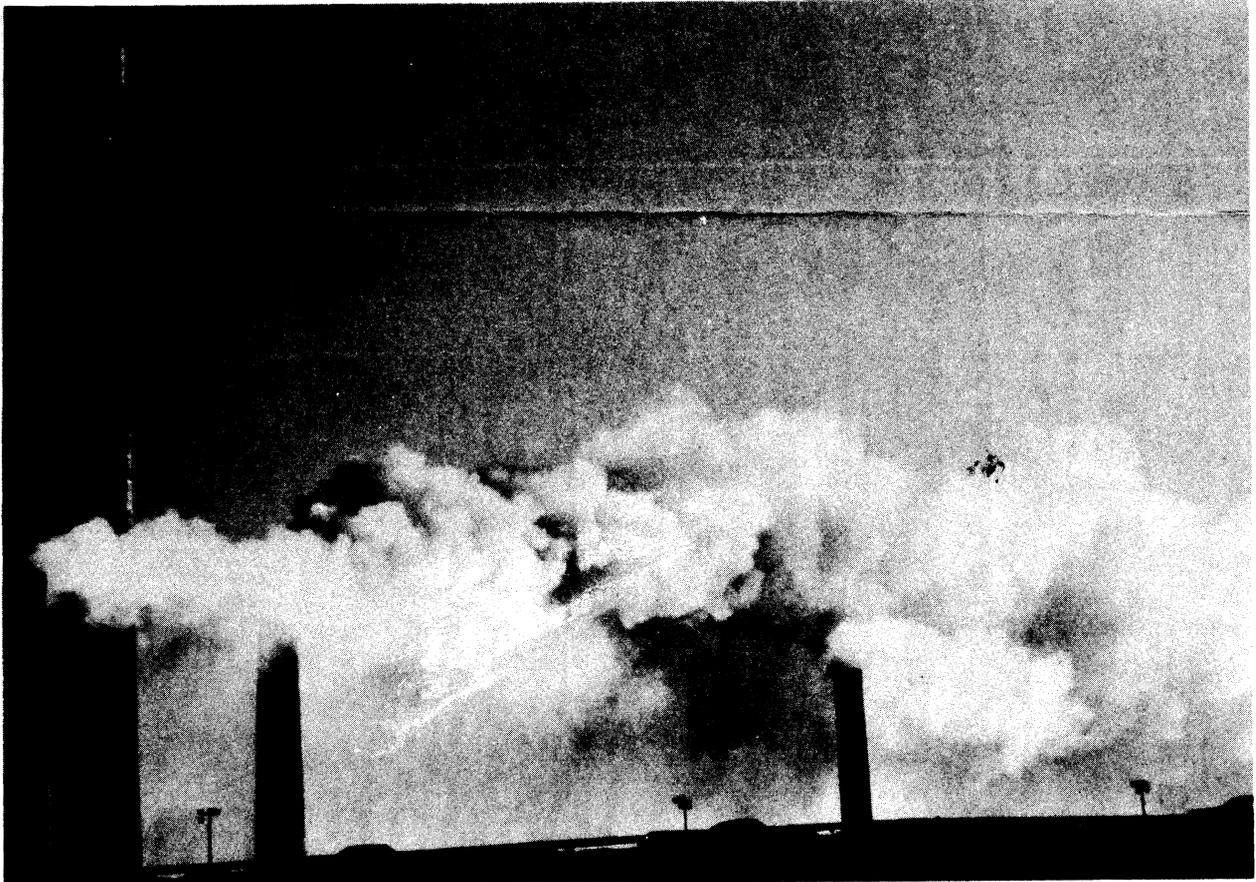
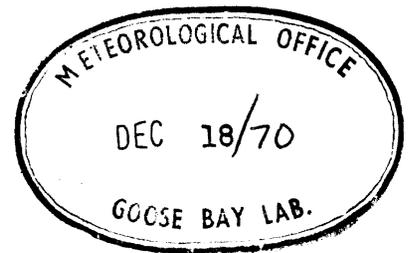


**MONTHLY REPORT
OF THE
CANADIAN
METEOROLOGICAL SERVICE
OCTOBER 1970**



IT IS THE GREAT PREROGATIVE OF MANKIND ABOVE ALL OTHER CREATURES THAT WE ARE NOT ONLY ABLE TO BEHOLD THE WORKS OF NATURE, OR BARELY TO SUSTAIN OUR LIVES BY THEM, BUT WE ALSO HAVE THE POWER OF CONSIDERING, COMPARING, ASSISTING AND IMPROVING THEM TO OUR VARIOUS USES.

ROBERT HOOKE (Micrographia 1665)

MONTHLY REPORT OF THE
CANADIAN METEOROLOGICAL SERVICE

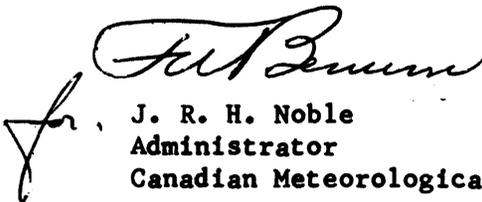
OCTOBER 1970

<u>ITEM</u>	<u>SUBJECT</u>	<u>REFER</u>
1.	Weather Reports on NTCL Boats	---
2.	ASTS Keeps Pace With New Instruction Techniques	Aug. 70
3.	WMO Technical Conference	July 70
4.	International Symposia on the Role of Snow and Ice in Hydrology	June 70
5.	Presquile Point Lake Tower Instrumentation	Sep. 70
6.	Evaporation Pan - Energy Balance Study	Feb. 69
7.	Voyage Sur Le St. Laurent	---
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10.	Personnel	Sep. 70

Editor's Note

Robert Hooke was born in 1635 on the Isle of Wight. He was responsible for fixing thermometrical zero at the freezing point of water and was involved in early barometric studies.

APPROVED


J. R. H. Noble
Administrator
Canadian Meteorological Service

MONTHLY REPORT OF THE
CANADIAN METEOROLOGICAL SERVICE

OCTOBER 1970

ITEM 1

WEATHER REPORTS FROM NTCL BOATS

The autumn of 1970 terminated a successful weather reporting program involving 5 Northern Transportation Vessels.

The Frank Broderick, Angus Sherwood, Pinnebog and Kelly Hall operated along the Arctic Coast from Shepherd Bay, N.W.T. to the Alaskan-Canadian Border. The Radium Gilbert operated on Great Bear Lake.

The Canadian Meteorological Service supplied these vessels with temperature, pressure, and wind equipment and in return the boats supplied the Canadian Meteorological Service with abbreviated weather observations called SHRED*Reports. The reports were transmitted in Synoptic Code to Northern Transportation radio office in Tuktoyaktuk where the reports were then relayed to the Arctic Weather Central in Edmonton via teletype.

The calibre of the reports was excellent and transmission time to Edmonton was prompt. Each report was plotted on the appropriate weather map and filed with the current weather data. Consequently the forecasters incorporated the information into the latest forecasts and as a result we feel the weather service offered to the Western Arctic improved considerably.

The information from the ships logs will be entered in the Climat Bank at Headquarters. Due to the success of this program the Northern Transportation vessels will continue to report each shipping season.

ITEM 2

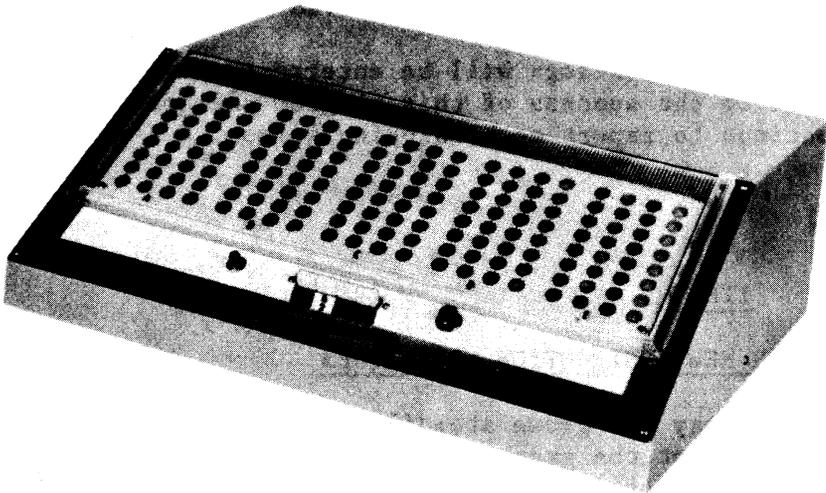
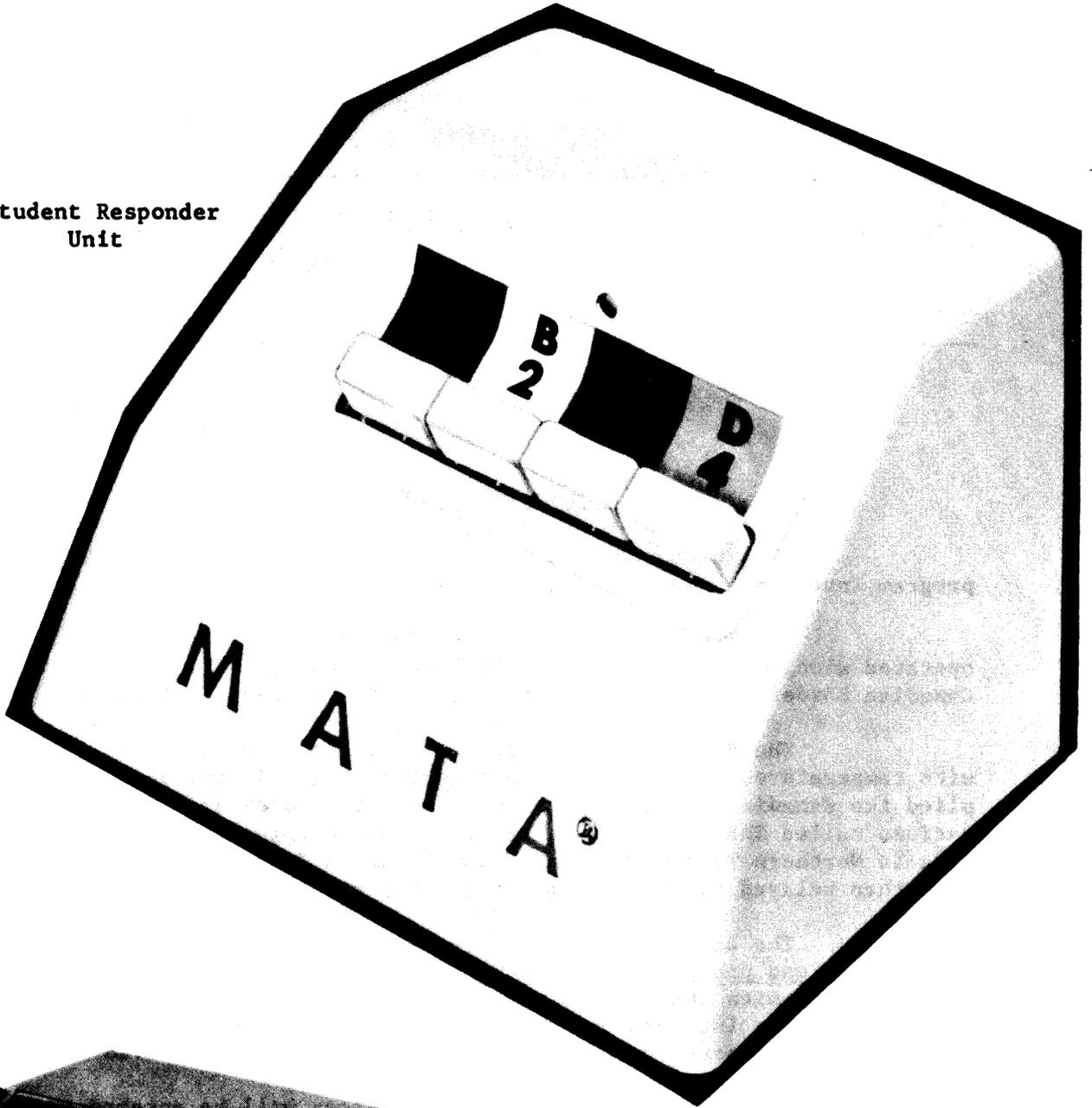
ASTS KEEPS PACE WITH NEW INSTRUCTION TECHNIQUES

The science of Meteorology has grown steadily since the time of Aristotle, but few will question that the greatest strides have been made in the past ten years. It is interesting to note that these advances have not been limited to one field, but have taken place in every aspect of the science. For example, advances in research have been paralleled by advances in instrumentation, data processing, communications, and, of course, in the forecast output.

Ever since the Air Services Training School first undertook the training of meteorological technicians and technologists in the summer of 1960, it has been evident that the quality and amount of this training must progress if the Canadian Meteorological Service is to keep pace with this scientific advancement. To this end, the ASTS meteorological division has been continually experimenting with new techniques and equipment. We feel that this has led to improvements in the past and we are sure that more significant improvements will be forthcoming in the future.

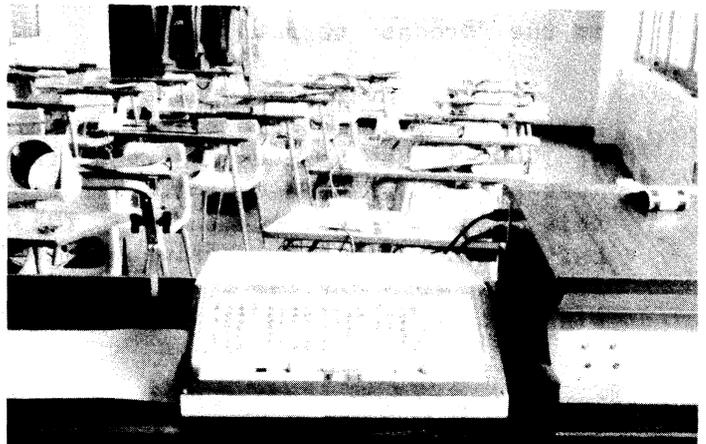
* A WMO abbreviated weather report code for ships.

MATA - Student Responder
Unit



MATA - Master Consol

MATA System in Use At The
Air Services Training School



One of the newest pieces of equipment being tested on the Basic Meteorological Technician's Course currently in progress, is the MATA System (see previous page).

MATA (Multiple Answering Teaching Aid) provides for total student participation, instant student reinforcement, instant feed-back for the instructor and instant student evaluation.

Each student desk is equipped with a responder unit, which is essentially a box with four push buttons labelled A, B, C, D or 1, 2, 3, 4. These responder units are linked electrically to a master console. When a multiple choice question is put to the class, each student pushes the button which he feels represents the correct answer. By means of appropriately coloured lights on the master console, the instructor has an instant analysis of which students have right answers.

This system not only provides a rapid means of administering and marking exams (using multiple choice questions only) but permits the instructor to evaluate each lesson or topic by administering carefully chosen criterion questions at the end of each lesson or topic.

Comments from both instructors and students using MATA have been quite favourable. Instructors say that it is an excellent teaching aid, although time-consuming in preparation since each question must be made up for presentation on a projector. Perhaps the most telling comment from a student was "It tells me right away what I know and shows me what I don't know". One instructor's comment was "I was skeptical at first, but now I'm sold and I think as we become more used to the system and all its various applications, MATA will become an even more valuable teaching aid".

In the forthcoming months, we will be explaining other new systems and techniques recently introduced at A.S.T.S.

ITEM 3

WMO TECHNICAL CONFERENCE

A World Meteorological Organization Technical Conference of Hydrological and Meteorological Services was held in Geneva, September 28 to October 7, 1970, primarily to discuss the responsibilities of WMO in the field of hydrology and to recommend ways and means of strengthening the WMO program in the operational aspects of hydrology. One hundred and twenty-five participants representing 55 countries and 7 international organizations attended the Conference. T.L. Richards, Superintendent, Hydrometeorology, was a member of the Canadian delegation which was led by Dr. A.T. Prince Director, Inland Waters Branch, Department of Energy, Mines and Resources.

The Conference endorsed previous recommendations of the WMO Commission for Hydrometeorology which included a change in name to the Commission for Hydrology and enlarged terms of reference covering all phases of operational hydrology. In this connection, it was recognized that activity in such fields as water quality, soil moisture and ground water should be pursued in consultation with other international organizations. In addition, it was recommended that an "Advisory Committee for Operational Hydrology" composed of Directors of Hydrological Services or national representatives of agencies responsible for hydrological services be established as a committee of the WMO Congress. A number of other recommendations were made designed to improve world-wide and regional cooperation between hydrological and meteorological services.

ITEM 4

INTERNATIONAL SYMPOSIA ON THE ROLE OF SNOW AND ICE IN HYDROLOGY

The International Symposia on Snow and Ice, sponsored by WMO, United Nations Educational, Scientific and Cultural Organization (UNESCO), International Association of Scientific Hydrology (IASH), and the Canadian National Committee for the International Hydrological Decade (IHD), will be held at Banff, September 6-20, 1972. The first seven days, at the Banff School of Fine Arts, will be devoted to technical sessions. Topics will include the physics of snowfall and snow distribution, total energy exchange at the air-snow interface, properties, processes and forecasting of river and lake ice and the artificial modification of hydrometeorological regimes. The last seven days will be given over to study tours in southern Alberta and British Columbia. Among the points of interest will be Marmot Creek Basin, Peyto and Athabaska Glacier Studies, the Columbia Icefield, the Federal-Provincial Okanagan Basin Study, Columbia River Development Projects, avalanche forecasting at Rogers Pass, and irrigated land hydrological studies near Lethbridge.

Details of the Symposia are being arranged by four committees, each having a representative of the Canadian Meteorological Service. These are the Planning Committee (T.L. Richards), the Program Committee (H. L. Ferguson), the Local Arrangements Committee (D. Storr), and the Technical Study Tours Committee (H.L. Ferguson, Chairman). Details of the program and a call for papers will be incorporated in an information note scheduled for early in 1971.

ITEM 5

PRESQUILE POINT LAKE TOWER INSTRUMENTATION

A Bedford buoy-tower was installed off Presquile Point in Lake Ontario again this past summer in support of the NRC windwave study. The buoy-tower is situated in 152 feet of water. The meteorological equipment being used includes some of the prototype instrumentation developed for use during the IFYGL program in 1972. The wind, air temperature and water temperature data are being radio-telemetered to shore every six minutes and punched out on paper tape in the ASCII teletype code.

ITEM 6

EVAPORATION PAN - ENERGY BALANCE STUDY

Instrumentation of an evaporation pan energy balance study is underway. The study was initiated by Climatology Division to increase understanding of the physics of evaporation pan operation. Instrument Division is instrumenting the project which calls for three Class A evaporation pans to be fitted with sensors for measuring water temperatures, wall and bottom temperatures, heat flows through the walls and bottom, net radiation on the water surface and of course the evaporation. These measurements will be measured and recorded either continuously or at frequent intervals (15 seconds). One of the pans is to be insulated on sides and bottom to compare performance of insulated and non-insulated pans. A second pan is to be operated as a constant level pan. Two similar pans but deeper (2 feet) are to be similarly instrumented and will be sunk into the ground. So far, two of the Class A pans have been fitted with sensors and installed on the Meteorological Research Site. A pylon has been developed for support of water temperature sensors which enables the upper sensor to move up and down with changes in water level. Development of still wells and Differential

Transformer level measuring instrumentation is ready for testing. The two special evaporation pans have been manufactured on contract. The observational part of the project is to start in the spring of 1971.

ITEM 7

VOYAGE SUR LE ST. LAURENT

Le premier voyage d'accoutumance maritime entrepris par un météorologiste du Bureau météorologique de Montréal a eu lieu vers la fin d'Octobre.

Le cargo allemand, le Suncapri, qui jauge 15,000 tonnes, charge maximum, voyage régulièrement entre Montréal et la Guyane sous contrat de Saguenay Shipping. Je me suis embarqué à Montreal pour ensuite débarquer deux jours et demis plus tard à Halifax.

Le Suncapri, un cargo très moderne bâti en Allemagne de l'Ouest, est entré en service l'année dernière. Pendant ce court voyage nous avons subi beaucoup de mauvais temps. Il y avait de la pluie qui a empêché le chargement à Montréal, du brouillard entre Trois Rivières et la Ville de Québec, encore du brouillard le long de la côte de la Gaspésie, et des vents très forts sur le Golfe. Le capitaine W. Hesse m'a dit ---- "Ca va mal depuis que vous vous êtes joint à nous. Nous avons un Jonas abord. Savez-vous ce que nous faisons d'un Jonas?" Je lui ai répondu ---- "Sans doute vous le jetex aux requins, mais pour le moment j'espère que vous pouvez retarder cette démarche jusqu'à l'arrivée à Halifax". Selon le capitaine, "Canada" veut dire mauvais temps. Evidemment, on a moins de problèmes aux Caraïbes, pourvu qu'on évite les ouragans.

Les prévisions météorologiques que nous avons reçues de Montréal et d'Halifax étaient très bonnes, mais ça forme le sujet d'une autre rapport.

Le pilote qui nous a guidé entre la Ville de Québec et les Escoumains a dirigé le navire près de Tadoussac à fin que je puisse mieux voir l'embouchure du Saguenay. Celle-ci paraît plutôt étroite vue du fleuve. Nous avons pu distinguer les bâtiments de Tadoussac et l'immense colline ronde, "La Boule", au-delà de laquelle la rivière Saguenay change de direction plus au nord (en amont). Un fois le pilote débarqué aux Escoumains, nous avons traversé la fleuve pour voyager le long de la côte Gaspésienne à une distance de deux à trois milles. Il était possible de voir, muni de jumelles, les avions que décollaient de l'aéroport de Mont Joli.

En traversant le Golfe, nous sommes passés au nord des Iles de la Madeleine. Tout ce que j'ai vu de ces îles était Bird Rock, un rocher plat qui s'élève quelques cent pieds au-dessus des vagues et dont les flancs sont blancs en raison des milliers de oiseaux qui s'arbitrent là.

Influencé par une tempête en développement au sud de Terre-Neuve, un vent très fort soufflait sur le Golfe. En nous dirigeant vers le sud-est, nous avions le houle à babord et par conséquent nous avons été sujet à un roulis régulier. La période était environ neuf secondes, et l'angle entre les mâts et la verticale parfois a atteint trente-cinq degrés. Il n'était pas du tout facile de se déplacer sur le navire.

Puisque le cargo (et la plupart de l'équipage) était allemand, tous les renseignements se trouvaient, naturellement, en allemand. Un instant de réflexion et on pourrait se débrouiller avec Kapitän, Steuerhaus, Schwimmveste, etc. Mais il y avait un avertissement sur la paroi de l'écoutille qui m'a fort intrigué c'était "Kopfsprung Verboten". Pourquoi quelqu'un a trouvé nécessaire d'aviser les marins, supposé

raisonnables, de ne pas se projeter tête en bas dans les cales? Le deuxième officier, originaire des Philippines, qui étudie l'allemand, m'a expliqué la chose en riant. Au bout de l'écoutille il y a un réservoir aménagé pour recevoir les panneaux de l'écoutille pendant le chargement. En pleine mer on le remplit d'eau et voilà.....une piscine instantanée. Etant un peu plus d'un mètre en profondeur, on n'y plonge pas.

J'ai trouvé les repas très bons. Une nourriture substantielle pour ceux qui voyagent en pleine mer ----- ragoûts appétissants, poulet, poisson, salades, fruits. Aucune trace des aliments comme gâteaux, tartes, pâtisseries, crème glacée (si attrayants au goût mais si nuisants à la santé). Le pain allemand est nourrissant, mais il faut avoir les dents bien solides avant de s'aventurer.

"Pourquoi déparquer à Halifax? Venez à la Guyane avec nous." j'étais fort tenté. Suivant des escales aux Bermudes, à la Barbade, et à Georgetown, on remontait la rivière Demerara jusqu'à Mackenzie où on se chargeait de bauxite destinée à Port Alfred. Le capitaine a décrit ce voyage sur la Demerara.....comme si vous voyagiez en gros navire dans les forêts tropicales. La jacasserie des perroquets, des singes, et les autoctones des cases ser piloties qui venaient se baigner en famille dans la rivière. Comme j'ai déjà dit, j'étais fort tenté, mais je jugeais que la Meteo ne favoriserait pas l'idée d'accoutumance maritime à ce point-là.

La soirée avant le départ, les deux officiers et moi, nous avons échangé quelques histoires en buvant de la bière allemand. Le premier officier, M. Coonah, a conté un incident bizarre qui s'est passé en Angleterre. Je me garde de citer le port en question, mais les Beatles s'y trouveraient chez eux. On avait mis dans les cales une assez grande quantité de boisson forte, fermée derrière un mur de grosses poutres. Pour sécurité additionnelle on avait façonné une digue de sacs de farine allant de haut en bas et épaisse de plusieurs sacs. Alors, on a filé tranquillement. C'était ignorer l'ingéniosité des débardeurs de L..... Oops. Enfin, deux hommes sont restés enfermés dans la cale. Il paraît que l'un d'eux a enlevé un sac ou deux, découvrant un tunnel dans le mur de sacs, surnoisement fait pendant le chagement de la cargaison. L'autre a grimpé dans le tunnel pour attacher un croc aux poutres et le treuil a fait le reste. Deux cent caisses ont disparu. Les autorités sont devenu~~e~~s soupçonneuses quand le bruit courrut que l'on pourrait acheter une bouteille de Scotch pour deux dollars à n'importe quel carrefour de L.....

Nous sommes entrés paisiblement au port d'Halifax le jour où le Bonaventure était censé laisser le port pour être remorqué jusau'au Japon. En pensant aux retours de Chypre et des Bermudes, j'ai versé une larme symbolique pour le brave Bonnie qui n'est plus.

J.R. Miller
Montreal, le 13 novembre, 1970.

ITEM 8

JOINT FRS-FIELD RESEARCH PROJECTS

In recent months a number of cooperative actions have been taken involving Headquarters and Regional personnel in the initiation or conduct of forecast research projects. Out of these actions is emerging experience from which the CMS can learn how the creative initiative and energies of meteorologists concerned with modernizing operational methods can combine to undertake a host of developmental tasks that have emerged as requiring urgent attention if the quality and quantity of our forecast service is to be improved.

Vancouver -- A project is underway by the Scientific Services Officer (S. Nikleva) in consultation with the FRS in order to develop a largely automatic method for preparing daily forestry weather forecasts for 35 locations during the fire season. Sizeable data gathering statistical analysis and experimentation is involved. Another project deals with statistical-physical quantitative prediction of precipitation and is being carried out by several meteorologists under the leadership of L. Parent. The project has been outlined for management, and allocation of manpower and computer resources to the project has been approved.

Halifax -- Meteorologist A.L. Bealby has been assigned to a six-month study of the potential for computer assistance and automation of operations of the Ice Central. In this work Mr. Bealby cooperates with W.E. Markham, Officer-in-Charge, and reports to the Forecast Research Section (FRS) which has supervisory responsibility for the project.

Montreal -- Scientific Services Officer Norm Powe is collaborating with the FRS in analysis of the surface wind rose at Dorval in relation to the simultaneous geostrophic winds prepared from five years' surrounding hourly data. Estimates of surface wind roses at Montreal Airport II from Dorval wind roses and a short period of wind records at Montreal II, as well as the results of a longer period of measurements, are to be compared with a physical estimate, based on terrain, of the differing response at the new airport to an assumed common geostrophic wind rose. Runway orientation decisions in the relocation of other major airports will be aided by experience with this method.

Winnipeg -- Close contact is now being maintained between Weather Central meteorologist Mike Balshaw and Clive Jarvis of the FRS in the evaluation and statistical analysis of the influence of a number of important dynamic properties of atmospheric flow on observed weather elements. Parallel investigations had been proceeding in this area and very encouraging results suggest the desirability of further allocation of resources to this work.

All of these projects form necessary building blocks in a long term program of research leading to forecast automation.

ITEM 9

ERROR FEEDBACK IN THE CAO BAROCLINIC MODEL

The monthly mean errors of the CAO baroclinic forecast model are characterized by geographically fixed large scale patterns with an annual cycle. These persistent errors, increasing linearly with forecast period, are due to the adiabatic assumption in the model, i.e. the neglect of radiation, latent heat and sensible heat exchange. These energy source terms have been included in experimental versions of the model, but they are considered too complex and time-consuming for real-time operations. The simpler approach of estimating these terms from the forecast error was therefore adopted.

At each one-hour time step of the model integration a correction is made to each grid-point at each level based on accumulated error statistics. The correction fields are continually updated by adding a small fraction of the error for the latest 24-hour forecast to the previous accumulated error field. The correction fields thus contain no diurnal component, and the large errors associated with individual synoptic systems carry little weight.

This procedure, which commenced on October 27, has been found

to reduce not only the mean error or bias of the forecasts, but also the root mean square errors of both height and windspeed. Due to the large scale of the correction patterns, the height forecasts do not appear significantly different but the by-products of the model, the wind and precipitation forecasts, show definite improvement. The most marked changes are to be expected in the statistical maximum and minimum temperature forecasts, especially for stations such as Kamloops which have previously demonstrated a serious bias.

It should be noted that statistical procedures are notoriously unreliable in rare or unusual situations, and the present scheme is no exception. One case of "digging" in Western North America was very poorly handled, and, while this was the only serious deterioration to occur during the 30-day test period, it is to be expected that other peculiar configurations will arise in the future.

ITEM 10

PERSONNEL

The following have accepted positions as a result of recent competitions:

- Competition 70-MET-HQ-17 - Meteorology MT5
Supervising Forecaster
Weather Office, Edmonton
- L.R. Layton
 - W.J. Sowden
- Competition 70-PTAH-64 - Regional Superintendent
Scientific Support Services Unit
Pacific Regional Headquarters
Vancouver
- J.B. Wright

The following transfers took place:

- Dr. P.E. Carlson - To: Forecast Research Section, Toronto
From: Dynamic Prediction Research Unit
Montreal.
- R.G. Lawford - To: A & P Unit, Central Analysis Office
From: W.O. Edmonton
- P.B.H. Lee - To: A & P Unit, Central Analysis Office
From: A.W.C. Halifax
- D. Mudry - To: CFB Uplands
From: W.O. Gander
- A. Pohl - To: W.O. Gander
From: W.O. Resolute
- Dr. R.H. Shaw - To: Micromet. Research Unit, Toronto
From: Educational Leave, McGill
- C.H. Sutherland - To: Scientific Support Unit, Moncton
From: W.O. Gander
- Mrs. W.A. Batten (nee Ticknor) - To: School of Meteorology, Trenton
From: W.O. Edmonton

NORAD Certificate of Achievement to B.V. Benedictson

Mr. B.V. (Vern) Benedictson, Base Meteorological Officer at CFB Comox, has been awarded the NORAD Certificate of Achievement in recognition of his recent outstanding work while on a tour of duty as Chief of Operations and Training at the USAF 4th Weather Wing H.Q., Air Force Base Colorado.

Vern is a 26-year veteran of the Meteorological Service. On the occasion of the presentation he received a congratulatory message from the ACMS, quoted in part "Such an excellent performance serves as further confirmation of the high standards established by personnel of the Canadian Forces Weather Service both in Canada and Abroad."



Mr. Vern Benedictson is shown receiving the NORAD Certificate of Achievement Award. The presentation was made by Col. G.H. Nichols, Base Commander, CFB Comox on behalf of the Commander-in-Chief, NORAD.

C.H. (Conn) Sutherland Leaves Gander

Mr. C.H. (Conn) Sutherland recently assumed the position of Regional Superintendent of Scientific Support Services, Canadian Meteorological Service, in the Atlantic Air Services Region in Moncton on October 15th.

Born in Nova Scotia, Mr. Sutherland is a graduate of Dalhousie University. He spent some years as principal of schools in several Nova Scotia communities.

During his career with the Meteorological Service, which he joined in 1941, he completed a number of assignments. One of these involved forecast services to 164 Transport Squadron RCAF as well as civil interests while stationed at Moncton Airport. From 1955 to October of this year, he occupied the position of Officer-in-Charge of the Gander Weather Office, Newfoundland. The Gander Office provides weather service for international and domestic aviation in addition to handling the requirements of the public, marine and industrial interests of Newfoundland itself.

His wife, Frances (nee Carson), was also a forecaster at Moncton Airport during the war years. She is a native of St. Andrew's-by-the-Sea and a graduate of Mount Allison University. Their son, John, is a Systems Analyst with a Toronto Computer firm.

On October 8th, a dinner in honour of Conn and Frances, sponsored by the staff of the Gander Weather Office, was held at the Gander Hotel. A number of prominent members of the community of Gander, in which the Sutherlands are held in high esteem, attended. Three oil paintings of typical Newfoundland scenes were presented to them. One picture was the work of Mr. Frank Rowe, Officer-in-Charge of the St. John's Weather Office, who was present for the occasion.



In the picture above, reading from left to right are: Conn, Fran, Frank Rowe and (seated) Father McCarthy a close friend of the Sutherland's for many years.

J.L. (Jamie) Galloway Retires

Mr. James L. (Jamie) Galloway, meteorologist at the Central Analysis Office, retired in October 1970. Mr. Galloway was a graduate of the University of Edinburgh and joined the British Meteorological Office in 1936. Shortly thereafter he was sent to Iraq to help set up and operate the meteorological office at Airport Basra. He returned to England in 1939. During the war he was Senior Meteorological Officer for No. 4 Group, RAF, and for a time acted in a similar capacity for No. 6 RCAF (Bomber) Group. From 1945 to 1948 he was the British representative on a four power Committee on Meteorology in Germany. From 1948 to 1952 he was at the Air Ministry in London as Chief Meteorological Officer for Fighter Command. From 1952 to 1955 he was employed by the World Meteorological Organization in Geneva as Chief of the technical assistance activities of WMO in the United Nations Program of Technical Assistance. During his career he visited forty countries in connection with his work.

In 1955 Mr. Galloway joined the Canadian Meteorological Service and, except for a brief tour in the Montreal Weather Office, was stationed at the Central Analysis Office. For most of that period he was a shift supervisor in the Analysis and Prognosis Unit.

A dinner in honour of Mr. and Mrs. Galloway was held in September at Le Vieux Moulin in Pointe Claire with about seventy friends in attendance. A gift of money was presented to him at that time.

Following his retirement, effective October 18, 1970, Mr. and Mrs. Galloway plan to make their home in Western Canada, but expect to travel extensively.



JAMIE GALLOWAY RESPONDS