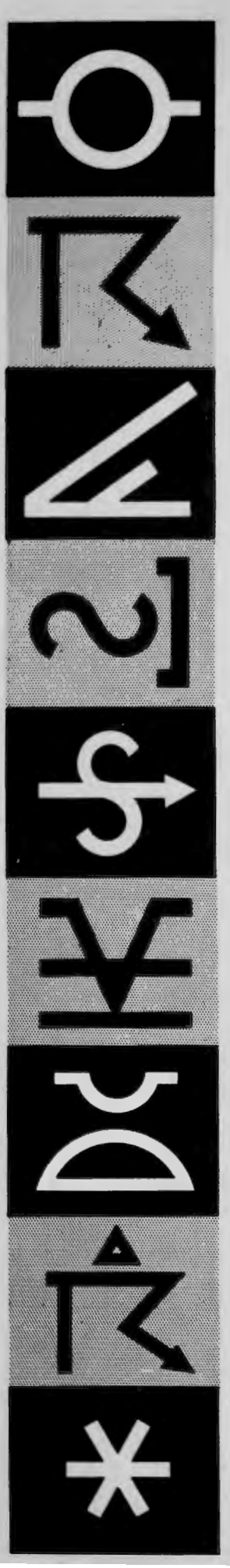

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TOURS FOR CLIMAT OBSERVERS & WEATHER USERS

by Bill Wyllie & Dave Murdoch

The Ontario Region, over the last two or three years, has shown its appreciation of the work done by the voluntary climat observers within the Region by arranging and conducting tours of the A.E.S. Headquarters and the Toronto Weather Office. We have concentrated on inviting volunteers within a reasonable travelling distance of Toronto since funds have not been available to cover travel expenses. Despite this restriction, observers from as far away as Kapuskasing, Kemptville, Harrow and Kingston have been able to take advantage of the tours.

Once the tours were underway, we felt that we should include a few police officials since a large number of requests are received for climat information to be used in court cases where weather is a factor. The popularity of these tours with the police departments has exceeded our expectations. We have had senior police officials from the Ontario Provincial Police, Metro Toronto Police, R.C.M.P., Halton Police, Peel Police, Oakville Police and officials from the Coroner's office. A recent letter from Deputy Chief Oliver of the Halton Police is typical of the response these tours generate – "I found the recent tour of your Headquarters of the Atmospheric Environment Service most interesting and I am sure the service will be beneficial to our force. I would appreciate the opportunity to have eight of our staff attend the same program if at all possible." We try to limit the police officers on any one tour to about five but the number could easily soar to fifteen.

Other groups, which asked if they could attend the tours (once they were aware of them) have been the Claims Departments of the CNR and CPR. Weather plays a significant part in the damage claims due to freezing temperatures, heavy rains and weather-related accidents. At the present time, all but two of the local Claims Department of the CPR have attended our tours and the Head of the department has been most anxious to get these two on a tour as soon as possible. Equally as great an interest has been generated in the CNR Claims Department.

D.N. McMullen, hydrometeorologist with the Ontario Conservation Authorities Branch, has had members of his staff attend our tours. His staff work very closely with the A.E.S. on their precipitation studies and have found the tours most beneficial.

Members of the Ontario Ministry of Agriculture and Food and Canada Department of Agriculture (even though they do not participate directly in our climat program) have expressed an interest in attending the tours. The Market Information Service which helps to distribute the Farm Weather Bulletin to the farmers has sent most of its staff to familiarize themselves with the service A.E.S. provides. Other members of O.M.A.F. and C.D.A., from research scientists to the agriculturalists working directly with the farmers, have attended the tours and found them both interesting and informative.

Ontario Hydro operates an extensive climat network both for their own use and for the use of A.E.S. A number of their observers have participated in the tours as well as hydrologists from their Headquarter's staff. They have appreciated the opportunity of attending and feel that the experience has been of great benefit to them.

A typical tour begins with a showing of the film "In One Day" which gives the visitors some idea of the scope of the work of the A.E.S. Then the group visits the satellite laboratory, the ice reconnaissance section, the climatology section, the computer, the wind tunnel and other sections of the Headquarters of interest to the visitors. After

a light lunch at the Skyline Hotel, the group travels to the weather observing site at Toronto International Airport and the Air Traffic Control Centre. Then the tour ends with a visit to the Ontario Weather Centre. The chief meteorologist usually gives a comprehensive description of the forecast program and follows this with a conducted visit to the various sections within the Weather Centre.

These tours have been arranged and conducted by D.D. Murdoch and W.D. Wyllie of the Ontario Regional Headquarters. We have been pleasantly surprised with their popularity. At times, we have had difficulty "dragging" some of the visitors away from a section that particularly interested them. The various section heads at A.E.S. Headquarters, the observing office at the Airport, the Control Centre and the meteorologists at Ontario Weather Centre are particularly deserving of commendation for making the tours so interesting.

VISITES ORGANISÉES POUR LES OBSERVATEURS CLIMATIQUES ET LES USAGERS DE PRÉVISIONS MÉTÉOROLOGIQUES

par Bill Wyllie et Dave Murdoch

Au cours des deux ou trois dernières années, la Région de l'Ontario a organisé et dirigé des visites de l'Administration centrale du SEA et du bureau météorologique de Toronto à l'intention des observateurs climatiques bénévoles, en reconnaissance du travail qu'ils accomplissent dans la Région. Nous avons surtout adressé nos invitations aux observateurs bénévoles qui demeurent à une distance raisonnable de Toronto car il n'existe pas de fonds pour rembourser les frais de déplacement. Malgré cette restriction, des observateurs venant de localités très éloignées, comme Kapuskasing, Kemptville, Harrow et Kingston, ont pu profiter de ces visites organisées.

Ayant mis sur pied ces visites, nous avons cru bon d'inviter aussi quelques agents de police car nous recevons un grand nombre de demandes de renseignements climatiques destinés aux tribunaux pour les cas où interviennent les conditions atmosphériques. Le succès de ces visites auprès des services de police a dépassé nos espérances. Nous avons reçu des agents de police supérieurs de la police provinciale de l'Ontario, de la police torontoise, de la gendarmerie royale, de la police de Halton, de la police de Peel, de la police d'Oakville et des agents du bureau du coroner. Une récente lettre de M. Oliver, chef de police adjoint de la police de Halton, exprime bien la réaction suscitée par ces visites: "J'ai trouvé très intéressante la visite que j'ai faite dernièrement à l'Administration centrale du Service de l'Environnement atmosphérique et je suis sûr que cette expérience profitera à nos services. J'aimerais bien que l'occasion se présente de faire bénéficier du même programme huit membres de notre personnel, si possible." Nous nous efforçons de limiter le nombre d'agents de police à environ cinq par visite, mais il pourrait facilement atteindre quinze.

Parmi les autres groupes qui, ayant eu connaissance de ces visites, ont demandé à y participer, citons notamment les services de réclamations des chemins de fer nationaux et des chemins de fer du Pacifique. Les conditions météorologiques jouent un grand rôle dans les réclamations en dommages-intérêts par suite de gel, pluies intenses et accidents

associés au temps. Jusqu'à présent, tout le personnel du service local de réclamations des chemins de fer du Pacifique a assisté à nos visites à l'exception de deux employés que le chef de service se montre très désireux d'envoyer faire la visite dès que possible. Le service de réclamations des chemins de fer nationaux a manifesté autant d'intérêt.

M. D.N. McMullen, hydrométéorologiste de la Direction des administrations de la conservation, du ministère des Richesses naturelles de l'Ontario, a fait participer des membres de son personnel à nos visites organisées. Les membres du personnel de cette Direction travaillent en collaboration très étroite avec le SEA à l'occasion d'études qu'ils mènent sur les précipitations et ils ont trouvé très utiles ces visites organisées.

Des employés du ministère de l'Agriculture et de l'Alimentation de l'Ontario et du ministère de l'Agriculture du Canada ont manifesté leur intérêt pour ces visites bien qu'ils ne participent pas directement à notre programme climatique. Le service de renseignements sur l'état du marché, qui aide à diffuser aux agriculteurs le bulletin météorologique pour les exploitations agricoles, a envoyé la majeure partie des membres de son personnel faire la visite pour se familiariser avec le service que fournit le SEA. D'autres employés du MAA et du MDA, depuis les chercheurs jusqu'aux experts agricoles travaillant directement avec les exploitants agricoles, ont pris part à ces visites qu'ils ont trouvées intéressantes et utiles.

L'Hydro Ontario exploite pour son usage personnel et à l'usage du SEA un réseau climatique étendu. Un certain nombre d'observateurs de ce réseau ont participé aux visites ainsi que des hydrologistes de l'Administration centrale de cette société. Ils sont enchantés d'avoir pu effectuer ces visites et pensent que l'expérience leur a beaucoup profité.

Normalement, la visite organisée commence par la projection du film "Au jour le jour" qui donne aux visiteurs une idée du champ d'action du SEA. Puis le groupe visite le laboratoire des données recueillies par satellite, les sections de reconnaissance des glaces, de climatologie, de calcul, la soufflerie et d'autres sections de l'Administration centrale présentant un certain intérêt pour les visiteurs. Après un déjeuner léger à l'Hôtel Skyline, le groupe se rend à l'emplacement d'observation météorologique de l'aéroport international de Toronto et au centre de contrôle de la circulation aérienne. La visite se termine alors au centre météorologique de l'Ontario. Le météorologiste en chef fait généralement une description détaillée du programme de prévision qu'il fait suivre d'une visite guidée dans les différentes sections du centre météorologique.

Le succès de ces visites, organisées et dirigées par M.M. D.D. Murdoch et W.D. Wyllie de l'Administration de la Région de l'Ontario, nous a agréablement surpris; parfois, nous avons eu des difficultés à "arracher" certains visiteurs d'une section qui les intéressait en particulier. Les chefs de différentes sections de l'Administration centrale du SEA, le bureau d'observation de l'aéroport, le centre de contrôle de la circulation aérienne et les météorologistes du centre météorologique de l'Ontario méritent tout particulièrement des éloges pour avoir su rendre ces visites si intéressantes.

PRECIPITATION CHEMISTRY

It is not raining rain to me
Its raining violets
– and sulfuric acid
– and vanadium
– and lead

(after Delâss Matheson)

Measuring the quantity of water reaching the earth's surface in precipitation has long been an important activity in meteorology. Nowadays we are also interested in measuring the quality of that precipitation, both as an indicator of tropospheric composition and in order to estimate the quantities of many materials which are deposited at the earth's surface in rain and snow.

Historical Developments

Most of the early precipitation-chemistry work was done by biologists interested in the availability of the nutrients - nitrates, phosphates, potassium. Probably the first study in Canada was carried out at the Dominion Experimental Farm at Ottawa - a program terminated in 1925 because "... the atmosphere about Ottawa, especially in the winter time, no longer represents, in respect to degree of purity, that of the surrounding country". Unfortunately, no air-pollution meteorologist recognized the significance of this remark and undertook to continue the record. It is only during the past 20 years that precipitation-chemistry has received much attention from atmospheric chemists and meteorologists. Studies began in earnest in Sweden, when it was hypothesized that "acid rain" was the cause of the observed increase in the acidity of certain lakes to the point where fish were being exterminated.

Sulfur emitted as sulfur dioxide gas was, it was suggested, being transported in synoptic-scale airstreams from mid-European countries and Britain. Much of the gas would be oxidized to sulfate particles en route. Orographically-triggered rain over southern Scandinavia would then remove these sulfur compounds, creating rain which was a dilute solution of sulfuric acid. Over the years these rains would, it was claimed, seriously affect the chemical balance of any lakes or soils which had limited capability to neutralize acids. Fish kills and decreased forest productivity were suspected to be the end result.

It need hardly be said that the international implications of this hypothesis led to a great deal of activity. Swedish concern with this problem was one of the important stimuli for the U.N. Conference on the Environment, held in Stockholm in 1973. It also led to a major international study involving a European precipitation-chemistry network, real-time meteorological forecasts of acid rain events, compilation of emission data, etc. One measure taken nationally to reduce local air pollution, the construction of tall stacks, now stood accused of causing distant problems. Several nations therefore undertook research on removal mechanisms for sulfur in its various forms and began examining the possible significance of nitrates and other substances in rain in order to see whether the "export" of sulfur was indeed as significant as the Scandinavians claimed. The effects of pollutants once they became incorporated in soils, waters, animals, and plants also came in for intensive study.

Many questions remain to be answered, but it is now widely accepted that the long-range transport of air pollutants and the removal of these pollutants in precipitation are indeed significant factors in the acidification of lakes and soils in Scandinavia and in a consequent reduction in productivity of forests and inland fisheries.

The Acid Rain Question in North America

Results of the European studies are not directly applicable to North America because of differences in climate and geography. North American studies have generally concentrated on more local precipitation-chemistry effects, for example around the strong sources of sulfur dioxide at Sudbury, in the natural gas fields of Alberta, and in parts of the north-eastern United States. The Sudbury area has received special attention because it combines both high emissions (prior to 1972 from relatively low stacks) and some poorly-buffered lakes in which acidity has increased and fish populations have disappeared.

In the past two years several scientific workshops have concluded that the available data strongly suggest widespread, long-term adverse effects in eastern North America from acid rains. Sulfur emissions, even with better removal-at-source procedures, are projected to continue at present levels or, with increased use of coal in the thermal generation of electricity, to increase. Each workshop concluded that increased attention should be given to acid rain and its effects, especially in the eastern half of the continent.

Precipitation Chemistry in Canada

Drs. Doug Whelpdale and Peter Summers, of the Dispersion Division in the Air Quality and Inter-Environmental Research Branch at AES Headquarters, have recently completed an extensive review of Canadian and related precipitation chemistry investigations (Acid Precipitation in Canada, Internal Report ARQT-5-75, September 1975). They conclude that two regions of Canada are receiving precipitation containing high sulfate and nitrate concentrations and/or with low pH values: in central Alberta downwind of the natural gas processing plants, and in southern Ontario (probably extending into southern Quebec and the Atlantic provinces).

This review shows that a good deal of precipitation-chemistry work has been done in Canada over the years. However, most of the records cover only a year or two at one location, include only a few of the constituents of interest, and are difficult to compare because of differences in sampling and analytical procedures. Until very recently, there were no "networks" of the type we are familiar with in meteorology.

Networks did not appear on the Canadian scene until about 1970. Probably the first was set up around Sudbury by Professor Kramer at McMaster University under contract to the Ontario Air Management Branch. The objective was to study deposition patterns from the smelter complex in that mining region. The network used open collectors left exposed for one month. Since the results are affected by dustfall and any other material entering the collector (leaves, insects, etc.), this type of network measures "bulk deposition" and is not a true "precipitation-chemistry" network.

A similar network was established around the Upper Great Lakes in the early 1970's as part of an intensive water quality study under the aegis of the International Joint Commission. This network was spearheaded by Messrs. F.C. Elder and M. Shiomi of the Canada Centre for Inland Waters at Burlington, and involved the cooperative efforts of several Canadian and U.S. agencies (including AES).

Also in the early 1970's, samples of rain, hail and snow collected during the Alberta Hail Studies were analyzed in order to study the deposition of sulfur around the sour-gas plants in the Alberta foothills. Dr. Summers, then with the Alberta Research Council, was active in this project.

University and governmental research groups across the country are becoming increasingly involved in precipitation chemistry work as part of broad ecological studies. The primary focus is usually on the materials cycles in lakes, river systems, forests, agricultural lands, etc. Thus, the measurements are usually site-specific, concentrating on local variations rather than on the large, synoptic-scale distributions. It is interesting to note here that rare precipitation-chemistry events can cause sudden and dramatic changes in an ecosystem, in much the same way as unusual rain or wind storms can "shock" stream systems, a stand of trees, etc. Thus, the ecologist wants information not only on average (or climatological) deposition rates, but also on the frequency of such rare events as a highly-acidic rainfall or a sudden injection of materials during a chemically-unusual snowmelt. To provide such information, we must know a lot more than we do now about the atmospheric processes governing the transport and removal of airborne materials.

Before turning to activities in AES, one further piece of evidence pointing to a widespread anthropogenic influence on the chemistry of precipitation should be noted. Dr. Ted Munn, Chief Scientist in the Air Quality and Inter-Environmental Research Branch, has shown that summer haziness has increased over the Atlantic provinces and eastern Quebec since 1953 and that the increase has been associated mainly with south to southwest winds (Atmosphere, Vol. 11 No. 4, 1973). He suggested that the increase has been due to "increasing photochemical activity, resulting from greater emissions of gases such as SO_2 and No_x from sources along the United States eastern seabord." If this be true, one would also suspect changes in the composition of precipitation falling from east-coast storms. And lest the finger be pointed too quickly south of the border, emissions have also increased dramatically in the Lower Lakes - St. Lawrence areas of Canada over the past quarter century or so. Control measures have slowed the upward trend in recent years, but there is no cause for complacency on either side of the border.

Precipitation Chemistry Measurements by AES

Beginning with Mount Forest, Ontario, in 1973, AES began establishing Canadian stations in the background monitoring network of the World Meteorological Organization. In addition to Mount Forest, monthly samples of precipitation are now being collected at Puntzi Mountain, B.C., Fort Simpson and Mould Bay, N.W.T., Edson, Alta., Wynyard, Sask., Armstrong, Ont., Maniwaki, Que., Shelburne and Sable Island, N.S. Until recently, samples were sent to the chemical laboratory in AES Headquarters where they were analyzed for pH, alkilinity, conductivity, and the concentrations of the major ions - sulfate, nitrate, ammonium, potassium, calcium, chloride, magnessium, and sodium.

Sample collectors used are the automatic, precipitation-only type, since for our purposes contamination from dust, insects, leaves, etc., must be carefully avoided. During 1974 and 1975, several different collectors were tested at the Atmospheric Experiment Station near Woodbridge, just a few miles from AES Headquarters (see the report on the WMO expert meeting, Zephyr, November 1975, for further details). As a result of this test a new type of collector will be installed at Canadian stations within the next year.

This WMO network is designed to produce long-term records (over decades) from which trends in the background concentration of pollutants can be studied. A network of only ten stations across Canada leaves many questions unanswered as to regional differences, especially in those areas of the country where strong emissions of sulfur and

nitrogen oxides may be affecting the acidity of precipitation. To search for answers, some forty additional precipitation collectors are to be installed in early 1977. It is hoped that two years of data from the expanded network will permit us to draw maps showing the large-scale distribution patterns for some of the important constituents. These results will also be used to assess the need for ongoing precipitation-chemistry networks.

Beginning in January, 1976, samples from the AES precipitation-chemistry stations were sent to the Ontario Regional Laboratory of the Inland Waters Directorate, Environmental Management Service, for analysis. This laboratory, plus five others like it across Canada, analyze many water samples per month from lakes and river systems. The analysis includes phosphates and certain trace metals in addition to the major ions, and many scientists are very interested in obtaining similar data from the precipitation samples. We are likewise interested in the concentrations of these materials from an atmospheric-chemistry point of view. Thus, this cooperative program promises large dividends to AES and its sister Services in the Department.

We also hope to cooperate in obtaining data on organic compounds such as pesticide and insecticide residues and the PCB's. (Many readers will have heard of the concern last year when elevated levels of PCB's were found in gulls and fish in the Great Lakes area). The atmosphere is a significant pathway for many organic compounds, but data are limited. Unfortunately, the precipitation samples we now collect are not suitable for such analysis since different collector materials must be used and larger volumes are required. Hopefully, some of our stations will be asked to collect a few special samples in the months ahead as a start in this new precipitation-chemistry activity.

A special precipitation-chemistry study is planned for August, 1976. That month has been proposed for an intensive study of sulfates in airborne particulates over eastern North America. On the sulfates side, AES will assist by collecting filters (exposed for 24 hours in high volume air samplers) at a number of rural and isolated northern stations. The availability of these air-concentration figures will make it an ideal time to study precipitation quality on an event basis. Accordingly, simple collectors will be used to obtain daily precipitation samples from some 15 or 20 stations extending from Lake Superior to the Atlantic provinces and northward as far as James Bay and Labrador. If the weather cooperates, results should permit some very interesting information on long-range transport and the atmospheric sulfur cycle.

All of the foregoing activities relate to "background" precipitation quality - the stations are selected so as to avoid undue influence from any single source of air pollution. However, AES scientists are also studying wet deposition on smaller scales, largely as a means of investigating the mechanisms involved in the removal of pollutants. A dense network of precipitation-chemistry stations is planned as part of the Alberta Oil Sands Environmental Research Project, a comprehensive federal-provincial study of the potential environmental effects of development in the oil sands region. Individual rain and snow events have been studied around Sudbury, where a very high stack is combined with very high sulfur dioxide emissions. Naturally enough, what happens when that unique elevated plume gets involved with precipitation processes is of great interest from both the air-pollution and atmospheric-processes points of view.

The procedure at Sudbury was to set out funnel-and-bottle collectors just before precipitation began and to collect the samples as soon as the precipitation event passed. This involved a good deal of running around over often difficult terrain. Three areas were used, one 7.5 km upwind of the stack and two downwind at 7.5 and 15 km. The weather never cooperated very well (plume wandering over and out of the areas, low precipitation amounts, etc.) but on one or two occasions the effects of the plume were clearly seen in the sulfur content of the rain.

Future Activities

Protection of the environment from pollution and the mismanagement of renewable resources must be based on a thorough knowledge of the cycles of many materials through the earth's biogeochemical systems. As in the hydrologic (water) cycle, the atmosphere frequently plays an important part in these cycles. As with water, trace materials may affect the atmosphere itself on scales ranging from local effects on rainfall to changes in global climate.

Precipitation chemistry is only one of several new activities in AES in the past few years which are related to materials-cycles studies. The breadth of these activities are illustrated by balloon flights looking at the effects of nitrogen oxides and freons on the stratospheric ozone layer on the one hand, and on the other by work on the effects of sulfur dioxide on lichens. However, it is safe to say that we have no more than begun our work as an environmental-science service. Many new and exciting challenges, involving many more AES members than at present, are sure to come our way in the years ahead.

DR. WARREN L. GODSON AWARDED IMO PRIZE

As the result of a decision taken at the 12th session of the Executive Committee (June 1960) the World Meteorological Organization has set aside March 23 of each year to mark "Meteorological Day" in every nation of the world. The purpose of this annual event is to call attention to the importance of the work of national weather services and particularly to the contribution to the economic development of the country that they can make.

This year, World Meteorological Day is devoted to the theme of "Meteorology and Food Production."

Half the world's population suffers from hunger and malnutrition and have no permanent food supply for tomorrow. Weather and food production are closely related, and the science of meteorology can be applied to agriculture–fisheries–water resources development, etc. and thus play its part in the fulfilment of man's needs.

1975 – Meteorology & Telecommunications

1974 – Meteorology & Tourism.

WMO Day – is a fitting occasion to congratulate Dr. Warren Godson as the recipient of the highest award which the World Meteorological Organization has to offer – the IMO Prize.

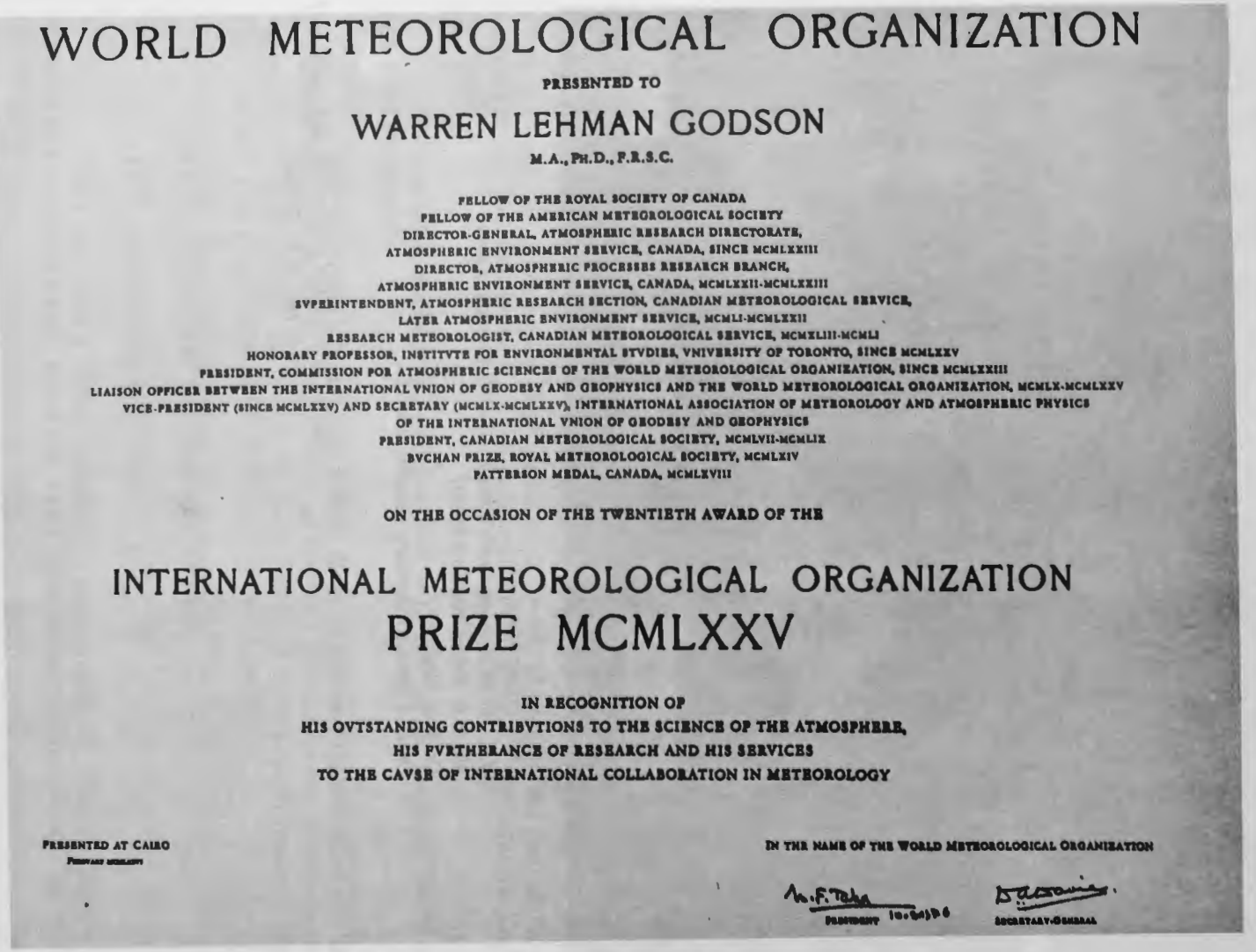
Dr. Godson thus becomes an illustrious member – the twentieth and the first Canadian, of the small and highly eminent group of IMO Prize winners.

The IMO was created at the First International Met. Congress in Vienna in 1873 which followed the recognition by a number of countries of the essentially international character of the science of Meteorology.

IMO PRIZE PRESENTATION – CAIRO, 10 FEB. 1976
PRÉSENTATION DU PRIX DE L'OMI AU CAIRE – LE 10 FÉVRIER 1976

Left to Right: de g. à d.:
H.E. Mr. M.H. Abou-Zeid (Minister of Civil Aviation, Egypt)
Mr. M.F. Taha (President WMO)
Dr. W.L. Godson
Dr. D.A. Davies (Secretary-General, WMO).

Photo Courtesy/Les photos sont une gracieuseté
of/de Mrs. W.L. Godson



WORLD METEOROLOGICAL ORGANIZATION

PRESENTED TO

WARREN LEHMAN GODSON

M.A., PH.D., F.R.S.C.

FELLOW OF THE ROYAL SOCIETY OF CANADA
FELLOW OF THE AMERICAN METEOROLOGICAL SOCIETY
DIRECTOR-GENERAL, ATMOSPHERIC RESEARCH DIRECTORATE,
ATMOSPHERIC ENVIRONMENT SERVICE, CANADA, SINCE MCMLXXIII
DIRECTOR, ATMOSPHERIC PROCESSES RESEARCH BRANCH,
ATMOSPHERIC ENVIRONMENT SERVICE, CANADA, MCMLXXII-MCMLXXIII
SUPERINTENDENT, ATMOSPHERIC RESEARCH SECTION, CANADIAN METEOROLOGICAL SERVICE,
LATER ATMOSPHERIC ENVIRONMENT SERVICE, MCMLI-MCMLXXII
RESEARCH METEOROLOGIST, CANADIAN METEOROLOGICAL SERVICE, MCMXLIII-MCMLI
HONORARY PROFESSOR, INSTITVTE FOR ENVIRONMENTAL STVDIES, VNIVERSITY OF TORONTO, SINCE MCMLXXV
PRESIDENT, COMMISSION FOR ATMOSPHERIC SCIENCES OF THE WORLD METEOROLOGICAL ORGANIZATION, SINCE MCMLXXIII
LIAISON OFFICER BETWEEN THE INTERNATIONAL VNION OF GEODESY AND GEOPHYSICS AND THE WORLD METEOROLOGICAL ORGANIZATION, MCMLX-MCMLXXV
VICE-PRESIDENT (SINCE MCMLXXV) AND SECRETARY (MCMLX-MCMLXXV), INTERNATIONAL ASSOCIATION OF METEOROLOGY AND ATMOSPHERIC PHYSICS
OF THE INTERNATIONAL VNION OF GEODESY AND GEOPHYSICS
PRESIDENT, CANADIAN METEOROLOGICAL SOCIETY, MCMLVII-MCMLIX
BVCHAN PRIZE, ROYAL METEOROLOGICAL SOCIETY, MCMLXIV
PATTERSON MEDAL, CANADA, MCMLXVIII

ON THE OCCASION OF THE TWENTIETH AWARD OF THE

INTERNATIONAL METEOROLOGICAL ORGANIZATION
PRIZE MCMLXXV

IN RECOGNITION OF
HIS OVTSTANDING CONTRIBVTIONS TO THE SCIENCE OF THE ATMOSPHERE,
HIS FVRTHERANCE OF RESEARCH AND HIS SERVICES
TO THE CAVSE OF INTERNATIONAL COLLABORATION IN METEOROLOGY

PRESENTED AT CAIRO

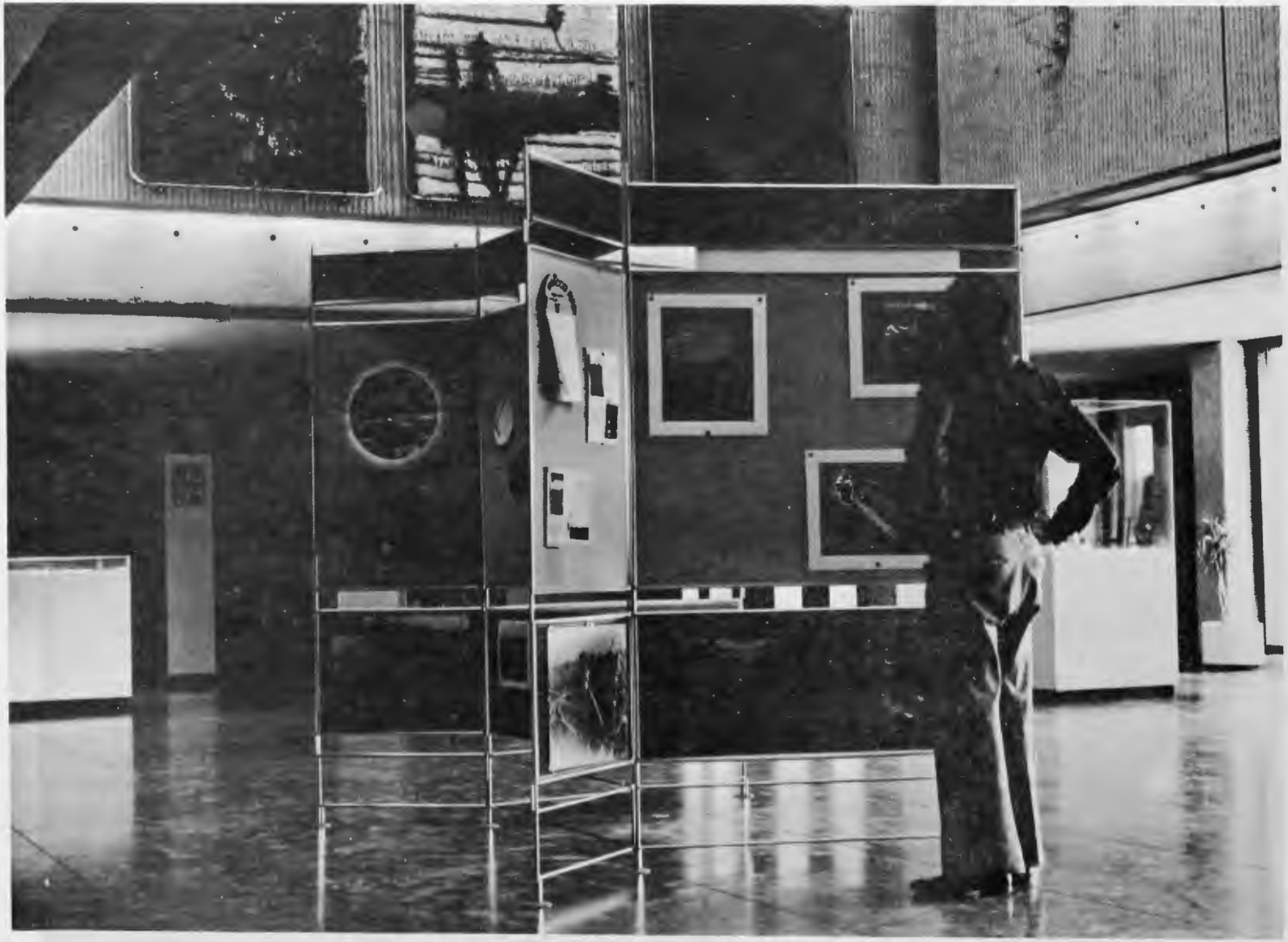
IN THE NAME OF THE WORLD METEOROLOGICAL ORGANIZATION

PRESIDENT

SECRETARY-GENERAL

Citation IMO Prize.
Citation sur parchemin – Prix de l'OMI.

Dr. W.L. Godson displaying IMO medal.
Dr. W.L. Godson montrant la médaille de l'OMI.



WMO Day Display in AES Headquarters Lobby.
Exposition soulignant la journée de l'OMM dans le hall de l'administration centrale du SEA.

Photo ab Photographic

The IMO Prize was created when in 1951 the IMO changed its status and became a specialized agency of the United Nations and changed its title to WMO.

The WMO took over the responsibilities of the IMO, and assumed many new ones. The resources of IMO were also transferred at this time and such was the esteem and respect for the old IMO that it was decided to use a part of the available funds to establish an annual prize which would serve as a means of recognizing outstanding service to the science of meteorology and also to international collaboration and at the same time serve to commemorate IMO.

A noteworthy feature of the prize is that all 145 Member-Countries are invited to submit candidates for this award and the final selection is made by the WMO Executive Committee at its annual session by secret ballot.

Candidates from all parts of the world are considered, and it is a signal honour to be selected for the award.

The ceremony of presentation of the Twentieth IMO Prize to Dr. Warren L. Godson, Director-General, Atmospheric Research Directorate, Atmospheric Environment Service, was held by the Meteorological Authority, in Cairo, Egypt, February 10, 1976. Mr. M.F. Taha, President of WMO made the presentation. Taking part in the ceremony were H.E. Mr. M.H. Abou-Zeid, Minister of Civil Aviation, Dr. D.A. Davies, Secretary-General of WMO, H.E. Mr. Jean Touchette, Ambassador of Canada to the Arab Republic of Egypt, Mr. A.F. Hassan, Chairman of the Board of Directors of the Meteorological Authority.

CENTENARY WEATHER CELEBRATIONS FOR BEATRICE, ONTARIO

By David W. Phillips

An important milestone in the history of weather observing in Canada occurred in February 1976. Members of the Hollingworth family of Beatrice, Ontario, have now been the official weather observers for a full century at the same site - an unique achievement in Canada and perhaps in the world. There are longer series of instrumental meteorological records in Canada, but in no other case have records been continuously maintained for so long in one place by the same family.

The Beatrice story dates back to February 1876, when John Hollingworth began to record weather observations for the Meteorological Office. Three times each day (morning, 2:00 p.m., and evening) he recorded the temperature and precipitation, as well as noting the speed and direction of the wind, a task he performed every day for 42 years. John Henry Hollingworth inherited his father's farm in 1918 and with it went the weather duties. Between 1918 and 1941 he kept a daily record of the weather, and in 1941 his son, Albert, assumed those duties along with the family farm. Today, the path from the farm-house to the instrument area (less than three metres from the original site) shows the wear of more than 73,000 visits. Such an unique achievement calls for an unique recognition.

Presentation to Mr. and Mrs. A.L. Hollingworth by Mr. J.R.H. Noble ADM, on behalf of AES.
Présentation en l'honneur de M. et Mme A.L. Hollingworth par M. J.R.H. Noble, s.-m. a., au nom du SEA.
Photo Robert Lansdale

Celebrations to mark this important event were held in the auditorium of the Headquarters of the Atmospheric Environment Service (AES) on the 30th of March. It brought together 250 people to honour the present observers at Beatrice, Mr. & Mrs. Albert Hollingworth. Present were Mr. J.R.H. Noble, Assistant Deputy Minister of the AES; D.S. Ross, Acting Ontario Regional Director of AES, who chaired the ceremony; and Dr. P.D. McTaggart-Cowan, a neighbour, friend, and fellow-apiarist of the Hollingworths and a former Director of the Meteorological Branch (now AES).

Presentation of an orchid to Mrs. Hollingworth by Bernice Sherman.
Bernice Sherman offre une orchidée à Mme Hollingworth.

Photo ab Photographic

Mr. Noble recalled the activities of the Meteorological Office back in 1876 (it was then only a couple of years old) when the observational program at Beatrice began. During that year the first storm warnings were issued, and for the first time, probabilities were relayed by telegraph to various newspapers in Ontario and Quebec, and the observing network consisted of less than one-tenth the number of stations in operation today. Mr. Noble expressed the great obligation of the AES to the perseverance and skill displayed by thousands of weather observers from both the past and the present, which are so well exemplified by the Hollingworth family. Mr. M.K. Thomas, Director-General of the Central Services Directorate of AES, presented the honoured guests with the first copies of an 18-page commemorative booklet entitled, "A Century of Weather Observations at Beatrice, Ontario, 1876-1975." The booklet tells of the beginnings of the Beatrice station and of the meticulous work of three generations of Hollingworths recording the weather in the Muskoka countryside of Ontario. It also describes the value of weather information to the country. Long-established records, such as those from Beatrice, provide an important link between the records of recent years and those of the past century. Research in the problems of both long-range weather forecasting and secular fluctuations of climate makes use of these records.

Mr. D.W. Phillips, representing the Canadian Meteorological Society, presented the Hollingworths with an aerial photograph of their farm property, in recognition of their exceptional dedication and contribution to Canadian meteorology. Mr. Noble read a letter from Jean Marchand, Minister of the Environment, Canada, who lauded Mr. & Mrs. Albert Hollingworth and their relatives for the "quality and continuity of records at Beatrice so important especially in these days when questions are being raised about changes in climate." As a permanent tribute to the Hollingworth family, Mr. Noble presented the couple with a sterling silver tray, engraved with the expressions of appreciation for their century of service.

Those who were present that afternoon felt an immeasureable sense of satisfaction. Few who volunteer their resources to observe weather phenomena are honoured, and probably seldom expect to be. Yet, in this recognition of the Hollingworth endeavour and tradition, faithful service received the respect it deserves.

R.R. 6, Bracebridge
April 12, 1976

Dear Mr. Noble, –

Having had time to come down to earth and recall the wonderfull day of March 30th, 1976 we would like very much to thank you and the Staff at Atmospheric Environment Service for the presentation that we will never forget as long as we live.

Again may we say a good "Honest Thank you."

Albert and Mabel Hollingworth.

LONG AGO – IL Y A DE CELA PLUSIEURS ANNÉES . . . .

Left to Right: de gauche à droite:
Back Row/à l'arrière: C. Sutherland, Bishop, M. McKay, J. Turner, Wright, R.H. O'Brien, Pilcher, Spiers.
Middle Row/au centre: Ayoub, Grills, Roseland, E.R. Walker, V. McWhinnie, G. McKay, Greenhaus, Fleming, Wolverton, Stapley, , O'Brien.
Front Row:/à l'avant: Ferguson, I. Smith, White, G. Bragg, R. Smith, J. Crowley, Oldaieve, G. Robertson, H. Thompson, R. Dahl, J. Mathieson, Allen,

LE TEMPS DES SUCRES

par Hélène Gignac

Fièrement, notre vieil arbre
Reprend sa tâche vulnérable
Des jours d'antan,
Et l'arôme de ses blessures
Embaume toute la nature:
C'est le printemps.

Le printemps de chez nous
Chansons du vieux Québec.

L'érable à sucre ne croît nulle part au monde, excepté dans le Québec, l'Ontario, le Nouveau-Brunswick, la Nouvelle-Ecosse et la Nouvelle-Angleterre. C'est sans doute la gratitude d'un peuple envers la manne sucrée qui a valu à la feuille d'érable de se voir immortalisée sur un drapeau!

Qu'est-ce qui vaut alors à l'érable à sucre d'être considéré comme typiquement québécois? Le Québec fournit à lui seul 90% de la récolte canadienne. Et le temps des sucres fut sans contredit l'un des moments les plus importants de la vie des vieux Québécois.

Les techniques d'exploitation des sucreries n'ont pas beaucoup évolué depuis le début du siècle. La forme des feux, les récipients de collecte de la sève, le mode de transport de l'arbre à la cabane et les méthodes d'évaporation de l'eau d'érable ont subi des transformations radicales depuis leur introduction dans la Beauce au XIX^{e} siècle.

Les pionniers d'avant 1900 se servaient, pour la récolte de sève, de "goudrilles" faites d'écorce de cèdre de 15 centimètres de longueur. Ces éclisses en bois étaient fichées aux érables dans un entaille faite à la hache; la sève s'égouttait alors dans des cassots d'écorce. De là, elle était transportée à pied dans un chaudron de fonte suspendu au-dessus d'un feu. Le sirop résultait d'une longue évaporation de l'eau d'érable. Après 1900, les "goutterelles" de bois font place aux goudrilles de cèdre. Ces petites conduites sculptées déversaient l'eau dans des chaudières de fer blanc elles-mêmes transvidées dans un baril. La sève était acheminée à la cabane par un traîneau tiré par un cheval. L'évaporation de l'eau se faisait dans des casseroles en métal reposant sur des "feux de roches", genre de fournaise bâtie en forme de muraille de pierres dont l'intérieur était enduit de glaise.

A partir de 1940, le développement du marché obligea les producteurs (appelés communément "sucriers") à entailler leurs érables à l'aide de mèches d'aluminium. Des "chaudières" recueillaient la précieuse sève. Le traîneau de récolte fut remplacé après 1960 par des systèmes de transport par tubes de plastique et aux casseroles de métal succèdent des "bouilleuses" ou évaporateurs modernes.

Toutes ces nouvelles techniques ont contribué à transformer l'exploitation des érablières ou "acériculture" en une industrie.

Le vocabulaire des sucreries est à lui seul tout un monde. L'eau d'érable, le réduit, la tire, le sucre, la cabane: autant de mots évocateurs d'une tradition aussi vieille qu'eux. Il ne faudrait surtout pas oublier l'expression "avoir les yeux dans le sirop d'érable" qui désigne une personne en amour.

Pour les besoins de la cause, en l'occurrence la sauvegarde d'une industrie québécoise, la tradition technique doit faire place au modernisme. L'histoire des techniques acéricoles demeure cependant gravée dans le passé des Québécois, page de l'histoire qui nous remémore l'ingéniosité de nos ancêtres à agrémenter les dures saisons. Ces pénibles "levées de chemins", ces "agréables veillées à la cabane", et ces "savoureuses trempettes de sirop", ont délicieusement façonné la vision québécoise du printemps. Printemps qui n'en est pas un si l'on ne s'est pas "sucré l'bec!"

1) Dupont, Jean-Claude – Le sucre du pays, Ed. Leméac, Montréal, 1975.
2) L'acériculture au Québec – Ministère de l'Agriculture du Québec, Québec, 1967.
3) Demers, Onil – L'aménagement de l'érablière pour un rendement plus élevé, forêt – conservation. vol. 38 (3), février – mars 1972.

A TRIP TO THE LIGHTHOUSES IN THE LOWER ST. LAWRENCE AND THE GULF. (Cont'd)

Our next halt was at Forteau, ice in small quantities had been seen as far west as Pt. Rich, but here were two moderate sized bergs grounded near shore, their presence gave a decided feeling of chilliness to the surroundings, our steward availed himself of the opportunity of the ice to replenish his refrigerators and to stock us with ice generally. There are two fog-whistles at Forteau one being kept in reserve in case of accidents, as this is an important point for vessels entering and passing out of the Straits, a very fine light is also maintained here. From Forteau we made direct for Belle Isle, soon after leaving we passed through an immense school of herrings, our screw must have killed barrels of them, as we continued to proceed the icebergs became unusually numerous, as many as eighty could be counted at one time. The magnificent, yet awe inspiring spectacle that they presented is past description, they were of all shapes and sizes, some assumed immense proportions, one we afterwards saw from the top of Belle Isle far out to sea looked like a huge island, some of the bergs were remarkable for their beautiful colouring, in many also, great chasms appeared to be hewn out; again on others thousands of seabirds were calmly perched apparently being quite indifferent to cold feet. Our anchor was run out just where the dominion Line 85 Montreal lies on the bottom, a few yards from the shore, deep water running right up to Belle Isle. As we approached this desolate and storm beaten island, which was called in olden times the island of demons and is represented in ancient maps as covered with devils rampant with wings, horns, and tails. Daniel Colton one of the keepers at Belle Island who had been wintering at Quebec and was then returning, seemed to become quite happy and excited. He confided to me that he had found the winter in Quebec terribly slow, and had it not been that he had hired a horse and sleigh for a time, he thought that he would have died. He further added that as spring had set in he was fearfully tormented by house flies, and that he had quite made up his mind that there was no place as nice to live in as Belle Isle. A short description of the life led here will be inter-

esting. The inhabitants comprise Michael Colton, his wife and child, Daniel Colton, and two other men assistants. The duties are to tend the two Lighthouses during the season of navigation, the larger one is on the summit of the island 484 feet above the sea. It is a solid structure; the walls being some feet (twelve I believe) in thickness, the lense which is dioptical and very large is said to alone have cost 34,000 dollars. The smaller Lighthouse is about two hundred feet lower than the other one, a railing runs down the cliffs to it and often it is necessary to cling closely to this ladder or be blown into the sea below. A man is required to sit up with this lower light all night and terribly lonely work it must be. During foggy weather a cannon is fired at Belle Isle every half hour, night and day and as there is a large preponderance of fog, this duty alone entails heavy work. To compensate in a measure for the lonely life here endured, the codfishing off the island during the summer months is good, then as autumn sets in, the duck and goose shooting is very fine, and again, as spring approaches a profit is to be reaped by sealing, the seals passing here on the ice in countless numbers. Another compensation is the healthiness of the place. Michael Colton assured us that during his twenty-nine years residence, he had never had so much as a cold. It was strange to find in this outlandish spot such a cosy and well furnished drawing-room as there was here, numerous pretty nicknacks added to the general surroundings not forgetting a really good piano. At this place as at many others that we had visited, a room was fitted up as a chapel with altar and image of the Virgin etc. Our stores were all landed at Belle Isle by dark. During the night a northeasterly gale with heavy rain set in and when daylight broke it was deemed advisable to run to"Quirpon" on the Newfoundland coast for shelter. In crossing to this desired haven, our ship almost rolled her boats "under", and it was a case of cling on as best you could. Our first Engineer, who appeared to do as little and to take life as easily as these fortunate individuals always appear to do, came to me at this stage of the proceedings, and remarked with great gusto "I tell you sir, she's beginning to dance now ." We were forced to remain two days at "Quirpon" until the gale had abated, July 22nd and 23rd, the weather was miserably cold. The maximum temperatures recorded being 41°and 43°respectively, not congenial midsummer heat. Quite a colony of huts are here to be found, the occupants of which are miserably poor and numbers die annually from starvation. The people are however terribly improvident and when food is abundant never put any bye, but like the Indians gorge until all is gone. On entering one hut a young girl quickly followed us carrying an ordinary pint beer bottle; the fisherman into whose hut we had gone, took the bottle, and after looking at it in amazement said that he could not believe that the doctor of "R.M.S. Emerald" (she had been in "Quirpon" a day or so previous to this) was mean enough to leave such a small amount, as there then was in the bottle, for his sick child. The girl then explained that in the hut where the bottle had first been left, another child had got hold of it and drunk all but the small remaining contents. My curiousity being thereby aroused, I asked to be shown the bottle and found it to be labelled "castor oil". We never heard what became of child No. 1. "Cape Bauld" which we next visited is blessed with a fog horn which like most of these useful yet abominably noisy institutions along the Newfoundland coast, is kept continually on the go during the season of navigation. Here we were well entertained by it, as delay was necessary whilst a crane was being erected. Cape Bauld Lighthouse is some distance from where the supplies are landed, a rough road connects the two spots an intervening chasm being spanned by a bridge. The keeper when asked by the Inspector why certain repairs ordered the previous autumn to the supports of the bridge had not been attended to, replied that the snow had only left the ground a few days before our arrival. In fact in the gullies deep drifts still existed, this was on the 24th of July. We now recrossed the Straits to Chateau Bay on the Labrador coast. This is a curious looking place, and well named as the adjacent hills look in the distance just like old castles, numbers of icebergs grounded in the bay gave the place a still further weird appearance. The next stop was at Cape Norman, huge quantities of caplin (a small fish) had been noticed in the water for days, and here we found them washed up on the shore by millions, the easterly gale which had just previously prevailed having been the cause of the destruction. Together with this great mass of putrifying fish, the air was swarming with

mosquitoes and blackflies, the combination did not suggest a very delightful abode, the fish no doubt were an innovation, but the flies it appears are constant summer visitors. The Lighthouse keeper and his family seemed however quite healthy and contented. Soon after leaving Cape Norman night came on and coupled with heavy fog and rain with so many icebergs about one did not feel in a very enviable position. Two men were kept on the lookout "forward" and our engines were at dead slow. At this critical moment a steamer's whistle was heard close to us and the short time it took for the next blast to sound a long distance away proved that she must have been steaming rapidly. Our captain said she was the "Vancouver" and that the "mail boats" seldom slowed down in bad weather, the only wonder is that under the circumstances so few accidents occur. As we reached more open water again, a heavy westerly blow was encountered, the Napoleon having landed most of her cargo was very light, consequently she dived in and out of the seas in great fashion, sticking in ones bunk was almost impossible, and everything moveable was thrown in all directions. Our French passengers, notwithstanding the length of time we had been at sea, suffered again terribly from mal-de-mer and spent a miserably cold night on deck, hanging on as best they could. Approaching the "Bird Rocks" it seemed as if we were to be treated to a snow covered island, closer inspection however proved the white appearance to be caused by seabirds, many points such as Greenly Island, Percé Rock, etc. swarm with birds, but here they were in countless millions and of every size and kind, the higher ledges of the rocks were taken up by the ganets or solon geese, then came the puffins, then the gulls and lastly the bottom places were filled with hordes of the smaller species of seabirds, pigeons, etc. The birds are wonderfully tame and caught at pleasure, one amusement indulged in by the men at Bird Rocks, is to catch the ganets, paint them in diverse colours and then let them go again. The rock rises perpendicularly out of the sea to a height of over one hundred feet, its summit is reached in a basket hoisted by means of a crane, the ascent is not pleasant, the birds screech about you and you almost expect to have your eyes torn out by them. The top of the rock is of small dimensions and again and again in this storm beaten spot, it is not safe to go outside of the Lighthouse for fear of being blown into the sea. Three or four men are always kept here; at present there is the keeper, his wife, and two men, the poor woman finds it a terribly desolate place, and already after her two years experience, she has wasted away from a robust person to almost a skeleton. A gun is fired here half-hourly during fog, about ten years ago when firing it, proper precautions were not taken with adjacent powder magazine, the result being that a stray spark caused its explosion killing three men, leaving only one with the dead until relief tardily arrived from the adjacent Magdalen Islands. "Brian Island" the nearest of these, about fifteen miles distant, can be signalled in fine weather by means of flags. On another occasion the Lightkeeper and his son went on the ice during winter for seals, they were carried off on the floe and never heard of again. As this shows Bird Rocks has already some sad stories in connection with it. Our next stop was at Paraquet Island Lighthouse, the keeper here is said to be a french count, whatever he may be by birth. He is certainly a very pleasant fellow to meet, his wife also seems to be a perfect lady. Paraquet is a small barren island, and the "Count" has to row to the adjoining mainland, four miles distant, for his firewood. We then skirted the "North Shore" which has a very desolate wild rocky appearance, notwithstanding this however, numbers of wretched looking little huts are to be seen in almost every bay and inlet. We stopped for a short time at Manicougan where a large American company is engaged in converting porpoises etc. into a fertilizing compound, and then crossed to Father Pt. where I said "good bye" to the Napoleon as duties required my presence elswhere.

ᑕᓯᕐᒥᖅ ᑲᐅᔨᓴᑐᑦ
CHAR LAKE

"INUIT TODAY"

ᐊᕐᒍᐃᑦ ᐊᓂᒍᕐᓯᒪᓕᕐᑐᓂ, ᕐᑲᐅᔨᓇᓱᒃᑐᕐᑲᕐᓂᕐ ᒪᑦ ᐃᕐᑲᓗᖕᓇᓐᖏᓗᑎᒃ ᑕᓯᑯᓗᖅᒥ ᐃᕐᑲᓗᖅᓂᒃ ᑎᓯᕙᓐ ᖅᒥᑦᑐᓂᒃ ᓄᓇᓖᑦ ᕐᑲᓂᒥᔭᖅᒪᓂ, ᐅᓛᓴᓗᖅᒥ ᑕᕙᓂ ᕐᑲᐅᔨᐃᑦᑐᒥ. ᐃᓄᐃᑦ ᐅᖕᓗᒥ ᐱᑎᑕᐅᓚᐅᕐᒪᑕ ᑕᒃ ᑯᓂᖅᒪ ᑎᑎᕐᕐᓯᒪᔪᓂᒃ ᕐᑲᐅᔨᓴᕐᓂᐱᓂᖅᒥᑕ ᑎᑎᕐᕐᑕ ᐅᓯᒪᓂᐱᓂᖅᒥᓐᓂᒃ ᑰᒃᑯᐊ ᐃᑲᔪᖅᑎᑦᓱᒍᑎᒃ ᐱᓇᓱᒪᕐ ᓂᖅᒥᓐᓂᒃ ᐅᓂᒃᕓᖅᓯᒪᔪᑦ ᑰᑦᓱᔪᖅᒪ ᕐᑲᖕᓄᓈᔪᑦ ᕐ ᑲᐅᔨᓴᕐᑕᐱᓃᑦ Harold Welch ᐊᒻᒪᓗ ᑰᓐᓇᑕᐅᖅ ᐊᓐᑐᕈ ᐊᑕᒍᑦᑰᓗᒃ ᐃᓄᒃᑎᑑᖅ ᒪᓕᕐᑎᑦᑎᔪᐱᓂᖅ. ᑰᒃ ᑯᓇᓂ ᑎᑎᕐᕐᑕᐱᓂᕐᒥᓂ ᑰᓐᓇ Mr. Welch ᐅᕐᑲᖅᑐᐱᓂᖅ, "ᑐᓴᕈᒪᓇᓱᒥᑦᓗᑎᑦ, ᐃᒦᒃ ᒪᑯᐊ ᑕ ᒫᓂ ᐃᓄᐃᑦ ᓅᓇᓖᑦ ᐅᓐᓂᕐᓗᒃᓴᕐᑲᑦᑕᕐᒪᑕ, ᒪᑯᓂᖅ ᒪ ᕐᑲᐅᔨᓴᓇᐊᕐᑐᕐᓯᒪᓕᕙᒃᑑᒪᓗᐊᓂᒃ, ᕐᑲᐅᔨᑎᑦᑎᔪᓐ ᓇᕐᑲᑦᑕᒥᑦᑕᓇᐊᒃᓴᖅᒥᓐᓂᒃ ᐃᓄᖅᓂᒃ." ᐅᕙᑑᔪᒍᑦᓕ ᕐᑲᐅᔨᑎᑦᑎᔪᒪᒪᑦᑕ ᐅᕐᑲᓕᒫᕐᓂᐊᕐᑐᑦᓗ ᑐᓴᕈᒪᔪᒃᓴ ᐅᒥᔪᑦ ᑐᓴᕐᑕᐅᕐᑯᒪᑦᑎᒍᑦ ᑰᒃᑯᐊ.

Several years ago, a group of scientists studied the contents of Char Lake, a small lake near Resolute in the high Arctic. Inuit Today recently received a report based on their study of the lake that was prepared by a member of the research team, scientist Harold Welch, and translated by Andrew Atagotaluk. In a letter which accompanied his report, Mr. Welch said, "I thought you might be interested as well, particularly since native northerners complain, with justification, that we scientists rarely communicate our findings with the people." We were interested, and we think our readers will be too.

*   *   *   *

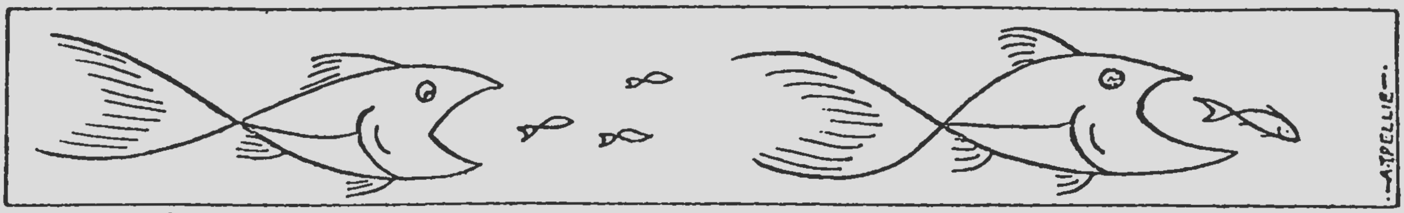
ᐃᕐᑲᓗᖅᓇᐊᕐᑎᒃ ᑯᓐᓂᒥᐅᖅ ᒍᔪᒍᑦ (Char Lake Project) ᕐᑯᔭᓐᓇᒦᕈᒪᒪᑦᑕ ᐅᓛᓴᓗᖅᒥᐅᑦ ᐃᓄ ᓕᒫᖅᒥᓐᓂᒃ, ᐃᑲᔪᕐᓂᖏᐅᕐ ᑕᖅᒥᑦ ᐅᕙᕗᑎᓐᓂᒃ ᐱᓇ ᓱᐊᕐᓗᑕ.

ᐱᓇᓱᐊᒪᕐᐳᑦ ᖃᓄᔭᕐᑲᕐᑎᑕᐅᓚᐅᕐᐳᖅ ᐃᒦᒃ ᐊᐅ ᖅᑎᑕᐅᓚᐅᕐᐳᒍᑦ ᒪᕙᒪᒃᑯᓐᓂᑦ ᖃᓄᔭᓂᒃ ᐱᓇᓱᐊᒪᕐ ᐳᑦ ᐱᓐᓗᒍ, ᕐᑲᐅᔨᓇᓱᐊᕈᒪᓕᐅᕐᑦᑕ ᐃᓄᐃᑦ ᓄᓇᖅᒪ ᓈᓐᓂᑦᑐᒥᒃ ᑕᓯᕐᒥᒃ, ᒪᕐᕈᖅᓂᒪᓕ ᐱᑦᔪᑎᒃᓴᕐᑲᓗᐊ ᕐᓗᑕ, ᐃᒪᒃ ᕐᑲᑦᔩᓇᐅᓂᕐᓴᓂᒃ ᐆᒪᔪᕐᑲᕐᒪᑕ ᕐᑯ ᐱᕐᕿᕐᑲᖅᓗᑎᒃᓗ ᕐᑲᖕᓄᓈᑦ ᓄᓇᖅᒪᑕ ᑕᓯᕐᑯᑎᖅᒥᓂ ᑦ, ᑕᒪᓐᓇ ᐱᖕᓗᒍ ᕐᑲᐅᔨᓇᓱᐊᓇᐊᕐᒥᑕ ᐱᔭᕐᓂᖅᓂᕐ ᓴᐅᖅᒪᑕ. ᐁᐸᖅ ᒪᓂᖅᓕ ᐃᓄᐃᑦ ᓄᓇᖅᒪᓃᑦᑐᑦ ᑕᓰᑦ ᕐᑲᐅᔨᓴᖅᑕᐅᑎᑦᓇᐅᖅᓯᒪᓐᖅᒥᒻᒪᑕ, Char Lake (ᑕᓯᑯᓗᒃ ᐃᕐᑲᓗᖅᓂᐊᕐᑎᒃᑯᑦ ᐱᓇᓱᐊᕐᐱᕆᕙᐅᕐᑕᖅ ᒪᑦ) ᓂᕈᐊᕐᐅᕐᐸᕐᑦ ᐊᕐᒥᓂᖅᒪ ᓈᒻᒪᖅᒪᑦ, ᐊᒻᒪ ᓗ ᕐᑲᖅᒪᑕᕌᓄᑦ ᒥᑦᑕᕐᕕᐅᕙᒃᑐᒥᒃ ᕐᑲᓂᒃᓴᕐᒪᑦ,

*   *   *   *

We, the IBP Char Lake Project, want to thank all the residents of Resolute for the help they have given us from 1967 to 1973. We also want to tell you what we found out.

Our work was financed (paid for) by the Canadian government. We wanted to study an Arctic lake for two reasons, first, because they have fewer kinds of animals than southern lakes and are therefore easier to understand, and secondly, because almost nothing was known about Canadian Arctic lakes. We chose Char Lake because it was the right size, close to a major airport, and in the high Arctic (far North).



ᐊᒻᒪᓗ ᑕᕝᕙᓂ ᓂᒃᑲᓱᕐᓂᕐᒐᓂᑲᕐᔪᕐᒪᑦ ᐃᓄᐃᑦ ᓄᓇᕐᓃᑦᑐᓂᑦ. ᐊᒪᓗ ᐱᓇᓱᐊᑦᑲᑕᐅᑕᐅᓇᐳᔪᑦ ᑕᓯᖅᒥᒃ ᐅᐸᑦᑐᐊᓗᖏᓂᒃᑯᑦ ᓴᑦᑎᐊᕐᒪᓃᑦᑐᒥᒃ ᑯᖅᕕᕐᒥᓄᑦ ᑯᖅᕕᐅᓂᕐᒪ ᐱᑦᔪᑎᒥᐅᓗᒍ.

Char Lake (ᐃᑲᓗᕐᓂᐊᑦᑎᒃᑯᑦ ᐱᓇᓱᐊᖅᕕᒥᑦᑲᑦ ᑕᑯᑦᑕᕐᒪᑦ ᑕᓯᖅ) ᓯᑯᑦᑲᑦᐸᒃᑐᖅ ᓯᑎᐱ 20ᒥᑦ ᐱᒋᐊᑦᓗᓂ ᐋᒥᓯᑎᐅᐸ ᐱᒋᐊᑦᓂᕐᒪ ᑎᑭᑦᓗᒍ. ᓯᑯᕐᒪᓗ ᐃᑦᔪᓂᑦᑲᑦᐸᒃᑐᖅ ᐅᐱᕐᓚᒃᓴᒃᑯᑦ 8ᓂᒃ ᐃᓯᒪᒃᓂᒃ (ᐃᓄᕐᒥᑦ ᐊᒥᓂᖅᓴᒥᒃ). ᑕᓯᑦᓗ ᐃᑎᓂᑦᑲ ᓇᓗᓂ 85ᓂᒃ ᐃᓯᒪᕐᓂᒃ ᐅᑲᓪᓗᓐᓃᑦ ᐆᒃᑰᑎᓂᒃ 27 ᐸᐅᓗᐊᑦᑐᓂᒃ ᐅᐱᕐᓚᒃᓴᒃᑯᐅᓗ ᐃᖅᑲᓕᕐᒪ ᑕᑯᒃ ᓴᐳᓗᑦᑲᑦᑕᖅᑐᖅ ᐃᔪᓐᕐᒥᑦᑎᐊᑦᑎᐅᓗᒍ. ᑕᓯᐅᓕ ᐊᔪᕐᒥᑦ ᐅᓚᓴᓗᕐᒦᑦᑐᑦ ᑲᓂᒥᔭᕐᒪᓃᑦᑐᑦ Char Lake ᑐᑦ ᐃᒻᒥᓐᓇᕐᒥᑦᑐᑦ Resolute Lake 60 ᐃᓯᒪᒃᓂᒃ ᐃᑎᓂᑦᑲᖅᑎᒥᔪᖅ Meretta (ᐊᐳᖅᑐᐊᓗ ᕕᓂᒃᑯᑦ ᓴᑎᐊᒪᓃᑦᑐᖅ) 35ᓂᒃ ᐃᓯᒪᒃᓂᒃ ᐃᑎᓂᑦᑲᖅᑎᒥᔪᖅ Small Lake 30ᓂᒃ ᐃᓯᒪᕐᓂᒃ ᐃᑎᓂᑦᑲᖅᑎᒥᔪᖅ ᐊᒻᒪᓗ North Lake 40 ᐃᑎᓂᑦᑲᖅᑐᓂ.

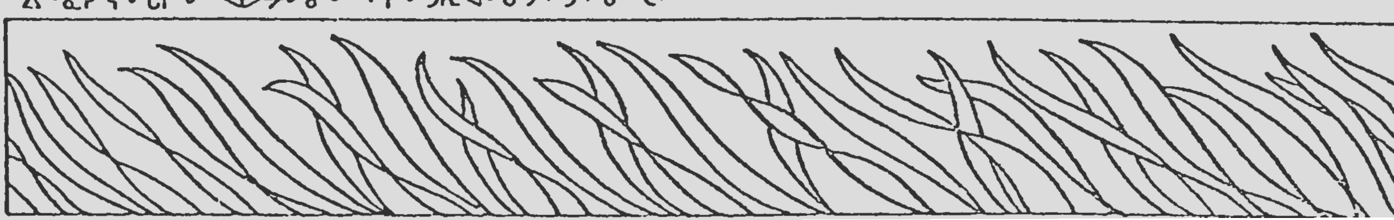
ᐱᓇᓱᐊᓚᐳᑦ ᐱᑦᔪᑎᑦᑲᓗᐊᖅᑕᐅᖅᒥᔪᖅ ᐆᒪᔪᑦ ᑕᓯᑦ ᒥ ᓂᕆᑦᑲᑦ ᑕᐅᑎᑦᑲᑦᑕᖅᓂᕐᒥᑦ ᐱᐅᓗᒥᑦ, ᐆᒪᔪᑦ ᐊᕐᒥᓂᑦᓴᐃᑦ (ᐃᑦᑲᓗᐃᑦ) ᓂᕆᑦᑲᑦᑕᑦᒪᑕ ᐆᒪᔪᓂᒃ ᑦᑯᐱᖅᐳᓂ ᑦᑯᐱᖅᐳᐃᐅᓗ ᓂᕆᑦᑲᑦᑕᑦᑐᑦ ᐱᐳᖅᑐᓂᒃ ᑕᓯᐅᐸ ᐃᖅᑲᕐᒪᓃᑦᑐᓂᒃ, ᑳᑯᐊᓗ ᒥᑭᓐᓂᑦᓴᑦ ᑯᐱᖅᐳᐃᑦ ᓂᕆᕙᕐᒥᔪᑦ ᐱᐳᖅᑐᑯᕐᓂᒃ ᑕᓯᖅᒦᑦᑐᓂᒃ, ᑳᑯᐊ ᐱᐳᖅᑐᑦ ᓯᑦᑭᓇᐅᐸ ᑦᑲᐅᒪᓂᕐᒪᓄᑦ ᐊᐅᑎᑦᑲᑦᑕᑦᓂᕐᒪᓄᑦ ᑕᓯᑦᒥ ᔫᓂ ᑎᑭᐅᓗᒍ, ᐊᒻᒪᓗ ᓯᑯ ᑲᑦᑲᑦᑕᑦᓂᕐᒪᓄᑦ ᐋᒥᓯᑎ ᑎᑭᐅᓗᒍ ᐱᑦᐸᐅᓕᐊᕐ ᒥᑦᔪᑎᒥᓪᒪᑦᔪᒃ ᑕᓯᖅᒥ. ᐊᑦᕿᔪᑕᓖᑦ ᐱᐳᖅᑐᑦ ᐊ ᕐᒥᑎᒥᔪᒥᒃ ᐃᑦᓯᑦᓱᑦᔪᑦ ᑕᑕᐅᑎᐅᓗᐊᑐᐃᓇᐅᑦᑲᑦᑕ ᑦᑐᑦ. ᑕᒪᒃᑯᐊ ᐱᐳᖅᑐᑦ ᐱᒋᐊᖅᕕᑦᑲᑦᑲᑦᑕᑦᑐᑦ ᐃᖅᑲᕐᒪᓂ ᐱᐳᖅᑐᓂᑦ, ᐃᑦᔪᒥᑦ ᐊᒻᒪᓗ ᑦᑯᐊᐳᐅᑎᓂ ᑕᒪᒃᑯᐊ ᐱᐳᖅᑐᑦ ᐃᑎᓂᒻᒪᓐᓇᕐᒪᓄᑦ ᑎᑭᐅᑎᓯᒪᑦᑲᑦᑕᑦᑐᖅ. ᐃᓚᑦᑲᖅᓗᑎᒃ ᑦᑯᐱᖅᐳᑯᓗᕐᓂᒃ ᐃᒫᓃᑦᑐᓂᒃ ᑕᒪᓇ ᐃᑦᔪᖅᔪᓯᔪᖅ ᐃᖅᑲᕐᒪᓂᑦ ᐱᐳᖅᐸᒃᑐᖅ ᐃᑦᔪ ᓂᑦᑲᑦᑲᑦᑕᖅᑐᖅ ᒪᑦᕿᕐᓂᒃ ᐃᓯᒫᕐᓂᒃ, ᐊᑦᓚᑦᕐ ᒪᓂᑦ ᒥᑭᓂᖅᓴᐅᔪᒃ ᑕᓯᐅᐸ ᐃᖅᑲᕐᒪ ᐱᐳᖅᐃᐅᑦᑲᑦᑕᖅᑐᖅ, ᐃᑦᔪᒥᑦ. ᑕᒪᓇ ᐱᐳᖅᑐᖅ ᓂᑦᑭᒥᔭᐅᑦᑲᑦᑕᖅᑐᖅ, ᑦᑯᐊᐳᐅᓕᒌᑦᑐᓂᑦ ᑦᑯᐱᖅᐳᓂᑦ, ᐊᒻᒪᓗ ᑦᑯᐱᖅᐳᑯᓗ ᕐᓄᑦ ᐃᒫᓃᑦᑐᓄᑦ. ᑭᓱᑐᐃᓇᐃᑦ ᐱᐳᖅᑐᑦ ᑕᓯᖅᒥ ᓱᑭᑦᑐᑯᕐᒥᒃ ᐱᐳᖅᐸᓗᐊᑦᑲᑦᑕᖅᒪᑕ, ᐅᑯᐊ ᑦᑯᐱᖅᐳᑯᓗᐃᑦ ᐃᒫᓃᑐᐃᓇᑦᐸᒃᑐᑦ ᐊᑦᑯᔪᓕᒪᒥᒃ ᐱᐳᓯᐊᕐᐸᒃᑐᑦ. ᑕᒪᐸᑯᐊ ᐊᔪᕐᒥᑦ ᑦᑯᐱᖅᐳᐃᑦ ᐊᑦᑯᔫ ᕐᓂᒃ ᒪᑦᕿᕐᓂᒃ ᐱᕐᓚᓱᓂᓚᒍᓐᓃᑦ ᐱᐳᓯᐊᕐᐸᒃᑐᑦ. ᒪᓐᓂᓐᓇᐅᑦᓗᑎᒃ ᑳᑯᐊ ᐃᖅᑲᕐᒪᓃᑦᑐᑦ ᑦᑯᐱᖅᐳᐃᑦ ᐃᓐᓇᐳᑦᕐᒪᓕᒃ ᐊᐳᖅᑯᑦ ᑦᑭᑦᑐᓇᐊᕐᔪᓯᑦᑐᑦᑲᑦᑕᖅ

We also worked on Meretta Lake because it was polluted by the sewage from the airbase at North Camp.

Char Lake is covered with ice from September 20 to early August, and the ice is 8 feet thick in springtime. The lake is 85 deep and the water is clear enough to see almost to the bottom in spring. Other lakes near Resolute are not as deep; Resolute is 60 feet, Meretta 35 feet, Small Lake 30 feet, and North Lake 40 feet.

Most of our work was on the food chain, where large animals like fish eat smaller animals like insects (chironomid larvae of flies) which in turn eat plants. The plants use sunlight and nutrients dissolved in the water to grow. Because there is snow until June, and ice until August, there is very little plant growth produced in Char Lake. Each year about a teacup of plants is provided in an area as big as a table, much less than in a lake down south. Most of this plant material is produced by moss and algae growing on the bottom, as deep as 85 feet, with a little bit produced by the tiny floating plants or plankton. Beds of moss up to two feet thick cover one third of the bottom of Char Lake.

This plant material is eaten by insect larvae and zooplankton. Everything grows slowly in Char Lake, with the zooplankton having one generation per year (taking one year to grow) and the insects taking two or three years to grow from egg to adult. The insect larvae living on the bottom turn into adult flies in summer. When they swim to the water surface from the lake bottom, they are eaten by fish, and they often must go through cracks in the ice before emerging as flies. They



ᑐᑦ. ᐊᒻᒪᓗ ᕐᑲᖅᒪᑕᑐᐃᓐᓇᓂᐊᕐᑲᓂᖏᖅᒪᒥᒃ ᐃᖕᑲ ᖅᒪᓂᓐᖅᑳᕐᔪᑎᒃ ᓄᐃᔭᖕᑐᖕᑎᐤᔪᒥᑦ ᐃᕐᑲᔪᖅᓂᑦ ᓂᓇ ᔭᐅᕐᑲᑦᑕᕐᒥᔪᑦ. ᐊᒻᒪᓗ ᓯᓂ ᕐᑲᖅᒪᑦᑕᕈᓐᓇᕐᑎᒃ ᐃᖕᑲᖅᒪᓂᓐᖅᑳᕐᔪᑎᒃ ᓯᑯᕐᑲᖕᓴᐤᔪᔪ ᕐᑯᓐᖅᓂᖅᒥᑎᔪ ᑦ ᓄᐃᕙᒃᑐᑦ. ᐊᒻᒪᓗ ᐃᓐᓇᐅᓂᖏᖅᒪᒥᒃ ᒪᓂᒃᑳᕐᒥ ᔪᑦ ᐃᒻᒪᕐᑳ ᐊᑐᓂᑦ 250ᓂᒃ ᕐᑯᐱᖕᕆᓐᖅᔫᑦᐸᒃᔪᑎ ᒪᓐᓂᕕᓃᑦ ᐃᖕᑲᖅᒪᓂᑦ ᑕᖕᑭᖕ ᓈᔭᖏᖅᒪᑦ ᑕᕙᕙ ᐊᕐ ᖏᑐᓂᒃ ᐱᕆᓴᓪᓗᓂᐊᕋᕐᔪᑎᒃ. ᐃᒻᒪᕐᑳ ᕐᑯᐱᖕᕆᐃᑦ 20ᑐᐃᓐᓈᐅᖅᒪᑕ ᐊᐅᓚᕆᓐᖅᒥᑦᑐᑦ, ᐃᒪᓃᑐᐃᓐᓇᕐᑐᐤ ᔪ ᐊᒻᒪᓗ ᐃᖕᑲᖅᒪᓃᑦᑐᑦ, ᕐᑲᐅᔫᐅᓯ ᓄᓇᖅᒪᓂ ᐊ ᒥᓯᐋᓗᒪᔭᕐᑎᐅᔪᒥᑦ ᐊᕐᓚᕆᓐᖅᒥᑦᑐᑦ ᕐᑯᐱᖕᕆᐃᑦ ᑕ ᓯᖕᒥ. ᕐᑲᑦᓰᓐᓇᐅᔪᓗᐊᖕᑎᐅᔪᒥᑦ ᐊᐅᓚᕆᓐᖅᒥᑦᑐᑦ ᐃᒻᒪᕐᑳ ᐃᖕᑲᖅᒪᓂ ᖀᑐᑦ (ᐊᑭᑐᑦ) ᐊᖅᒥᑎᒥᔪᖕ ᐊ ᒥᓯᐊᔪᖅᓂᒃ ᕐᑯᐱᖕᕆᕐᑲᕆᓐᓇᕐᑐᖕ. ᑕᓯᐅᐸ ᐃᖕᑲᖅ ᒪᓂ ᒪᕐᕋᐅᓂᖅᒪᓂ ᐊᒻᒪᓗ ᐱᕆᖕᑐᕐᑲᕐᓂᖅᒪᓂ.

(Char Lake) ᐊᑕᐅᓰᓐᓇᕐᓂᒃ ᐃᕐᑲᔪᕐᑲᖕᑐᖕ ᑎ ᓱᔪᓐᓈᖅᒥᑦᑐᓂᒃ ᑕᓇᐅᕐᔫᑦ (ᓅᑎᐤᓕᐊᕐᔪᖅᓂᒃ), ᑕ ᒪᓐᓇ ᑰᖅᒪ ᒥᑭᔪᐊᕐᒪᑦ; 3,000ᓂᒃ ᐃᕐᑲᔪᓚᐅᕐᐸ ᔫᑦ ᓄᔪᐊᓅᑦ (ᒪᕐᑎᑦᑕᐅᑎᓅᑦ) ᐊᒻᒪᓗ ᐃᕐᑲᔪᔭᓅᑦ: (ᐅᓚᔭᐅᑎᓅᑦ), ᐊᒻᒪᓗ ᓇᓗᓇᐃᒃᑯᕐᓯᕐᓱᓚᐅᕐᐸᕗᑦ ᓈᔭᐅᓯᕐᓱᕐᔪᒥᑦ ᐅᐊᔮᔪᑦ, ᓇᓗᓃᒃᑯᕐᓯᕐᓱᓇᖏᖅᒪᕐᑎᔪ ᐅᑎᖕᑎᐸᐸᒃᔪᒥᑦ ᑕᓯᖕᔪᑦ, ᑐᑭᓯᓚᐅᕐᐸᔫᑦ ᐃᒻᒪᕐᑳ, 20,000ᓂᒃ ᐃᕐᑲᔪᕐᑲᖕᓱᒥᐤᔪᔪ ᑕᓯᖕ ᐱᓇᓱᐊᕐᕕᒥᕐ ᑲᑦᑕᓚᐅᕐᑕᕗᑦ Char Lake.

ᒥᑭᑦᑐᑰᖅᒪᑕ ᐃᕐᑲᔪᖅᒥᑦ ᐊᒻᒪᓗ ᓱᒃᑫᑦᑐᒥᒃ ᐱ ᕆᖕᐸᐤᓕᐊᐤᔪᑎᒃ, 15ᓂᒃ ᐊᕐᖏᔫᕐᑲᓕᕐᑲᔪᐊᕐᔪᑎᒃ 9 inch. ᑐᐃᓐᓇᕐᒥᒃ ᑕᑭᓂᕐᑲᕐᑲᑦᑕᕐᑐᑦ ᑕᒪᒃᑯᐊ ᐃᕐ ᑲᔪᑯᔪᐃᑦ ᓂᓇᕙᒃᑐᑦ ᕐᑯᐱᖕᕆᓂᒃ ᐊᒻᒪᓗ ᐊᔪᖅᒥᓐᓂᒃ ᐆᒪᔪᑯᔪᖅᓂᒃ ᑕᓯᖕᒥ, ᓂᓇᓇᓱᔪᐊᕐᑲᑦᑕᕐᑐᑦ ᐅᔭᐅᓕ ᖏᖅᒪᑦ ᐊᒻᒪᓗ ᑕᐤᓕᒪᓂᒃ ᐃᕐᑲᔪᕐᑲᕐᒥᔩᒪᔪᐊᖕ ᐊᖅᒥ ᓂᖕᑳᓂᒃ, ᖄᒃᑯᐊ ᐊᕐᖏᔫᕐᑲᕐᑐᑦ 20ᑦ ᐅᖅᒪᖄᓂ, ᓂᓇᕙᒃᔪᑎᒃ ᐃᕐᑲᔪᖅᓂᒃ ᑕᒪᒃᑯᓂᖅᒪ ᒥᑭᓐᓂᖅᒥᓐᓂᒃ. ᖄᒃᑯᐊ ᐃᕐᑲᔪᐃᑦ ᑲᑎᕙᒃᑐᑦ ᐃᒫᒃ ᐃᓚᓕᕐᒥᓃᓕᕐᐸᒃᑐ ᑦ ᓯᑎᐱᓐ 10ᐅᓕᕐᑎᐤᔪᔪ ᑕᒫᓂ ᑐᐊᑉᐅᓂᖅᒪᓂ ᐃᖕᑲᖅ ᒪᑕ, ᑯᓚᑯᔫᐸ ᐊᑭᐊᓂ, ᐊᕐᓇᐅᓂᖅᒥᑦ ᒪᓐᓂᕐᑲᓕᖕᐸ ᒃᑐᑦ (ᓯᕙᕐᑲᓕᕐᐸᒃᑐᑦ) 20 ᐅᖅᒪᖄᓃᑦᑐᓂᒃ ᐊᕐᖏᔪ ᐁᐸᐱᑐᐋᖏᖅᒪᑦ. ᐃᓚᖅᒥᑦ ᒪᓐᓃᖅᒥᑕ ᓂᓇᔭᐅᕙᒃᑐᑦ ᐃᕐᑲᔫᕐᑲᑎᖅᒥᓐᓄᑦ: ᒪᓐᓂᖅᒥᑦ ᐱᕆᕐᐸᐤᓕᐊᕙᒃᑐᑦ ᐅᑭᐅᓖᖕ ᐅᐱᕐᖅᒪᒃᖏᒃᑯᑦ ᐃᕐᑲᔪᖅᔫᕐᑲᐸᒃᔪᑎᒃ, (ᐃᒻ ᒪᕐᑳ ᐁᕙᓂᓕᒥᒃ) ᐃᒥᖕᑯᑕᐃᓚᐃᑦ ᑕᒪᒃᑯᓂᖅᒪ ᐃᕐᑲᔪ ᖅᔫᕐᑲᖄᕐᑐᕕᓂᕐᓂᒃ ᓂᓇᕙᒪᔪᔪᑦ. ᐊᒻᒪᓗ ᕐᑲᖕᓴᐅᑦ ᐊᖅᒥᓂᖕᓴᓂᒃ ᓂᓇᕐᑲᑦᑕᖕᒥᔪᑦ, ᐃᕐᑲᔪᒃᓯᐅᕐᓯᒃᔪᓂ ᐃᕐᑲᔪᕐᑲᕐᑎᐊᕐᑲᑦᑕᓐᖅᒥᑦᑐᖕ ᐃᕐᑲᔪᖅᒥᑦ ᒥᑭᔪᐊᕐᒪ ᑕ ᐅᐸᖕᑐᐊᔪᕕᓂᒃᑯᑦ ᖀᕐᑎᐊᖅᒪᓃᑦᑐᖕ ᐊᐅᓚᕆᔪᓐᓃᕐ ᒪᒍ ᑕᐃᒪᓐᖅᒪᑦ ᑕᓯᖕ ᐃᓄᕐᑲᓕᑲᐅᕐᑎᓪᓗᔪ ᐅᑳᓴᔪᕐᐯ (Resolute) ᑕᓇᐅᒥᒃ ᐃᓚᕐᑲᓕᖕᒪᑦ ᑕᓯᖕ ᕐᑲᐅᔪ ᓈᑦ ᑕᐸᐸᒃᑯᐊ ᕐᑯᖕᕕᕆᔪᖕᒥᓐᓂᒃ ᑰᐅᒃᕕᐅᒪᒥ Char Lake-ᒥ (ᐃᕐᑲᔪᒃᓂᐊᕐᑎᒃᑯᑦ ᑕᓯᕐᑯᑎᖅᒪᓂᑦ) ᐱᕆᖕᑐᕐᑲᖕᓂᕐᓴᐅᓕᕐᑐᖕ, ᐱᕆᕐᑐᐤᓕ ᑕᒪᒃᑯᐊ ᐃᓚᖅᒥ ᑦ ᐳᒃᑕᓚᕐᒪᑕ, (ᐃᒪᐅᐸ ᕐᑳᖅᒪᓃᒻᒪᑕ) ᐅᔭᒃᑯᑦ ᑕᓯᖕ ᑐᖅᔫᔪᕐ ᑕᓐᖅᔫᕐᑲᑦᑕᖕᑐᖕ ᐃᒪᖅᒪ. ᐃᖕᑲᖅᒪᓂ ᔪ ᐃᐤᔪᒥᒃ ᐱᕆᖕᑐᕐᑲᕐᑎᐊᓐᖅᒥᑦᑐᖕ, ᐃᒻᒪᖕᑳ ᐱᕆᖕ ᑐᕐᑲᔪᐊᕐᓂᑯᔫᑦ ᕐᑲᐅᒪᕐᑎᐊᕈᓐᓈᓐᖅᒥᒻᒪᑦ ᐃᖕᑲᖅᒪ ᖄᐅᓕᖕᑕᐅᓯᒪᖅᒪᑦ ᐱᕆᖕᑐᓅᑦ. ᐃᕐᑲᔪᕐᑲᖕᒥᔪᖕ ᑎᓯᕙ ᓐᖅᒥᑦᑐᓂᒃ ᐊᖅᒥᓂᖕᔭᐅᑦᓅᑎᒃᔪ ᐃᕐᑲᔪᖅᓂᐊᕐᑎᒃᑯᑦ ᑕᓯᕐᑯᑎᕕᓂᖅᒪᓂᑦ, Char Lake ᐃᒻᒪᖕᑳ ᓂᕐᑭᑲᔭᕐ ᑲᖕᓂᖕᔭᐅᒪᒥ. ᑕᕙᕙᓕ ᐱᕆᖕᑐᕐᑲᕐᓂᕐᔭᐅᓂᖅᒪᓄᑦ ᐅ

live a few days and lay 250 eggs each, which hatch out as larvae one month and live on the bottom for several years. There are about 20 kinds of plant-eating insects, zooplankton, and small animals living on the bottom, compared with hundreds in a southern lake. Even though there are not many kinds, an area of bottom as big as a table would have many thousands of animals living in the moss and mud of Char Lake.

There is only one kind of fish in Char Lake, the arctic char. It is landlocked - it does not go to sea because the outlet stream is too small. We captured about 3,000 fish by nets and fishing with hooks, branded a number on them with a hot wire, and let them go, and we found that there are about 20,000 char in the lake. They are only 9 inches long (as long as a man's hand). These small fish eat insects (chironomids) and other little animals, feeding mostly in the summer. There are also about 5 large char weighing several pounds a piece. They are over 20 years old and feed on small char.

These fish spawn (lay their eggs) about September 10, in 5-15 feet of water on a gravel bar (small rocks) where a small stream flows into the lake. Each female fish lays a few dozen eggs every second year. Many of the eggs are eaten by other char. The eggs develop (grow) over winter and hatch next April. Terns (emerkotailuk) feed on the young fish and the next summer, the loons eat the older fish, but fishing by people is not very good because the fish are so small.

Meretta Lake has changed since people came to Resolute. Because there are so many nutrients (slats) being added to the lake from the airport sewage, the lake produces about three times as much plant material as Char Lake. Much of this material is floating as plankton and turns the lake green in summer. There are no large areas of moss on the bottom, perhaps because the plants in the water shade out all the light. Meretta also has landlocked char, and they are bigger than those in Char Lake, perhaps because they are getting more

ᐸᖅᑐᐊᓗᕕᓂᒃᑯᑦ ᕿᓐᓚᓂᑦᑐᖅ ᑕᓯᖅ ᐅᑭᐅᒃᑯᑦ ᐊᓂᕐᓂ ᕐᑲᕐᓇᖅᑐᒥᒃ ᐊᑐᖅᓂᖅᓴᐅᔾᒪᑦ ᑕᐸᕙᓂ ᕐᑲᐅᒪᑕᐅᓯᒪᔪ ᓐᓃᕐᔪᒐᒥ ᓯᕐᑭᓂᖅᔪᑦ ᐅᑭᐅᒃᑯᑦ, ᐊᓂᕐᓂᕐᑲᖅᓇᖅᑐᖅ ᑕᓯᖅᒦᑦᑐᖅ ᓄᖅ ᔪ ᐸᐸᐅᓂᐊ ᒡᓂᕐᑲᑦᑕᖅᒪᑦ ᐱᕈᖅᑐᓂᒃ ᐱᕈᕈᑕᐅᐸᒃᑐᖅ,. ᐅᔾᒍᓐᓂᖅᒐᓄᑦ ᐊᓂᕐᓂᕐᑲᖅᓇᕐᑐᖅ ᑕᓯᖅᒥ ᐱᑕᕐᑲᕐᑎᐊᕈᓐᓃᕐᑲᑦᑕᖅᑐᖅ ᐅᑭᐅᒃᑯᑦ, ᐃᒻᒪ ᕐᑳᓗ ᐆᒪᔪᑯᓗᐃᑦ ᐃᓚᖅᒥᑦ ᑐᕐᑯᕐᑲᑦᑕᖅᑐᑦ. ᐊᓯᕐ ᔪᓂᒃ ᐱᖅᒐᓖᓐᓗᐊᖅᑐᓂᒃ ᐃᕐᑲᓗᒐᑯᓗᖅᓂᒃ ᑕᑯᔪᕐᑲᓚᐅ ᕈᓐᓃᖅᒪᑦ ᑕᐃᑲᓂ ᑕᓯᖅᒥ (ᐃᒪᒃ ᐃᕐᑲᓗᖅᔪᕐᑖᖅᑐᓂᖅ) ᐱᒻᒪᕆᖅ ᓯᐸᐃᑦ· (ᐃᕐᑲᓗᐃᑦ ᒪᓐᓂᖅᒥᑦ) ᐃᖅᑲᖅᒐᓂ ᑐᕐᑯᕐᑲᑦᑕᖅᒪᑕ ᐅᑭᐅᒃᑯᑦ, ᐊᒻᒪᓗ ᕐᑯᐱᖅᕈᓐᓗᐊᑕᐅᕙᒃᑐᑦ ᑕᓯᖅᒥ ᐱᑕᕐᑲᕈᓐᓃᓐᓇᓐᓂᖅ.

ᑕᒪᓐᓇ ᐱᓐᓗᒍ ᐃᓄᐃᑦ ᑲᒪᕐᑎᐊᕆᐊᑲᕈᑎᒋᔪᑦ ᒪᕐᓗ ᐅᕈᕚᖅᓂᒃ ᐊᒃᑕᖅᕕᕈᕚᖅᓂᒡᓗ ᐃᓄᐃᑦ ᓄᓇᖅᒐᓐᓂ, ᒪᕐ ᓗᑯᕈᔪᑐᐃᓐᓇᖅ ᐊᕐᒥᔾᓇᖅᒥᒃᑯᓂ ᕐᑲᓄᐃᑎᓐᑎᓐᓗᐊᕐᓴᓐ ᖅᒥᑦᔫᒐᓗᐊᖅ ᑕᓯᖅᒥᒃ ᐱᕈᐊᔪᕐ ᖀᖅᐸᓐᓂᖅᑎᑦᑎᔾᓐᓇᖅᒪ ᑦ, ᑭᓯᐊᓂ ᐊᕐᒥᓗᐊᕐᑐᒥᒃ ᒪᕐᓗᑯᑕᕐᑲᓂᖅᐸᑦ ᐆᒪᔪᓂ ᒃ ᑕᓯᖅᒦᑦᑐᓂᒃ ᑐᕐᑯᑎᕐᑎᓐᔪᓐᓇᖅᒪᑦ ᐃᒥᒃᑯᒥᓇᕈᓐᓃᕐ ᓴᖅᓗᓂᓗ.

ᐊᒻᒪ ᓯᓂ ᐱᓇᓱᐊᑲᐃᓐᓇᓚᐅᕐᒥᔪᔪᑦ ᐊᑯᓂᐅᓐᓂᕐᑦᑐ ᖅ ᐅᓛᓴᓗᐸ ᑲᓐᒥᖅᓗᐊᓂ ᑕᕆᐅᒥ. ᑕᕆᐅᖅᓕ ᐊᕐᓯᓂᖅ ᓵᓗᓐᓂᒃ ᐆᒪᔪᕐᑲᖅᓗᓂᓗ ᐱᕈᖅᑐᕐᑲᖅᓂᕐᓴᐅᓚᒪᑦ ᑕᓯᖅ ᒥᑦ. ᐃᖅᑲᓪᓚ ᐊᕐᓯᓂᒃ ᐊᐅᓛᓐᓂᕐᒥᑦᑐᓂᒃ ᐆᒪᔪᕐᑲ ᖅᒪᑦ (ᕐᑯᐱᖅᕈᕐᑲᖅᒪᑦ) ᐊᒻᒥᓪᓚᔪᓂᒃ, ᑭᓐᒍᒃᓂᒃ ᐃ ᕐᑲᓗᕈᓗᕐᓂᒃᓗ, ᐊᒻᒪᓗ ᐊᕐᒥᔪᓂᒃ ᐱᕈᖅᑐᕐᑕᕐᑲᖅᓗ ᓂ ᑕᒪᒃᑯᐊ ᓂᕆᔭᐅᕙᒃᑐᑦ ᓇᑦᑎᖅᓂᑦ, ᕐᑭᓪᓕᓗᒐᖅᓂᑦ, ᐊᐃᕕᖅᓂᑦᓗ.

ᑕᒪᒃᑯᐊ ᕐᑲᐅᔨᓴᕆᐊᖃᐅᕐᑕᕗᑦ, ᐊᒻᒪᓗ ᑐᑭᓯᕗᓐᓂ ᕐᑕᕗᑦ ᕐᑲᐅᔨᒪᑦᔪᑎᒃᓴᐅᓂᐊᕐᒪᑕ ᐃᓄᐃᑦ ᓄᓇᖅᒐᓐᓂᑦ ᑐᓂᒃ ᑕᓯᖅᓂᒃ ᐊᒻᒪᓗ ᐃᕐᑲᓗᖅᓂᐊᕐᑎᓄᑦ. ᑕᒪᒃᑯᐊ ᕐᑭᑐᕐᖅᒪᓇᓴᕙᑦ ᒫᓇ ᐊᒻᒪᑦᑕᐅᖅ ᐱᓇᓱᐊᕐᑲᑦᑖᕐᑯ ᓐᓗᒥᑦ ᐅᕙᒍᑦ ᐱᓇᓱᒃᕕᒥᕙᒃᑕᑦᑎᓐᓂᒃ ᓂᕐᑭᒃᓴᕐᓯᐅᕐ ᕕᒥᕙᒃᑕᑦᑎᓐᓂᒡᓗ ᑕᓯᖅᓂ ᑕᓐᐅᒥᓗ.

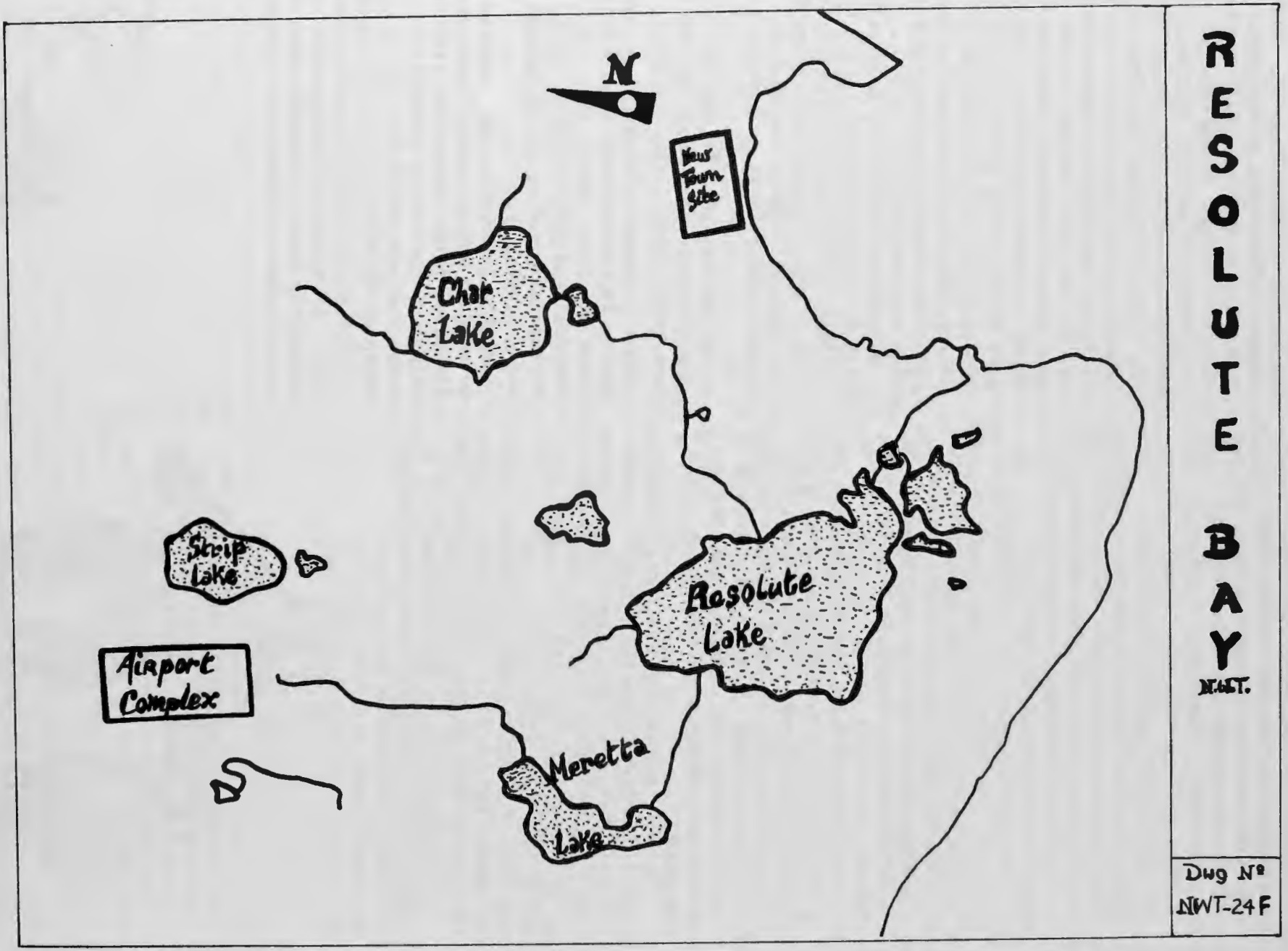
ᐊᒻᒪ ᓯᓂ ᕐᑯᔭᓐᓇᕆᕈᒪᕙᑦ ᐅᓵᓴᖅᒥᐅᑦ ᐃᓄᖅᒥ ᑦ ᐃᑲᔪᕈᑦᕐᓂᖅᒥᑦ ᐱᓐᓗᒥᑦ ᐱᓇᓱᐊᕐᑎᓐᓗᑕ ᑕᒪᑐᒥᖅ ᒐ. ᐊᒻᒪᑦᑕᐅᖅ ᐊᔪ ᖁᑎᓐᓂᒃ ᕐᑲᐅᔨᓴᕐᑐᕐᑲᕈᖀᖅ ᒐᑦ ᐃᓄᐃᑦ ᓄᓇᖅᒐᓂ ᐃᑲᔪᖅᑕᐅᕐᑲᑦᑕᕐᓂᐊᕐᒥᔪᑦ ᓇ ᓄᓇᖅᒥᑦᑐᖅ ᐃᑲᔪᖅᑕᐅᒐᓴᕐᒥᒐᑦᓯ ᑕᐃᒪ ᕐᑲᐅᔨᓴᕐᓯᐊ ᕐᐸᒃᑐᓄᑦ ᐃᓄᐃᑦ ᓄᓇᖅᒐᓐᓂ.

food. But because there is much more plant material being produced (growing) in Meretta Lake, the lake uses more oxygen in the winter, when there is no light and therefore no oxygen being produced by the plants. Because of this increased respiration the concentration of dissolved oxygen in later winter is very low, and may be killing some kinds of animals. We have found almost no little char the past three years, perhaps because the eggs die on the bottom over winter, and the most important zooplankton animal (limno calanus) has also disappeared.

People must therefore be careful with sewage and garbage in the North. A little bit of pollution might not harm a lake, only make it grow, but too much will kill some of the animals and ruin it as a water supply.

We also worked a little bit on Resolute Bay. The ocean at Resolute grows about 5 times as much plants and animals as a lake. The bottom is covered with hundreds of kinds of clams, shrimp (kingook), and fish and large plants, which in turn are feeding seals, whales and walruses.

All the information we gathered will be used to manage Arctic lakes and fisheries (fish harvest or fish catching) so that our grandchildren will enjoy the same water that we did. Again we thank the people of Resolute for their help during this study, and we hope you will help other people who study the North, because you will benefit from such studies.


N
New Town Site
Char Lake
Strip Lake
Resolute Lake
Airport Complex
Meretta Lake
RESOLUTE BAY
N.W.T.
Dwg Nº
NWT-24F

GRADUATION OF METEOROLOGIST COURSE No. 32

Graduation ceremonies for Meteorologist Course No. 32 took place at A.E.S. Headquarters on April 1, 1976. The afternoon ceremonies were preceeded by a luncheon for the students and staff of the Professional Training Division at the home of instructor J. Percy.

Mr. L.T. Campbell, Director-General of Field Services, congratulated the students on their successful completion of the course and welcomed them as professional meteorologists. He spoke of anticipated developments in meteorology, of the changing role of meteorologists in the A.E.S. and of the opportunities and challenges these changes would present to the students in their careers in meteorology. Mr. Campbell also read a letter of congratulation from Mr. H.V. Tucker, Director of the Canadian Forces Weather Service, who was unable to attend the graduation. In his letter, Mr. Tucker welcomes the graduates into the Canadian Forces Weather Service, where they will all be serving on their initial field assignments.

Mr. W.D. Lawrynuik, A-Chief of the Professional Training Division, congratulated the graduates on the sustained effort they had made throughout their eight months of training and on their high academic achievement. Mr. Lawrynuik assisted Mr. Campbell in the presentation of the Certificates of Professional Training.

The ten graduates, who were recruited a year ago from universities all across Canada, now proceed to Canadian Forces Base Winnipeg for 5 weeks of contact training before reporting to Canadian Forces Bases from Cold Lake to Shearwater as operational meteorologists.

Back Row/L-R: à l'arrière, de g. à d.:
B.W. Boughton, G.N. Ord, C.W. Fliss, T.B. Shannon, T.O. Goos, K.A. MacDonald, R.D. Grimes, B.D. Greer.
Front Row/L-R: à l'avant, de g. à d.:
W.D. Lawrynuik, G.S. Lines, K.P. Spring, N.S. McLennan, A.F. Davies.

"LA TERRE: UNE SERRE CHAUDE"

La fonte des glaces polaires prévue d'ici 80 à 180 ans

NEW YORK (NYTNS) – Quelle sera la température de la planète dans la prochaine décennie, le prochain siècle ou le prochain millénaire? Voilà un sujet qui a suscité presque autant de théories et de débats différents qu'il y a de nuages dans le firmament. Dernièrement, les arguments et les discussions se sont multipliés, parce que les scientifiques savent mieux maintenant comment l'activité de l'homme influence le climat qui l'environne, depuis l'expansion urbaine jusqu'à l'épanchement de produits chimiques dans l'atmosphère.

Mais la théorie la plus provocante et la plus récente, susceptible d'attirer l'attention des météorologues, est celle du docteur Howard A. Wilcox, physicien nucléaire et ingénieur maritime de Californie dont le livre "La terre: une serre chaude" vient de sortir aux éditions Praeger. L'auteur en est venu à la conclusion que, si la croissance industrielle et la consommation d'énergie se maintenaient au rythme actuel, la chaleur dégagée dans l'atmosphère pourrait élever la température de la planète à un point suffisant pour faire fondre les glaces polaires et provoquer, en conséquence, des inondations dans des régions très peuplées de la terre, d'ici 80 à 180 ans.

A plus court terme

Les prédictions antérieures sur la possibilité d'une si terrible catastrophe se faisaient en terme de siècles ou de millénaires à venir. Selon Wilcox, elles ne tenaient pas compte de l'accroissement énorme de la quantité de chaleur que l'humanité diffuse dans l'atmosphère par un taux annuel de consommation d'énergie de 4 à 6 pour cent. D'après lui, le climat actuel de la terre est relativement stable, parce que la chaleur générée par l'homme n'est pas suffisante pour renverser l'équilibre naturel des effets du chaud et du froid qui se compensent, en raison de facteurs changeant constamment, comme les vents, les courants marins et la couverture des nuages.

L'homme lance dans l'atmosphère environ un dix-millième de la quantité de chaleur que le soleil fournit à la terre. On estime en effet que le soleil irradie annuellement l'équivalent de quelques 5,000 milliards de milliards de BTU (unités thermales) d'énergie à la terre. Un BTU est la quantité de chaleur nécessaire pour élever d'un degré F la température d'une livre d'eau.

Une hausse de 1 à 3 degrés

Mais au rythme actuel de la consommation de l'énergie qui nécessite des quantités toujours plus considérables de carburant et la prolifération d'usines nucléaires et de raffineries de pétrole, l'humanité retournera dans l'atmosphère 1 pour cent de toute la chaleur que le soleil transmet à la terre en 80 ans.

Cette estimation, basée sur les calculs de l'auteur et des météorologues, signifierait une hausse de température de 1 à 3 degrés F à l'échelle planétaire. Or, ces mêmes savants ont déjà calculé que même une hausse de température de 1 degré aurait des effets significatifs sur la terre et pourrait provoquer éventuellement la fonte des glaces des pôles.

Dans l'Arctique, par exemple, environ les deux tiers de la calotte, qui contient 11 pour cent des 5 millions de milles cubiques de glace du globe (500,000 milles cubiques), fondent durant l'été et regèlent durant l'hiver. Mais un changement d'un degré dans la température de l'atmosphère signifierait qu'une plus grande proportion de la calotte polaire fondrait.

L'albédo de la glace

Il y aurait alors moins de glace pour réfléchir ou retourner la chaleur dans l'atmosphère, ce phénomène s'appelle l'effet de l'albédo. Il y aurait aussi plus d'eau pour absorber les rayons chauds du soleil. En retour, il s'ensuivrait une hausse accélérée de la température pour toute la région polaire, ce qui causerait un rythme de fonte toujours plus rapide.

Vu que les effets de cette hausse de température se feraient sentir à très court terme par des phénomènes, comme des marées plus hautes, des précipitations de pluie plus grandes, des modifications du calendrier de migration des animaux et, en général, un climat plus chaud, les hommes de science se font le raisonnement suivant: l'humanité sera suffisamment alertée pour changer à temps ses critères de consommation d'énergie et prévenir toute altération importante de l'environnement mondial.

CONGRATULATIONS ET FÉLICITATIONS

How Sweet It is !!!!

Radio OB Ltd.,
930 Portage Ave.,
Winnipeg, Man.
R3G 0P8

Mr. J.J. Labelle,
Regional Director,
Atmospheric Environment Service,
6th Floor, 185 Carlton St.,
Winnipeg, Man.
R3C 3J1

March 29, 1976.

Dear Mr. Labelle:

During the storm on March 20th, you and your office were most cooperative in assisting us to advise our listeners of the dangers of the storm and the precautions that should be taken. Happily, there were very few mishaps in the community and I would like to feel that your office and our station were at least partly responsible for averting any major problems.

Would you kindly extend to your associates and certainly to yourself our grateful "Thanks" for your continued cooperation and help.

Yours sincerely,

RADIO OB LTD.

R.M. MacLennan, General Manager

Monsieur Bureau
Environnement Canada
Ancienne Lorette
Québec

Québec, le 3 avril 1976

Monsieur:

Par la présente je tiens à vous remercier pour les détails fournis concernant les jours propices aux cafés-terrasse.

Vous vous êtes acquitté de cette tâche avec un empressement sans pareil sans compter l'exactitude de vos statistiques.

Chapeau à l'organisme gouvernemental qui pourrait en montrer à plusieurs.

Agréez, Monsieur, l'expression de mes distingués sentiments.

Maurice Maurin
C.P. 506
Haute Ville
Québec

CAN PRO AWARD

"Can Pro" is a festival for private television broadcasters, designed primarily as a means of exchanging programs, program ideas and concepts.

Station CFQC, Saskatoon won a first for the series "Understanding Weather" in the 'B' series for cities under 150,000. This is the series which Mr. Don Bernachi, OIC, Saskatoon Weather Office collaborated with Mr. Greg Barnsley, the TV Weathercaster of CFQC to produce for Educational TV. The four programs on video cassettes were subsequently purchased by the Saskatchewan Department of Education and also the Manitoba Government. A fifth cassette is being prepared.

'SELECTED SHIPS' LOG SHEET

This log sheet records weather observations taken on board the M/V Antenor. Mr. D.W. Stocks, Third Officer, is principal observing officer and is responsible for the volunteer weather program in operation on the Antenor.

The M/V Antenor is of British registry and was recruited as a Canadian Selected Ship by the Port Meteorological Officer in Vancouver.

NAME OF VESSEL *ANTENOR* CAPTAIN *W.E.LEATHART.* PRINCIPAL OBSERVING OFFICER *D.W.STOCKS.*

YEAR *1974*

Do not write in this column	MONTH (G.M.T.)	DAY OF MONTH (G.M.T.)	Message Identifier	POSITION OF SHIP: LATITUDE (Degrees and Tenths)	POSITION OF SHIP: Quadrant of Globe	POSITION OF SHIP: LONGITUDE (Degrees and Tenths. Hundreds (0 or 1) included.)	Day of Month (G.M.T.)	Time of Observation Nearest hour 00 - 23 (G.M.T.)	Wind Indicator (0-4)	Ship's Course at time of Obs. (°True)	Ship speed (□ mph □ kts)	APPARENT WIND: Direction Relative to Ship (010°-360°)	APPARENT WIND: Speed (□ mph □ kts)	Total Cloud Amount (0-9)	WIND: TRUE DIRECTION (00-36)	WIND: TRUE SPEED (knots)	VISIBILITY (Coded 90-99)	WEATHER: PRESENT (Coded 00-99)	WEATHER: PAST (0-9)	BAROMETER AS READ	PRESSURE: CORRECTIONS	SEA LEVEL PRESSURE Millibars and Tenths (09 or 10)	TEMPERATURE: DRY BULB °C	TEMPERATURE: WET BULB °C	CLOUDS: Amt. of C_L (or C_M) Cloud	CLOUDS: Type of Low Cloud	CLOUDS: Height of Lowest Cloud	CLOUDS: Type of Middle Cloud	CLOUDS: Type of High Cloud	3-HR PRESSURE CHANGE: Ship's Course Made Good (3 Hrs.)	3-HR PRESSURE CHANGE: Ship's Av. Speed - Past 3 Hrs.	3-HR PRESSURE CHANGE: Characteristic (0-8)	3-HR PRESSURE CHANGE: Amount (Mbs. & Tenths)	‡SIGNIFICANT CLOUD GROUP(S): Group Indicator	‡SIGNIFICANT CLOUD GROUP(S): Amount (Coded 1-9)	‡SIGNIFICANT CLOUD GROUP(S): Type (Coded 0-9)	‡SIGNIFICANT CLOUD GROUP(S): Height (Coded 00-89)
			GROUP 1: 99 $L_aL_aL_a$		GROUP 2: Q_c $L_oL_oL_oL_o$		GROUP 3: YY GG i_w								GROUP 4: N dd ff		GROUP 5: VV ww W					GROUP 6: PPP TT			GROUP 7: N_h C_L h C_M C_H					GROUP 8: 0_3 s_n a pp				GROUP 9: 8 N_s C h_sh_s			
	JUNE	13	99	259	5	0428	13	00	3					8	24	14	98	14	2	1014.1	0.3 2.3	10	167	188 188	153	8	7	3	+	+	6	4	2	18				
	—"—	—"—	99	255	5	0444	13	06	3					4	24	6 23	99	02	1	1014.5	0.3 2.3	10	171	194 194	150	4	1	3	0	0	5	3	4	00				
	—"—	—"—	99	250	5	0456	13	12	3					8	21	4 12	99	01	2	1017.6	0.3 2.3	10	202	194 194	154	8	5	3	+	+	6	3	2	20				
			99					18							FROM		RIO			GRANDE																	
			99					00																													
	JUNE	23	99	305	5	0495	23	06	3					0	00	0 00	99	02	0	1017.2	0.3 2.0	10	195	166 166	121	0	0	9	0	0	1	4	8	02				
	—"—	—"—	99	295	5	0483	23	12	3					1	31	3 10	99	02	0	1019.9	0.4 2.0	10	223	186 188	144	1	1	3	0	0	1	4	2	18				
			99					18									NAVIGATIONAL:																					
	JUNE	24	99	277	5	0458	24	00	3					3	99	2 04	99	02	0	1018.1	0.3 2.0	10	204	198 198	158	3	3	3	0	0	1	3	4	00				
	—"—	—"—	99	268	5	0446	24	06	3					2	99	1 01	99	03	0	1018.4	0.3 2.0	10	207	205 205	153	2	1	3	0	0	1	3	7	15				
	—"—	—"—	99	256	5	0432	24	12	3					6	02	4 14	99	01	1	1018.1	0.3 2.0	10	204	226 226	179	4	2	3	1	0	1	3	3	13				
	—"—	—"—	99	246	5	0420	24	18	3					4	05	4 12	99	02	2	1015.0	0.3 2.0	10	173	244 244	194	3	2	3	1	0	1	3	7	21				
	JUNE	25	99	236	5	0408	25	00	3					6	06	5 18	99	03	1	1014.9	0.3 2.0	10	172	234 234	196	6	2	3	0	0	1	3	1	03				
	—"—	—"—	99	227	5	0395	25	06	3					7	04	4 14	99	02	1	1013.1	0.3 2.0	10	154	233 233	190	7	2	3	0	0	1	3	5	05				
	—"—	—"—	99	218	5	0383	25	12	3					6	03	4 16	99	02	1	1014.1	0.3 2.0	10	164	242 242	198	1	2	3	0	5	8	3	3	08				
	—"—	—"—	99	201	5	0378	25	18	3					8	04	4 16	99	02	1	1010.8	0.2 2.0	10	130	256 256	203	0	0	6	0	7	8	3	4	00				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38

Supplementary Ships report only the data in columns indicated by this hatching

Shaded columns indicate data which do not form part of transmitted weather message.

*Data in columns 10 to 13 required only from ships equipped with an anemometer.

†Provision is made in columns 31 to 34 for entering the extra group 99ppp when the 3-hour pressure change is 9.9mbs. or more.

‡The groups $8N_sCh_sh_s$ and $1T_wT_wT_wt_T$ are optional for Selected Ships, but mandatory for Ocean Weather Ships.

VOYAGE FROM PERSIAN GULF TO PARANAGUA

Height of barometer above sea level 73 ft

Method of taking sea temperature: Rubber Bucket / Other / Condenser intake

SPECIAL PHENOMENA**			SEA TEMPERATURE								ICE ACCRETION				WAVES					ICE						REMARKS			
Group Indicator	General	Detail	Actual Temperature of sea water °C	Difference Dry Bulb minus sea temperature °C	Group Indicator	AIR-SEA TEMP. DIFF. IN HALF DEGREES CELSIUS (Coded)	DEW POINT TEMP. °C	Group Indicator	SEA TEMPERATURE Degrees and Tenths C	Tenths Figure Of Air Temperature	Group Indicator	Cause of Ice Acc.	THICKNESS OF ICE ACC. (Cm.)	Rate of Ice Acc.	SEA WAVES: Group Indicator	SEA WAVES: PERIOD Seconds	SEA WAVES: MEAN MAX. HEIGHT (Coded)	SWELL WAVES: DIRECTION FROM (True 00-36)	SWELL WAVES: PERIOD (Coded)	SWELL WAVES: MEAN MAX. HEIGHT (Coded)	INDICATOR FOR ICE GROUP	Kind of Ice	Effect on Navigation	Bearing of Ice Limit	Distance from Ship	Orientation of Ice Edge	Enter times of beginning and ending of precipitation of any kind, fog (visibility less than 1100 yds.), and thunder: and times of windshifts. Enter details of special or unusual phenomena in the space provided at the end of the logbook.	Address to which sent, if transmitted by radio	Call sign of station to which sent, sent, G.M.T.	Initials of officer who made observation
GROUP 10					GROUP 11			GROUP 12			GROUP 13				GROUP 14			GROUP 15			ICE GROUP									
0 $S_p S_p$	$s_p s_p$				0	$T_g T_s$	$T_d T_d$	1	$T_w T_w T_w$	t_T	2	i_s	$E_s E_s$	R_s	3	$P_w P_w$	$H_w H_w$	$d_w d_w$	P_w	$H_w H_w$	ICE	c_2	K	D_i	r	e				
0					0	t t	13	1	220	8	2				3	01	02	25	6	07	ICE						0012 CLOUDS DISSOLVING.	068. R10.	F 1 C 0	
0					0	t t	13	1	240	4	2				3	02	03	25	7	08	ICE						0018 3/8 CLOUD COVER.	—H—	P 3 1. 54	KGH
0					0	t t	12	1	220	4	2				3	01	02	21	6	08	ICE						POOR BAROGRAPH TRACE DUE TO VIBRATION	—H—	PPS 1237	
0					0	t t	11	1	220	4	2				3	01	02	21	6	08	ICE						13TH JUNE 2300 VESSEL ARRIVES AT PARANAGUA.	—H—	PPS 1237	
0					0	ST.		1	VINCENT		2		CAPE		3	VERDE		ISLANDS.			ICE						20TH JUNE 1400 VESSEL DEPARTS FROM PARANAGUA.			
0					0			1			2				3						ICE						21ST JUNE 2300 VESSEL ARRIVES AT RIO GRANDE.			
0					0	t t	09	1	160	6	2				3	t t	00				ICE						22ND JUNE 1900 VESSEL DEPARTS FROM RIO GRANDE.	083. R10.	PPS 1223	KGH
0					0	t t	11	1	180	6	2				3	t t	00	20	8	05	ICE						SIGNS OF BIOLUMINESCENCE IN BOW WAVE.	—H—	PPS 1226	
0			DUTIES.																		ICE									
0					0	t t	14	1	220	8	2				3	t t	00				ICE							083. R10	PPS 0019	
0					0	t t	13	1	220	5	2				3	t t	00				ICE						CLEAR SKY 0330~0445	—H—	PPR 1243	KGH
0					0	t t	16	1	230	6	2				3	01	02	21	5	05	ICE							—H—	PPR 1246	
0					0	t t	18	1	230	4	2				3	02	02	18	5	04	ICE							—H—	PPT 2030	KGH
0					0	t t	17	1	240	4	2				3	01	02	17	5	04	ICE							083. R10	PPT 0013	
0					0	t t	16	1	240	3	2				3	01	02	17	5	04	ICE						ALSO Sc FORMED FROM SPREADING OUT OF Cu.	—H—	PPT 1241	KGH
0					0	t t	17	1	250	2	2				3	01	01	04	5	04	ICE							—H—	PPT 1243	
0					0	t t	16	1	250	6	2				3	01	02	13	6	07	ICE							—H—	PPT 2350	KGH
39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69

** For use by Ocean Weather Ships only.

If, for any reason, an observation is not to be transmitted, it should nevertheless be taken and logged, as it is required for climatological purposes. If one or more consecutive observations are not taken, leave the appropriate number of lines blank, up to a maximum of eight. Start a new page at the beginning of each month, and a new logbook at the beginning of each year.

PERSONNEL

The following have accepted positions as a result of competitions:
Les personnes suivantes ont accepté ces postes apprès concours:

75–DOE–TOR–CC–147	Arctic Projects Meteorologist MT4 Central Services Directorate HQ J.E. Donegani
75–DOE–TOR–CC–178	Halifax METOC Centre Duty Forecaster MT 4 R.V. Horne
75–DOE–WIN–CC–518	Prairie Weather Centre Administrative Officer AS 1 P. Forbes
75–DOE–WIN–CC–516	Central Region HQ Financial Clerk CR-3 S. Napper
75–DOE–TOR–CC–178	Halifax METOC Centre Duty Forecaster MT 4 R.J. Daigle
74–DOE–TOR–CC–443	CF Fleet School Met Training Officer MT 4 B.W. Veale

The following are on temporary duty or special assignment:
Les personnes suivantes occupent temporairement ces postes ou sont en stages spéciaux:

G.E. Anderson	FROM: De Prairie Weather Centre TO: A CFWO Portage la Prairie

The following transfers took place:
Les transferts suivants ont été effectués:

M.J. Hawkes	FROM: De DND – Germany TO: A Arctic Weather Centre

Recent Graduates of TCTI:
Nouveaux diplômés de TCTI:

F. Clark	TO: A Armstrong
R. Guedo	TO: A Atikokan
P. Barg	TO: A Prairie Weather Centre

Resignations:
Retraités:

J.R. Coueslan	FROM: De Prairie Weather Centre EG–3
R. Evans	FROM: De Broadview, Sask. EG–2

Deceased:
Décédé:

E.M. Porteous	FROM: De Ontario Weather Centre EG–4 Died Friday, April 9, 1976

TRIVIA

Une liste d'expressions diverses.

Expression	Signification ou équivalent
Sacre ton camp!	Va t'en
J'accepte d'emblée	J'accepte tout de suite
Qui a bu, boira	On ne se corrige pas d'une mauvaise habitude
Etre racké	Très fatigué
Grincher des dents	Grincer des dents
Faire beaucoup de train	Faire beaucoup de bruit
C'est un coq l'oeil	Il voit mal

Il a la bosse des affaires	C'est un véritable homme d'affaires
Il fait des pieds et des mains pour lui plaire	Il fait tout pour lui plaire
Espèce de bréteux!	Qui parle pour ne rien dire

. . . . . .

Don't waste time worrying about moon germs. We all know they couldn't survive our polluted air.

. . . . . .

Asking us to bravely give up inches, the metric system will bring centimeters, complaints, and many wonderfully woeful mistakes.

. . . . . .

Slipping on the ice can be just as exciting as skiing, and you don't have to buy all those expensive clothes.

. . . . . .

Living high on the hog and putting on the dog are such false values, and almost impossible at present big prices.

. . . . . .

My interest is in the future, because I'm going to spend the rest of my life there.

. . . . . .

Perhaps because happy birds are healthier, the surly bird gets the germ.

. . . . . .

When all the cars in the city are laid out end to end, we know another weekend is here.

. . . . . .

PROVERBES QUÉBÉCOIS

"Quand on n'a pas ce qu'on aime, on chérit ce qu'on a."

Celui qui, ne pouvant s'acheter un piano, devra se contenter d'un harmonica.

"L'amitié, c'est l'amour en habit de semaine."

L'amitié ne nécessite pas de grands frais comme l'amour, et est quand même agréable.

"On choisit ses amis mais on ne choisit pas ses parents."

On n'est pas libre du choix de ses parents.

"L'habit ne fait pas le moine."

Les apparences sont trompeuses.

"L'argent ne rentre pas par la porte mais sort par les fenêtres."

L'argent se gagne difficilement mais se dépense par contre avec facilité.

"L'argent du diable retourne en son."

L'argent mal acquis ne profite pas.
"Quand on est valet, on n'est pas roi."

Quand on est subalterne, on doit obéir.

. . . . . .

THE METEOROLOGICAL GLOSSARY – AN IRREVERENT REVIEW

"Weather" Feb. 1976

Anticyclone:	A term to describe a centre of low pressure which continues to deepen in spite of predictions to the contrary.
Back-bent occlusion:	A special condition resulting from long periods of chart plotting and chart drawing.
Cold Dome:	A condition experienced by hatless bald observers in winter.
Dissipation trail:	A queue of out-of-work meteorologists.
Equatorial bulge:	An alternative for middle-age spread.
Float barograph:	Desirable quality of barographs used at sea.
Hadley cell:	Place of confinement for failed forecasters.
Jet Stream:	Torrential rain.
Torrid Zone:	The immediate vicinity of the duty senior forecaster.
Upper level trough:	Officers mess.

Wilting point:	Half an hour after starting work.
X-Rays:	The ultimate in see through.
Year:	Once the shortest distance between two pay raises.
Zone of silence:	Ottawa during parliamentary recess.

POST CELSIUS

By John MacNeil

Moderate winds with gusts to 40 are no April fool's joke.

The following footnote was attached to the maritime provinces forecasts today, compliments of forecaster-poet John MacNeil at the Weather Office in Halifax:

"April 1 marks the introduction by Environment Canada of the use of the international units Kilometres per hour to replace miles per hour and kilopascals to replace inches of mercury. In honor of this event, we contribute the following poem entitled Post Celsius.

Although it is April Fool's Day

We are not joking when we say

Farewell to the inch, the foot and the mile

For the metre has come to stay for awhile

There is milli for rain and centi for snow

We suppose that is something you already know

But are you aware that as of this day

Kilometres of wind is what we will say

And if you are not confused
as yet

There is one more thing not to
forget

Pressure will be in kilopascals

Now are we not just the
worst of rascals

These changes now are
unfurled

So we may keep pace with
the rest of the world

Certainly they are not just a
fad

So hopefully you will not feel too bad."