NATIONAL METEOROLOGICAL CONGRESS

University of British Columbia
Vancouver, B.C.

June 8 - 9, 1965.

PROGRAMME

SESSION ONE

June 8, 1965

900 - 1200 AM

WEATHER FORECASTING

Chairman: D. Strachan, Chief Forecaster,
Pacific Weather Central,
Vancouver International Airport, B.C.

MECHANICS AND FORECASTING OF MESOSCALE DISTURBANCES

C.W. Newton
National Center for Atmospheric Research
Boulder, Colorado
(Invited paper) (45 min.)

An outline review is given of the processes on different space and time scales which are considered relevant to the forecasting of convective storms, particularly of the types that produce severe weather. On the broader scale, the problem is considered identical with that dealt with by current numerical forecasting procedures, but with more attention particularly to ageostrophic motions and stability representation. On the smaller scale, the interactions of individual

storms with their environment becomes important. The motion, persistence, and development patterns become dominant considerations. Questions of effective digestion and representation of radar and other data, and of the representativeness of present observing networks, are briefly reviewed. Gaps in our present knowledge of the structure and mechanics of convective storms are outlined.

WEATHER FORECASTING

Roy Lee
Meteorological Service of Canada, Toronto
(15 min.)

The method selected for solving any prediction problem depends primarily on the explicit formulation of the problem itself. Since many "prediction techniques" appear to be in current use, it is of vital interest to analyse the general prediction problem to see what possible approaches can be applied toward its solution. A prediction system is identified as an integral part of a logical decision-making process. The weather forecasting problem is then discussed as a special case of the general prediction problem and the natural properties of the atmosphere are outlined to illustrate its specific nature and some of the natural limitations on the ultimate accuracy of weather prediction.

SYNOPTIC EXPERIMENT IN SNOW FORECASTING

S. Ramsden
Meteorological Service of Canada, Vancouver
(10 min.)

The variability of precipitation across the province of British Columbia is well known and forecasting of this parameter has been strongly conditioned by reports from valley stations. Synoptic studies have identified some relationships between flow patterns and precipitation and these are the basis of a snow warning service for the Mount Fidelity Avalanche Warning Station in Rogers Pass, B.C.

4 LOW-LEVEL WIND STRUCTURE IN THE GEORGIA STRAIT

K.F. Harry
Meteorological Service of Canada, Vancouver
(10 min.)

Time - Vertical Cross-Sectional Studies of certain cases of strong north-west winds in Georgia Strait reveal the existence of a low-level jet structure. One case is examined in detail and a thermal explanation of the jet is advanced.

5 THE DETERMINATION OF SPOT VALUES OF VERTICAL VELOCITY AND PRECIPITATION RATE

W.S. Harley, H. Dragert and I.D. Rutherford
Meteorological Service of Canada, Toronto
(10 min.)

A graphical technique is presented for the rapid computation of spot values of vertical velocity and precipitation rate from fields of vorticity advection and 1000-500-mb thickness advection, taking into account initial unsaturation, topography, latent heat effects, and height of cloud base. The procedure can be applied on both current and predicted charts, and the effect of instability is incorporated by means of two regression equations.

6 MEAN MONTHLY TWO-HOUR TEMPERATURE CHANGES AND MEAN TIMES OF MAXIMUM AND MINIMUM TEMPERATURE AT SELECTED CANADIAN STATIONS

W.S. Harley
Meteorological Service of Canada, Toronto
(10 min.)

Mean monthly two-hour temperature changes for selected localities in Canada are depicted on polar diagrams for ready reference together with mean times of maximum and

minimum temperature. The use of these diagrams in temperature forecasting is discussed.

7 AVIATION CLIMATOLOGY, PAST PRESENT AND FUTURE

J. Rogalsky
Meteorological Service of Canada, Toronto
(15 min.)

A brief review of past climatological data processing methods is given. Some of the currently produced climatic summaries for aviation are presented and discussed, and finally some future trends in aviation climatology are indicated.

8 OUTBREAKS OF ANTARCTIC AIR IN RELATION TO THE INCIDENCE OF HURRICANES IN THE NORTH ATLANTIC DURING THE YEARS 1962 and 1963

M.R. Morgan
Meteorological Service of Canada, Halifax
(15 min.)

The reasons put forward for tropical storm development have never been conclusive. Theories concerning easterly waves, break-away centers from the Inter-tropical Front, waves forming on an extended polar front, etc., have each had their adherents. There have been references which have suggested that southern hemisphere air is often present in the region of hurricane cyclogenesis.
This paper puts forward the hypothesis that hurricanes forming in the eastern Atlantic in 1962 can be related to the arrival of injections of modified Antarctic air into the North Atlantic. When strong pressure surges occurred in the Antarctic during the 1962 winter, very cold air poured into the South Atlantic Trade Wind Belt. This air can be traced via Gough Island, St. Helena and Ascension Island to the Tropics. Whenever this cold air showed certain instability criteria at Ascension Island, a hurricane was formed in the

eastern North Atlantic 5 - 9 days later on almost every occasion. When a similar examination was made of the 1963 season, all 5 hurricanes which formed in the eastern North Atlantic showed up as readily recognizable discontinuities at Ascension Island 5 - 9 days previously. Conversely, periods of marked stability at Ascension Island, indicating no influx of antarctic air into the Tropics was occurring, coincided with periods when no hurricanes were generated.

9 SEA SURFACE TEMPERATURE - ITS MEASUREMENT, ANALYSIS AND USE

F. Cushing
Maritime Headquarters Forecast Office, Esquimalt, B.C.
(To be presented if time becomes available)

10 THE USE OF THE AIRBORNE RADIATION THERMOMETER

B.V. Benedictson
RCAF Station, Comox, B.C.
(To be presented if time becomes available)

SESSION TWO

June 8, 1965

200 - 500 PM

CLOUD AND PRECIPITATION PHYSICS AND GENERAL SESSION

Chairman: Dr. J. Maybank
Saskatchewan Research Council,
Physics Division,
University of Saskatchewan

1 CLOUD SEEDING IN WESTERN QUEBEC, 1959-1963

W.L. Godson, C.L. Crozier and J.D. Holland
Meteorological Service of Canada, Toronto
(20 min.)

From 1959 to 1963 tests of cloud seeding by aircraft with silver iodide were conducted in the Rouyn-Noranda area of Northwestern Quebec as part of a Precipitation Physics Project designed for study of basic precipitation mechanisms. The design and operation of this project were described in a paper presented at the National Meteorological Congress in Montreal in June 1961. Statistical analysis of the effect of the cloud seeding has now been completed and the results of this analysis are now presented. In addition to an index of the effect of seeding, correlations are computed between the individual seeding index ratios for each storm and precipitable water and stability indices.

2 COMPONENTS CONTRIBUTING TO THE HEAT EXCHANGE OF GROWING HAILSTONES

R. List, R.G.J. Methot, and P.H. Schuepp
University of Toronto, Toronto
(15 min.)

Thermodynamic calculations are made about three different types of heat exchanges which govern the growth of hailstones. They are (a) by conduction and convection, (b) due to evaporation, (c) by sensible heat transfer based upon the temperature difference between the cloud droplets and the collecting hailstone. Ratios of these components and the total heat exchange, which is needed to freeze the accreted water or parts of it, are presented as functions of height in a cloud model and Reynolds number of hailstones.
Cooling by evaporation is dominant only for cloud temperatures just below $0^{\circ}C$, preferably at icing conditions which lead to the growth of solid ice deposits with a temperature of $0^{\circ}C$. At lower cloud temperatures the sensible heat of the cloud droplets is the dominant factor as long as spongy deposits are formed, whereas the growth of solid deposits is controlled by heat exchange through conduction and convection.

3 ENSEMBLES OF HAILSTONES

R. List
University of Toronto, Toronto
(15 min.)

An ensemble of hailstones having spherical and ellipsoidical shapes is proposed with the special feature that all particles have the same fall velocity despite a variation in mass by a factor of up to nine.
Such ensembles may be of particular importance in nature when hail is formed in thunderstorm cells.

4 INTERMITTENCY IN
WESTERN CANADIAN HAILFALL

R. H. Douglas
McGill University, Montreal
(15 min.)

Hail swaths in Alberta appear to be laid down by an organized hail-generating system, in the sense that hailfall progresses systematically (though often erratically) downswath, and that the size of the hail decreases from the central swath to the edges, more rapidly to the right (looking downswath) than to the left. However, a lack of continuity (or of steady-state) is suggested by the presence, within the swath, of hail-free gaps, and also by the intermittency of the point hailfall, which is frequently reported to occur in a series of "bursts" rather than continuously.

5 STATISTICAL ESTIMATES OF PRECIPITATION
EXTREME FOR THE PRAIRIE PROVINCES

G.A. McKay
Meteorological Service of Canada, Regina PFRA
(15 min.)

Estimates of extreme precipitation for various return periods, and the probable maximum are used in hydrologic and other engineering design. The estimation procedure is simplified by the use of extreme-value statistics wherein the estimate may be expressed as a linear function of the mean, standard deviation, and a frequency factor (1) (2) (3). Maps of statistical parameters are presented here along with computational and conversion graphs so that this procedure may be readily used for the computation of 24-hour rainfall extremes for the prairie provinces. The adjustments required to convert 24-hour point values to other durations and areas are also indicated.

6 MICROMETEOROLOGICAL MEASUREMENTS OF WIND COMPONENTS AND TEMPERATURE VARIABILITY AT SUFFIELD ALBERTA

E.R. Walker
Suffield Experimental Station
Ralston, Alberta
(15 min.)

Measurement of the variability of wind components and temperature have been made on the 300-foot tower over gently rolling prairie terrain. Spectra and the values of the standard deviations with different averaging times are presented. Changes in the standard deviation values and the associated changes in spectrum shapes are related to changes in atmospheric stability. The variations with height of the results of the measurements are also discussed.

7 METEOROLOGICAL AIR POLLUTION RELATIONSHIPS AT VANCOUVER, B.C.

J.H. Emslie and J. Satterthwaite
Meteorological Service of Canada, Vancouver
(15 min.)

8 AIR-MASS MODIFICATION OVER THE OCEAN OFF THE EAST COAST OF CONTINENTS IN WINTER

Tomio Asai
National Center for Atmospheric Research
Boulder, Colorado
(15 min.)

Cold air flowing over a warmer sea is modified rapidly by a great amount of heat and water vapor supplied from the sea. The classical theory of air-mass modification, based on eddy diffusion, is re-examined by taking into account the phase change of water and the variable exchange coefficient dependent on the static stability.

Numerical experiments are made to test the model. The results obtained are compared with the observations over the Japan Sea, which is one of the most favorable regions in the world for this phenomenon to occur. The model can represent the average weather condition over the Japan Sea in winter, when the variation of exchange coefficients in the model is taken into consideration.

9 THE KERNLOSE WINTER OF THE CANADIAN ARCTIC

R.W. Longley
University of Alberta, Edmonton
(15 min.)

An analysis of the temperature data from the Arctic stations of Canada has confirmed the "kernlose" or coreless nature of the polar regions. By a careful analysis of the data for the period near the time of the first appearance of the sun, it is shown that the minimum temperature occurs on approximately the date when the noon sun is about 7^{o} above the horizon. By analogy it was suggested that the time of minimum temperature on the diurnal variation of temperature comes when the sun is about 5^{o} above the horizon.

10 MEAN MONTHLY AMOUNTS OF PRECIPITABLE WATER VAPOUR IN THE ATMOSPHERE OVER CANADA FOR THE DECADE, 1951-1960

E.J. Truhlar
Meteorological Service of Canada, Toronto

Mean monthly amounts of precipitable water vapour have been estimated for layers of the atmosphere over Canada below 300 mb by means of a single FORTRAN programme written for an IBM 7044 computer. Typical mean seasonal distributions of precipitable water are presented for the decade, 1951-1960, using the regular radiosonde data recorded at 35 Canadian stations in conjunction with data observed in the bordering American network.

(To be presented if time becomes available)

SESSION THREE

June 9, 1965

900 - 1200 AM

WAVE MOTIONS AND ATMOSPHERIC DYNAMICS

Chairman: Dr. R.E. Munn
Research and Training Division
Meteorological Branch,
Toronto, Ontario.

1

ON WINDROWS

G.T. Csanady
University of Waterloo, Waterloo
(15 min.)

Langmuir (1938) has shown that "windrows" are a consequence of helical vortex motion set up by a moderately strong wind on the surface of a lake or ocean. In the present paper the proposition is examined that these vorticies are caused by evaporative surface cooling acting as a heat sink for a rather inefficient "heat engine". The theory developed by Pellew and Southwell (1940) for slow laminar free convection cells is applied to the calculation of windrow spacing and of the depth of convective movements and leads to results in good qualitative agreement with observation. Thermodynamic arguments show that the supply of mechanical energy that can be provided by a vortex working as a "heat engine" is more than adequate to counteract dissipation by eddy momentum transfer.

2 THE GROWTH AND DISSIPATION OF WIND GENERATED WATER WAVES

R.C. Staley
The University of Oklahoma, Norman, Oklahoma
(15 min.)

3 MOMENTUM FLUX BY MOUNTAIN-WAVES IN A STRATIFIED ROTATING ATMOSPHERE

William Blumen
National Center for Atmospheric Research
Boulder, Colorado
(15 min.)

The momentum flux by small-amplitude gravity waves generated by steady-state flow over an irregular lower boundary in a stratified rotating atmosphere is investigated. The results show that the component of momentum normal to the basic current is transferred from the earth to the atmosphere by external-type gravity-inertia waves and the flux convergence of momentum is a monotonically decreasing function of height. In contrast, the component of momentum parallel to the basic current is transported downward by internal-type gravity-waves. This flux is independent of height and is essentially independent of the earth's rotation. The dependence of the derived drag coefficients on atmospheric and mountain-shape parameters are presented; and comparisons are made with theoretical and observed estimates of the magnitude of frictional drag coefficients.

4 SMALL-SCALE VORTEX MOTION

J.A. Turner
Meteorological Service of Canada, Vancouver
(15 min.)

This will discuss several models applicable to dust devils,

fire whirls, and steam devils such as observed over west coastal water on December 16, 1964.

5 PRESSURE JUMP LINES AND ASSOCIATED WEATHER

C. East
Observatoire de Geophysique College
Jean-de-Brebeuf
(15 min.)

The 26 pressure jump lines, recorded during the summer 1960 by a meso-network of 45 stations in Central Alberta, could be grouped according to the shape of their barograph traces into two basic types, dome or step. Severe weather occurred within or close to the region swept by the dome jump, whereas severe weather was not observed or at least was far away from any step jump. Also, the dome jumps were found to have, on the average, greater amplitudes and slightly greater intensities than the step jumps, although the differences were not statistically significant. On seven occasions, both types constituted one single phenomenon without any obvious break in the pattern of isochrones, of intensity and of intensity-amplitude values.
On no occasion did severe weather form after the passage of a step jump, but the formation of one dome jump was associated with some thundery activity. In view of these observations, the explanation proposed by Tepper of the pressure jump line in terms of a gravity "wave" which would trigger the severe weather, cannot be applied to all jump lines of Alberta.

6 COMPUTATION OF SYMMETRICAL ONE-DIMENSIONAL DIGITAL FILTERS FOR EQUALLY SPACED DATA

J.A.W. McCulloch
Meteorological Service of Canada, Toronto
(15 min.)

Objective statistical filtering of time series of geophysical parameters is becoming increasingly practical and routine

as the use of computers becomes more general. This paper discusses a computer program that will calculate a digital filter function with arbitrary response characteristics. The theoretical basis for the computation is described; some comments on the technique are made; and some examples of results are shown.

7 FILTERING OF RADIOSONDE ASCENTS TO REVEAL THE MACROSCALE THERMAL STRUCTURE AT THE TROPOPAUSE

W. Godson and J.A.W. McCulloch
Meteorological Service of Canada, Toronto
(15 min.)

An attempt is made to smooth out the micro- and mesoscale thermal features in radiosonde ascents in order to better define the tropopause, a macroscale feature of the atmosphere. The reasons for choosing a filtering interval of one to one and half kilometers are described and the filter used illustrated. Some results of filtering are shown and the tropopause level as determined from the filtered ascents compared with that from conventionally treated data.

8 A THRUST ANEMOMETER MEASUREMENT OF WIND STRESS

Stuart D. Smith
University of British Columbia
(15 min.)

Wind stress in the atmospheric boundary layer is a turbulent momentum flux. I.O.U.B.C. has measured this by three methods at a location in English Bay. Cup anemometers gave a profile of mean velocity against height from which stress can be deduced. Fluctuating velocity components were measured by hot wire anemometers and by a thrust anemometer.
The thrust anemometer measures wind force on a ten centimeter diameter sphere, resolved into three components. The force signals are recorded on magnetic tape, and

velocity components can be computed from them. For 96 minutes of data from July 23, 1964 at a mean wind speed of 4.5 meters per second and a height of 1.7 meters above the water, stress was found to be 0.53 dynes per square centimeter, and the drag coefficient was 0.0021. Power spectra of horizontal and vertical turbulent velocity, and of stress, have been calculated by analog methods.

9 WIND MEASUREMENTS IN THE COASTAL INLETS OF BRITISH COLUMBIA

N.H. Thyer
Institute of Oceanography
University of British Columbia
(10 min.)

Some measurements of the surface winds in Bute Inlet and two adjacent valleys were made in the summer of 1964. Data were obtained on the time variations of these winds, and on the interaction between the flows in the valley and the fjord.

SESSION FOUR

June 9, 1965

200 - 500 PM

DYNAMIC METEOROLOGY AND NUMERICAL WEATHER PREDICTION

Chairman: Prof. A.W. Brewer
Professor of Physics (Meteorology)
University of Toronto.

1 LONG PERIOD ATMOSPHERIC OSCILLATIONS AS COMPONENTS OF THE GENERAL CIRCULATION

W.L. Godson
Meteorological Service of Canada, Toronto
(15 min.)

The relatively recent discovery of the quasi-biennial oscillation in the equatorial stratosphere has provoked a reassessment of our attitude toward long-period (months to years) harmonic phenomena in the atmosphere. The behaviour of the equatorial stratosphere is dominated by the quasi-biennial mode of oscillation, whose existence can no longer be questioned. Three basic questions arise, which will be considered here: to what extent is the quasi-biennial oscillation a world-wide phenomenon, are there other periods which seem to be significant on a global scale, and to what extent does such periodic behaviour reflect a fundamental property of the general circulation. There is a natural fourth question, which can probably not be answered in a satisfactory manner at the present time, related to the causative mechanism for any or all of the basic periods that can be identified.

When we examine atmospheric processes, it is almost invariably helpful to study these in terms of their related space and time scales. Thus we may proceed from the

micro-scale, dealing with seconds and metres, through the meso-scale and synoptic macro-scale to the planetary macro-scale, dealing with weeks and thousands of kilometres. When we extend our time scale even further, to consider months and years, we find ourselves at a loss to discover associated scales in the horizontal and vertical, although we believe intuitively that virtually the entire atmosphere must be involved and any propagation involved is probably no longer primarily in the horizontal. A further corollary, related to the absence of a clearly-defined associated space scale, is that there seems to be no obvious classification of long periods, even over the range from months to millions of months, and it may well be that phenomena throughout this range are basically very similar.

2

COMPARATIVE ENERGETICS OF THE SOUTHERN AND NORTHERN HEMISPHERES

B.W. Boville
McGill University
(15 min.)

The southern hemisphere shows very little planetary wave activity in the stratospheric polar vortex until Spring, whereas the northern vortex may have large oscillations throughout the six colder months. Qualitatively this is related to the very different tropospheric wave spectra in the two hemispheres, particularly as regards the standing modes.

3

AN INTEGRATION OF THE PRIMITIVE METEOROLOGICAL EQUATIONS IN TERMS OF SPHERICAL HARMONICS

André J. Robert
Meteorological Service of Canada, Montreal
(15 min.)

The grid point method commonly used in numerical calculations presents serious problems in experiments that require a global coverage of the meteorological variables. The shape of the earth and the form taken by the meteorological equations in a system where longitude and latitude are the

basic coordinates, suggest the use of spherical harmonics for the horizontal specification of the variables. This method eliminates grid points and all the truncation errors due to finite difference approximations. It also permits the retention of all the terms in the meteorological equations including those that would normally exhibit an anomalous behaviour near the poles.

A model based on five levels and 15 coefficients was integrated for 200 days starting from an atmosphere at rest. The integration was then continued for another 20 days with 45 coefficients. Cross-sections show a jet stream in each hemisphere and low level easterlies along the equatorial belt. The amplitudes, the phase speeds and the structure of the planetary waves in the model compare favorably with their atmospheric equivalents. The results of this integration indicate that spherical harmonics could be used profitably in general circulation models and for the preparation of extended range forecasts.

4 BAROCLINIC MODEL EXPERIMENTS AND RESULTS

R.A. Strachan
Meteorological Service of Canada, Montreal
(15 min.)

A four level baroclinic model has been integrated experimentally at the Central Analysis Office for several months. This stream-function model is quite stable and capable of producing 72 hour prognostics in approximately one hour's computer operations. Initial forecasts exhibited excessive amplitudes in synoptic wavelengths. This has been corrected by changing the static stability assumptions. Comparisons with barotropic forecasts indicate that the four level model has good advective speed and a much better definition of trough and ridge positions. Promising experiments incorporating a variable static stability and effects of low level heating have been initiated.

5 INCORPORATION OF NON-ADVECTIVE TERMS IN A THICKNESS PREDICTION MODEL

D.E. McClellan, D.E. Page
R.H. Robinson and N. Yacowar
Meteorological Service of Canada, Montreal
(15 min.)

Multilevel prediction models are expensive computer operations in comparison to barotropic models and accordingly for periods in excess of 36 to 48 hours only barotropic predictions may be available. A theory by Fjørtoft, tested by Sigtryggsson and Wiin-Nielsen, indicated a function X_i, thickness minus one-half of the space mean predictions for the layer 850-500 mb can be quickly obtained and show merit. The Extended Forecast Unit has experimented with a crude method to incorporate diabatic effects which are a major source of error. A field is derived, following a study by Martin, which includes the normal low level thickness for the time of year plus a mountain term. The Jacobian of this field and the predicted contour field at 750 mb yields a tendency which is applied, under constraint, to modify the hourly X_i function tendency. In North America major modifications are observed along the west coast and bordering the Gulf Stream where the normal thickness pattern shows the strongest gradients. Examples of the modifications introduced in these areas are presented.

6 EFFECTS OF RELEASE OF LATENT HEAT IN THE NUMERICAL PREDICTION OF CYCLONE DEVELOPMENT AND PRECIPITATION AMOUNTS

M.B. Danard
Meteorological Service of Canada, Toronto
(15 min.)

A numerical method for predicting the precipitation amounts and heights of the 300, 500, 700, 850 and 1000 mb surfaces is presented. The basic equations used are the quasi-geostropic vorticity and omega equations. Influences of released latent heat are incorporated through a reduction in the static stability. Frictional and orographic effects are included in the

lower boundary condition for the vertical velocity. A numerical integration of a case of intense cyclogenesis is described. Predicted precipitation amounts and flow patterns are in fairly good agreement with observations. For purposes of comparison, computations are also performed with the initial state moisture-free. These latter calculations failed to forecast the observed intensification in the lower troposphere, demonstrating the importance of release of latent heat in the numerical prediction of cyclone developments.

7

VERTICAL MOTION WITH VARIABLE STATIC STABILITY

Brian O'Reilly
McGill University, Montreal
(15 min.)

An experiment was run in which a two-level model was used to diagnose synoptic-scale vertical motion and precipitation. Static stability was varied horizontally, and for wet or dry ascent on the basis of simple selection rules. Results indicate quantitative promise of the method for convergent or warm-frontal rain, but the usual deficiencies for situations in which convection cells are involved.

8

THE OPERATIONAL USE OF NWP PROGS

W. L. Gutzman
Meteorological Service of Canada, Montreal
(15 min.)

The improvement of the 500 mb prog by the introduction of the NWP 36-hour barotropic has made it the most important tool in forecasting the upper, as well as surface circulation patterns. The associated vorticity fields is all-important in producing the details of the surface forecast. A consistent set of prognoses is now made by using differential analysis techniques to build downward from 500 mb to the surface.
The barotropic prog has characteristic errors and must be

modified subjectively to take baroclinic processes into account, and for computational reasons.

Low-level cyclogenesis results in a positive height forecast error. The position and extent of this error is illustrated by results of about 40 cases in which sea-level cyclones deepened over 20 mb in 36 hours. These cases occurred in eastern North America and western Atlantic during winters of 1963-65.

The use of finite differences in NWP computations results in an under-forecast of short wave speeds. Results are given for over 500 short wave troughs examined in Oct-Dec 1964.

Because of finite difference and filtering operators, the barotropic forecast tends to fill cold lows. A study of such cases for USA, where data is adequate, provides a rough estimate for the correction which must be made.

SIXTH NATIONAL CONGRESS OF THE CANADIAN BRANCH OF THE ROYAL METEOROLOGICAL SOCIETY

Another National Meteorological Congress has been held, for the sixth year in succession. This year the host city was Vancouver, B.C., and the site was the University of British Columbia, with its campus located in Point Grey overlooking the waters of Georgia Strait. This time the weather cooperated in every way, with beautiful sunshine and with afternoon temperatures the warmest of the year to date, reaching a high of 72° on the day of registration. A pleasant afternoon sea breeze aided by removing most of the atmospheric pollution and thus permitting plentiful views of the mountains to the north and east, with their snow capped peaks standing out against the blue of the sky and the green of the forests.

The campus, also, was at its best and Mr. S. Nikleva had everything well organized for the meetings. A representative of R.M.S. was present at the main registration desk both Sunday and Monday before the meetings to pass on information to delegates and wives and to answer questions or give directions.

Mr. Dave Strachan, Officer-in-Charge of the Pacific Weather Central and chairman of the first session, opened the meetings Tuesday morning, June 8, with a welcome to the more than sixty members of the Royal Meteorological Society and guests.

The morning session was entitled "Weather Forecasting", and eight interesting papers were presented on subjects ranging from general weather and precipitation forecasting, to aviation climatology and the measurement of sea surface temperature.

The afternoon session, guided by Dr. J. Maybank, of the Saskatchewan Research Council, saw papers on cloud and precipitation physics, and on a number of general subjects ranging from air pollution in Vancouver to "the Kernlose Winter" of the Arctic. Wednesday's sessions were chaired by Dr. R.E. Munn in the morning and by Professor A.W. Brewer in the afternoon. Topics included "Wave Motions and Atmospheric Dynamics" and "Dynamic Meteorology and Numerical Weather Predication".

The variety and quality of papers presented during the two days were outstanding, and the only real complaint was a shortage of time. A number of papers were necessarily severely condensed. A source of satisfaction, too, were the number of papers presented by members of the Meteorological Service of

Canada, suggesting that the time is fast approaching when we can form and support our own Canadian Meteorological Society.

Tuesday's luncheon and Annual Meeting of the Canadian Branch were held in the Faculty Club of the University. The head-table party included our present and two past directors, in the persons of Mr. J.R. Noble, Dr. P.D. McTaggart-Cowan and Dr. A. Thomson. Mr. Noble, chairman of the Patterson Medal Committee, named the two recipients and presented this year's medals to Dr. Thomson and Dr. McTaggart-Cowan for outstanding contributions to meteorology in Canada. Dr. B.W. Boville named Mr. John Clark of McGill University winner of the Darton Canadian Prize; Professor S. Orvig of McGill winner of the President's Prize; further, a book was presented to Mr. W.K. Sly of Edmonton as winner of the Applied Meteorology Prize.

Dr. R.E. Munn commented on the expansion of the Canadian Branch of the Society with the establishment of two new centres, in British Columbia and Halifax. Due to the shortage of time, with the meeting already running into the time allotted for the afternoon sessions, the business meeting was quite short. In view of this, it was suggested from the floor that more time be allotted for the business meeting next year.

Another highlight of the Congress was the Wednesday evening dinner at the Centennial Pavilion on the top of Burnaby Mountain, and the subsequent visit to Simon Fraser University - still under construction. The site is on the very top of the ridge at an elevation of approximately 1500 feet above Burrard Inlet. Every effort has been made to take advantage of the site, and the resulting structure shows imagination and audacity. Dr. McTaggart-Cowan is certainly to be congratulated and envied on the results, for there is no doubt that the finished product is going to be an outstanding achievement.

J.B. Wright.