management styles, she will develop decision-making and problem-solving expertise, important management skills in any organization.

Dr. Phillips, and the four to five other AES staff who are currently participating in MOP, were all nominated by their directors, on the basis of demonstrated management potential early in their careers. The MOP is a two-year development program, designed to give employees management experience within the Service and to expose them to other Services, Departments and Central Agencies.

Marlene Phillips joined the Air Quality Research Branch, Atmospheric Research Directorate, in 1972 as a research scientist. She researched the effects of air pollutants on vegetation and natural ecosystems, the development of air quality criteria, and the establishment of air quality objectives (the latter under the auspices of the Federal-Provincial Committee on Air Pollution). In October 1978 she was appointed acting chief of the Atmospheric Dispersion Divison of the Air Quality Branch for an eight-month period.

Dr. Phillips chaired the AES EOW committee from its inception in 1977 to 1980. During this period, the EOW committee worked with the AES management committee in developing policies to facilitate the professional development of women at AES and to ensure that managers have an input into EOW planning. The new policies include a mechanism to review annually the successes and failures of the program.

Her education includes B.Sc. and M.Sc. degrees in biology from Queen's University in Kingston, Ontario, a Ph.D in plant physiology from the University of Adelaide (Australia), and a Post Doctoral Fellowship in biochemistry at the University of Toronto.

Marlene Phillips

This is a column devoted to the careers of women of AES. To make it relevant, we would welcome success stories or other career-oriented information about women in AES. Please forward any suitable material to Yolande Baldachin (ID), AES Downsview, Ontario or call (416) 667-4551.

Walter Halina retires after 39 years

After almost 39 years of continuous service, Walter (Wally) Halina, head of Basic and Aerological Systems, Observational Systems Division, Downsview, retired on February 29, 1980.

Wally was one of the original Met Officer/Inspectors and, for close to 25 years, ensured that meteorological instruments and station programs were maintained at a high standard in the Ontario Region. Since 1975, he worked at Downsview. Over 50 colleagues attended a farewell luncheon at the Village Loft Restaurant, at which Paul Johns, director, Field Meteorological Systems Branch, presented Wally with gifts and memorabilia.

Al Mowat leaves Pacific Region

A retirement gathering at Pacific Regional Headquarters on February 15 honored A.T. Mowat, superintendent, Station Operations, Data Acquisition Division. A number of other employees, who had also retired at the end of the year, shared the limelight at the same gathering.

Al joined the Canadian Meteorological Service shortly after the World War II and was first posted to Trout Lake. During the following years, he worked at the London Weather Office, Toronto Island Weather Office, and Downsview. Before coming to the Pacific Region, he was supervisor, Station Operations, in the Ontario Region.

Al will be missed by his colleagues, notably for his quiet, gentlemanly nature.

After visiting British Columbia, the Mowats will retire in Ontario.

Herta and John Emmet sitting side-by-side in the Downsview foyer, after the retirement ceremony.

John Emmet retires

John (Jock) Emmett retired on May 7, 1980 after 24 years of service with AES.

Jock was born in Edinburgh, Scotland. He joined the Canadian Meteorological Service in 1956 as an observer at Malton. He was a senior technician with Training Branch from 1964 to 1974. His last position was with Arctic Meteorology in Downsview, which he joined in 1974.

Many friends and colleagues gathered for a luncheon on April 25, 1980 to honor Jock and his wife Herta, and to wish them all the best in the years to come.

Book Review

Report of the Special Committee on the Review of Personnel Management and the Merit Principle – Guy D'Avignon, Minister of Supply and Services, Ottawa, Canada, 1979, 259 pp.

In response to complaints from public service managers, the public, and unions, the government established in 1977 a review body to examine all matters pertaining to the Public Service Employment Act (PSEA). The objectives were to develop a more efficient personnel management system that meets the needs of the operating department and the public it serves, and to foster improved employer-employee relations within the public service.

A special committee was formed, composed of both government and union representatives. In 1979, the committee issued a well-written and lucid report, which should be of interest to all levels of management, personnel administrators and unions.

The committee recommends the adoption of a well-defined philosophy of management that will establish an appropriate employment climate and the formation of a distinct management group whose members would be certified and trained in management and supervisory techniques, and who would be capable of developing departmental goals and objectives.

Legislative changes were suggested to permit variable personnel practices depending upon occupational groups, departments, geographic needs and special measures for desginated special groups.

The report discusses the benefits of redress under the Public Service Staff Relations Act (PSSRA) for all involuntary terminations or demotions, with access to adjudication and a third party final decision.

It also recommends that the public service be divided into three distinct groups with respect to job sensitivity and political activities, to permit increased political freedom.

Perhaps the most controversial and far-reaching recommendation is the proposal to expand the scope of collective bargaining to include, within the forum of a National Staffing Council, the negotiation of matters now under the PSEA. The proposal would have the National Staffing Council deliberate on such items as selection standards and selection tools, minimum areas of competition, the use of open and closed competitions, probationary period duration, extensions and exemptions, rules governing surplus status, lay-off, recall and associated rights, transfers, and access to training.

Many of these recommendations have been made before by various committees and studies. However, given that it was a Liberal government that requested the subject to be reviewed and given that a Liberal government is now in power with a majority, it would seem appropriate to expect that some of these recommendations will be given more serious consideration for implementation.

Many of the recommendations are timely, important and progressive, especially from the point of view of employee rights. But one nagging question persists: can we really accommodate these recommendations without further burdening an already complex and cumbersome system of personnel administration?

Reviewed by Eva Dojc.

Mrs. Dojc is staff relations officer, Ontario Area Personnel, Downsview, Ont.

Modular Acquisition Processing System seminar

A MAPS[R] maintenance seminar was presented to representatives of each of the six AES Regions and AES Downsview by Jerry Musil (AIDR), of the Research and Project Support Section, Instruments Branch, and a team of specialists from March 17th through 21st, 1980. The seminar provided information ranging from over-all concepts, to electronic circuits, to a practical exercise for this automatic weather station.

Fine spring weather facilitated the practical portion of the seminar. Using information provided in a lecture, Gordon Pool (AIMM) of Installation and Maintenance, Instrument Branch, provided antenna coordinates to a GOES satellite from AES Headquarters and successfully transmitted meteorological data from a trailer-mounted MAPS[R] system - a fitting end to the formal portion of the program.

Doubleheader

First row: From left to right P. Ségouin, J. Bureau, C. Labonne, J. Arbour, G. Desjardins, J. Lavigne. Second row: P.A. Ladouceur, A. Larocque, L. Primeau, Y. Landry, R. Lancup.

The annual meeting of the officers in charge of Quebec Region weather offices was held on 12 March 1980 at the Sherbrooke weather office.

This meeting, the first to be held outside regional headquarters, enabled all participants to familiarize themselves with the services offered by a downtown office and with the different means of providing meteorological information to users.

During the meeting Mr. Laurent Primeau, Meteorological Services Division, gave Roger Lancup, acting head of the Dorval weather office, a plaque commemorating twenty-five years of meritorious service.

Mr. Lancup joined the Public Service in April 1954. He was posted to Goose Bay for two years and then worked in the Montreal regional forecasting office. He has spent the major part of his career at the Quebec Meteorological Office and at the AES Canadian Meteorological Centre in Dorval, Quebec.

DEPARTMENTS

Staff Changes

Promotions/ Appointments

W.S. Appleby (MT-6) Scientific Officer, APCO, Ottawa, Ont.
B. Barette (EG-3) Observer, **QAEOU**, Inoucdjouac, Que.
Y. Bilan (MT-2) Meteorologist, Arctic Weather Centre, Edmonton, Alta.
J. Blommers (CS-3) Senior System Analyst, Arctic Weather Centre, Edmonton, Alta.
G. Burke (EG-6) Officer-in-Charge, Inuvik, N.W.T.
C. Chang (SCY-3) Secretary, Pacific Region, Vancouver, B.C.
G. Chataigneau (IS-3) Scientific Editor, Training Branch, Downsview, Ont.
G. Coulombe (EG-3) Observer, QAEOU, Nitchequon, Que.
P. Cromwell (MT-2) Meteorologist, CFWO, Greenwood, N.S.
S.J. Hickey (EG-6) Port Met. Officer, Atlantic Region, St. John's, Nfld.
K. Kanthak (CR-1) Junior Records Clerk, Central Records, Downsview, Ont.
A.S. Koonar (CS-2) Systems Programmer, Ice Branch ACIF, Ottawa, Ont.
M. Lazare (MT-2) Meteorologist, Arctic Weather Centre, Edmonton, Alta.
R. LeCotey (EG-5) Officer-in-Charge, Norman Wells, N.W.T.
D.A. Mason (EG-6) Pres. Tech. Atlantic Region, Bedford, N.S.
D.W. Matthews (EG-5) Pres. Tech. Atlantic Region, Moncton, N.B.
R.J. Miller (EG-6) Pres. Tech. Toronto Weather Office, Toronto, Ont.
J.M. Nicolau, (TR-1) Translator, AAT, Downsview, Ont.
J. Ostrander (EG-6) Instructor Tech. Training, Meteorological Training Centre, Cornwall, Ont.
R. Santo (EL-5) Electronics Tech. Region Office, Edmonton, Alta.
M.M. Savard (EG-3) Observer, QAEOU, Frobisher Bay, N.W.T.
G.M. Shah Dr. (PC-2) Project Physical Scientist, ARPD/ARPX, Downsview, Ont.
D.K. Smith (SX-2) Director General, Central Services, Downsview, Ont.
E. Taylor (MT-2) Meteorologist, Arctic Weather Centre, Edmonton, Alta.
R.T. Varriano (CR-4) Accounts Payable Supervisor, Finance Div. Downsview, Ont.
A.F. Wallace (MT-5) Senior Meteorologist, Ontario Weather Centre. Toronto, Ont.

Transfers

G. Brien (EG-2) Observer, QAEOO, Cape Dyer, N.W.T.
N. Bussieres (MT-2) Meteorologist, PRWC, Winnipeg, Man.
E. Byrne (CR-3) Senior Records Clerk, Central Records, Downsview, Ont.
P. Cote (MT-5) Ice Climatologist, Ice Branch, ACIC, Ottawa, Ont.
L. Dixon (EG-5) Presentation & Obs. Tech. WO4, Edmonton, Alta.
S.A. Dupuis (MT-3) Meteorologist, Arctic Weather Centre, Edmonton, Alta.
D. Forbes (MT-5) Meteorologist, AES, Bedford, N.S.
A. Forgues (EG-6) CDS, QAEOU, Fort Chimo (Kuujuak) Que.
D. Jolly (EG-6) Specialist Instructor, Training Branch, Cornwall, Ont.
F.K. Keyte (MT-7) Program Analyst, Monitoring & Prediction Div. Downsview, Ont.
R. Lagace (EG-4) Observer, QAEOU, Maniwaki, Que.
R. Lepine (EG-2) Observer, WAEO, Cape Parry, N.W.T.
P. Montambault Central Region, Winnipeg, Man.
H. Mosher DSS, Darmouth, N.S.
M.L. Phillips Dr. OAED (MOP) Toronto, Ont.
R. Rioux (EG-2) Observer, QAEOO, Clyde, N.W.T.
T.B. Shannon Ontario Weather Centre, Toronto, Ont.
M.E. Still (MT-5) **ARQT**, Downsview, Ont.
R.A. Stuart Dr. APDG, Downsview, Ont.
T. Yip (MT-2) Pacific Weather Centre, Vancouver, B.C.

Retirements

A.H. Carson, (CR-3) Toronto Weather Office, Toronto, Ont. April 1980
M.O. Cooper, (CM-5) Ontario Weather Centre, Toronto, Ont. March 1980
D.T. Hay, CM-5) Ontario Weather Centre, Toronto, Ont. April 1980
M. Kostiuk, Training Branch, Downsview, Ont. April 1980
L. Receiver, (CR-5) Pacific Region, Vancouver, B.C. March 1980
A. Roy, Computing Centre, Downsview, Ont. February 1980
G. Thompson, (SCY-3) Pacific Region, Vancouver, B.C. March 1980

Departures from AES

D. Bentley, Alberta Weather Centre, Edmonton, Alta.
R. Coroza, Computing Centre, Downsview, Ont.
M. Cote, CPQ, Ville St-Laurent, Que.
P. Delannoy, Canadian Forces School of Meteorology.
F.R.C. Ezemenari, Dr. ARMD, Downsview, Ont. to Ajaokuta Steel Co. Ltd., Nigeria.
C. Kechichian, Data Acquisition, QUAO, Ville St-Laurent, Que.
J. Law, Instruments Branch, Downsview, Ont.
G. McDonald, W.O.4 Calgary, Alta.
R.L. Milo, Canadian Forces MetOc Centre, Halifax, N.S.
F. Schultz, W.S.1, Sachs Harbour, N.W.T.
P. Stacey, St. John's AES, St. John's, Newfoundland

Temporary or Acting Positions

K. Little (EG-7) Specialist Instructor, ACGC, Cornwall, Ont.
E. Traill, (SCY-2) Secretary, Information Directorate, Downsview, Ont.
R. Winterer, (MT-4) Meteorologist, Canadian Forces Weather Services, Canadian Forces Forecast Centre, Edmonton, Alta.

Deceased

L.R. Layton, retired Meteorologist from Edmonton, Alta., March 20, 1980

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
SERES –	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

Corrections

Jim McCulloch's name was misspelled on the article he prepared for the Jan./Feb. issue of Zephyr. Part two of his article in the subsequent issue incorrectly indicated that part one was in the Nov./Dec. issue.

The Mar./Apr. article on AES's Sunday Historian was written by Zephyr staff and not by Gwen Rawlings.