

MAR 31 1971



MONTHLY REPORT OF THE CANADIAN METEOROLOGICAL SERVICE

FEBRUARY 1971

1871



1971

FEBRUARY 1971

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TRIVIA

Forecast Fee Schedule
(Courtesy CFWO, CFB Portage La Prairie)

MONTHLY REPORT OF THE
CANADIAN METEOROLOGICAL SERVICE

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ITEM 1

SIR HENRY LEFROY - 1817-1890



The following biography of Sir Henry Lefroy was written
by Dr. Andrew Thomson as part of a continuing series of
biographic sketches on previous Directors

John Henry Lefroy was born at Ashe, Hampshire, England, January 28, 1817, the son of Rector J.H.G. Lefroy, being the sixth of eleven children. He was only six years old when his father died. Soon after, the family moved to Ewshott and in 1826 he first went to school at Alton. In later life Lefroy wrote that the school at Alton was a bad school, so bad that some traits of it would seem hardly credible: "The master was hardly a gentleman but ground Latin grammar into us very well". Lefroy's mother moved him in 1828 to a school at Richmond where Lefroy learned Greek, but little else. In January, Lefroy passed the entrance examination to the Royal Military Academy where he wrote that "swearing and abominable language prevailed to a frightful degree and at the time the moral state of the academy was very shocking". Lefroy graduated from the academy in 1831 and for a few years was stationed at Woolwich before he was finally promoted to 2nd Lieutenant and posted to Chatham.

At Chatham, Lefroy was able to secure professional instruction with the Engineer Officers, which was rarely available to Artillery Officers such as himself. However his lack of science and mathematics when he arrived at Chatham led Lefroy and another junior officer to suggest the establishment of the Royal Artillery Institution to provide adequate instruction. Starting in a small way the Institution grew slowly. However when Lefroy finally returned from his position in Canada he was appointed Secretary of the Institution and securing a large government grant a new building for the Institution was opened in 1854.

In the 1830's the imagination of the scientific world was attracted to terrestrial magnetism in about the same way as pollution is attracting scientific and popular attention today. Resulting from this popular interest, the British Government was approached by the Royal Society, the British Association for the Advancement of Science and by German scientists, to establish magnetic observatories around the world. The British Government agreed with the proposal and selected sites for five magnetic observatories to be located at or in St. Helena, Cape of Good Hope, Van Diemens Land (Tasmania), Canada and India. Col. Edward Sabine was appointed Superintendent of all stations 1839 to 1853.

John Henry Lefroy was one of the specially selected officers to be sent to Prof. Lloyd of Dublin University for instruction before proceeding to a magnetic observatory. Lefroy was appointed to the St. Helena Observatory and after a long devious voyage he arrived at St. James Bay, St. Helena on January 31, 1840. He remained at St. Helena until February 1842 setting up the observatory and subsequently taking observations. Lefroy was present at the day long disinterment of the body of the great Napoleon Bonaparte and he has recorded that the body was perfectly preserved with the features distinguishable and the dress as unimpaired as when he was buried.

In August 1841, Lefroy was offered the Observatory in Canada and together with it the survey of Western Canada. Landing in England on April 4, 1842, he spent fourteen weeks busily preparing for the magnetic

survey. Lefroy crossed the Atlantic in six weeks taking magnetic observations every day. He took a three week visit to the Eastern United States, meeting its leading scientists including Agassiz, Dana and Joseph Henry - also President Jackson. On subsequent occasions Lefroy met, at various times, five American Presidents. Lefroy reached Toronto and then travelled on to Montreal arriving on April 16, 1843 after a rough jolting journey from Toronto in an open country waggon. The effects of the jolting on the instruments was disastrous and the letters from England with introductions to the Hudson's Bay Company and important instrumental equipment had not arrived when Lefroy started up the Ottawa River on May 1st.

Space does not permit giving the exciting details of what Lefroy referred to as the second act of his humble part on the theatre of life. With one European assistant, he travelled from Montreal through Western Canada reaching Fort Good Hope lat. $66^{\circ}16'$ on May 20, 1844, returning to Toronto November 18, 1844 and Montreal a week later. A few places and dates are given here to indicate Lefroy's route:

May 20, 1843	-	S. Ste. Marie
June 28, 1843	-	Fort Garry
July 23, 1843	-	York Factory
Aug. 12, 1843	-	Norway House
Aug. 20, 1843	-	The Pas
Sep. 23, 1843)	-	Fort Chipewyan
Mar. 25, 1844)	-	
Mar. 26, 1844)	-	Fort Simpson
May 25, 1844)	-	
May 29, 1844	-	Fort Good Hope
June 30, 1844	-	Fort Chipewyan
Aug. 19, 1844	-	Edmonton
Sep. 6, 1844	-	Norway House
Oct. 10, 1844	-	Fort William

On the long stay at Chipewyan September 23, 1843 to March 25, 1844, he built a temporary observatory and when finished on October 15th observations were commenced. These were taken hourly, day and night, by Lefroy and Corporal Henry and on all occasions of magnetic disturbance were taken at intervals of about two minutes uninterrupted for hours at a time. Until about 1910, Lefroy's continuous and painstaking method of observation was universally recognized as the ideal standard for all work of this kind. During the survey through Western Canada, he travelled 5,475 miles and made observations at 314 stations en route.

A very interesting account of Lefroy's travels is given in "In Search of the Magnetic North" being intimate letters of Lefroy to his mother while making the survey. The letters were collated and edited by George F. Stanley and published by MacMillan Canada 1955.

On his return to Toronto in November 1844, Lieutenant Lefroy found the work at the Observatory "terribly in arrears and the buildings

in very bad shape". A year later, on November 21, 1845, Lefroy was able to write to Lieut. Col. Sabine that he was transmitting the magnetical returns for the last two months. In addition to Lefroy's extraordinary efforts the N.C. officers had exerted themselves to the full to clear off the accumulation of arrears which had not been caused by any deficiency on their part.

On April 16, 1846, Lieut. Lefroy was married to Emily Robinson and the happy couple left for England. While there Sabine, who was "hot" on introducing photographic recording of magnetic records, insisted on Lefroy learning photography from a teacher who was quite incompetent. Lefroy's life, on his return to Toronto November 21, 1846, was made miserable for the two following years with his experiments on photographic registration.

For his work in St. Helena and Canada, Lefroy was elected a Fellow of the Royal Society on June 9, 1848. About the same time a dear friend of Lefroy's, Augustus Fraser, died leaving Lefroy a legacy of £4,000.

Lefroy's heavy routine work at the Observatory combined with his efforts to reduce photographic registration to a certainly brought about a general impairment of his health and in 1850 his physicians ordered him to take leave in England. Also in 1850, the Ordnance Department decided to discontinue and dismantle the Toronto Observatory and recall Captain Lefroy to England on completion of his term of duty in Canada.

After his convalescence Captain Lefroy, on his return to Toronto, strongly recommended that the Canadian Government continue the Observatory. The Canadian Institute, which was an important general science organization in Toronto of which Lefroy was Vice-President, also memorialized the Government and it was finally agreed that the Observatory would be taken over by the Provincial Government on March 31, 1853. The Government made a grant of £2,000 to replace the wooden Observatory building, located on the site of the present Galbraith Engineering Building, by a stone building. This stone building was subsequently moved stone by stone to its present site south of Hart House.

Lefroy's departure for England was greatly regretted by Toronto's leading citizens as can be judged by their accounts at this time of his character and standing in the community -- "Lefroy was a man of singularly attractive personality --- A fellow of the Royal Society, he was at the same time, a man of simple piety --- Few gentlemen ever visited this country who acquired so general esteem as Mr. Lefroy; his gentlemanly bearing and affable manners endeared him to us all".

On his return to England, Lefroy was appointed "scientific adviser on artillery subjects" and wrote "Handbook of Field Artillery for the use of Officers" which was a textbook for Artillery Officers until 1884. In 1855 the entire administration of the British War Office was placed on a new basis. The Board of Ordnance, which had existed from Henry VIII's

time, was abolished and although Lefroy's title was changed his duties remained the same as adviser on artillery subjects. His most important recommendation was to have the barrels of all weapons, from rifles to cannons, rifled instead of having a smooth bore.

On October 26, 1855, the Minister of War ordered Lefroy to proceed immediately to Constantinople to improve hospital arrangements in the Crimea for wounded soldiers in the field and during their journey home. He made the acquaintance of Florence Nightingale, with whom he enjoyed a life-long friendship.

Lefroy continued in the War Office until his retirement on April 1, 1870 with the honorary rank of Major General. His wide range of activities, from hospital reorganization in Crimea in 1855 until 1870, included membership in the Royal Commission on the Defence of the United Kingdom 1859, and Secretary and later President of the Ordnance Select Committee. He was finally appointed Director-General of ordnance, but when he failed to secure the changes in the administration of the army that he desired, he resigned, his last service in the War Office being as a member of a committee to consider the proposed submarine defence of certain harbours.

In March 1871, Lefroy was appointed Governor and Commander-in-Chief of Bermuda. While Governor he wrote a history of the discovery and early settlement of the Bermudas in two bulky volumes and resumed magnetic and meteorological observations in the colony. He was interested in the social welfare of Bermuda and its scientific, literary and social activities. He had much sympathy with the negro population and was often spoken of as the "Negro Governor" by those who despised this race. Altogether Lefroy greatly enjoyed his six year term of service in Bermuda.

He returned to England by way of New York, Washington, Boston and Canada, visiting many friends and distinguished Americans including Prof. Joseph Henry at Washington and at Boston Prof. Asa Gray, Longfellow, Russell Lowell and many scientific men. While at Niagara Falls he heard that the Queen had conferred on him the honour of knighthood (K.C.M.G.). After spending three weeks in Canada, Sir Henry and Lady Lefroy sailed from Quebec on July 7, 1880.

Sir Henry Lefroy had been greatly weakened by an illness in 1877 while in Bermuda and had never fully recovered. He had planned, after his return to England, to spend the winter in Malta. However, shortly after his arrival in England he received, unexpected and unsought, an offer of a temporary appointment as Governor of Tasmania. Sir Henry gladly accepted and on October 21, 1880 was able to take up residence in Government House, Tasmania, which was so much grander and more comfortable than Government House, Bermuda. He was enthusiastically received by the people of Tasmania and enjoyed the beauty and novelty of Tasmanian scenery. His interest in terrestrial magnetism continued and he wrote a paper published by the Royal Society on "The Magnetic Variation at Hobart".

Sir Henry Lefroy returned to England in May 1882 and lived in London for three years. He wrote his "Diary of a Magnetic Survey of a Portion of the Dominion of Canada" at this time which was published in 1883. Sabine's maps of Lefroy's magnetic survey published in 1846 and 1872, had shown only smoothed values for Lefroy's observations which was not satisfactory to Lefroy as the latter rightly considered his determinations of the magnetic values at each station were accurate.

Sir Henry visited Canada in August and September 1884 as President of the Geographical Section of the British Association for the Advancement of Science, and gave his Presidential address at Montreal. He received the LL.D degree from McGill University and wrote to his sister that he had "at last the right to a cap and gown, the object of my ambition". He travelled as far west as Winnipeg, and on his return visited Toronto where he saw his younger son, A.H.F. Lefroy K.C. (1852-1919), married. This son practiced law in Toronto, became a leading authority on constitutional law and was a member of the law faculty of the University of Toronto from 1900 until his death. Sir Henry Lefroy's name is preserved in Canada by having a mountain in the Rockies named after him and a village in Simcoe County, Ontario.

Sir Henry and Lady Lefroy returned to London from Canada, but a severe attack of congestion of the lungs forced Sir Henry to leave London in the autumn of 1885 and settle in Cornwall where he died on April 11, 1890. He was buried near his birthplace at Crowall, Hampshire beside the body of his first wife. He was twice married. As already noted his first wife was Emily Robinson of Toronto and his second wife Charlotte Anne, widow of Colonel Armine Mountain, who with two sons and two daughters survived Sir Henry.

Sir Henry Lefroy was a good scientist and an incredibly hard worker. As a friend wrote of him "he contrived to find for himself ceaseless work such as few men venture to undertake". He wrote eight books and over eighty papers. These books and papers showed high scientific attainments, but these were not the particular qualities which endeared him to all who came within the range of his charm. His clear blue eyes and winning smile invited confidence and admiration. Sir Henry was a devout member of the Anglican Church and a stalwart kindly christian gentleman.

ITEM 2

EASTERN SNOW CONFERENCE

Eighty-four scientists including 10 from the Canadian Meteorological Service attended the 28th Eastern Snow Conference held in Fredericton on February 4-5, 1971. Eleven scientific papers were presented including four by Canadians. One of these was a paper on Ice Forecasting

by Mr. W.E. Markham of the Ice Forecast Central, Halifax. Papers dealing with basin snowmelt and snowmelt runoff gave indication that modelling of snowmelt processes based on energy budget considerations and basin topographical features in a number of forested mountainous areas in the north-eastern United States is producing good results. Another paper was presented on the forecasting of winter-time water surface temperatures of the St. Lawrence River based partly on ART data provided by the Headquarters' Hydrometeorology Section.

ITEM 3

FORT RELIANCE C.M.S STAFF AND SNOWMOBILE AID IN MEDICAL EVACUATION

The Ski-do type of snowmobile sent to Fort Reliance in mid-January 1971 came in handy a month later when the lives of two babies were threatened.

A native family group was camped about two miles from the isolated weather station at Fort Reliance. On the night of February 16-17 a member of the group came to the station and requested the staff to contact the Northern Health Nurse as two of their babies, one four months old and the other seven months, were sick.

Northern Health in Yellowknife was contacted by radio and requested a check of the children's temperature and general condition. As a result of this check two nurses arrived by chartered aircraft and were taken to the camp and brought the children back for evacuation by aircraft to a hospital in Yellowknife. The Ski-do was used for transportation of the nurses and children between the camp and the aircraft and it is thought that this quick action was critical in the survival of at least one of the children, as the seven-month old child required artificial respiration; she was choking with fluid in her throat and lungs.

Congratulations to the O.I.C John Turner and his staff Brian Davies and George Key, and cook Frank Wilson, for a job well done.

ITEM 4

QU'EST-CE QUE VOUS DITES LA? ENCORE DE LA NEIGE?

Jeudi, le 4 mars, une tempête s'est abattue sur Montréal et la Province de Québec. Ce n'était pas simplement une autre tempête, mais

en faire "une de ces tempêtes", certains diraient "la tempête du siècle".

La neige a commencé mercredi soir, devenant plus intense pendant la nuit pour aboutir à un vrai "blizzard" jeudi. Vers midi, les rafales de 40 à 60 milles-à-l'heure ont réduit les visibilités à zéro à cause de la neige et la poudrerie. Environ dix-huit pouces sont tombés sur Montréal et ça en plus des dix ou douze pieds de neige déjà tombés cette saison. S'il existait un marché pour la neige, les citoyens seraient tous riches. La tempête rageuse a supprimé tout semblant de vie normale dans la ville de Montréal et dans le sud du Québec jeudi, vendredi, et même pendant la fin de semaine.

Au Bureau Météorologique, nous avons subi les mêmes harassements que la population. Ceux qui sont arrivés au bureau à minuit mercredi et à huit heures du matin jeudi sont sortis vendredi à quatre heures de l'après-midi, ceci étant leur première opportunité d'aller se reposer. Comme ça, les météorologistes Ring, Desautels et O'Doherty ont passé 32 à 40 heures à leur poste. Ceux qui ont voulu se servir de leur voiture, stationnée à l'extérieur pour aller à l'aéroport jeudi l'ont vue disparaître sous un manteau blanc. Les voitures se trouvant entre deux bancs de neige hauteur dix pieds, et avec des vents de soixante milles à l'heure, c'était l'affaire d'un moment. Notre observateur, M. MacNair, est resté emmuré dans sa cabane durant vingt-quatre heures, seul et sans nourriture avant que de l'aide ne lui soit parvenue.

Parmi les grandes villes du monde, Montréal se trouve seule dans l'obligation de faire face aux difficultés d'enlever une telle quantité de neige des rues. Selon son honneur le maire, M. Jean Drapeau, les allocations pour cette saison approchent seize millions de dollars. Décidemment, on n'oubliera pas très vite cet hiver.

J.R. Miller
Montreal, le 10 mars, 1971.

ITEM 5

DR. MCINTYRE'S SPECIAL ASSIGNMENT WITH ENVIRONMENTAL QUALITY DIRECTORATE

Dr. D.P. McIntyre, Chief of the Research and Training Division, has been appointed CMS representative on the Task Force on Program Objectives and Activity Structure, Department of Fisheries and Forestry. For the month of March he will be working in the Environmental Quality Directorate of the Department, which has a directive from the Minister to make recommendations relating to the objectives of the environmental quality program, which includes the CMS.

ITEM 6

COMPUTER-PRODUCED CLOUD FORECASTS

Last December, the Analysis and Prognosis Unit began to transmit predicted cloud-cover charts over the facsimile circuits. These are for the region of the atmosphere over 10,000 feet and are valid for 18 and 24 hours after initial time. Simultaneously, cloud forecasts for three layers of the atmosphere centred at 850, 700 and 500 mb were made available from the computer as guidance material on an operational basis. Stratiform and cumuliform clouds are predicted in exactly the same manner as large scale and small scale precipitation amounts, but with somewhat less restrictive threshold values. At 18 hours, for instance, the onset of large scale precipitation may take place at a dew point depression of 6.2 C deg, but stratiform cloud may begin to form at a dew point depression of 6.8 C deg when the temperature is - 30 deg C, and at a dew point depression of 8.3 deg C when the temperature is 0 deg C. Although the air has to be in ascending motion for large scale precipitation to occur, stratiform cloud is permitted with slight subsidence.

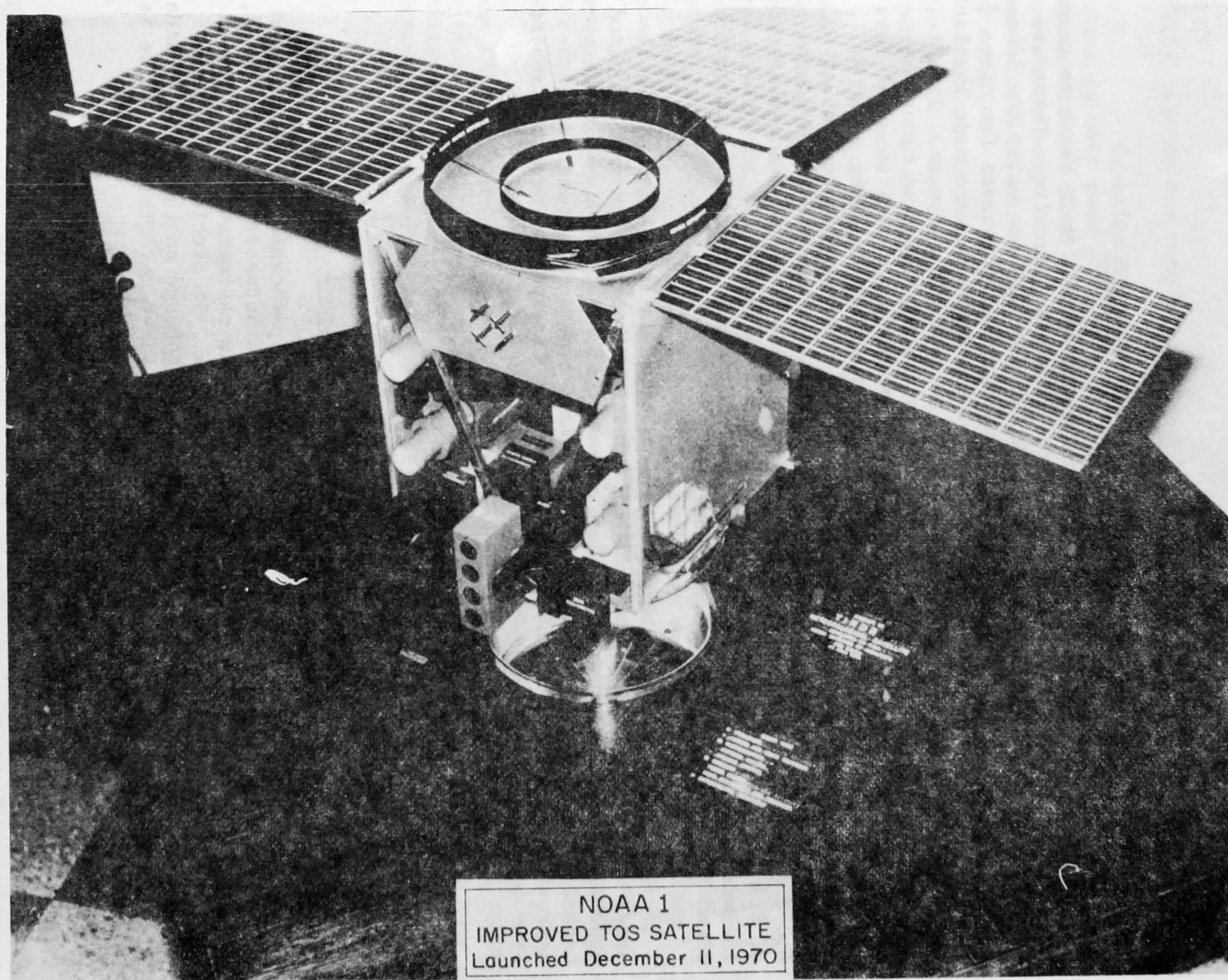
The computer product is capable of delineating the main cloud areas quite well, and makes useful distinctions between the various cloud types. The main weakness is a lack of vertical resolution. With the present technique, it is impossible to specify cloud tops and bottoms to the nearest 2,000 feet, yet this kind of accuracy is expected from the subjective forecasts.

ITEM 7

LATEST WEATHER SATELLITE NOAA-1

NOAA-1, the second meteorological spacecraft of the Improved TIROS Operational Satellite series, was launched successfully December 11, 1970. This spacecraft was injected into a polar retrograde orbit with an inclination of 101.9° at an altitude of 755 n.m. It circles the earth every 114.08 minutes, crossing the equator northbound on the daylight side of the earth at approximately 1500 hrs. local sun-time. This satellite is similar to I-TOS-1, the first of the I-TOS series.

It was given the new name "NOAA-1" instead of I-TOS-2 to signify inclusion of the meteorological agencies within the new National Oceanic and Atmospheric Administration of U.S. government services. This new spacecraft carries two vidicon cameras which transmit information both via the Automatic Picture Transmission (APT) system, to real-time users, as well as over broad band via the Advanced Vidicon Camera (AVCS) System, to the Command and Data Acquisition (CDA) stations for use in global weather



NOAA 1
IMPROVED TOS SATELLITE
Launched December 11, 1970

analysis. NOAA-1 also carries two Scanning Radiometers (SR) which may operate in either the visual or IR mode and transmit this data both to APT and CDA stations.

After the gravity gradient system stabilized the spacecraft in orbit, a post launch check-out of all of the systems was conducted. All sensors were operating, but there were some unassessed troubles with one of the radiometers. However, during a four day period, 16-19 January inclusive, an operational evaluation was carried out, to assess the quality and calibrate the sensor systems for operational application. This revealed a conflict at certain periods with the ESSA-8 transmission, when both spacecraft were in the same geographical area, since both transmit on 137.62 MHz frequency. It determined that some conflict is likely to occur for 21 days in every 53 days between the satellites. Serious effects would probably exist for 10 days out of the 21 days. NOAA will, therefore, be commanded off, at properly prescribed times, during serious conflict periods so that it will not interfere with reception of data from ESSA-8, the present operational TOS spacecraft.

This new spacecraft is currently a back-up for I-TOS-1, launched in January of 1970, which has been operated successfully for almost a year. At the present time, NOAA will be used only in the IR mode both day and night. The vidicon cameras will be activated only when I-TOS-1 fails, or shows indication of an impending failure. These IR transmissions which are received locally during mid-afternoon now provide a second coverage of cloud dispositions, etc., to show the progress of weather systems, since the visual satellite data from the ESSA-8 spacecraft is received during the mid-morning period of the same day.

The Satellite Data Laboratory of the Canadian Meteorological Service, at Toronto International Airport, has been acquiring NOAA-1 data since the spacecraft check-out was completed. Night-time and afternoon IR data is currently being passed to the Toronto Weather Office for forecast applications. The Laboratory has been requested by the National Environmental Satellite Service (NESS) of NOAA, to obtain information for them on the exact times of conflict with ESSA-8, plus the effects of such conflict upon data received. This Canadian receiving station, being farther north, is in a better position to obtain this type of data since the conflict occurs when NOAA is disappearing Northbound over the pole and ESSA-8 is, at the same time, approaching Southbound from the polar region. The accurate assessment of such conflicts will assist in preventing the loss of information from either spacecraft.

ITEM 8

THE WMO GLOBAL AIR POLLUTION NETWORK

The WMO Executive Committee has agreed to organize a Global Network of air pollution sampling stations to provide basic observations

for studies of climatic change over decades. Two types of stations have been defined:

(a) Baseline Stations

In remote regions, far from towns and local sources of pollution.

(b) Regional Stations

In rural and semi-remote areas, at least 100 miles from towns, with no land-use changes expected in the next 50 years.

The minimum program consists of turbidity observations, once daily whenever a direct siting of the sun is possible, and chemical analyses of monthly precipitation. In addition, at baseline stations, a once-daily flask of air will be collected for subsequent chemical analysis.

Three Canadian baseline stations are being organized, at Ship Papa, Sable Island and at a site in the Arctic. In addition, there will be seven regional stations, including Suffield, Alberta, and White-shell, Man.

The turbidity measurements are being organized by the Physical Research Unit. Photometers have been requisitioned and should be available for field testing by summer.

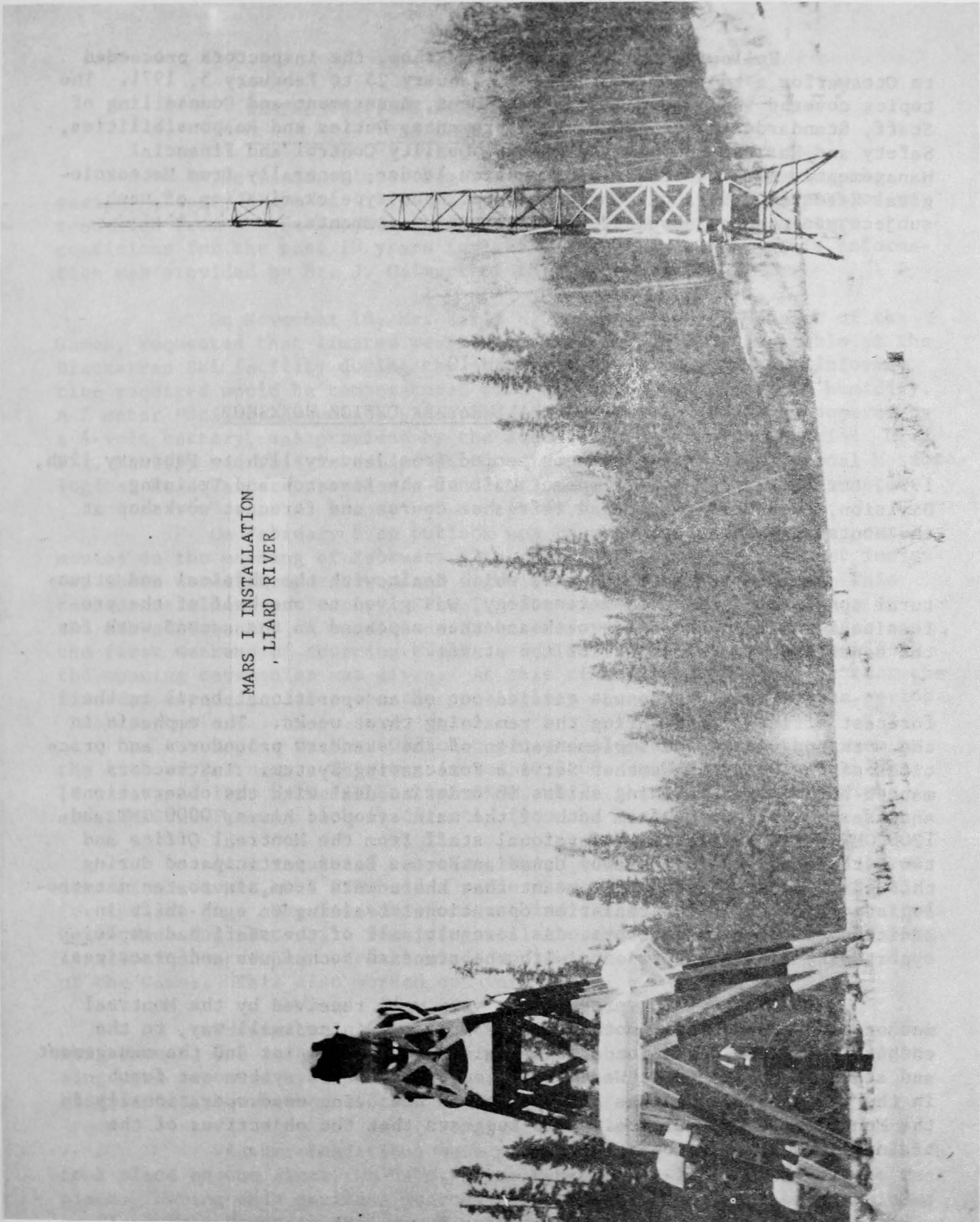
The other part of the program is being arranged by the Micro-meteorological Research Unit. The Air Pollution Control Division of the new Department of the Environment has agreed to undertake the chemical analyses. Initial observations are expected this spring.

ITEM 9

METEOROLOGICAL INSPECTORS' WORKSHOP AND SEMINAR

A three week instrument workshop, January 4-22, 1971, was held at the Scarborough Field Station. The first two weeks dealt entirely with the maintenance and calibration of the MARS system. The third week dealt with installation, maintenance, calibration, repair and testing of U2A and 45B wind equipment, U2A recorder, tipping bucket raingauge, Fischer Porter precipitation gauge, and barometers. Fifteen inspectors successfully completed the course. All Regional Offices were represented as well as the DEW Line and Meteorological Headquarters.

MARS I INSTALLATION
, LIARD RIVER



Following the instrument workshop, the inspectors proceeded to Ottawa for a two week seminar from January 25 to February 5, 1971. The topics covered included Career Development, Assessment and Counselling of Staff, Standards and Exposure of Instruments, Duties and Responsibilities, Safety and Hazards, Supply and Stores, Quality Control and Financial Management. Each topic had a discussion leader, generally from Meteorological Headquarters, and the informal and open type examination of each subject produced an abundance of interesting comments.

ITEM 10

REPORT ON THE MONTREAL WEATHER OFFICE WORKSHOP

During the five-week period from January 11th to February 12th, 1971, the Professional Development Unit of the Research and Training Division, conducted a combined refresher course and forecast workshop at the Montreal Weather Office.

The Refresher Course, which dealt with the physical and structural concepts of synoptic meteorology, was given to one-half of the professional staff in the first week and then repeated in the second week for the benefit of the remainder of the staff.

The workshop was carried out on an operational basis in the forecast office itself during the remaining three weeks. The emphasis in the workshop was on the implementation of the standard procedures and practices of the Canadian Weather Service Forecasting System. Instructors manned both day and evening shifts in order to deal with the observations, analyses and prognoses from both of the main synoptic hours, 0000 GMT and 1200 GMT. All available professional staff from the Montreal Office and two meteorologists from nearby Canadian Forces Bases participated during this phase of training. This meant that there were from six to ten meteorologists involved in the real-time operational training on each shift in addition to three instructors. As a result, all of the staff had ample opportunity to gain experience with the standard techniques and practices.

The training program was very well received by the Montreal meteorologists and its smooth progress was due, in no small way, to the enthusiasm and co-operation of the Regional Meteorologist and the management and staff of the Montreal Weather Office. The entire system set forth in the training program was adopted and is now being used operationally in the Montreal Weather Office. This suggests that the objectives of the training program have been achieved.

ITEM 11

WEATHER SUPPORT FOR THE CANADA WINTER GAMES
FEBRUARY 12-21, 1971

The Canada Winter Games were held at Saskatoon during the period February 12-21 of 1971. As early as June 12, 1970, information was requested from the Saskatchewan Research Council on mean temperature conditions for the past 10 years for the dates in question. This information was provided by Mr. J. Calvert of that organization.

On November 18, Mr. Early W. Bowman, General Manager of the Games, requested that limited weather information be made available at the Blackstrap Ski facility during the period of the Winter Games. Information required would be temperature, wind direction and speed and humidity. A 2 meter "Science Associate Windspeed and Direction Recorder", powered by a 6-volt battery, was provided by the Saskatchewan Research Council. Mr. F.R. Mahaffy had this installed at the site of the ski-ing, Regional Meteorological Headquarters provided a hand anemometer and a Sling psychrometer.

On February 8 an outlook was requested for the opening ceremonies on the evening of February 12th. The USWB Five-Day Forecast indicated above normal temperatures and light winds for the ceremonies. This turned out almost perfectly. CFQC TV interviewed the Weather Office on the 8th of February on conditions expected for the opening ceremonies and the first weekend of sporting events. On Thursday the final outlook for the opening ceremonies was given. At this time it was pointed out that the five-day forecast called for the possibility of a thaw early in the period.

Regina Weather Office began a daily outlook for the games on the 11th of February. This was issued at 7:00 a.m. daily until the 21st. It was taped live by Radio Station CKOM, while the other radio stations and the Star-Phoenix took it directly from the Press Circuit.

As a result of the thaw, which took place on the first three days of the event, the CBC held a radio interview on the weather outlook for the ski-ing. The five-day forecast indicated a cooling to temperatures below freezing, but still remaining well above normal for the time of year. It also indicated that surface winds would increase during the latter days of the Games. This also worked out very well.

Precipitation was light with about 1.2 inches reported. Of this amount, 0.8 inches fell on the night of the 15th. Thunder and lightning were reported by various people during the storm, but it was not observed at the weather office.

Weather conditions were perfect during the speed skating which took place on the first two days. From February 17-21, the ski trials took place. During this period a weather observer, Mr. G. Innes, was stationed on Blackstrap Mountain during the events. As no suitable location could be

found for the SRC anemometer the hand anemometer was used. Winds were moderate to strong most days of the competitions. On the final day they averaged better than 30 mph.

In summary, the weather program ran smoothly during the period of the Winter Games. The weather co-operated to the extent that for a couple of days it was feared that the ski-ing competitions would have to be called off.

ITEM 12

STORM SIGNALLINGS - AN IMPORTANT MATTER

The following is an excerpt from "The Daily Colonist, Vol. 6," dated 1891.

Whilst His Excellency Governor O'Brien was visiting Canada last year, he was very favourably impressed by the Meteorological Service, which, within a few years, has been brought to great perfection in the Dominion and the United States. As a means of saving life and property, by a system of storm warnings or daily predictions of coming weather, it is almost incalculable value, especially to those whose occupation it is to "go down to the sea in ships". With the view of having the manifest advantages of the services participated in by this colony, His Excellency made enquiries as to the manner and cost of having the weather predictions telegraphed and signalled in Newfoundland. The following letter from the Head of the Department in Toronto, to the Governor, shows that the expense would be comparatively small compared to the great value which it would unquestionably be in preventing much of the loss which annually happens along the coasts of this island. It should immediately enlist the attention of our legislators, insurance agents and others interested in shipping:-

METEOROLOGICAL OFFICE
Toronto, Jan. 5th, 1891

SIR TERENCE O'BRIEN, K.C.M.G.,
Government House, St. John's, Nfld.

Sir:

Referring to your letter of the 17th November last, asking me how you could obtain storm warnings for Newfoundland, similar to those issued in Canada, I considered the matter of such importance that I did not feel justified in replying thereto without first consulting the department at Ottawa, so that they might approve of any offer that I might make; hence the delay in replying to your note.

In order to be able to issue storm warnings or daily predictions of coming weather, it would be necessary that we should collect data daily, in addition to the information we already receive for making the predictions for Canada. This would materially increase our expenditure; but I am authorised by the department to offer to give you storm warnings and daily probabilities, if the Newfoundland Government will contribute \$1,000 per annum towards the expense of this service. This sum would not include the cost of telegraphing such storm warnings and daily probabilities to Newfoundland; but this cost would have to be paid direct by the Newfoundland Government to the Telegraph Companies interested, and they would also have to arrange for the publication in such manner as they deemed desirable.

The storm warnings we at present issue are not intended to apply to Newfoundland, although in some cases they would extend to that colony. Neither could we, on the material we at present receive, issue storm warnings for Newfoundland which would be as good as those for our own provinces. I am, however, authorised to offer to furnish, gratis, storm warnings only (that is without daily probabilities) for a limited time only, on condition that the Newfoundland Government pays for the telegraphing of the same to Newfoundland.

I might add that we are already paying for observations taken at two stations in Newfoundland, viz. at St. John's and Sandy Point, St. George's Bay.

I remain, sir, your obedient servant,

CHARLES CARPMEAL
Director

ITEM 13

ICE RECONNAISSANCE

Ten candidates successfully graduated the ten week Ice Observer Course #13 held at Canadian Meteorological Service Headquarters commencing during the latter part of 1970. The course included twenty additional lecture hours on photo interpretation and seventeen of the existing Ice Observer staff also received this photographic training.

Two "Ice Interpretation Courses" were provided to forty controllers of Montreal Ship Control and Quebec Ship Control by unit training personnel in December, 1970 and February, 1971. In addition a two day "Ice Interpretation Course" was provided for twelve field technicians of CCIW DEMR as part of their winter training seminar.

"In house" training completed over the past three months by Ice Observer personnel included: School of Instructional Technique (2), Climatology Course (2), AMC (1), and Maritime/Bush/Arctic Survival (2).

Ongoing investigations on remote sensing equipment and programs were carried out where possible. A special project's Meteorologist finalized a report on the joint DRB/CMS Infrared Test in Norwegian Bay conducted in early September, 1970. In the USCC report of July, 1970, entitled "Data Reduction of Sea Ice Records", associated with the first tanker trial of SS MANHATTAN in company with CCGS JOHN A. MACDONALD, showed that the remote sensor data acquired on Canadian Meteorological Service Charter Aircraft DC-4 CF-KAE and free dropped for processing and analysis, indicated good results.

A computerized program, designed by the T & E Branch Liaison Engineer, and entitled "Mission Performance Evaluation" of the dual doppler Navigation System in twin gyro compass mode on the two CMS Douglas DC-4 aircraft has been carried out in cooperation with Climatology Division on almost 10,000 flying hours completed on the five year contract to date. Preliminary results indicate on the average 13% of the flights fixes were without latitudinal errors and 88.5% of the flights were within ± 5 miles. Also 28% of the longitudinal positions showed zero errors and 95% of the fixes were with ± 5 miles.

ITEM 14

PERSONNEL

The following have accepted positions as a result of competitions:

Competition 69-PTAH-140	-	Meteorology (MT7) Shift Supervisors
		- W.D. Wyllie, Toronto
		- Y.G. Ishii, Toronto
		- K.A. Fluto, Winnipeg
		- M.F. Rose, Vancouver
Competition 70-MET-HQ-26	-	Meteorology (MT9) Acting Appointment RSGWS, Quebec Region
		- F.J. Lemire
Competition 70-MET-HQ-27	-	Meteorology (MT7) Officer-in-Charge, W.O. Gander
		- R. Nelis

Competition 70-MET-HQ-61 - Meteorology (MT5)
Acting Appointment
Supervising Forecaster
W.O. Goose
- J.R. Sandilands

The following transfers took place:

R.J. Mills	-	<u>To</u> W.O. Frobisher <u>From</u> CFB Winnipeg
L.G. Sonley	-	<u>To</u> CFB Summerside <u>From</u> CFB Winnipeg
P.S. King	-	<u>To</u> W.O. Gander <u>From</u> CFB Chatham
J.P. Kelly	-	<u>To</u> W.O. Halifax <u>From</u> W.O. Gander
N.C. Turko	-	<u>To</u> CFB Winnipeg <u>From</u> CFB Rivers

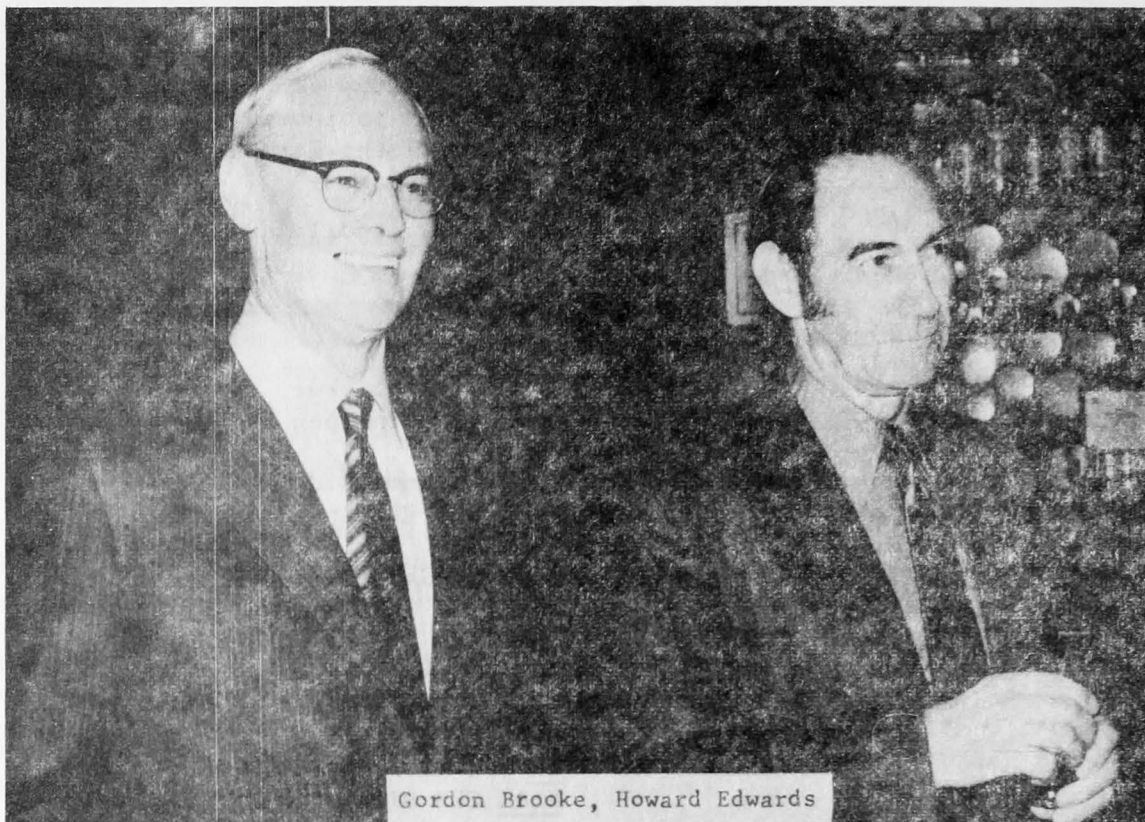
MR. H.B. KRUGER - NEW APPOINTMENT

Mr. H.B. Kruger has been appointed to the position of staff officer responsible for providing support to Forecast Division in developing plans and policies. This appointment, which took effect on February 8, 1971, is for a period of approximately six months, and is part of an organizational adjustment necessitated by the temporary-duty secondment of Mr. H. Cameron to the office of the Administrator.

LONG TIME VANCOUVER WEATHER OFFICE EMPLOYEES RETIRE

Two long time employees of the Vancouver Weather Office, Howard Edwards and Gordon Brooke, retired from the Canadian Meteorological Service at the end of 1970.

Howard Edwards was one of the first forecasters at Vancouver Airport. After graduating from the University of Saskatchewan with an M.Sc. degree, Mr. Edwards joined the Meteorological Service of Canada in 1937, took a Master's degree in Meteorology at the University of Toronto.



Gordon Brooke, Howard Edwards

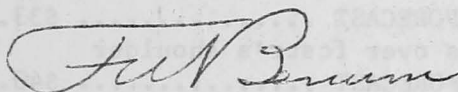


Mr. and Mrs. Gordon Brooke, John Knox (R. Met.)

and was posted to the Vancouver Weather Office in 1938. He was a leading and popular member of the office throughout his career and for many years has been the senior Shift Supervisor at the Pacific Weather Central. Eleanor and Howard Edwards are living in Tsawwassen, about 20 miles south of Vancouver Airport.

Gordon Brooke joined the Meteorological Service in 1940, served in Western Air Command at several B.C. coastal stations during the war and for many years was the Senior Technician at the Vancouver Weather Office. In recent years, Gordon has been a Briefing Officer in the new Airport Terminal Office. Mary and Gordon Brooke are now living at Halfmoon Bay on the Sechelt Peninsula, known as the Sunshine Coast.

A retirement party was held on December 2nd at the Skyline Hotel and 150 friends and colleagues gathered to honour Howard and Gordon and their wives. David Strachan, OIC of the Pacific Weather Central, made a presentation to each from the staffs at the Vancouver Airport and from former associates from across Canada.



J. R. H. Noble
J. R. H. Noble
Administrator
Canadian Meteorological Service

Zephyr

Date: 710200

0019973E

ARCH # 2

OTM



FORECAST FEE SCHEDULE
(Courtesy CFWO, CFB Portage La Prairie)

MEDIOCRE FORECAST	\$ 2.75	**** EXTRAS ****
GOOD FORECAST	\$ 5.00	WEATHER - four hours old or more \$.95
GOOD FORECAST w/WINDS	\$ 8.50	WEATHER - three hours old \$ 1.95
Fcstr checks charts		WEATHER - two hours old \$ 4.00
GOOD FORECAST w/WINDS	\$10.00	WEATHER - one hour old \$ 6.00
Fcstr checks w/shift chief		CURRENT WEATHER (Price set by fcstr. on duty 10% to obs.)
GOOD FORECAST w/WINDS	\$12.50	WINDS - 10,000 ft from Altitude..\$ FREE
Fcstr checks w/observer		WINDS - 7,000 ft from Altitude..\$ 1.50
EXCELLENT FORECAST	\$20.00	WINDS - 5,000 ft from Altitude..\$ 3.00
EXCELLENT FORECAST	\$23.00	WINDS - 3,000 ft from Altitude..\$ 5.00
Fcstr checks w/radar		WINDS - At Altitude\$ 7.50
(Additional 35¢ per hr. for radar)		ADDITIONS TO ANY FORECAST (Except mediocre forecast)
EXCELLENT FORECAST	\$29.95	Observer yelled at by forecaster \$10.00
Fcstr runs around and screams at observer for data		
EXCELLENT FORECAST	\$33.50	Forecaster yelled at by Shift Chief \$15.00
BMetO looks over fcstr's shoulder		
EXCELLENT FORECAST	\$40.00	Shift Chief yelled at by BMETO \$25.00
BMetO runs around screams at observers for data		
EXCELLENT FORECAST	\$ (No	SPECIAL CLEARANCES THROUGH SEVERE WEATHER AREAS \$75.00
Observer brings data	price set as this	(this includes agreement to pay attorney fees for forecaster)
has never happened)		SPECIAL FOR HELICOPTER PILOTS .. \$39.95
		(a detailed map of all roofs in 500 mls of Base where women sunbathe)
SUPERB FORECAST - not available at this station		The same map is available showing all nudist camps \$99.95

CHARGES BY DISTANCE

Any clearance within Canada	\$19.95
(Special on local clearances)	\$12.95
Overseas Flights (First 1,000 M)..	\$20.00
(Additional charge for ea. 100 M). \$	1.50

**** ALL PRICES ABOVE ARE FOR VFR ****
FLIGHTS

Add 25% for IFR Flights

No forecast is valid unless

stamped with this trademark

