ZEPHYR

DECEMBER 1974 DECEMBRE

Environment Canada
Environnement Canada

Atmospheric Environment
Environnement atmosphérique

ZEPHYR

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Published Under Authority of the
Assistant Deputy Minister
Atmospheric Environment Service

Publié avec l'autorité du
Sous-ministre adjoint
Service de l'environnement atmosphérique

editor/la rédactrice: B.M. BRENT

CLIMATIC CHANGE IN CANADA

By M.K. Thomas

Are we heading for another ice age? This question and others having to do with climatic change have become of significant interest to the Canadian public. It was only about 25 years ago that even meteorologists began to realize that the climate of the Northern Hemisphere had been warming up for several decades, but since then the pattern has changed, and it is now getting colder. During the past two decades glaciologists, biologists, hydrologists, geographers and other kinds of scientists have become interested in the subject because of the obvious social, economic and political problems likely to be raised by a deteriorating climate. Unfortunately, despite meteorologists' experience in preparing daily weather forecasts, in analyzing climatological data and in basic and applied meteorological research, they are as yet unable to provide the Canadian government and the public with meaningful scientific forecasts of climatic trends and fluctuations. In other words the Atmospheric Environment Service is not able to forecast whether next summer will be relatively cool and damp or hot and dry in any specific region in Canada.

Fortunately, for most practical purposes, Canada's climates can be considered stable – we can plan for cold in winter and warm in summer, snow in winter and rain in summer, etc. There are, of course, marked day-to-day changes in weather, and there is also considerable year-to-year natural variability. But when climatic data are analyzed it is possible to discern trends and fluctuations with irregular cycles over the past 100 years for which data exist. As in most Northern Hemisphere countries, Canada's temperatures warmed from the 1880s until about 1950. The present cooling trend, which has now lasted for about 25 years across southern Canada, has seen mean temperatures drop by about one degree Fahrenheit, which is a little less than the earlier one and a half degree increase over the 60-year period before 1940. More specifically, in eastern Canada, the 1870s and 1880s were generally cooler and snowier than the 1840s and 1850s, or any decade since. Temperatures increased after the 1880s and precipitation was particularly abundant across the prairies following the turn of the century. Temperatures continued to increase in the 1920s and 1930s, and particularly so in the Arctic in the early 1940s. During the late 1940s and the 1950s, however, the temperature fluctuations "peaked" across the country, and temperatures in southern Canada are now averaging a degree or two lower than in the early 1950s. It is more difficult to analyze precipitation records since there is greater variability within each region, but we do know that there has been more snowfall in some of the most recent winters than previously reported since the turn of the century.

Canada is not an isolated country when we look at what is happening weatherwise around the world. The slight southward shift in the general circulation of the atmosphere, which has produced cooler temperatures in Canada, is part of a general shift towards lower latitude of Northern Hemisphere climatic zones. This is not a regular and consistent feature – with a cooling trend in the north, the north to south temperature gradient is greater than what we consider normal, and thus there is an increase probability for prolonged hot or cold spells, wet or dry spells and storminess, unusual weather, etc. Further south than Canada's latitudes, but still north of the great deserts of the world, some dry countries which normally receive most of their precipitation in winter time have been plagued with abnormally heavy rainfall. Even further south, on the equator side of the desert areas, the African countries south of the Sahara have had abnormally dry periods.

What has been the effect on our life and society of the slightly cooler conditions which we have experienced for the past two decades? In general, the cooler climate has led to greater heating costs in our northern areas, greater needs for fuel production and storage facilities, and more winter transportation difficulties. On the other hand, the skiing seasons have been longer and better than conditions experienced 25 years ago. Cooler weather is usually associated with greater variability of weather which leads to droughts or floods with their disastrous effects on agriculture. Some areas of Canada report shorter growing seasons than 30 years ago and thus a greater frequency of damaging late spring and early fall frosts – phenomena which are quite damaging economically. For example in many parts of the country in 1974 crop planting was delayed by rains and flooding, the mid-summer period was unusually dry and damaging frosts came relatively early in September. But meteorologists and agriculturalists still have much to learn about the specific and direct influence of a deteriorating climate on agriculture.

Research into atmospheric processes, the energy balance between the earth and its atmosphere and the global atmospheric circulation is being pressed forward in Canada and other countries as fast as resources will allow, but it is unlikely that such basic meteorological research can produce results to significantly help in the preparation of climatic forecasts for at least another decade. Nor do meteorologists have much confidence in their ability to extrapolate climatic data from past decades into the future, since contemporary geophysical data are not necessarily representative of much longer periods. However, scientists in astronomy and glaciology have used data series from their respective sciences to offer climatic extrapolations which are amazingly similar. These extrapolations suggest that our climate will continue to cool a little until the 1980s and then warm with temperatures only regaining the early 1960s level by the 2020s.

Our knowledge of atmospheric processes is still so incomplete that meteorologists do not know what has caused the climatic change and fluctuations in the past. Over the millions and billions of years there have been geophysical changes – continents have drifted, mountains have formed, etc., and such actions have undoubtedly changed the climates. Meteorologists have always suspected changes in the output of solar energy and this may be one of the natural causes of climatic change but there is still no absolute proof that the solar output has ever changed. Over the past decade much attention has been focused on the possibility that changes in the transmissivity of the atmosphere have been of greatest importance. In the past centuries colder conditions have followed major volcanic eruptions, and it seems reasonable to believe that as the upper atmosphere becomes more polluted, more solar energy is reflected and thus not available to heat the surface of the earth and the lower atmosphere.

Most meteorologists believe that on a macro or countrywide scale man has not yet done anything to affect our climate, but as more industrial and agricultural pollution is released into the atmosphere, there is greater opportunity for atmospheric pollution to cause a global cooling. On the other hand, as more fossil fuels are burnt, more and more carbon dioxide is released into the atmosphere and the increased presence of this gas leads to a warming of the lower atmosphere. A third result of man's industrial activities is the production and escape of heat to the atmosphere. This contribution to climatic change is not yet of major concern to meteorologists, but will become so as we produce more and more energy. While man has probably not yet done anything to change the climate on a macro or continental scale, the "urban effect" in our cities has been recognized for some time – as a rule, cities are warmer, drier and less sunny than the surrounding countryside.

But what about an immediate ice age in Canada? Scientists have determined that temperatures need to fall only a few degrees before ice could begin to accumulate in the areas on either side of Hudson Bay, in northern Quebec and the Northwest Territories. This is apparently what happened about a million years ago when the Pleistocene ice age began. Interestingly the formation of an ice cover and subsequently a glacier depend primarily on the amount of snowfall. If so much falls during the winter that the snow cover cannot all be melted in summer, then an ice cover begins to form. Thus colder temperatures and more winter snowfall are the conditions required for another ice age, but it must be remembered that this is a long process and there are as yet no indications that the present climatic deterioration will continue for a sufficient length of time to cause such problems in Canada over the next several centuries. It is, however, in the less spectacular aspects that climatic fluctuations can damage our environment and economy, longer heating seasons, poorer winter transportation conditions, shorter growing seasons and consequently less food production.

Research into basic meteorological processes is proceeding, but in the interval before results are available for climatic prediction, there is much that the Atmospheric Environment Service can do to keep abreast of the current climatic fluctuations, prepare and issue special statistics on an operational basis and, if at all possible, attempt climatic outlooks for the next year or so.

LES CHANGEMENTS CLIMATIQUES AU CANADA

par

M.K. Thomas

Parmi les questions actuelles qui intéressent le public canadien il en est une qui retient de plus en plus notre attention, à savoir si nous sommes au seuil d'un nouvel âge glaciaire. Il y a seulement 25 ans que les météorologistes ont commencé à se rendre compte que le climat de l'hémisphère Nord s'était réchauffé pendant plusieurs décennies, mais cette tendance s'est modifiée depuis et notre hémisphère est en train de se refroidir. Durant les 20 dernières années, glaciologistes, biologistes, hydrologistes, géographes et autres chercheurs se sont intéressés à ce sujet, car la détérioration du climat aura d'évidentes répercussions sociales, économiques et politiques. Malheureusement, en dépit de leur expérience dans les domaines de la prévision météorologique journalière, de l'analyse des données climatologiques et de la recherche météorologique fondamentale et appliquée, les météorologistes ne peuvent, à l'heure actuelle, fournir au gouvernement et au public canadien, des prévisions scientifiques valables des tendances et des fluctuations climatiques. En d'autres termes, le Service de l'Environnement atmosphérique ne peut pas prévoir si l'été prochain il fera frais et humide ou chaud et sec dans une certaine région du Canada.

Pour la plupart des fins pratiques, on peut heureusement admettre que le climat du Canada est stable. On peut prévoir qu'il fera froid en hiver et chaud en été, qu'il y aura de la neige en hiver et de la pluie en été, etc. Il y a, bien entendu, d'importantes variations journalières et une importante variabilité naturelle du temps d'une année à l'autre. Mais, si l'on analyse des données climatiques des 100 dernières années, il est possible de distinguer des tendances et des fluctuations par cycles irréguliers. Comme ce fut le cas dans la plupart des pays de l'hémisphère Nord, il y eut au Canada,

un accroissement de la température à partir des années 1880 et jusqu'aux environs de 1950. La tendance au refroidissement qui dure depuis 25 ans environ dans le sud du Canada, s'est caractérisée par une chute de la température moyenne d'environ un degré Fahrenheit, ce qui est légèrement inférieur à l'augmentation de un degré et demi de la température pendant la période de 60 ans qui a précédé 1940. Plus précisemment, dans l'est du Canada, les années 1870 et 1880 étaient généralement plus froides et plus enneigées que les années 1840 et 1850, ou que toute autre décennie depuis lors. Après les années 1880, les températures se sont accrues et les précipitations furent particulièrement abondantes dans les Prairies au début du siècle. Durant les années 1920 et 1930, les températures continuèrent de croître, particulièrement dans l'Arctique au début des années 1940. À la fin des années 1940 et durant les années 1950, les fluctuations de température atteignirent un maximum dans tout le pays et, dans le sud du Canada, les températures sont maintenant en moyenne inférieures de un ou deux degrés aux températures du début des années 1950. Il est plus difficile d'analyser les données archivées relatives à la précipitation, car la variabilité pour une même région est plus importante. Nous savons cependant, que les chutes de neige étaient plus importantes certains hivers des dernières années, que ce qu'elles furent au début du siècle.

Le Canada n'est pas un cas isolé en ce qui concerne la situation météorologique. Le léger déplacement vers le sud de la circulation générale de l'atmosphère qui est responsable du rafraîchissement au Canada, fait partie d'un décalage général des zones climatiques de l'hémisphère Nord vers les basses latitudes. Il ne s'agit pas d'une caractéristique régulière et uniforme: étant donné la tendance au rafraîchissement dans le Nord, le gradient de la température du nord vers le sud est supérieur à la normale admise et les vagues prolongées de chaleur ou de froid, d'humidité ou de sécheresse, les tempêtes et les conditions météorologiques inhabituelles sont donc en probabilité croissante. Au sud du Canada, mais au nord des grands déserts du monde, certains pays secs qui reçoivent habituellement la plus grande partie de leurs précipitations en hiver, ont souffert d'importantes chutes de pluie anormales. Plus au sud encore, les pays africains au sud du Sahara ont connu des périodes anormalement sèches.

Quelles ont été les répercussions du léger rafraîchissement que nous avons connu pendant les deux dernières décennies sur notre vie et sur notre société? En général, le rafraîchissement s'est traduit par un accroissement des coûts de chauffage dans les régions au nord du pays, un accroissement des besoins de combustible et d'installations de stockage et plus de problèmes de transport en hiver. D'autre part, les saisons des sports d'hiver sont plus longues et les conditions pour le ski bien meilleures qu'il y a 25 ans. Le rafraîchissement et les vagues de temps extrême sont accompagnés de sécheresse, d'inondations et de leurs effets désastreux sur l'agriculture. Dans certaines régions du Canada, les saisons de croissance sont plus courtes qu'il y a 30 ans d'où une plus grande fréquence de gelées dévastatrices et ruineuses à la fin du printemps et au début de l'automne. En 1974, les plantations ont été retardées par les pluies et les inondations dans de nombreuses parties du Canada. La mi-été était inhabituellement sèche et il y eut des gelées dévastatrices au début de septembre. Météorologistes et agronomes ont encore beaucoup à apprendre relativement à l'influence directe et précise d'une détérioration du climat sur l'agriculture.

Au Canada et dans d'autres pays, on pousse la recherche sur les processus atmosphériques, le bilan énergétique entre la terre et son atmosphère et la circulation atmosphérique globale autant que les ressources le permettent, mais il est peu probable que ces recherches fondamentales aboutissent à des résultats qui permettront d'améliorer de beaucoup les prévisions climatiques d'ici 1985. Les météorologistes ne croient pas non plus être en mesure d'extrapoler les données climatiques des dernières décennies car les données géophysiques dont ils disposent ne sont pas nécessairement représentatives de périodes beaucoup plus longues. En astronomie et en glaciologie, les chercheurs ont

cependant fait des extrapolations climatiques qui se ressemblent remarquablement en se servant de séries de données de leurs sciences respectives. Ces extrapolations indiquent que le climat continuera de se rafraîchir un peu jusqu'aux années 1980 puis se réchauffera, les températures atteignant le niveau du début des années 1960 vers les années 2020.

Notre connaissance des processus atmosphériques est encore tellement limitée que les météorologistes ne savent pas ce qui a causé les changements et les fluctuations climatiques dans le passé. Il y eut des changements géophysiques pendant des millions et des millions d'années: dérives de continents, formation de montagnes etc. et il n'y a pas de doute que cela a changé les climats. Les météorologistes ont toujours fait l'hypothèse qu'il y a des changements dans le dégagement d'énergie solaire et il s'agit peut-être d'une des causes naturelles du changement climatique, mais il n'existe encore aucune preuve absolue que le dégagement d'énergie solaire se soit jamais modifié. La possibilité que les modifications de la transmissivité de l'atmosphère aient été de toute première importance a attiré beaucoup d'attention pendant la dernière décennie. Au cours des derniers siècles, d'importantes éruptions volcaniques ont été suivies par des refroidissements et il est raisonnable de penser qu'au fur et à mesure que la haute atmosphère se pollue, plus d'énergie solaire se réfléchit, qui n'est donc plus disponible pour réchauffer la surface de la terre et l'atmosphère inférieure.

La plupart des météorologistes pensent que les activités de l'homme n'ont pas encore affecté le climat à grande échelle ou à l'échelle de tout un pays, mais au fur et à mesure que la pollution industrielle et agricole se dégage dans l'atmosphère, les risques de refroidissement global par pollution atmosphérique s'accroissent. D'autre part, la combustion de plus de combustibles fossiles dégage de plus en plus de gaz carbonique dans l'atmosphère et la présence de ce gaz en forte concentration entraîne un réchauffement de l'atmosphère inférieure. En troisième lieu, les activités industrielles de l'homme produisent de la chaleur qui se dégage dans l'atmosphère. A l'heure actuelle, les météorologistes ne sont pas encore trop inquiets de cette contribution au changement climatique, mais ils le seront puisque nous produisons de plus en plus d'énergie. Les hommes n'ont probablement pas encore induit de changement climatique à l'échelle d'un continent ou à grande échelle par leurs activités climatiques, mais depuis quelque temps, on reconnaît dans nos villes l'effet de l'urbanisme: en règle générale, les villes sont plus chaudes, plus sèches et moins ensoleillées que les campagnes environnantes.

Qu'en est-il alors d'un âge glaciaire dans l'immédiat au Canada? Les chercheurs ont déterminé qu'il suffirait que les températures baissent de quelques degrés pour que la glace s'accumule dans les régions des deux côtés de la baie d'Hudson, dans le nord du Québec et les Territoires du Nord-Ouest. C'est apparemment ce qui s'est passé il y a un million d'années au début de l'âge glaciaire du Pléistocène. Il est intéressant de remarquer que la formation d'un manteau de glace et par la suite d'un glacier, dépend surtout de la quantité de neige qui tombe. S'il en tombe suffisamment pendant l'hiver pour que la couverture de neige ne fonde pas totalement en été, un manteau de glace commence à se former. Pour qu'il y ait un autre âge glaciaire, il faut qu'il fasse donc plus froid et que les chutes de neige soient plus importante en hiver. Mais il faut se rappeler qu'il s'agit là d'un long processus et que nous n'avons actuellement aucune indication qui permette de penser que la détérioration climatique que nous connaissons se prolongera assez longtemps pour causer de telles difficultés au Canada pendant les siècles à venir. C'est dans leurs aspects moins spectaculaires que les fluctuations climatiques peuvent nuire à notre environnement et à notre économie: saisons de chauffage prolongées, transport en hiver rendu plus difficile, saisons de croissance plus courtes et par conséquent productions alimentaires réduites.

Les processus météorologiques fondamentaux sont à l'étude, mais en attendant d'avoir à sa disposition des résultats qui permettront de faire des prévisions climatiques, le Service de l'Environnement atmosphérique est en mesure de se tenir au courant des fluctuations climatiques, de préparer et de diffuser des statistiques spéciales pour l'exploitation et si possible d'essayer de donner un aperçu climatique de l'année à venir.

THE INTERNATIONAL STUDY CONFERENCE ON THE PHYSICAL BASIS OF CLIMATE AND CLIMATE MODELLING

In order to outline a feasible approach to climate modelling and to prepare a plan for the implementation of the Second GARP Objective, some 70 scientists representing a wide range of problem areas met at Wijk outside Stockholm during the period 29 July - 9 August 1974. The report of the Conference is expected to be published early in 1975 as GARP Publications Series No. 16.

The Conference focused on four main topics: the observed variability of the climate; the overall design of climate models and their use in sensitivity and predictability studies; the physical, chemical and biological processes of the atmosphere, ocean, land surface and biomass to be included quantitatively in climate models; and, the formulation of an observational program related to climate modelling and monitoring.

Most emphasis was placed on seasonal and inter-annual variations and on fluctuations on the decade to century time-scale. The importance of understanding the variability of climate, as opposed to the average conditions, was stressed. It was recognized that in addition to intensified study of the surface, aerological and satellite data of recent years, it would be necessary to reconstruct and study the climates of the past using instrumental data, historical accounts, chronological measurements of tree-growth, and biological and chemical records from lake, bog and ocean sediments and from the polar ice sheets.

In order to construct numerical models of climate, it is necessary to describe quantitatively the physical, chemical and biological interactions of the atmosphere, oceans, land surface, cryosphere (sea-ice, land-ice and snow) and biomass. A variety of modelling approaches were proposed, ranging from models with low spatial resolution such as global-average or zonal-average heat budget models to models with high resolution comparable to those of present day general circulation models of the atmosphere. It was recommended that strong support be given to the development of high resolution models of the climate system, in which the large-scale dynamical processes are treated explicitly. Low and intermediate resolution models may be particularly useful for extended numerical simulations of climate if they can be properly calibrated with the aid of observations and high resolution models.

A number of different kinds of experiments with climatic models were envisaged. Sensitivity studies are required to investigate the climatic response to modifications in both external parameters (such as the solar irradiance or the aerosol loading due to volcanic activity).

There was general agreement that efforts should be concentrated on the modelling of seasonal and interannual fluctuations as well as fluctuations on the time-

scale of decades to centuries; in addition, climate models are needed to assess both the short-term and long-term climatic consequences of certain of man's activities. For these purposes, experiments were recommended to establish the degree to which climatic fluctuations are predictable. It was emphasized, however, that the prediction of individual events of a particular season or year was an unlikely outcome of climate modelling and forecasting; if predictability can be shown to exist, it will be of a statistical nature.

The study of specific climatic events was also proposed, including, for example, variations of the monsoon circulation, patterns of drought and the influence of ocean temperature and sea-ice variations on atmospheric circulation patterns.

A variety of physical, chemical and biological processes must be incorporated in climate models. In various research areas (radiation and cloud processes, land-surface processes, ocean processes, cryosphere processes and aerosol, carbon dioxide and ozone-related processes) observational and modelling experiments were proposed to increase our understanding of the processes involved and thereby lead to improved parameterization techniques. For example, in the area of modelling, processes of the rapidly varying layer above the seasonal thermocline, as well as processes of the intermediate and deep ocean were treated. Topics in cryosphere modelling included snow cover, sea-ice and continental ice-sheets. In the areas involving biological or chemical interactions, such as ozone formation and destruction or the movement of carbon dioxide between atmosphere, ocean, land and biomass, various proposals were made to simplify the treatment of these complex processes.

The proposed observational programs were of three kinds: firstly, intensive observational efforts of limited duration to develop proper parameterization schemes for specific processes; secondly, global or semi-global observations of key parameters over several years needed to test and validate climate models; thirdly, observation of some external parameters (such as the solar irradiance) and internal parameters (such as extent of snow or sea-ice cover) for long periods of time in order to study mechanisms of possible importance for climatic fluctuations. Where possible, tentative specifications were made of the variables to be observed, the frequency of observations, the spatial resolution and the accuracy required.

The observing systems developed in connection with the WWW and the First GARP Global Experiment (FGGE) will play essential roles in the proposed observational program for the study of climate. However, new observing systems will also be required, particularly with regard to observing the oceans.

Special efforts were made to identify supplementary observations useful for the study of climate that could be obtained during the FGGE, and to take advantage of GARP sub-programs such as the Monsoon Experiment (MONEX) and the Polar Experiment (POLEX) to further the study of climate.

The appendix to the report will include papers prepared by twenty-two of the participants. These papers review the present state of knowledge in the various topic areas of the Conference.

Doctors W.L. Godson and R.E. Munn of the Atmospheric Environment Service participated in this Conference.

SUBARCTIC ENVIRONS

by Dennis L. Stossel

Fort Churchill Aerological WS2 Station at latitude 58°45'N and longitude 094°04'W is situated on the edge of the northern limit of boreal forest and southern edge of the tundra – a transition zone of subarctic forest. Besides being adjacent to the M.O.T. airport/runway, viewing south and eastward are numerous small ponds, muskeg, sedge meadows, lichen heath and dwarf willows. Towards the west are small spruce trees, tamarack and birch.

The observing program at Fort Churchill consists of rawinsonde every twelve hours; ozonesonde using a Brewer-mast sonde every Wednesday morning; a ten-point snow survey course; two radiation fields using a global solar radiation Kipp pyranometer and a net radiation Csiro pyrradiometer; a morning ozone observing program using the Dobson ozone spectrophotometer for observing and recording measurements of total atmospheric ozone and mercury, standard lamp tests and wedge calibrations are performed every two weeks; special observations are taken between April and August when suitable sky conditions permit; vertical distribution of ozone measurements are made by observing the 'umkehr effect' between February and October from sunrise to local apparent noon on a zenith blue sky depending on weather conditions at sunrise; evening moon observations are conducted for a week during the full moon phases in November, December and January. A first order seismology station is operated and maintained by the aerological observers for the Department of Energy, Mines and Resources Seismology Division. Three Columbia long period seismometers and three Mark II Willmore Seismometers are used in the vault and six galvanometers in the recording room. Seismic events are annotated, coded and sent by telex to Ottawa daily Monday to Friday.

The staff complement in August were W. Boughton, W.G. Harrison, F. Karpenic, L.O. Leclair, M.A.R. Maclean, B. Routledge and D.L. Stossel. The new Churchill townsite will house all the D.O.E. families by September. The homes are very well designed spacious three and four bedrooms fully furnished modern dwellings. Within a year, community services provided by the new townsite will include schooling from kindergarten through grade 12; a 30 bed treatment hospital, medical clinic, dental clinic, day care centre; offices for the various social development and health care facilities, and complete recreational complex consisting of swimming pool, gymnasium, skating and hockey arena, curling rinks, bowling alley, theatre and library for community use. The townsite is managed by the Local Government District and the Manitoba Housing & Renewal Corporation and has the makings of a fully integrated viable community by 1976. The older PMQs at the airport are gradually being phased out as the townsite is phased in and all activity will be centred around the new community. The Port of Churchill operated by the National Harbours Board will be undergoing renovation and expansion to increase its present five million bushel storage capacity and also to prepare for sulphur storage and eastern arctic resupply facilities. The Churchill area is serviced three times each week by train and six times a week by air from Winnipeg.

Three major tourist attractions are the old Fort, the new museum and bird-watching. At the mouth of the Churchill River, on the north side stands historic Prince of Wales Fort constructed by HBC between 1731 and 1746 with outside dimensions of 100 yards square that mounted 42 guns up to 24 pounders in size. The Centennial Eskimo Museum in the centre of town is run by the Roman Catholic Church

O.M.I. and is the finest collection in the country of eskimo artifact and indigenous birds/animals of the Hudson Bay area. Birding at Churchill is excellent as the area is a most suitable nesting ground for many typical birds. Loons, geese, ducks, hawks, plovers, sandpipers, gulls, owls, swallows, warblers, sparrows, and dozens of other species have been sited and recorded within walking distance of the aerological station . . . .

PORT OF CHURCHILL

Looking at Townsite eastward from top of grain elevators.

Upper air station – Churchill.

Federal apartment block and hospital residence for employees.

Hospital, school, recreation complex, Churchill.

WOMEN IN THE HIGH ARCTIC

Among the twenty-one Aerological Observers Training Centre graduates who received their certificates on Friday, December 13, 1974, were two young women. They were not the first female aerological observers to graduate, but they did go on to another first. These young ladies were assigned to Eureka, N.W.T., the first female aerological observers to be assigned to a High Arctic Weather Station.

When interviewed, Heather Blain and Cheryl Leyten both expressed an interest in seeing Canada and in experiencing life in the north as motivating factors for becoming aerological observers. They felt too that an assignment at an isolated post would give them an opportunity to spend more time on their hobbies. Cheryl is interested in photography and the outdoor life; Heather's interests lie in needlework, reading and hiking.

The guest speaker for the bilingual ceremony, held in the A.E.S. auditorium, was Mr. G.A. McKay, Chief of Applications and Consultation Division of the Meteorological Applications Branch. In his talk, he reminded the graduates of the contribution they would make to the small isolated communities to which they were assigned and their impact on the world-wide network in which they would be working. He could not see their role completely replaced by satellites or computers.

To all the graduates, we wish good fortune in their new career.

AOTC Course 7402

From Left to Right:

Back Row: *Rick Risbey, Brian Bain, Louis Joly, Bob Thoren, Yves Belland, François Beaumier.*

Middle Row: *Allan Stone, Ted Harder, Michel Zavada, Gerry Kluth, Michel Rocheleau, André Forgues, Réjean Lebel.*

Front Row: *Scott Bruce, Gerry Funston, Ted Schroter, Cheryl Leyten, Heather Blain, Bob McInnes, Claude Levesque, Mr. G.A. McKay (guest speaker).*

Missing: *Ben Kessler.*

DES FEMMES DANS L'EXTRÊME-ARCTIQUE

Deux jeunes femmes faisaient partie des vingt-et-un diplômés du Centre de formation d'observateurs aérologiques qui ont reçu leur certificat le vendredi 13 décembre 1974. Ce ne sont pas les premières observatrices diplômées en aérologie, mais les premières nommées dans une station météorologique de l'Extrême-Arctique: elles ont, en effet, été affectées à Eureka (Territoires du Nord-Ouest).

Interrogées, Heather Blain et Cheryl Leyten ont toutes deux indiqué que l'envie de découvrir le Canada et de connaître la vie dans le nord était ce qui les avait incitées à devenir observatrices en aérologie. Elles pensaient aussi qu'une nomination à un poste isolé leur permettrait de consacrer plus de temps à leurs passe-temps. Cheryl s'intéresse à la photographie et à la vie en plein air; Heather aime les travaux d'aiguille, la lecture et les randonnées.

M. G.A. McKay, Chef de la Division des Applications et Consultations de la Direction des Applications météorologiques, était l'orateur invité pour la cérémonie bilingue tenue dans l'auditorium de SEA. Dans son discours, il a rappelé aux diplômés quelle aide ils allaient apporter aux petites communautés isolées où ils étaient affectés et quelle influence ils allaient exercer au sein du réseau international où ils s'apprêtaient à travailler. Il a déclaré qu'on ne pouvait envisager que des satellites ou des ordinateurs les remplacent tout à fait.

Nous souhaitons à tous les diplômés, bonne chance dans leur nouvelle carrière.

ATMOSPHERIC ACOUSTICS WORKSHOP

AES and York University are cosponsoring the Third International Atmospheric Acoustics Workshop, which will be held at York University, *24 to 27 June, 1975.* The contact in AES is W.L. Clink, AIDE, 667-4668. Previous workshops were at Boulder, Colo., and Norman, Okla. The Workshops are forums for the exchange of information on developing remote-sensing technologies, which include the passive infrasonic techniques and the active sonic radars, and on their application to the study of atmospheric gravity waves and to the measurement of the turbulent state of the lower atmosphere. Most of the interest at the workshops has been in the rapidly developing sonic radar technology. The Atmospheric Instruments Branch, in its development program, is calling the new technology – SODAR – for Sound Detection and Ranging of turbulent fluctuations in the velocity of sound in the atmosphere. Sound energy is scattered from a pulsed beam of sound by these inhomogenieties of temperature and wind, and detected by sensitive, highly-tuned, receivers. In the backscatter mode, analogous to vertical-pointing weather radars, the SODAR is primarily sensitive to temperature turbulence. It displays profiles suggesting the unfolding thermodynamics of the tropospheric boundary layer. Other modes can be arranged for SODAR to measure 2-D or 3-D wind profiles and turbulence components to heights useful to aviation in the vicinity of airports.

ISACHSEN – A HIGH ARCTIC WEATHER STATION

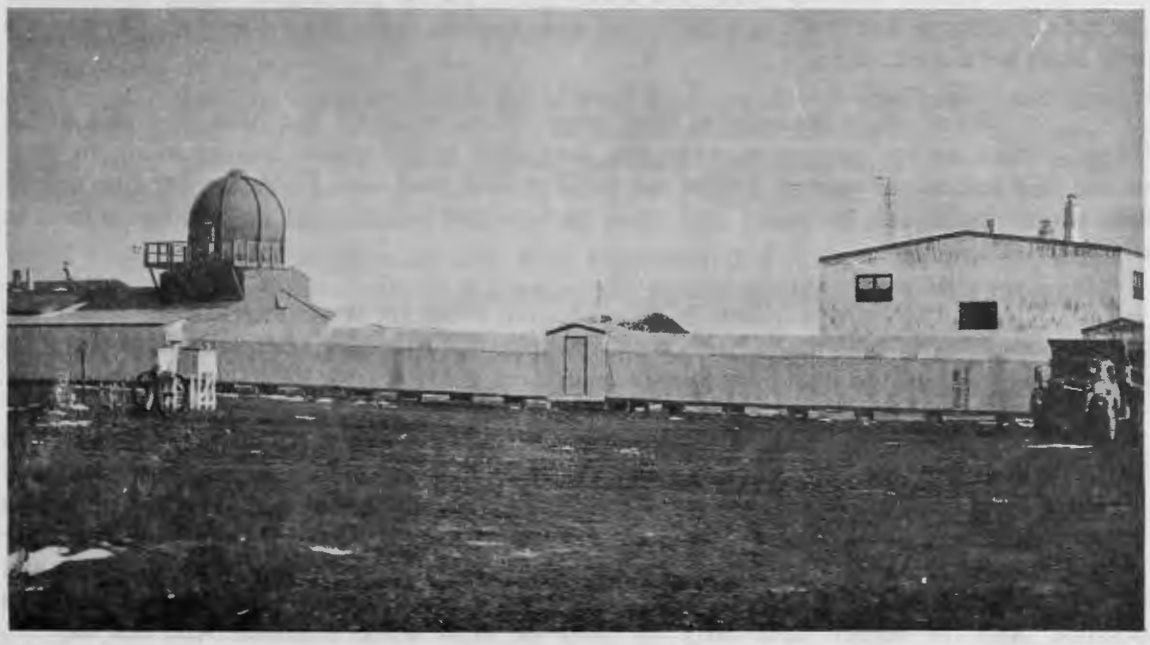
by Marvin Maronda

Located on Ellef Ringness Island in the Canadian High Arctic, 800 miles from the North Pole, Isachsen is one of this country's most isolated and remote settlements. Originally a Joint Arctic Weather Station staffed and operated by the Canadian and United States governments for 25 years, Isachsen was completely taken over by Canada in 1971. Since then a long-term construction and improvement program has been put into effect.

Isachsen is located at Lat. 78 degrees 47' North, Long. 103 degrees 32' West, and is one of a network of 35 Canadian stations which conduct regular balloon-borne radiosonde soundings of the atmosphere, as well as maintaining surface weather records. Third most northerly such station in Canada, the topography of the country surrounding Isachsen is markedly barren in summer, bleak in winter, when it is not uncommon to experience temperatures falling to –50 degrees F. and there is constant darkness.

The fine season of summer, with temperatures in the mid-thirties and forties, perhaps reaching the low fifties, reduces winter snows to a few drifts on the surrounding high hills by August. Although the ice on the Arctic Ocean never melts, Louise Bay, 100 feet beyond the camp, does sometimes clear in years with high temperatures and strong off shore winds.

Little vegetation grows on the island; only occasional patches of arctic grass and a widespread sprinkling of tiny arctic poppies are hardy enough to make a brief appearance during the middle of summer. This absence of vegetation only adds to the dullness of the surrounding landscape, and is another reason for the noticeable lack of wildlife in the area. Only on rare occasions are caribou seen, and even the wolves and arctic hares which abound near some northern stations are not often seen.



Operations building and barracks, Stevenson Screens on left hand side – Isachsen, N.W.T.

Early summer brings Lesser Canada Geese, Snow Buntings, Seagulls and Jaegers, and while most birds do not stay long, their brief presence is enjoyed. Protective hunting laws have largely removed their fear of man and they can be photographed and studied in a way that would be impossible in the south.

A permanent staff of 10 men operate the station. When fully staffed this includes an Officer-in-Charge, five aerological observers, a mechanic, electronics technician, cook and handyman. In the Spring and Fall research groups and government and private enterprise personnel visit the site. During the last several years construction crews with up to 20 workers have spent the summers here.

For a variety of reasons little construction had been carried on at Isachsen for some years before Canada took over the Joint Arctic Weather Stations. While other stations were being maintained and improved Isachsen was not. It was in 1972 that the long needed plan for improvements was implemented with the construction of a large new building to house the station power-plants and additional water storage tanks which boosted water storage capacity to over 60,000 gallons. Expanded fuel facilities made possible the storage of over 100,000 gallons of that commodity.

Construction on a new barracks began the following year. Much different from other residences, Isachsen's new barracks is two stories high. With fifteen two-room suites the building is large and comfortable. 1974 construction has added a new recreation room and indoor walkways to the weather office and power house.

The construction of a heated warehouse and needed improvements to the weather office itself, as well as general station repair, are the main construction considerations for this year. Several tentative projects are planned for 1975.

For the men who live at a station like Isachsen, so far removed from civilization and in such a severe climate, life is usually interesting, often enjoyable, but sometimes very difficult. The nearest settlement is over 300 miles away. With the exception of spring and fall airlift and a few extra planes that fly in during the summer the radio, teletype and once a month mail and produce flight from Resolute Bay are the only links with civilization.

From May through August, when there is bright sunshine day and night, there is much to do: hiking, photography, and later in the season rowing when the edge of the bay breaks up enough to get the small station boat out. There are trips to nearby hills where fossils can be found and hikes to wrecked aircraft and up nearby streams in the area.

In the winter there is a carpenter shop to work in, a dark room for developing pictures, billiards, a ham room, and plenty of reading material. There are eight films a month to watch many times over, and there is always plenty of work to do.

But winter, even with good meals and the other comforts provided, is a difficult time for many. The daily work routine, the darkness, the perpetual cold and distance from family and friends are a constant challenge to all on station. Storms bring winds that present chill factors colder than - 100 degrees F. There is boredom. There are disagreements. The time can stretch into an eternity, yet everyone must do his share and make a distinct effort to see the station carry on as efficiently and as effectively as possible. And the station does carry on. And the staff works together. And one day . . . it's Spring.

LA POLLUTION DE L'AIR: UN CRI D'ALARME DU MONDE SCIENTIFIQUE

Dans le monde médical, on s'inquiète de plus en plus de la pollution de l'air dans les villes, et l'on insiste pour que le gouvernement fasse plus de recherches à ce sujet.

Un physiologiste de la respiration à l'université McMaster, le Dr David Pengelly, est d'avis qu'une faible concentration de polluants peut être plus dommageable à la santé qu'on le croyait.

En effet, des expériences faites à l'université McGill chez des sujets dans des chambres expérimentales indiquent que même un bref contact avec de l'ozone ou de bioxyde de soufre – seuls ou en combinaison – peut affecter la santé. Le Dr Milan Hazucha y a déclaré que les effets sont graves mais on ne connaît pas les effets d'une longue exposition.

Cès expériences reproduisent des conditions qui se rencontrent fréquemment dans les villes: les sujets ont ressenti des malaises, bon nombre se sont mis à tousser, et il y eut des cas de pharyngite ou inflammation de la muqueuse.

Ce qu'il faut retenir c'est que tous les sujets des expériences ont été affectés à des degrés divers.

Aux Etats-Unis, on a constaté que des masses d'ozone dérivent hors des villes – provenant apparemment des centrales électriques – et qu'elles affectent non seulement les poumons de l'homme mais aussi la végétation.

Par contre, si l'ozone tend à augmenter en basse atmosphère il semble qu'il diminue en haute atmosphère, la cause principale en serait les gaz utilisés dans les contenants sous pression ou aérosole. Or, si la couche supérieure d'ozone diminue, les rayons ultra-violets du soleil accroîtront l'incidence des cancers.

Dans un numéro récent du journal de l'Association médicale canadienne, le Dr David Bates, doyen de médecine à l'université de la Colombie-Britannique, lance un appel aux gouvernements pour qu'ils activent les recherches sur la pollution atmosphérique.

Ce qui l'inquiète surtout, c'est l'augmentation des oxydes d'azote dans l'air des villes, ce que les détecteurs du gouvernement féderal semblent trop souvent ignorer.

C'est par l'action des oxydes d'azote que se produit la pollution atmosphérique due à un processus photochimique: quant aux causes de cette diffusion des oxydes d'azote, elles sont nombreuses, si bien que si l'on résout un problème il s'en crée un autre.

PROGRAM FOR TAKING STRATOSPHERIC MEASUREMENTS DURING A PARTIAL SOLAR ECLIPSE

by J.B. Kerr

SCIENTIFIC OBJECT

On December 13, 1974, a partial solar eclipse will occur with maximum shadow centred over, Eastern Canada. The eclipse offers AES a unique opportunity to conduct an experiment to determine the dependence of stratospheric constituents on the intensity of sunlight. The results of such an experiment could help to resolve the present uncertainty of stratospheric photochemistry.

Measurements of nitrogen dioxide and ozone will be made during the eclipse. The outcome of the NO_2 measurements will help to clarify an apparent controversy in current beliefs of stratospheric photochemistry. Simple photochemistry predicts that with lack of sunlight, NO would be converted into NO_2 during the eclipse. On the other hand, some observers have observed larger amounts of No_2 by day than at twilight and at night. Measurements of NO_2 during the eclipse will resolve the controversy and also provide quantitative values for one or possibly both of these solar driven reactions.

PLAN FOR MEASUREMENT

Four experiments will be conducted during the eclipse: three from aboard an aircraft and one based at a suitable ground station, preferably Sept Isles if the weather is favourable. The aircraft is a Jetstar which is operated by the Ministry of Transport. University of Toronto will make measurements of No_2 with one instrument from aboard the aircraft and an identical instrument on the ground. AES will conduct one experiment to measure No_2 and another to measure ozone from on board the aircraft. In addition, an ozonesonde will be released from Goose Bay during the eclipse.

The plane will take off from St. John's, Newfoundland, just prior to the eclipse and will fly westward at 50° latitude, passing over Sept Isles midway through the flight and land in Ottawa. Following the flight plan, the plane will always be near local noon and will also be flying against the moon's shadow, so the duration of the eclipse will be shortened.

RETIREMENTS

J.C. (Cy) Grady

Norman Gaskarth presenting Cy with retirement certificate.

On the 28 of December, a large number of friends gathered for a dinner to honour J.C. (Cy) Grady on the occasion of his retirement, after nearly 32 years with the Atmospheric Environment Service.

Cy joined the service as a Meteorological Assistant on January 18, 1943, and received his training at the Lethbridge Forecast Office. In 1957 he transferred to the Weather Office at Fort St. John, becoming Officer in Charge in 1958, and remaining in that capacity when the station assumed the presentation function. In 1966 he transferred to the Calgary Weather Office, where he remained until his retirement.

Cy has always brought a diligent and energetic attitude towards his work and taken pride in a job well done. We wish Cy and Margaret a long and happy retirement. Cy has promised to remain in Calgary, at least until such time as the Stampeders win another Grey Cup.

Cy and Margaret Grady.

J.S. Dickson **F.A. Rayfield** **J.S. Stodolak**

A luncheon was given in the "Hook and Ladder Room" at the Beverly Hills Motor Hotel on Thursday, December 12, 1974, for three gentlemen who retired from AIB after a combined term of service of over 100 years.

J.S. Stodolak, F.A. Rayfield, J.S. Dickson and their wives were honoured by over one hundred friends, family and associates.

Bob Vockeroth (Director, AIB), as master of ceremonies, introduced speakers on behalf of each of the three special guests.

Don Champ (Chief, Design & Development Division) spoke of Jay Dickson's contributions to Automatic Weather Stations and instrument testing. He presented Jay with a special barometer.

J.S. Stodolak, J.S. Dickson, F.A. Rayfield and their wives.

Vern Turner introduced John Stodolak and spoke of his contributions in instrumentation for Hydrometeorology.

Herman Gerger (Chief, Systems & Planning Division) represented the Systems Section and introduced Frank Rayfield, commenting on Frank's work in contract co-ordination and procurement.

Both Frank and John were presented with special barographs as mementos of the Instrument Branch at A.E.S.

Frank Rayfield receiving barograph from Herman Gerger.

Wendell Smith and Jay Dickson.

J.S. Stodolak.

RETIREMENT CANADA | RETRAITE CANADA

My file: IM4 - it
Your file: RUN VS?

FROM: Ex-Paew (Ret.)
TO: All Rgnl HQ Staff
SUBJECT: Gratitude

1. Reference is to the Dec. 2/74 Retirement Symposium at Stanley Park in respect of which extraordinary appreciation is submitted for your consideration.

2. Special commendation on project leadership is recommended in regard to Files 1814-Mathieson, 1814-Howard, covering factors (a) selection of space, facilities, cuisine and tributes (b) public relations, marketing, and personnel management.

3. Outstanding performances are acknowledged by the stable of introductory speakers assigned, the imaginative creativity of whom should be maintained at peak through cyclic rotation of reporting duties to "Zephyr" from this region.

4. The surprising disclosure by AEWR of submitting without complaint to ghost writing of his principal utterances evokes admiration tinged with remorse. Such enviable co-operation, and a demonstrated intellectual courage in entering a battle of wits half-armed, deserves assignment to a special project of re-writing all AEW correspondence for the past two years.

5. In regard to the gifts you were more than generous, and I am more than grateful. The long thin wallet will be ideal for a stretched pension cheque. The 1944 photos of Wright and Belhouse over a weather map show me doing all the work. I have had daily sessions with the fabulous golf bag and today I loaded all the clubs in par. Have already madly wielded the hi-speed rotor tool, letting chips fall where they may, fashioning little square pegs for little round holes, as if I had never left the office.

6. *May your Christmas and your New Year*
be very bright and happy

7. My thanks to all for your generous gifts and thoughts and especially for your companionship and friendship.

_____

Henry C. Belhouse
Superannuation No. 68718

Miss Mary Watson

Mary joined the Meteorological Service in 1944 and was first stationed at Lac la Biche. She was transferred to the Edmonton Forecast Office in 1950 and later became a Shift Supervisor in the map plotting section.

Mary will be missed by her co-workers and friends.

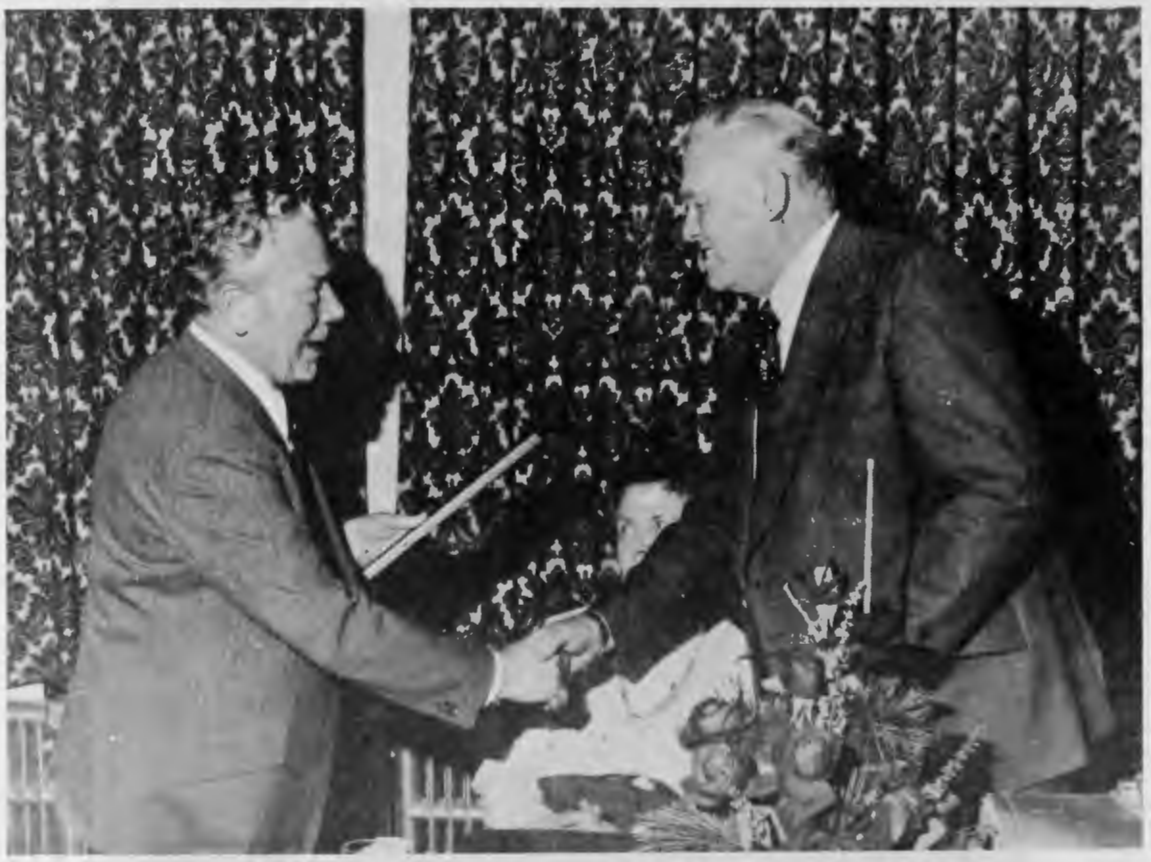
Mary Watson and Steve Checkwitch at Edmonton Weather Office.

C.G. Milgate

On December 17, 1974, about 70 friends and cohorts of Clarence Milgate gathered at the Garrison Club in Edmonton for a banquet to mark his retirement.

Clarence joined the Meteorological Service in 1939, serving in the Western Region. His strong capabilities in the Region as Senior Meteorological Inspector have been beneficial to the Service and AES customers.

Clarence's presence and expertise will be missed in the Region.



George Legg and Clarence Milgate at Garrison Club banquet.

WEATHER MAN RETIRES

With 31 years behind him in the weather forecasting business, Dick Bridgman, most recently a weather forecaster in MARPAC HQ received the best wishes of Rear Admiral Pickford and M. Blake, senior staff officer on his last working day.

Joining the Atmospheric Environment Service in 1943, Dick served with military personnel in a number of stations across Canada during the war. Later, ten years were spent at RCAF Trenton before being assigned as OIC of the Lakehead Weather Office for 13 years. Five years back, Dick and family, perhaps finally discovering where the good weather is, moved to Victoria.

Aside from his official duties of assuring good weather to Victoria and environs, Dick has been active in organizing, coaching and officiating hockey and baseball. Now that he has more time on his hands, it is expected that Dick will be even more prominent on the rinks and ball diamonds.

Left to right: D. Bridgman, M. Blake and Rear Admiral Pickford.

Photo courtesy Godden Photo

A.E.S. HEADQUARTERS RECREATION ASSOCIATION

The Recreation Association ended the year 1974 on a successful and happy note. The Childrens' Christmas Party was a huge success and the Dinner-Dance at Casa Loma was a fabulous affair.

Throughout the year the Executive had the assistance and cooperation of people such as Tom Fellion – for his printing services; General Administration, Drafting, namely, Tom Chivers and Gord Young for their cooperation in drafting ticket layouts; Norm Steinhaur for his eye-catching posters; and Pete Peterson for his fantastic performance as Santa Claus.

Without the cooperation and help of these kind people, the Recreation Association's Executive would not have been able to meet deadlines and urgent requirements to help in making 1974 a very good year for the Recreation Association.

The Executive would also like to express their appreciation and heartfelt thanks to all those who supported and attended the Association's functions. It is our hope that 1974 will be just the beginning of many happy years.

For the interest of those who attended the Children's Christmas Party and/or the Dinner-Dance, we hope you find the photographs shown to be a happy review.

A magical moment with the help (?) of Bert and Sheila.

And . . . a mink coat, a Mercedes, and . . .

Forever clowning – a real Cookie!

Dinner & Dance – Casa Loma

The New Nova Sounds – a real blast!

Mr. & Mrs. John Macguire receive their spot dance prize.

The Dinner & Dance held at Casa Loma December 6, 1974 had an attendance of over 180 people and the New Nova Sounds provided fantastic dancing music for all. This event was the success of the year.

PERSONNEL

The following transfers took place:

F. Canning	From: Goose Bay W.O. To: Arctic W.O.
G.A. Le Blanc	From: A.O.T.C. Scarborough To: Atlantic Region Upper Air Inspector
C.L. Cherney (Miss)	From: CFB Moose Jaw To: CFB Portage La Prairie
J. Rockwell	From: Nitchequon, EG-ESS-4 To: Atlantic Region
A. Ouellet	From: Bureau de Prévision, Montréal To: QAED, Montréal
D. Dubuc	From: Chibougamau, Qué., EG-ESS-1 To: Cape Dyer, N.W.T.

The list below are recent upper air graduates assigned within the Central Region:

G.D. Funston	– Alert, N.W.T.
T.P. Harder	– Alert, N.W.T.
*C. Leyton	– Eureka, N.W.T.
*H.L. Blain	– Eureka, N.W.T.
J.S. Bruce	– Mould Bay, N.W.T.
F.L. Risbey	– Mould Bay, N.W.T.
R.E. Thoren	– Mould Bay, N.W.T.
R.A. McInnes	– Mould Bay, N.W.T.

*First female Meteorological Technicians to be stationed North of 60° N.

The following have accepted positions as a result of competition:

74-DOE-WIN-CCID-587	Central Region Communicator, CM 5 K.D. Rackow
74-DOE-WIN-CC-581	Central Region Supervisor Arctic Stations, As 2 A.L. Borm
74-DOE-TOR-CC-165	Met. Instructor, MOTTI, EG-ESS-6 L.G. Sharron

74-DOE-WPNA-CC-032	Western Region, Aerological Inspector, EG-ESS-7 J. Klepacz
74-DOE-TOR-CC-13	Western Region, Arctic Weather Central, Supervising Meteorologist, MT 7 F.R. Bowkett
74-DOE-WPNA-CC-125	Western Region, Operations Tech., EG-ESS-5 J. Mullock
74-DOE-TOR-CC-226	Central Services Directorate, Data Standards Surface Meteorology, MT 6 J.T. Kotylak
73-DOE-TOR-CC-388	Field Services Directorate, Technical Officer, Inspection FMS – Observational Systems Division EG-ESS-7 C. Brown
74-DOE-TOR-CC-275	METOC Centre, Halifax Meteorologist, MT 4 L.M.D. Burns METOC Centre, Halifax Meteorologist, MT 4 E.M. Loder
74-DOE-WIN-CC-562	OIC Resolute W.O. Meteorologist, MT 5 G.D. Machnee
74-DOE-TOR-CC-166	Central Region Ice Observer, EG-ESS-6 R.W. Reimer
74-DOE-TOR-CC-166	Central Region Ice Observer, EG-ESS-6 R.S. Zacharuk
74-DOE-TOR-CC-224	Field Services, AES, HQ, Resource Manager, FSD, AS-4 P. Chirka

74-DOE-WIN-CC-783	Central Region, Winnipeg W.O. Supervising Forecaster, MT 5 M. Shewel
74-DOE-WIN-CC-783	Central Region, Winnipeg W.O. Supervising Forecaster, MT 5 M. Hacksley
74-DOE-WIN-CC-580	Central Region, Supervisor Contract & Cumat Stations, AS 3 F.T. Stelck
74-DOE-WIN-CC-592	Churchill W.O. OIC, Upper Air Station, EG-ESS-5 J.F. McLeod
74-DOE-TOR-WC-405	Central Services Directorate Network Standards Division Technical Editor, Manuals (Surface) EG-ESS-8 J.L. Berthelot
73-DOE-TOR-CC-364	Technicien de Projet EG-ESS-6 P.A. Learmouth

Appointments

J. Henderson	RSOS, Pacific Region HQ. Vancouver, B.C.
J.R. Mathieson	RSGWS, Pacific Region HQ, Vancouver, B.C.

The following are on temporary duty or Special Assignments:

K.W. Daly	From: Edmonton W.O. Western Region To: Regional Office Assistant RSOS
M. Stauder	FSD, Acting Head, Project Planning and Development Sections, (MT 9, DOE-914-320) (2 months)
N. Somlo	FSD Technician Project Planning & Development Section, (EG-ESS-6, DOE-914-019) (8 months)
R. Dickey	CSD, HQ. Agriculture & Forest Meteorology (1 year)
J. Linton	Arctic W.C. AFSD-1 Beaufort Sea Study
L. Joly	Aérologie, Maniwaki

Retirements

H.W. Johnston	FSD, HQ.
G.M. Champman	FSD, HQ.
R.H. Harley	CSD, HQ.
T. Galler	ARD, HQ.
C.G. Milgate	Western Region
A. Otto	Arctic Weather Central
M. Watson	Edmonton W.O.
C. Grady	Calgary W.O.
J. Moakler	AIB, HQ.
H. Chadburn	Toronto W.O.
D. Murden	Toronto W.O.
N. Powe	Quebec Regional HQ.
J.H. Sabraw	Montreal W.O.
J.M. Wingfield	Hamilton W.O.
L.J. Sobiski	FSD, HQ.
C.L. Johnstone	CFB North Bay
R.H. Bridgman	METOC Centre, Esquimalt
K.M. Korven	Winnipeg, W.O.

Separations

P. Chaine	CSD, HQ.

PROMOTION

In November 1974, Col. D. Haire, Deputy Chief of Operations at Maritime Command Headquarters, Halifax, presented a Warrant Scroll on behalf of the Minister of Defence to Warrant Officer A.P. Cottingham, Area Meteorological Inspector for Maritime Command in recognition of his promotion to the rank of Chief Warrant Officer.

CWO Cottingham has been a member of the Armed Forces since 1948 and has spent most of the past five years in the sea environment, including service aboard HMCS Provider and HMCS Assiniboine. His most recent assignment was that of Port Meteorological Inspector at MARPAC HQ Esquimalt, and he assumed his present position as Area Meteorological Inspector for Maritime Command in July of 1974. CWO Cottingham's home town is Worthing, England.

Left to right: Col. D. Haire, Warrant Officer A.P. Cottingham and D. Nowell.

Photo courtesy C.F. Photo

APPOINTMENT – REGIONAL SUPERINTENDENT OF GENERAL WEATHER SERVICES, PACIFIC REGION

Mr. J.R. (Jack) Mathieson has been appointed Regional Superintendent of General Weather Services, succeeding the retiring incumbent Mr. H.C. (Henry) Belhouse, effective December 28, 1974.

Mr. Mathieson is a native of Kamloops and a graduate of the University of British Columbia. He took post graduate training at Toronto. After wartime service as a Meteorologist with the R.C.A.F., he spent eight years in the Aviation Forecast Office in Whitehorse and later served as a Shift Supervisor at the Vancouver Weather Office for a number of years. For the past two years, Mr. Mathieson has held the position of Special Projects Manager at Pacific Region Headquarters.

One of Mr. Mathieson's primary duties will be the assessment and implementation of Requirements for Weather Services in B.C., including such users as Aviation and Marine Transportation, Forest Protection, the news media, and the general public. He will also be responsible for the overall direction of Weather Offices located at the larger centres of population throughout British Columbia. These include Terrace, Prince George, Victoria International Airport, Kamloops, Castlegar, Kelowna, Penticton, Port Hardy, and the Aviation Weather Office at Vancouver International Airport.

APPOINTMENT – REGIONAL SUPERINTENDENT OBSERVATIONAL SERVICES, PACIFIC REGION

Mr. J. (John) Henderson has been appointed Regional Superintendent of Observational Services, succeeding the retiring incumbent, Mr. W.H. (Bill) Mackie, effective December 30, 1974.

Mr. Henderson grew up in Vancouver. After graduating from U.B.C. he taught school in the Okanagan Valley for four years. On completion of "Short Course No. 6" he served at Victoria and then, following "Advanced Course No. 4" he went to Prince George. August 1945 found him at the Forecast Office in Vancouver where he eventually became a Shift Supervisor. For a number of years he provided the Frost Warning Service for the B.C. Fruit Growers at Penticton. In recent years he has been associated with fog dispersal experiments being conducted by airline operators at Vancouver Airport.

Mr. Henderson will be responsible for management of the Meteorological Data Acquisition Network in British Columbia, consisting of 70 Surface Stations, 3 Upper Air Stations (Vernon, Prince George and Port Hardy), and 500 Climatological Stations. He is also responsible for the Observing Program carried out at Ocean Station Papa located 900 miles off the B.C. Coast.

TRIVIA

"The trouble with what melts in your mouth is the way it turns to solids when you step on the scale."

"Water is a fine drink if taken with the right spirit."

"Individuality is the quality that makes any two children different – especially if one is yours and the other isn't."

"Alarm clock: small device used to wake up people who don't have small children."

Des Expressions Diverses

Expression	**Signification ou équivalent**
J'ai un blanc de mémoire	Je ne me rappelle pas
Vous pouvez laisser faire	Vous pouvez abandonner le projet
Vivre d'amour et d'eau fraîche	Se contenter de peu
Il a fait fiasco	Il a subi un échec
Beau comme un coeur	Beau comme Appollon
Gros comme un balai	Maigre
Bon comme du pain	Généreux et disponible
C'est un bon diable	C'est un homme honnête et bon
Je ne peux pas joindre les deux bouts	Je n'ai pas assez d'argent
C'est une poule mouillée	Il est peureux
Tu vas avoir du trouble	Tu vas avoir des problèmes
Avoir une tête dure	Etre opiniâtre
Sur un pied d'égalité	Au même niveau
Revenir à nos moutons	Revenir à notre sujet
Il est mourant	Il est très comique

Can you top this!!!

John Stodolak of AES who recently retired after 36 1/2 years in the public service has never found it necessary to use sick leave.