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ZEPHYR

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Poll shows only 28% have heard of AES

Only 28 percent of the people in a recent public opinion survey said they had heard of AES and 48 percent wrongly guessed that our main function was "regulating atmospheric pollution".

These are just two of the findings to emerge from a poll conducted this spring by CROP Inc. of Montreal in response to a request by the AES Management Committee and Information Directorate to explore public awareness of our corporate identity as well as probe people's attitudes to the weather service.

Nearly 2,000 people, representative of the adult population of Canada were asked 17 questions in their homes April 13-17 and among other things it was found that the majority of people received their weather information primarily from television. The next most used sources were radio and newspapers and a small but significant percentage used Weatheradio.

Although only 28 percent of people polled had heard of AES, 85 percent had heard of Environment Canada. When asked: who prepares the weather forecasts (for all sources of information), 43 percent replied: the Canadian Weather Service; only 15 percent said AES and 16 percent said Environment Canada.

If 48 percent of the poll said our main function was regulating atmospheric pollution, 40 percent replied correctly that our principal task was preparing weather forecasts. On the other hand six percent thought our main duty was weather modification!

Participants were asked to list, in order of preference, the information they wanted from the weather forecast. They picked temperature, precipitation, dangerous weather, wind, wind chill and cloudiness.

Although 56 percent thought today's weather forecasts were more accurate than those 10 years ago, only 32 percent thought forecasts were accurate enough to be useful to them "most of the time". Forecasts were termed "very useful" by 33 percent of respondents and "quite useful" by 45 percent. The terms used in weather forecasts were understandable to 93 percent of the poll. They used our information among other things to decide what to wear and to plan outings

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Cover: People of different generations discussing issues of the next decade inside a crystal ball . . . this sums up the spirit of the new Zephyr feature, **Future Forum**. See page 12. (Photo: Kate Middleton)

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Environment Canada	Environnement Canada
Atmospheric Environment Service	Service de l'environnement atmosphérique

and other activities.

Regarding the new probability of precipitations forecasts, 22 percent of respondents said they preferred numbers only while 29 percent said they had a predilection for words and 46 percent said they wanted a mixture of words and numbers.

Strict quotas were imposed by CROP concerning sex, age and numbers of women working outside the home in order to ensure proportional representation in each group. A national sample of this size provides an estimated accuracy of results within plus or minus 3 percent in 19 cases out of 20.

Chinese scientists view Cloud Physics section

AES played host to a group of scientists from China June 3-4. The delegation of four from the Chinese Academy of Sciences, were aided during their visit by Dr. Robert Schemenauer of the Cloud Physics section who was also one of the travelling hosts on their cross-Canada tour lasting from May 23 to June 10. The other Canadian host was Dr. Man Kong Yau, department of Meteorology, McGill University.

The national itinerary was designed to give the delegation a view of the complete range of cloud physics and weather modification activities in Canada. They

began their tour in Ottawa at the Canadian Meteorological and Ocean Sciences (CMOS) Conference where they presented papers. Then they were off to the department of Meteorology at McGill and the McGill Radar Observatory.

The Chinese scientists showed special interest in the AES Radar site at Woodbridge, Ontario. They also expressed great curiosity in the Canadian system of atmospheric electrical measurements and in its technology. In general they seemed intrigued by the parallels and differences between the two countries' respective government and scientific

organizations.

Much of the Chinese delegates' knowledge of AES goals in cloud physics and weather modification was gained through conversations with Jim Bruce, assistant deputy minister, Dr. Warren Godson, director general, Research Directorate, Dr. Alex Chisholm, director, Atmospheric Processes Research Branch, and Dr. George Isaac, acting chief, Cloud Physics Research Division, all of whom were on hand at AES Downsview to welcome the visiting scientists.

After visiting the Alberta Research Council and the Alberta Hail Project, the delegation flew to Vancouver, and then back to China.

According to Dr. Schemenauer the trip gave the delegation assistance in establishing priorities in their areas of research by emphasizing the necessity of producing experimental validation and by helping them realize the requirements for high technology.

The third secretary of the Embassy of

the People's Republic of China, in response to the assistance given the delegation, said, "We are confident we will be able to develop research cooperation in science and technology in the fields of weather modification and cloud

physics between our two countries."

In 1983 or 1984 a similar delegation from Canada will visit China and efforts will be made to have several Chinese scientists and engineers come to Canada for periods of 6 months to one year.



One of the highlights of the Chinese Scientists' tour of Canada was a visit to the Cloud Physics section of the AES in Downsview. Seen left to right are: Mr. Qin (third secretary of the Embassy of the People's Republic of China, Ottawa), Mr. Qu, Dr. Alex Chisholm (ARPD), Mr. Huang, Mr. Cai, Mr. Zhou and Dr. Robert Schemenauer (ARPP).

Larry Campbell wins Patterson Medal

Larry T. Campbell who served as a meteorologist and manager with AES for over 35 years, was awarded the 1981 Patterson Medal at the 16th annual CMOS conference in Ottawa, held in May.

The Patterson Medal is awarded to

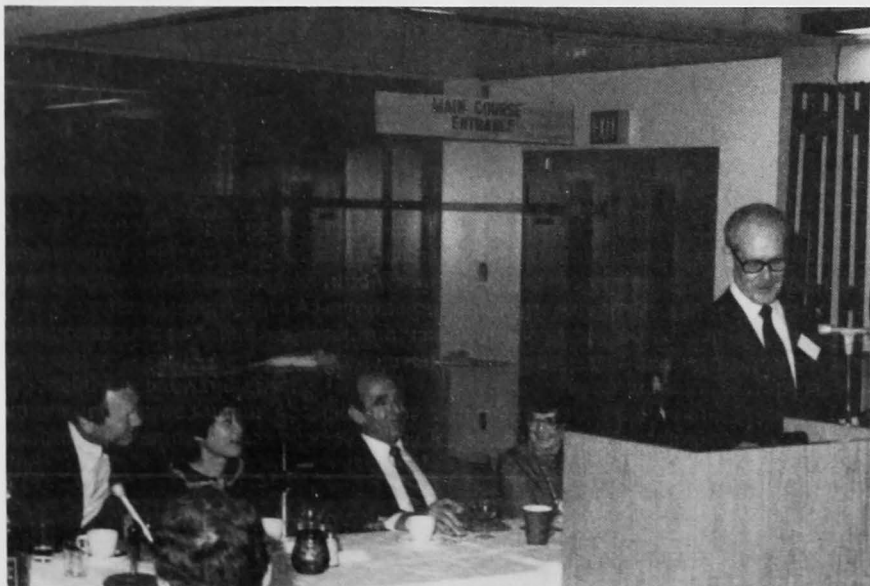
mark a significant scientific achievement or for a prolonged high level of service to meteorology. In presenting the award, Mr. Jim Bruce noted that there are few who fit into that second category better than Larry Campbell.

Early in his career, Mr. Campbell

played a key role in linking Canada's weather service with transportation — particularly aviation. He first served as a forecaster at airports in eastern Canada and, then, for 12 years as liaison meteorologist with the Department of Transport (DOT) in Ottawa. His work there contributed greatly to the smooth functioning of the air, marine and surface transportation elements of DOT and facilitated communication between officials of that department and the weather service.

In 1965 Mr. Campbell moved to AES headquarters in Toronto and, over the next 15 years, served in a series of progressively more responsible management positions as, director of administration and director general of central services, field services and planning, respectively. In this last position he carried out long range planning projects for AES, including, studies of the future communications system and computer needs at CMC.

Because of Mr. Campbell's work in support of civil aviation activities, it is appropriate that his nomination for the Patterson Medal was made by the Air Transport Association of Canada.



Former Director General, Field Services Directorate, Larry Campbell, addresses the CMOS Convention Banquet after being awarded the 1982 Patterson Medal.

New Ice Centre opened

Environment Minister John Roberts opened the new Ice Centre Environment Canada on June 1st. The Centre brings together for the first time three of the main functions of Environment Canada's Ice Branch: ice forecasting and analysis, ice climatology, and ice research.

Mr. Roberts also announced a new \$58 million contract with Nordair Limited of Dorval, Quebec to provide Environment Canada with ice reconnaissance aircraft for the next five years.

Mr. Roberts said "The government is determined that the development of Canada's offshore and frontier resources proceeds in such a way as to cause minimal environmental disruption. The knowledge and awareness of sea ice and icebergs are of prime importance to both the safe design and operation of offshore facilities and for the protection of our unique Arctic and coastal environments." He noted that it was appropriate, therefore, to open the new facility during National Environment Week.

Mr. Roberts said that although the federal government is committed to environmental protection, it does not "hide from economic realities". He pointed out that the ice information presently provided by the Ice Centre Environment Canada "facilitates northern development and the quest for offshore oil and gas". To increase his department's support of offshore hydrocarbon exploration, the Minister indicated that he was seeking Cabinet backing to expand the present ice program to include an iceberg forecasting service on the Atlantic Coast.

Ice Centre Environment Canada continuously receives data on ice conditions from aircraft, satellites, ships and shore stations. Using those data, the Centre provides such products and services as forecasts of sea ice conditions, a library of historical ice information, and publications on ice climatology. The Centre also conducts research into ways to improve those products and services.

Mr. Roberts concluded "The opening of Ice Centre Environment Canada is the first step in my department's long term plan to increase its ice services for Canadians. New technology, improved methods and new services ensure that our government's objective of rational, en-

vironmentally sound northern and offshore development are met during the coming decade."

In the foreground at the reception marking the opening of the new Ice Centre Environment Canada (Ottawa) are Environment Minister John Roberts (left) and Dave Mudry, chief, Ice Climatology and Applications.



CMOS Conference held in Ottawa

Sea Ice was the theme of the 16th Annual Congress of the Canadian Meteorological and Oceanographic Society, held in Ottawa May 25-28. Total attendance exceeded 400 delegates and included over 100 members of the CMOS Hydrology Special Interest Group.

The Congress was hosted by the CMOS Ottawa Centre at the University of Ottawa. Delegates were welcomed by Gordon Shimizu, Chairman of the Ottawa Centre and Mr. Ed Lozowski, President of CMOS.

Some 150 scientific papers were presented during the 28 sessions. The theme paper "Sea Ice Problems and Research Needs" was presented by Gerry Ewing, the Assistant Deputy Minister, Ocean Science and Surveys of the Department of Fisheries and Oceans. Mr. Ewing focussed his remarks on the problems that sea ice presents to Canadian development and reaffirmed the need for a continuing accelerated ice research program. He noted that, although considerable research has been done to support offshore oil and gas exploration, the research needs of meteorologists, oceanographers, fishermen and native peoples have been largely overlooked and deserve greater attention.

"No serious mishaps attributable to ice have befallen the arctic offshore drilling program and . . . no oil wells have blown out . . . but the story is far from over and much work still needs to be

done," he stated.

Assistant Deputy Minister Jim Bruce, Mr. Ewing and Dr. G. Julien of the Natural Sciences and Engineering Research Council participated in a special session titled "Today and Tomorrow" during which the present and future status of meteorology and oceanography in Canada was explored.

Mr. Bruce outlined the challenges ahead for AES in research, operations and policy making. AES has made its priority goal the improvement of the quality and utility of the day-one forecast and severe weather warnings. We are moving from a radio and land-line-based system to a higher speed system with a satellite component. Better processing and analysis facilities for weather satellite images and data are being installed in the Vancouver Weather Centre along with the improvement of other satellite facilities.

Other important issues are related to the atmospheric environment-CO₂, acid rain and the deterioration of the stratospheric ozone layer. Canada is leading this research for the WMO by operating the World Ozone Data Centre using the Brewer spectrophotometer (initiated at the University of Toronto, further developed by AES and now manufactured for world use by a Canadian firm).

However, Mr. Bruce concluded, "AES, plans and projections to 1990 explicitly recognize that we cannot meet these challenges alone. Our goal is to forge strong partnerships with all components of the atmospheric, oceanographic and hydrological communities."

AES has handicapped program

AES recently established a "Handicapped Program Committee" in support of the federal government commitment to improve employment opportunities in the public service for persons with mental or physical handicaps and to improve services to handicapped members of the public.

The committee will assume a wide range of responsibilities in what has been, until now, a neglected area. They will develop AES objectives and goals in support of the handicapped program, and will promote equal access to employment in AES for handicapped persons. The committee will encourage managers to employ handicapped per-

sons by developing availability lists and suggesting how they can be integrated into an operation and will ensure that the physical working environment is conducive to handicapped persons.

The committee will also review what services to the public are available for handicapped persons and recommend improvements. For example, are weather forecasts accessible to the hearing impaired?

Initially the committee will concentrate on programs at AES Downsview, and in the National Capital and Ontario regions. Other AES regional offices will be responsible, in cooperation with their regional personnel offices, for setting up

their own programs and maintaining close contact with the committee in Downsview.

AES employees at Downsview, and in Ontario and the National Capital regions will soon be receiving a questionnaire about the Handicapped Program. Nancy Mountford, OAP and a member of the committee, has asked for the staff's cooperation in completing the form and returning it as soon as possible. She also invited anyone wishing to discuss the program to contact herself or other members of the committee: Jim Woods, Shirley Smith, Judy Short, Joe Shaykewich, Ev Parker and Francis Bowkett.

Robert R. Dodds retires

After almost 40 years service Robert (Bob) R. Dodds, chief, Weather Services Division, Field Services Directorate, officially retired on December 30, 1981. However, because of his commitments in international affairs for Canada, and other projects in which he was involved, he was placed in a term position and continued working until the end of June 1982.

On June 24, about 80 of Mr. Dodds' friends and colleagues attended a retirement party given in his honor at the AES, Downsview Cafeteria. The guests included many AES retired personnel who came to wish him and his wife Jean a long, healthy retirement.

Master of Ceremonies, Phil Aber, Director, Field Meteorological Systems Branch briefly outlined Mr. Dodds' career and made several presentations including gifts from the personnel of AES Pacific and Central Regions. Mr. Dodds' Secretary, Sonia Ventresca read numerous congratulatory messages from the Regions, Transport Canada and ICAO. She also presented him with a Long-Service Award Certificate and Medallion. Former colleagues Alex McVicar, Paul Johns and Keith McGlenning also spoke, highlighting different facets of his career and personality. Allan Campbell, head, Public and Marine Weather Services and a colleague of Mr. Dodds for many years,

presented him with a mantle clock.

After graduating from the University of Toronto in 1941 (majoring in Mathematics and Physics), Mr. Dodds obtained his teaching certificate at the Ontario College of Education. He joined the Canadian Meteorological Service (CMS) and was appointed a meteorologist assistant in May 1942. He subsequently served as a meteorologist in locations such as Rockcliffe, Ont., Gander, Nfld., Dorval, Que. and finally was posted to Toronto in 1956, where he

remained until his retirement, filling a number of Headquarters positions.

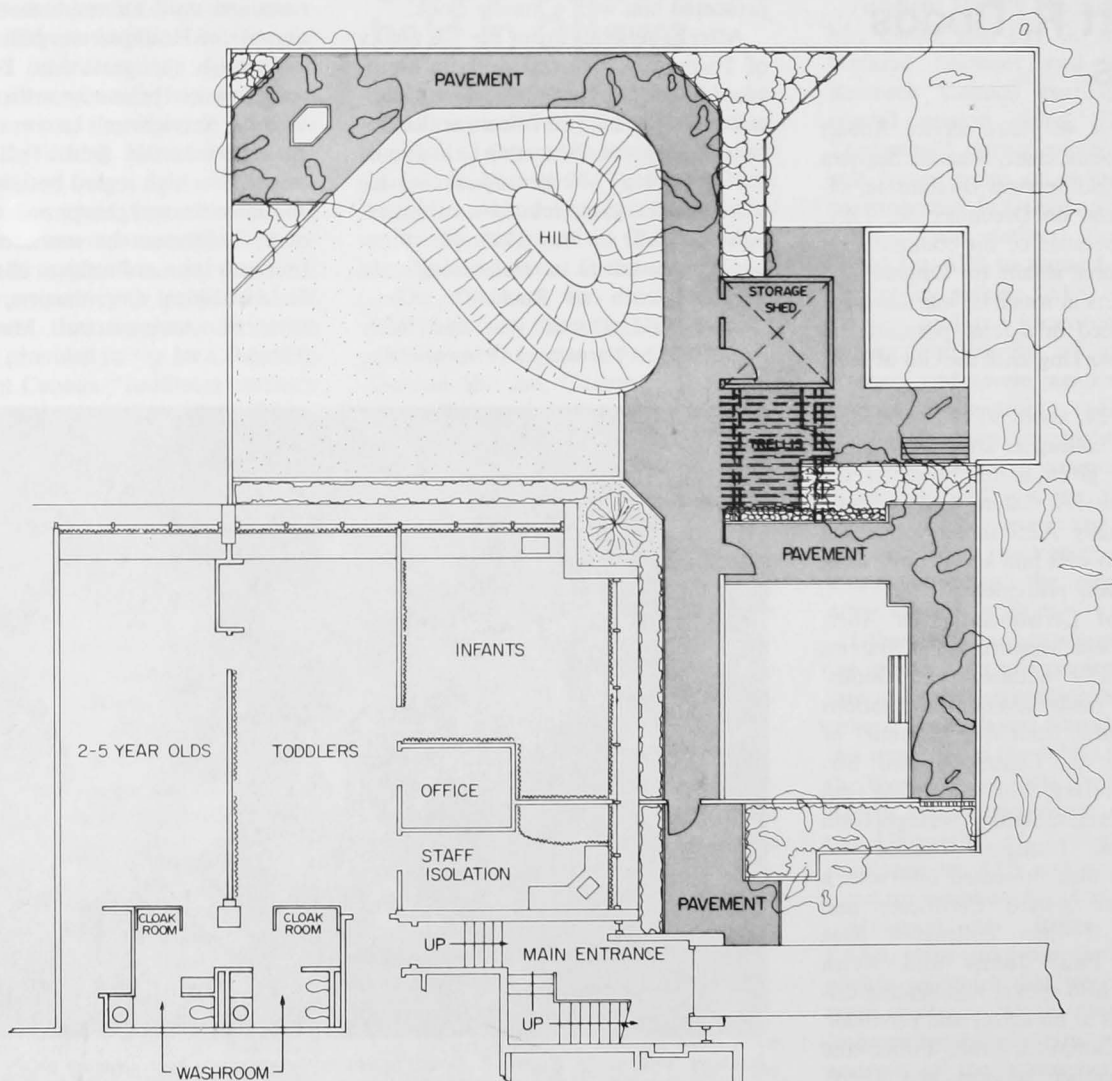
Through the years Mr. Dodds' interests were primarily with Aviation Weather Services and he was considered an expert in this field. This expertise earned him high regard both in national and international groups and at the time of his retirement he was completing a four year term as President of the World Meteorological Organization, Commission of Aeronautical Meteorology (CAeM).



Beaming contentedly, Robert R. Dodds listens to the praises of his colleagues on the occasion of his retirement: Al Campbell (AFWC), Sonia Ventresca (AFSD) and Phil Aber (AFSD). Seated beside him, sharing the conviviality, is his wife Jean. (Photo: Elsie Traill)



The graduation ceremony of UQAM No. 10 students took place in the Quebec Region premises on June 3, 1982. These students were trained in theoretical and operational meteorology at l'Université du Québec à Montréal from September 1981 to April 1982; the seven-week simulation training was held afterwards in the new French Professional Training Section premises located inside the Quebec Region quarters. Mark Trueman, chief of the Professional Training and Development Division, delivered a speech suited to the occasion, and Raymond Fichaud, Director of the Quebec Region, talked to the new meteorologists about AES priorities for the coming years. The group picture was taken after the graduation ceremony. In addition to the students, some will recognize members of the administrative, teaching and technical staff who made a success of this course.



Floor plan of the AES Sunburst Children's Centre, officially opened by Environment Minister John Roberts on September 24.

Jim Percy

Jim Percy, for almost ten years an instructor with Training Branch, died in Toronto on August 25, 1982, after a brief illness.

He was born in Toronto in 1944 where he attended St. Anselm's Catholic School, St. Michael's College School and Leaside High School before attending university. In 1967 he graduated with a B.Sc. in Physics from the University of Waterloo and joined the Canadian Meteorological Service to commence the Meteorological Officers' Course.

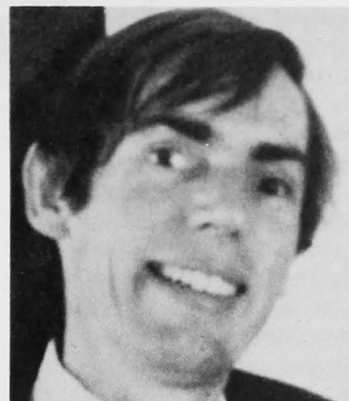
From 1968 to 1970, Mr. Percy served as a forecaster at St. Hubert, Greenwood, Shearwater and Summerside, including providing meteorological support to the Chedabucto Bay oil disaster clean-up operations. While in the Maritimes, he continued to take courses at Acadia and Dalhousie Universities in order to qualify for graduate studies.

Upon graduation in 1973, with a Master's Degree in Meteorology from McGill University, Mr. Percy joined Training Branch as an instructor with the Professional Training Division and in 1979 with the Development Division.

Mr. Percy was a most able and dedicated instructor who had a special gift of relating to the students on the meteorologist courses. He was very keenly interested in the science of meteorology and in particular in understanding the physical principles of atmospheric phenomena. Above all, he was a most loyal and personable member of the AES training team.

In early June of this year he transferred to the Network Planning and Standards Division.

Jim leaves his wife Elizabeth and their infant daughter.



Murray J. Helferty

Murray J. Helferty passed away March 3, 1982 after a year-long battle with cancer. He worked in the Ontario Region Scientific Services Division and his untimely death at 37 is considered to be a tragedy by his colleagues. He is survived by his wife Denise and their two children Natalie and Lloyd.

Mr. Helferty joined the Service as an Upper Air Technician in June 1965 and served at a number of sites, including Resolute, Mould Bay, Maniwaki and Fort Chimo. In 1970 he was transferred to the Windsor Weather Office and remained there until 1977 when he moved to Toronto to take up his duties in the Scientific Service Division. While at Windsor he took courses in biology at the University of Windsor and was often listed on the President's role of scholars and invited to enter the honours biology program.

In the Scientific Services Division, he took on challenging assignments in computer programming, data analysis and even preparing scientific reports. Again, his talents were evident. In writing to Mr. George McPherson, the Director of the Ontario Region, about one report he co-authored, Dr. Porter, then the Chairman of Ontario Royal Commission on Power Planning said, "In view of its intrinsic importance to all serious students of Canada's future energy requirements I believe it should have widespread circulation."

Murray's quiet, relaxed approach to his work inevitably produced thorough, valuable results. He was an excellent team member and his absence is being felt by his co-workers as well as the many friends he made during his years with AES. Members of the regional staff and AES Downsview join in expressing our deep sympathy to Denise and the children in their period of grief.



Hermes buoys keep functioning through thick and thin

Since 1978, drifting buoys have been used to obtain reliable oceanographic and weather data, especially in remote, data-sparse seas and oceans. These free-floating, expendable data collection platforms (DCPs) have been used experimentally in many parts of the world for both meteorological and non-meteorological purposes.

In Canada drifting buoys are seen as a potentially valuable means of obtaining marine data, and this country is among the top three DCP nations, in manufacturing, research or operations. For example, one of the most successful and widely used drifters is made by Hermes Electronics of Dartmouth, N.S. Weighing 90 kilograms and with a battery life of about a year, these free-floating platforms reliably monitor water temperature and air pressure. (This is calculated at Edmonton). Since 1978 some 300 Hermes buoys have been produced and sold around the world.

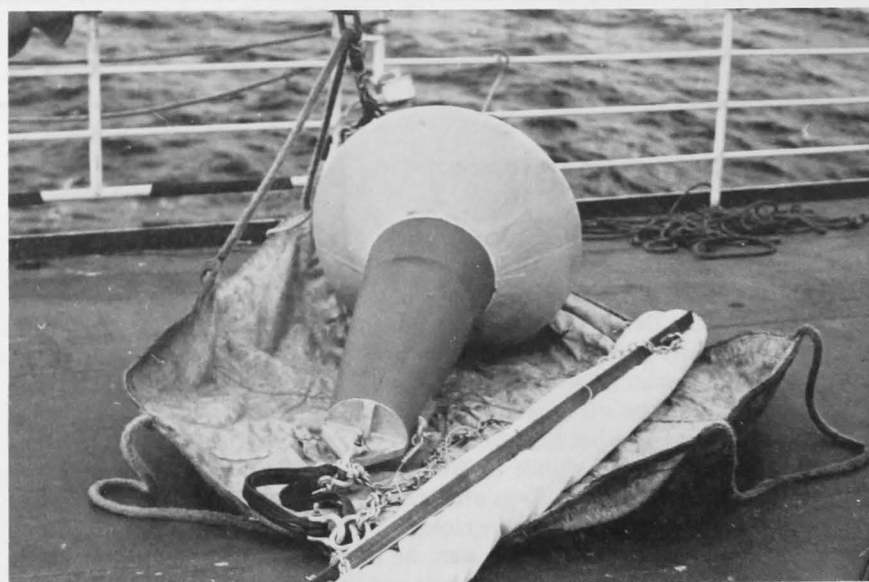
The AES is involved, in one way or another, in weather observation programs using drifting buoys in the Atlantic, the Arctic, Hudson Bay and the Pacific in operational and/or experimental modes.

To give you a better idea of the AES work with drifting buoys, a brief round-up of existing programs in the Hudson Bay and Pacific regions follows.

The Hudson Bay program

During 1981 AES Network, Planning and Standards Division (ACSN) set out to gather real-time weather data from two Hermes buoys deployed in Hudson Bay during the ice-free season. Air pressure, sea surface temperature were relayed to the Edmonton receiving station via polar orbiting satellite, then processed to extract the data and calculate the buoy location for input into the forecast system. Data obtained from the buoys were plentiful (1300 observations vs 89 obtained via ships), a definite improvement for a data-sparse area.

The project began when two Hermes buoys were shipped to Churchill, Man. Switched on July 9 by the Weather Of-



The above two pictures show Hermes drifting buoys being deployed by Canadian ships in the Pacific region.

fice OIC, they were loaded aboard the MV Keewatin and the first buoy was deployed July 23 near the northwest tip of Hudson Bay. The other buoy was deployed a couple of hundred kilometers southwest of the first. Both started satisfactorily by relaying weather data via satellite to Edmonton where they proved sufficiently reliable to be

retransmitted on AES circuits. However, a change in the prevailing wind in August and September swung the buoys round from northwest to southeast. The wind direction caused the "southern" buoy to drift down the bay for nearly six months until transmissions ceased in late January 1982. It transmitted despite icy conditions and reached within 120 km of

James Bay.

The "northern" buoy transmitted operationally for about a month, but Edmonton was able to keep track of its position even after it beached on Southampton Island in the Bay of God's Mercy. The buoy was retrieved in the fall, still transmitting, and was even sending signals in January, long after recovery.

The entire 1981 project is still being evaluated, but first results indicate that data can be received in real-time and can be very useful for forecast and observational needs.

Recovery

The recovery of the "northern" buoy proved interesting. It started when Field Services Downsview staff asked Coral Harbour upper air station (Southampton Island) to help them retrieve the buoy. Since signals indicated it was about 140 km away, the OIC commissioned a group of local Inuit to go by Peter Head boat to the beaching site and look around. The search party spent three days searching but could not find the buoy. However, they did not consider their time wasted. As it was polar bear hunting season, they were able to shoot three good specimens and load them on the boat for the return trip.

Due to the good hunting other Inuits decided to hunt the area. One of these spotted the buoy frozen in the ice, chopped it out and secured it until it could be transported to Coral Harbour. During this time the buoy continued to transmit, so progress of the rescue could be monitored directly from AES Downsview. The entire recovery mission cost AES \$1,500 plus a \$500 reward paid to the Inuit. The money was considered well spent since each buoy costs at least \$13,000.

Once retrieved, the buoy was flown back to Churchill, then sent by train and truck to Toronto. It was a proud moment for ACSN when the rescued buoy was put on display in the Downsview building lobby for three weeks. Instrument technicians found the buoy could be refurbished. Matt Stauder, project leader, says that "the buoy now stands a good chance of being redeployed for the 1983 Hudson Bay project or of being used for training purposes."

Further developments

The 1981 project was considered successful enough to launch a similar drift-

ing buoy program in 1982. Two new Hermes buoys were shipped to Churchill and deployed by ship in northern Hudson Bay in August, once the ice had cleared. The main objective will be to continue real-time weather observations, but eventually it is hoped to test use of the buoys in Hudson Bay for wind speed, wind direction and air temperature measurements. The use of anchors and drogues on buoys of this type will also be tested.

Additional data received in real-time will eventually allow AES to support Hudson Bay shipping, drilling operations and other economic developments in the area.

Northeast Pacific programs

Since January 1980, the AES has deployed 16 Hermes buoys in the northeast Pacific. The first were part of the new Pacific area data systems (PADS). There were some initial operational problems but these were solved. In October 1980, AES deployed a second group of Hermes buoys — six in all — as part of the STREX project, (Storm Transfer and Response Experiment). The STREX project was a multi-national, north Pacific experiment, lasting 6 weeks in late 1980, and involved the use of other drifting buoys by non-Canadian agencies.

The six Hermes buoys were reliable. These buoys, with a mean life of 360 days, contributed data for detailing meteorological lows and highs, pressure gradients and overall surface level weather analysis. Of the six Hermes DCPs deployed in STREX in October 1980, two were still operating 16 and 18 months later, although both had drifted aground earlier.

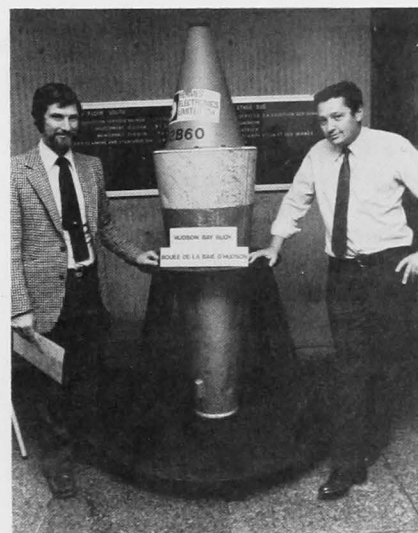
Recovery

Just as in the Hudson Bay project, the Pacific region has its own interesting recovery story. A buoy deployed in October 1980 by the C.C.S. Parizeau as part of the PADS program, drifted all the way from 149 degrees west to Kodiak Island just off Alaska, where it went ashore in June 1981.

The buoy lay there for seven weeks until it was noticed by a Kodiak fisherman, Philip Harris. Unsure what it was, he wrapped the object in a net and took it home as a memento. Usually when people do a bit of beachcombing, the rule is: finders keepers, but not so in this case. After a couple of weeks Harris got

the surprise of his life when U.S. Coast Guard and Weather Service officials called on him to pick up the buoy. How did they know Harris had it? Simple . . . the buoy had never stopped transmitting, and its position had been continually tracked by the AES computer in Edmonton. Mr. Harris did not give it up easily. After asking for a \$1,000 reward, he eventually agreed to \$100 compensation for return of the buoy.

In another month the U.S. Coast Guard brought the buoy south to Victoria, B.C. where AES officials and members of the Institute of Ocean Sciences found it was still functioning. Apparently after 495 days operation, it was still in excellent shape and batteries functioning normally. It is currently being outfitted for redeployment in the northeast Pacific, possibly by November 1982.



Matt Stauder, project manager (left) and George Payment (AFOO) stand beside Hermes buoy recovered from Hudson Bay and displayed in the lobby of the AES building, Downsview.

Future development

The AES Pacific program is an ongoing one. Several new Hermes buoy deployments have been made since the STREX era. Two sets of three buoys each have been deployed to drift through very data-sparse areas of the Pacific. The benefit of these two deployments, made for the AES by U.S. Coast Guard cutters on the longitude lines 157°W and 177°W, are being evaluated in the planning of further deployments after these buoys drift through and out of the targeted areas. There is also increasing

cooperation between the AES and U.S. ship operators for deployment and recovery. Not all buoys drift endlessly from one end of the ocean to the other. Some are carried at the back of bulk ships, e.g. an American tanker or a Japanese car carrier.

Commenting on the entire drifting buoy program, Bob Vockeroth, PADS

project manager, comments "there is widespread agreement among WMO members that such simple buoys have demonstrated their cost-effectiveness in data-sparse areas such as the southern hemisphere. The northeast Pacific is not such an area. Nevertheless, it appears likely that if current work to increase buoy and drogue reliability and to pro-

vide additional useful data is successful, these buoys can be an economical alternative to large moored discus buoys in data sparse areas in the Pacific, Atlantic and elsewhere. In addition, they provide a valuable opportunity for cooperation between the international meteorological, oceanographic and climatological communities."

Telescope centennial recalls meteorology, astronomy links

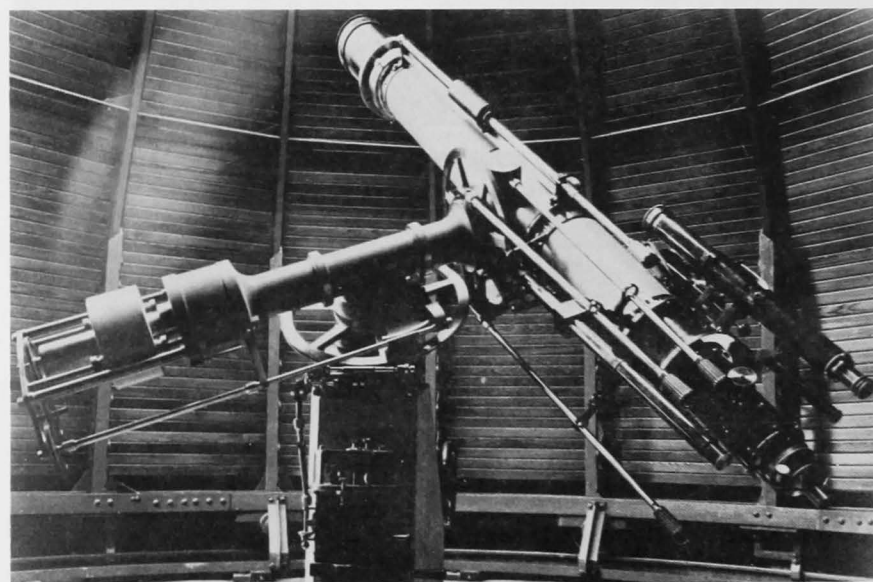
by Jim Low

Are meteorology and astronomy connected? Historically in Canada the answer is a definite yes. In fact 1982 is a landmark year. It marks the centennial of a famous Toronto telescope — the 6-inch (15 cm) Cooke refractor.

First it should be noted that the Toronto Magnetic Observatory was established in 1840 to study the earth's magnetic field for the purpose of gaining an understanding of weather patterns. Secondary duties included weather observing and determining time. Meteorology became the primary duty of the observatory when the Meteorological Service was established in 1871. However, magnetic work continued until the 1930s when this was transferred to the Dominion Observatory in Ottawa.

During the 1850s several papers on astronomy were read before the Canadian Institute in Toronto, including papers by Sir John Henry Lefroy and John Brandford Cherriman, both Directors of the Magnetic Observatory. In 1868 the Toronto Astronomy Club was organized, but not without some debate. Some, including George T. Kingston, Director of the Magnetic Observatory felt that it would be better to form an Astronomy Section of the Canadian Institute instead.

In 1882 the 6-inch Cooke refracting telescope was purchased by the Meteorological Service. Originally installed in the Toronto Magnetic and Meteorological Observatory, it has seen a century of service by the Meteorological Service,



The six inch Cooke Refractor is seen in the dome of the old weather service building at 315 Bloor Street West, Toronto. Telescope and dome were both removed around 1930.

amateur astronomers, and the University of Toronto. It is now located atop the administration building of the David Dunlap Observatory north of Toronto. A detailed account of this telescope is given by Brian Beattie in the April 1982 issue of the Journal of the Royal Astronomical Society of Canada.

The telescope was originally acquired by the Service as part of Canada's contribution to the international effort to observe the transit of Venus across the disk of the sun in 1882. Unfortunately the transit was completely clouded out in

Toronto! Later, the telescope was used by the Service to make sunspot observations.

The informal existence of the Toronto Astronomy Club was formalized by its incorporation as the Astronomical and Physical Society of Toronto in 1890, which became the Royal Astronomical Society of Canada (R.A.S.C.) in 1903. Charles Carpmal, Director of the Meteorological and Magnetic Observatory was asked to become Honorary President, but when he indicated a wish to become an active member of the new

society, he was promptly elected President. At the invitation of Mr. Carpmael, members of the society often met at the observatory to use the Cooke Refractor.

The next three directors of the Meteorological Service were also active members of the Astronomical Society. Sir Frederic Stupart, director from 1894 to 1929, served as President and published papers in the Journal of the R.A.S.C. When, in 1907, the Meteorological Observatory was making plans to move, Stupart supported a petition that the telescope be donated to the R.A.S.C. He felt astronomical observations were of little value for meteorological purposes. However, the government turned down the petition and the telescope was installed in the new building at 315 Bloor Street West, Toronto in 1909.

Solar observations continued until

1930 when the telescope and dome were removed.

John Patterson, director from 1929 to 1946, served on the council of the R.A.S.C. and was an associate editor of the society's Journal. Andrew Thomson, director from 1946 to 1959, served as President and as an associate editor.

From 1907 until 1922, the Journal of the R.A.S.C. carried a "Report from the Meteorological Service" in each issue. Later, various meteorological reports and papers from the directors were published. Between 1940 - 1946, a series of articles appeared on the founding of the magnetic observatory, which included many of the letters of its first director, Major General C.J.B. Riddell. During this past year, the Journal has included several historical papers in which the early Meteorological Service is dis-

cussed.

Although the relationship between meteorology and astronomy is not as intimate as it once was, the cooperation of these allied sciences continues. For example, AES has been called upon to give weather prospects for possible eclipse sites in Canada. With advancements in satellite meteorology and the development of extra-terrestrial meteorology through planetary probes, will cooperation between the two disciplines become close again? Only the future can tell.

Jim Low is a computer consultant, Consulting and Training Services, ACPT, Downsview and is a member of the Royal Astronomical Society of Canada.

Weather service has 140-year ties with U of T

At a ceremony held in June marking the reopening of the University of Toronto's Sandford Fleming Building after a major fire, Gord McKay, director of the AES Climate Applications Branch, told an invited audience that Canadian meteorology had had its origins on that very site and that a 140-year link between the Canadian weather service and the University had been preserved. Here are some excerpts:

"This is the site of Canada's first continuing weather observation station. Here in 1855, was appointed the first Professor of Meteorology in Canada, and the British Empire. This was also the site of the Headquarters of Canada's Meteorological Service for half a century. Scientific activities originating here gained for Canada a place of esteem in world meteorology.

Following a request by noted German scientist and explorer Baron Alexander von Humboldt to set up research establishments throughout the British Empire for the purpose of contributing to magnetic studies, Britain sent C.J.B. Riddell to Canada in 1838 to establish a Magnetic Observatory. Lieutenant Riddell first examined St. Helen's Island in the St.

Lawrence River, Montreal, but found the geological formations of the Island and its surrounding areas unsuitable. On the basis of information obtained from the Royal Navy, Lieutenant Riddell decided to act to establish a site in Toronto. In a letter to the Royal Engineers, October 17, 1839 he requested authority to proceed. The magnetic observations were to be carried on for

three years simultaneously with those made by a naval expedition; observatories were also constructed at St. Helena (South Atlantic) and at Cape of Good Hope for this research program.

Lieutenant Riddell was a dedicated scientist as well as an officer of the Royal Artillery, and he undertook parallel negotiations with the military and the University of Toronto. In



The first stone weather observatory to be erected on the campus of the University of Toronto was built 125 years ago and is still standing on a site near University College.

FUTURE FORUM

What will the Environment be like in 1990?

We asked six AES employees to express themselves freely about the future — in this case about their views on Canada's environment in the next decade. The variety and insight of their answers was both encouraging and disturbing. Future Forum plans to ask other questions tying in with our fast moving technology and our constantly changing life and work styles.

Dr. Wayne Evans (ARPX)

I see further degradation of the environment due to acid rain, toxic chemicals, depletion of the ozone layer and CO₂ increases from fossil fuel burning. Changes in the atmosphere longwave radiation budget will precede by about 10 years, changes in the climate itself. I would expect an improved AES research capability to detect, measure and monitor these changes in our environment by 1990. I expect these things to get worse before they get better, but our monitoring capabilities will enable us to persuade both politicians and the public on the need for action. I also foresee greater awareness of the possibilities of natural disasters such as volcanic activity or large meteors, with resulting climatic and pollution effects. By 1990 we will be doing experiments to design climate



Dr. Wayne Evans

modification strategies that will likely be in place 50-100 years later. We must look ahead and think in futuristic terms.

Yves Durocher (CCRM)

Right now it is unlikely that industries will want to put voluntary curbs on their toxic chemical emissions. Hopefully by 1990, the economy will have improved enough to allow companies to contribute to air quality again. By this time too it is possible there will be better cooperation between Canada and the U.S. on acid rain problems. As I see it the greatest source of future pollution will be combustion. For example, burning fossil fuels will drastically reduce our ability to breathe. I also fear that acid rain will have harmful effects on our wildlife, not



Yves Durocher

December 1839 he was advised by the council of King's College that his application for 2 acres of College grounds as a site for the intended Magnetic Observatory had been approved. With assurance from President McCauley of King's College, he urged the Governor General to accept the University's offer — since this would make the Observatory available to the University for scientific purposes on completion of the proposed World Magnetic Study.

Tenders were let for the construction of a log observatory at the northeast corner of the existing Sandford Fleming Building. The log structure was completed by autumn and on September 8th both the Magnetic and Meteorological programs were started.

From 1841 until 1853 the Observatory came under the direction of Captain (later General Sir John Henry) Lefroy.

Upon his departure, control of the Observatory was transferred from the British Army Ordinance Department to the Province of Canada and the management passed to the University of Toronto. The log observatory was dismantled and its site enclosed by a stone structure (1856-57). That building became the headquarters of the Canadian Meteorological Service from 1872 to 1907. Since it interfered with the access to the newly built Convocation Hall and the Sandford Fleming Building, it was in turn dismantled in 1908 and was reconstructed to the east of University College. The Meteorological Service headquarters relocated on Campus at 315 Bloor Street West in 1909.

In 1855 George T. Kingston, then Head of the Naval College in Quebec, was advised by George Etienne Cartier of his appointment as Professor of

Meteorology and Director of the Magnetic Observatory. His salary was 450 pounds over and above the fees received from students who attended his lectures. Following Confederation, at the time Sir Sandford Fleming was Dominion Engineer, Professor Kingston advised the new Canadian government of the need to develop a network of weather stations and a system to issue storm warnings. His advice was heeded and by Order of Council dated May 1871 he was allocated a budget of \$5,000 to organize Canada's Weather Service. Professor Kingston integrated the observational and services programs then operating in Quebec City, Kingston, Montreal and St. John, New Brunswick. By 1874, there were 35 storm warning stations. At the time of his retirement in 1880, Canada had a well established weather observing, climate and forecast service."

only on lake fish but also on our birds and mammals. As environmental problems become more critical, they should receive even greater press coverage than they do at present. AES should release up to date information on its findings concerning the different atmospheric components and the likely scope and range of their impacts.



Brian Taylor

Brian Taylor (AAG)

It is no use considering environmental problems in 1990 or tackling pollution globally until AES can clean up its act in its own backyard. For example, why is there so much salt on the AES (Downsview) parking lot in winter? Salt threatens to end our romance with the car far faster than rising gasoline prices. By 1990 I see our roadsides devoid of trees, having been felled by the salt menace. As president of the RA (Downsview) I am familiar with travel and recreation. By 1990 most U.S. tourists will have stopped visiting Canada because many of our northern lakes will be dead and there will be no more fishing. Right now most companies refuse to take acid rain seriously. Despite federal and provincial regulations requiring them to curb toxic emissions, companies like INCO (in Sudbury, Ont.) have managed to wangle stays of execution on the law. Instances like these make me pessimistic about our environmental future.

Francis Bowkett (AFDH)

I do not foresee any substantial changes in the environment, but by 1990, as we learn more about problems related to these topics, there should be some gradual improvement in the areas of acid



Francis Bowkett

rain and toxic chemicals. I think there is always a conflict between environmental and economic concerns, but I feel these can be balanced off against the different needs we have in our society. The same situation will still exist in 1990 and further down the road. It will always be a matter of making informed judgements. Personally, I use the environment as a camper, hiker and fisherman. It is definitely part of my lifestyle. The types of pollution I fear are those that threaten these activities.

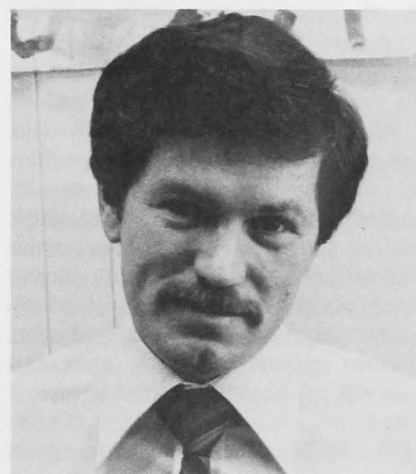
Joan Masterton (CCAI)

The environment won't be that different in 1990 from the way it is today. It would be nice, or perhaps naive, to think that changes for the worse will be gradual and will be out-weighted by more rapid changes for the better. I think there will be more joint ventures to attack specific environmental issues, say a combined effort by private individuals and companies, interested environmental consumer groups, researchers and



Joan Masterton

different levels of government to deal with major climate problems. I hope there will be a greater use of this interdisciplinary approach, enabling AES personnel interact with people in other specialties. Because of the economy, AES will have to fight very hard to maintain a high public profile and keep the financial support needed to continue research. It won't be easy and many of today's problems will still be around in 1990. For me personally the environment is everything I can touch, smell, see and hear, as well as the air I breathe. I am glad that I live in suburban Toronto rather than (say) Los Angeles, California. Clean air is essential to our future.



David Dockendorff

Dave Dockendorff (ACSN)

We must gain a better understanding of the whole eco-system and this takes time, maybe 10 or 20 years. AES has many plans for improved monitoring of the environment, for example the versatile new READAC automatic weather stations. Unfortunately, budgetary restrictions prevent AES playing its full part. Without the money, many long range programs will be cancelled and the environment will certainly suffer. Relations with the U.S. over acid rain have worsened and there are many examples of economic necessity forcing the public to choose jobs and affordable prices over a healthier environment. Nevertheless AES should implement more public awareness programs and start playing the political game, lobbying to achieve its environmental objectives. I personally won't feel threatened by the environment. I enjoy life one day at a time and short of some catastrophe like nuclear war, expect to continue that way.

FEATURES

BOOK REVIEW

Good Day Care Fighting For It, Getting It, Keeping It

Edited by Kathleen Gallagher Ross
The Women's Press
223 pages, \$7.95

Reviewed by Kate Middleton

Good Day Care emerged when a small group of people met with the Women's Press to discuss the need for Canadian material on day care. What started as an anthology of five or six articles grew to 21. The motivators of this book are the Day Care Reform Action Alliance of Ontario who add a slightly left-leaning horn to this cornucopia of information.

All the contributors are involved in day care themselves, some for more than 30 years: as parents, grandparents or workers. They evaluate existing alternatives, discuss basic ingredients, make international comparisons and suggest future possibilities in the development of a comprehensive child care system. Various sections attempt to place day care in a theoretical and political framework. E.g., "Notes from Cuba: 1976" by Margaret Randall, in which she describes the growth of day care in Cuba in the last 15 years.

The majority of papers are written from a personal perspective. The chapter entitled "A Father in Day Care" describes the growth of a father's responsibility for all children, not just his own. After attributing his child's problems to day care and his child's achievements to tender loving weekend care, the father eventually learned from day care the shortcomings of his attitudes and new and better ways of doing things with children.

Another chapter deals exclusively with myths associated with day care. The most commonly held theory is that home care is best for optimal child development. This myth has continually been supported by the research of a prominent English psychiatrist, John Bowlby, who did extensive work with emotionally-disturbed children, including badly traumatized war orphans, in the 40's and 50's. He developed a theory of

"maternal deprivation". However, since all his charges were not only orphans but also traumatized by the war, day care advocates severely question the use of his findings by day care opponents, who often quote Bowlby's work out of context.

In the section entitled "Assessing the Alternatives" four different types of day care are discussed: corporate, workplace, government and social agencies. One of the few workplace day care centres in Canada was opened in 1964 at the Riverdale Hospital in Toronto for its nurses and physiotherapists. Recently, the facilities have been made available to all Riverdale staff.

Government-controlled day cares get top marks for their innovation and recycling of fees into better staff wages and higher quality care for children, with social agency coming a close second.

Generally, Good Day Care is a good start for anyone wishing a comprehensive overview of day care in Canada. The more scholarly pieces balance out the plethora of personal-interest papers, and a comprehensive bibliography supplies anyone with more than a general interest with all the necessary information to further research the topic.

Kate Middleton is a member of Information Directorate, AES, Downsview.

STAFF CHANGES

Promotions/ Appointments

N. Arvidson (EG-6) Met. Inspector, CAED, Winnipeg, Man.

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A.D. Gates (REM-2) Meteorologist, Research Manager, APCO, Ottawa, Ont.

D. Grimes (MT-7) Meteorologist, Chief, PAEMM, PWC, Vancouver, B.C.

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C. Jollet (AS-3) QAEC, St-Laurent, P.Q.

G. Kearey (EG-8) Superintendent, Station Operations, PAEOO, Vancouver, B.C.

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S.A. Lupack (AS-3) Admin. Officer, CCCA, Downsview, Ont.

D. Lynch (EG-6) Met. Tech. AFON, Downsview, Ont.

J.C. McLeod (MT-6) Meteorologist, MOP, AFWC, Downsview, Ont.

A.S. MacLeod (CM-6) Met. Communicator, Pacific Weather Centre, Vancouver, B.C.

G. Meyers (EG-3) Data Processor, PAESI, Vancouver, B.C.

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M.H. Morin (EG-5) Officer-in-Charge, QAEOO, Clyde River, N.W.T.

C. Olsen (EG-5) Officer-in-Charge, WS3, Cape St. James, B.C.

D. Olivier (SCY-2) Secretary, QAEM, St-Laurent, P.Q.

A.D. O'Neill (EX-2) A/Regional Director, MAED, Bedford, N.S.

O. Peczeniuk (EG-4) Officer-in-Charge, WS3, Vancouver Harbour, B.C.

M.L. Phillips (SE-RES-3) Research Scientist, Chief, ARQT, Downsview, Ont.

R.W. Plaseski (AS-5) Head, Graphic Data Comm. System, ACPN, Downsview, Ont.

K.J. Puckett (SE-RES-2) Research Scientist, Head, LRTAP, LLO, Downsview, Ont.

P. Schwarzhoff (EG-5) Officer-in-Charge, WS2, Fort Nelson, B.C.

W. Scott (EG-4) Officer-in-Charge, WS3, Dease Lake, B.C.

M. Seguin (SCY-2) Secretary, QAES, St-Laurent, P.Q.

J.E. Shaykewich (MT-5) Meteorologist, Head, MOP, ARDS, Downsview, Ont.

H.E. Turner (SM) Director, ARQD, Downsview, Ont.

M.M. Villeneuve (SCY-2) Secretary, AIA, Downsview, Ont.

A. Whitman (EG-5) Officer-in-Charge, WS3, Cape St. James, B.C.

Departures from AES

S. Bruce, Hall Beach, N.W.T.

J. Campbell, QAED, St-Laurent, P.Q. to Provincial Government.

G. Lamb, WO4, Vancouver, B.C. to B.C. Environment, Vancouver, B.C.

L. Marier, APDG, Ottawa, Ontario.

J.D. McTaggart-Cowan, APCO, Ottawa, Ont. to COGLA, EM&R, Ottawa.

Y. Menard, QAEEA, St-Laurent, P.Q. to Municipal Government.

M. Miedreich, WO4, Banff, Alta.

J.G. Riopel, Quebec Weather Office, St-Laurent, P.Q.

A. Robichaud, WC1, Edmonton, Alta.

R. Sarrazin, PWC, Vancouver, B.C. to DND Trenton, Ont.

W.J. Whittaker, Gimli, Man.

Leave of Absence

J. Lauzon-Caron, QAEA, St-Laurent, P.Q.

Retirements

W.G. Barrey, ACSM, Downsview, Ont. May 1982

J.R. Colville, WS2, Vernon, B.C. August 1982

R.R. Dodds, AFWC, Downsview, Ont. June 1982

H.W. Gee, ARPX, Downsview, Ont. July 1982

G.T. Goryo, CCAA, Downsview, Ont. June 1982

J. Ing, CCAA, Downsview, Ont. May 1982

J. McGourty, QAEC, St-Laurent, P.Q. March 1982

O. Poulton, CCAS, Downsview, Ont. July 1982

Deaths

M.J. Helferty, OAED, March 3, 1982

B. Lamarche, Alberta Weather Centre, May 21, 1982

J.E. Percy, ACSN, Downsview, Ont. August 25, 1982

J.P. Perreault, CMC, Dorval, P.Q. May 1982

S.T. Toft, CCAA/Q, Downsview, Ont. July 19, 1982