

**SUPPLEMENT TO**

**THE JOURNAL OF THE**

**ROYAL ASTRONOMICAL**

**SOCIETY OF CANADA**



**March 1964**



## REPORT OF THE NATIONAL PRESIDENT

Astronomy in Canada was highlighted by the total solar eclipse of July 20, with the path of totality crossing from Alaska and the Yukon, south-eastward across the various provinces and northern Maine to the Atlantic Ocean. Members were organized for observing by Miss Isabel K. Williamson as National Co-ordinator for the 1963 eclipse. Although clouds brought disappointment to some, others were successful in carrying out their planned programmes. The airborne eclipse expedition co-ordinated by the Dominion Observatory succeeded in making numerous observations from above the clouds which hampered ground-based observers (see December 1963 JOURNAL). A colour reproduction of the eclipsed sun, photographed at Fort Providence, N.W.T., by Dr. G. A. H. Walker of the Dominion Astrophysical Observatory, appears in the February 1964 issue of the JOURNAL. This is the first colour plate in the JOURNAL since the reproduction of the painting of the historic "Meteoric Procession" of February 9, 1913.

The proposal for a large national observatory was given wide publicity by Canadian astronomers in August. Consideration is being given to the best design and the best site for such a large telescope.

Larger radio telescopes are under construction to increase the resolving power at the long wave-lengths used with this technique. At the Dominion Radio Astrophysical Observatory, Penticton, B.C., a T-shaped antenna covering 11 acres has been constructed; it will operate at 22.5 Mc./s.

Experiments carried in artificial satellites continue to add information about the immediate environment of the earth. The "Alouette" satellite, launched in September 1962 and carrying Canadian-made instruments, is still operating successfully and is gathering information about galactic noise at frequencies below 10 Mc./s. New satellites were launched in 1963 and have been phenomenally successful in improving global communication and weather prediction. Three astronauts orbited the earth: L. Gordon Cooper in May, and in June, Valery F. Bykovsky and Valentina V. Tereshkova (the first woman in space). Radio contact with the Soviet probe to Mars (launched in 1962) was lost in March, three months before its scheduled closest approach. The analysis of data acquired from another 1962 probe, that of the U.S. Mariner II to Venus, indicates that the planet has no surrounding region of trapped energetic particles, that its mass is 0.81485 that of the earth and that its surface temperature is 800°F.

The current sun-spot cycle, the most active since records began, is now drawing to a close and for the next couple of years solar activity is expected to be at a minimum. From January 1, 1964 to December 31, 1965, defined as the International Quiet Sun Years, some sixty nations, including Canada, have agreed to co-operate in the study of the effects of the sun by using all possible techniques. The first spot of the new cycle, at high solar latitude, appeared during 1963.

A number of new projects have been inaugurated: a committee on adult education has been formed; a start has been made in revising the constitution before applying for a national charter; a collection of meteorites for display in the National Office has been started with the purchase of a specimen of the Bruderheim fall; preliminary arrangements have been completed for having a portrait painted of the late Walter J. Helm; a Library Fund has been established, using as a nucleus the bequest of \$1,000 from the estate of the late Carl Reinhardt.

I have had the pleasure of meeting with members from the following Centres: Halifax, Hamilton, London, Centre Français de Montréal, Niagara Falls, Ottawa, Vancouver and Winnipeg. At meetings in the two western Centres I was indeed thrilled to present the astronomy winners at the Second Canada-Wide Science Fair with books from the Society.

Finally I wish to express my very sincere appreciation to all who have given of their time and effort to advance the aims of our Society during my two year term of office, and in particular, to the National Secretary and the Executive Secretary. May we have your continued support in order to successfully complete and extend the projects now begun.

*Ruth J. Northcott*  
National President.

### REPORT OF THE NATIONAL SECRETARY

Meetings of the National Council were held on January 4, March 8, May 18 and September 28. The Executive Committee met on April 8, June 21 and December 5. The Annual Meeting of the Society was held in Toronto on March 8, with our National President, Miss Ruth J. Northcott, as Chairman.

The membership of the Society at September 30, 1963, was 2,129 (including 121 Life Members) made up as follows:

#### CENTRES

Toronto	540	Calgary	49
Montreal	272	London	49
Ottawa	131	Vancouver	47
C.F. de Montréal	90	Hamilton	41
Quebec	84	Windsor	41
Winnipeg	74	Niagara Falls	33
Edmonton	65	Halifax	18
Victoria	64	Kingston	7

#### UNATTACHED

United States	330	Foreign	42
Canada	138	Honorary	14

The General Assembly of the Society was held at the Education Centre, 155 College Street, Toronto, between May 17-19. The William Ross Hossack Memorial Lecture was delivered at this Assembly by Dr. W. Petrie, Assistant Chief Scientist, DRB/HQ, on the topic "Science and Our Future". Residence accommodation for out-of-town members, excellent rooms for display purposes and committee meetings, plus a bus trip to Niagara-on-the-Lake and Niagara Falls made this a very successful week-end.

The Gold Medal of the Society for 1963 was awarded to Mr. Peter H. Reynolds, who is doing graduate work in Geophysics at the University of British Columbia. Service Awards were presented to Mr. E. E. Bridgen (Montreal Centre), Miss Miriam S. Burland (Ottawa Centre) and Dr. A. V. Douglas (Kingston Centre). Membership Certificates were awarded to ten members of the Montreal Centre. Dr. Martin Schwarzschild was elected to Honorary Membership in the Society.

The Society made a special award to Norman Wilde of Winnipeg for his entry in the Second Canada-Wide Science Fair. Prizes were also given to Hugh Ross of Vancouver and Gary Rathwell of Kingston for the excellence of their exhibits on astronomical topics. Miss Northcott presented awards to Norman Wilde and Hugh Ross while visiting their respective Centres in early September.

An active interest in the preliminary planning for a planetarium, for which some funds were provided by the estate of the late Carl Reinhardt, has been maintained by the Society's representatives, Dr. D. A. MacRae and Miss Ruth J. Northcott, working in close collaboration with Dr. V. B. Meen of the Royal Ontario Museum.

Our National Treasurer, Dr. J. F. Heard, experienced a lengthy illness throughout the latter half of the year and has now made a satisfactory recovery. The Society is indebted to Mr. R. Broadfoot and Mr. M. Thomson who have filled in as Acting Chairman of the Property Committee and the Committee on Constitutions and By-Laws, respectively, during this period. Rev. N. Green provided most valuable assistance as well in a dual role as Assistant to the National Secretary and Assistant to the National Treasurer throughout part of the year.

Dr. W. E. van Steenburgh, Deputy Minister of Mines and Technical Surveys, was appointed by National Council as Honorary President of the Society. Dr. Ian Halliday succeeded Miss Miriam S. Burland as Technical Correspondent for the Society at the Dominion Observatory. Mr. Ian McLennan became Chairman of the Committee on Publications, Sales and Advertising. Miss Isabel K. Williamson was Chairman of a special Committee for co-ordinating the observational programme on the 1963 total solar eclipse. Our sincere thanks to these and all our members for their contributions in advancing the work of the Society throughout this year.

The death of the following members is noted with regret:

Mr. George Arnott (Toronto Centre)	Mr. Herbert L. Moyer (Toronto Centre)
Mr. Frank Bull (Canada)	Mr. J. Proctor (Toronto Centre)
Mr. F. Cecil Carley (Toronto Centre)	Mrs. J. A. Stairs (Montreal Centre)
Mr. O. W. Colley (Calgary Centre)	Rev. N. R. D. Sinclair (Ottawa Centre)
Mr. Samuel Haines (U.S.A.)	Mr. A. Stockwell (Edmonton Centre)
Mr. Frank J. Kelland (Montreal Centre)	Mr. Ambrose Tree (Victoria Centre)
Dr. H. R. Kingston (London Centre)	Mr. A. T. H. Young (Toronto Centre)
Dr. E. J. Lehman (Toronto Centre)	

J. E. KENNEDY, *National Secretary.*

### REPORT OF THE LIBRARIAN

Since my last report the cataloguing of the classified part of the Library has proceeded and a few books, including new titles, have been added to that part of the collection. The purchase of several sets of black and white and colour slides to augment the Library's collection has been completed and Mr. Kurt Frenkel has kindly mounted these in metal and glass. Mr. M. Kalbfleisch has undertaken the care and servicing of the film and slide collection.

Approximately 400 books were borrowed from the Library during 1963 with 70 titles being borrowed by mail. Requests for 22 films and slides were filled during the year.

Donations to the Library by the estate of the late Carl Reinhardt, Wilfred Miller, Miss Ruth J. Northcott and Dr. Peter M. Millman are gratefully acknowledged and thanks are extended to those members of Centres who have responded to a request to donate their February 1963 issue of the JOURNAL to fill a gap in our supply. More copies are urgently needed.

LEONARD A. CHESTER, *Librarian.*

## REPORTS OF SECRETARIES OF CENTRES

### CALGARY CENTRE

Monthly meetings of the Calgary Centre were held at the University of Alberta, Calgary. Mr. S. Litchinsky continued as host for the Executive meetings.

A highlight of the year, as it must have been for many of our Centres, was viewing the total solar eclipse. The Calgary and Edmonton Centres together with the University of Alberta formed an expedition to watch the phenomena. Centre members Kais Bais, John Howell and family, Bob Nelson, Iain Robertson and Jim Wright made the 900 mile trip by car to Fort Providence, N.W.T.; the population of this small village was further increased by some 60 astronomers, both amateur and professional, from many parts of Canada and the U.S.A. All Calgary members shared the thrill, the awesomeness and the excitement of these experiences when slides, films and narration were presented at the September meeting.

Of major importance is the work of President Stilwell and his Planetarium Committee who have made a tremendous effort to arouse interest among the citizens in the building of a Planetarium as the City's Centennial Project. The idea won The Calgary Herald Prize for the best proposal submitted. Professor Stilwell presented a detailed brief to the Centennial Committee and copies were widely distributed; this project is still under consideration.

The Annual Meeting and Dinner were held at the Highlander Hotel on December 11, with President Stilwell delivering a most informative address.

Following is the programme of meetings, all of which have included talks by members on sections of the OBSERVER'S HANDBOOK and by Past President Meiklejohn on well-known constellations:

January 9—R. A. Nelson: "Solar Eclipse".

February 13—C. D. Anger, Ph.D.: "The Aurora".

March 13—J. Galt, Ph.D.: "Radio Astronomy at Penticton, B.C.".

April 10—H. Taylor Ph.D.: "Nuclear Energy Production in the Stars".

May 8—S. Wieser: "Electronic Computers and Their Application to Astronomy".

September 11—Reports from Eclipse Expedition; slides and films by members,  
I. McLennan: "The Day of the Black Sun".

October 9—Film presentation: "Space Exploration and Scatter Radar".

November 13—F. Adams, Ph.D.: "The Application of Spectroscopic Principles to Astronomy".

December 11—Annual Dinner Meeting; W. H. Stilwell, M.A.: "Methods of Determining Stellar Distances".

(MRS.) G. A. RABJOHN, *Secretary*.

### EDMONTON CENTRE

The meetings of the Edmonton Centre were again held in the Queen Elizabeth Planetarium. The two main projects during 1963 were the observation of the solar eclipse on July 20 and Star Nights, attempted on a much larger scale.

Parties of observers from the Edmonton Centre were based at two locations along the path of totality. W. Cable and G. Thompson recorded totality at Uranium City, Saskatchewan, while the larger group was located at Fort Providence, N.W.T. H. J. Montgomery, Prof. E. S. Keeping, W. Nacuk, E. Rogers, Dr. and Mrs. D. R. Crosby, R. Buckley, Mr. and Mrs. W. Franiel, and Mr. and Mrs. I. McLennan joined forces with Calgary Centre members J. Wright and R. Nelson to record and photograph the eclipse, marred only slightly by a light haze at this location.

The dates chosen by the Edmonton Centre to stage the largest Star Nights yet attempted were August 30th and 31st. The site was the lower floor of the Jubilee Auditorium and approximately 3,000 persons viewed the astronomical displays and films; gross receipts exceeded \$2,000. The Centre intends to direct the net profit toward the acquisition of an Observatory and Space Museum in Edmonton.

Meetings during the year were as follows:

- November 8—H. W. Taylor Ph.D.: "Application of Atomic Physics to Astrophysics".
- December 6—G. D. Garland, Ph.D.: "Clocks—Terrestrial, Astronomical and Atomic".
- January 10—G. Williams and I. C. McLennan: "The Mariner Spacecraft".
- February 14—R. E. Folsbee, Ph.D.: "Lunar Geology and Vulcanology".
- March 14—Film presentation: "Our Friend the Atom".
- April 11—C. D. Anger, Ph.D.: "Solar Eclipse—July 20, 1963".
- May 8—K. O. Wright, Ph.D.: "Chemical Composition of the Stars".
- June 13—I. C. McLennan: "Astronomy Around the World".
- August 8—Star Night preparations: Solar Eclipse reports and films.
- September 12—Film presentations: "Universe" and "Celestial Twins".
- October 10—Annual Dinner Meeting at Mayfair Hotel; J. Gordon Parr, Ph.D.: "There Were the Bodies Seven and Spirits Four".

(MRS.) ADRIENNE McLENNAN, *Secretary*.

#### HALIFAX CENTRE

During 1963, eight regular meetings of the Halifax Centre were held in the Planetarium Room of the Nova Scotia Museum of Science. The programmes were as follows:

- January 29—William MacIntyre: "Meteorites and the Accretion of Cosmic Material on the Surface of the Earth".
- February 27—W. L. Orr, M.D.: "What Other Amateurs are Doing".
- March 27—A. Mills, Ph.D.: "The Origin of the Oceans".
- April 24—A. Mills, Ph.D.: "Planetarium demonstration showing recent additions and improvements in the projector".
- May 29—General discussion regarding the total solar eclipse.
- September 25—Miss Ruth J. Northcott, M.A.: "The David Dunlap Observatory".
- October 30—W. L. Orr, M.D.: "The Planet Mars and the Amateur Astronomer".
- November 27—Rev. M. W. Burke-Gaffney, S.J.: "The Solar Eclipse in Quebec Province"; A. Mills, Ph.D. and R. L. Aikens, M.D.; "The Solar Eclipse at Clarke's Harbor, N.S."

In addition to the regular meetings, other activities of the Centre included instruction of Girl Guides and Boy Scouts by Professor A. Mills and Miss Mary King, L., R.C.N. Professor Mills gave regular planetarium demonstrations for the public throughout most of the year, with large attendances. Only one public star night was scheduled but had to be postponed on three successive occasions because of bad weather.

R. L. AIKENS, *Secretary*.

#### HAMILTON CENTRE

In 1963, eight meetings were held in the Physical Sciences Building of McMaster University. Four Council meetings were required in administering the activities and business of our Centre.

The year was highlighted by the success of our four Solar Eclipse teams; one excellent colour film and numerous 35-mm. colour slides were obtained and shown at our fall meetings.

Two Field Nights were held on September 7 and 8; these featured again a closed circuit television system attached to Mr. F. Schnieder's 8-inch reflecting telescope. Unfortunately, cool, cloudy weather prevented good viewing so that most of the activity was confined to movies, telescopes and displays within the University, with about 900 persons attending.

Our Junior section is very active with some twenty members under Junior President Doug Craig and Lorraine Nielson as Junior Secretary. Eight meetings of this group were held, with both junior and senior speakers, at the same time as our regular meetings but in a separate room.

Our regular programme consisted of the following:

- January 3—W. S. Mallory, M.A.: "From the Observer's Handbook"; W. J. McCallion, M.A.: "Novae".  
 February 7—S. J. Buntain: "Ancient Egyptian Astronomy"; L. V. Powis: "Black Light".  
 March 7—Junior Night: Miss J. Bankier: "Some Irregularities in the Ninth Planet"; Robert Allen: "Cosmic Rays"; Charles Little: "Aurorae"; Ross Chapman: "Neutrino Astronomy".  
 April 4—National President, Miss Ruth J. Northcott, M.A.; "Astronomy in Canada".  
 May 2—J. G. Craig, B.Sc.: "Variable Stars"; Ontario Hydro on Nuclear Power Demonstrator.  
 October 3—Annual Elections; "Eclipse Experiences — Summer of 1963", a report of solar eclipse teams with illustrations.  
 November 7—E. Ostrosser: "Atomic Structure in Astronomy"; R. J. Livingstone, N. Seville: "Solar Eclipse Films of July 20".  
 December 5—T. R. Norton: "Robert Hooke, M.D., F.R.S." (illustrated).

L. V. Powis, *Secretary*.

#### KINGSTON CENTRE

During the year, meetings have been held in the Observatory at Queen's University. Lectures have included the following:

- February 27—P. A. Jolliffe: "Associations of Stars".  
 October 17—R. Flynn Marr: "The 15-inch Telescope at Queen's".  
 November 7—R. C. Roeder, Ph.D.: "Cosmology".

In addition, star nights have been held every two weeks except during the summer months.

Plans have been made to renovate the Springfield Telescope owned by this Centre and install it near the Observatory dome. The main telescope of the Observatory has been made available for frequent use by authorized members of the Centre. The present membership of the Centre is 16.

PETER JOLLIFFE, *Secretary*.

#### LONDON CENTRE

Eight regular meetings were held during the year, all in the Hume Cronyn Memorial Observatory of the University of Western Ontario. Observations were made with the ten-inch refractor, weather permitting.



The programmes for these meetings were as follows:

- January 18—W. Wehlau, Ph.D.: "Handbook Study" and "Transits on the Map of the Sky"; Albert Sugarman: "Determination of Stellar Distances"; R. L. Williams: "Report of Members' Observations".
- February 22—President J. W. Haynes paid a tribute to the late H. R. Kingston, Ph.D., Honorary President and Founder of the London Centre of the Society; W. Wehlau, Ph.D.: "Report on Members' Observations"; W. J. Adamson: "Discussion of Conics" (illustrated with two films); Peter Warwick: "Precession of the Equinoxes".
- March 15—Albert Sugarman: "Handbook Study: Simple Sidereal Clock and Correction of Time"; James Rossiter: "Some Celestial Arithmetic Regarding Orbital Velocities of Satellites"; A. J. Watt, M.D.: "The Planet Mars"; R. L. Williams: "Report of Members' Observations".
- April 19—J. W. Haynes: "The Death of Astronomer Struve, The Giant of Astronomy"; G. Gunn, Honorary President: "Notice of a New Comet"; Miss Ruth J. Northcott, M.A., National President: "Astronomy in Canada".
- May 31—R. W. Richardson: "Total Eclipse of the Sun, July 20"; W. Wehlau, Ph.D.: "Mechanics of the Eclipse"; J. Livingstone: "Pictures of Moon's Surface using a Camera and six-inch Telescope".
- October 18—W. J. Adamson: "Larousse Encyclopaedia of Astronomy"; A. J. Watt, M.D.: "Planetary Members of the Solar System, Mercury, Jupiter, Saturn and Earth's Moon"; Peter Warwick: "Method of Determining Age of Meteorites and the Earth".
- November 15—J. W. Haynes: "Progress of Astronomy and How to Identify Meteorites"; W. J. Adamson: "Planets in General, Some in Particular".
- December 13—Annual Meeting; Reports and Election of Officers; Robert Wood: "The Black Nebula of Orion"; J. W. Haynes: "Story of the Star of Bethlehem".

(Mrs.) I. E. McKONE, *Secretary*.

#### MONTREAL CENTRE

Since our last Annual Meeting the Centre has met on the following occasions:

- October 11, 1962—Annual Meeting held in the Redpath Museum, McGill University; E. E. Bridgen: "Meteors"; followed by a social hour.
- November 8—M. M. Thomson, M.Sc., Head, Positional Astronomy Division, Dominion Observatory: "Time".
- December 13—Sidney van den Bergh, Ph.D., David Dunlap Observatory: "The Evolution of the Galaxy".
- January 10, 1963—Film presentation: "Time", courtesy of the Bell Telephone Company of Canada.
- February 14—John Hodgson, Ph.D., Head, Seismology Division, Dominion Observatory: "The Structure of the Earth".
- March 14—T. F. Morris, Ph.D., Department of Physics, McGill University: "The Atmosphere of the Sun".
- April 18—Peter M. Millman, Ph.D., Head, Upper Atmosphere Research Section, National Research Council: "Man in Space".
- May 9—Film: "The Strange Case of the Cosmic Rays", courtesy of the Bell Telephone Company of Canada; F. J. DeKinder: "How We Explore the Universe"; social hour.

August 15—A special meeting was held to consider the proposed By-Laws for incorporation in the province of Quebec.

It will be recalled that as reported at the last Annual Meeting, negotiations were proceeding in connection with a new observatory site. Our new Constitution has been approved and the application for incorporation has been forwarded to the Government; we are hoping that the response will be favourable. A suburban municipality has expressed interest in having the observatory located within their boundaries. The Relocation Committee is hard at work and as developments occur the membership will be informed.

As space restricts publication of complete details of the observational activities of the Centre, these may be found in the December issue of SKYWARD. The Director of Observations, Mr. F. J. DeKinder, reports activities in sun-spot study (telescopic and naked eye), lunar study and occultation, meteors, comet and nova, variable stars, planets, aurora, artificial satellites and solar eclipse observation and photography.

W. J. CULLINAN, *Secretary*.

### CENTRE FRANCAIS DE MONTREAL

Le conseil du Centre français s'est réuni cinq fois en assemblée.

Les réunions mensuelles suivantes ont été tenues:

- 24 septembre 1962—Soirée d'astronomie populaire au Jardin Botanique de Montréal.
- 8 octobre—Films sur l'astronomie, accompagnés d'explications.
- 12 novembre—Assemblée générale — Election du conseil — Fleurange Laforest: "Visite à l'Observatoire de Royal Oak".
- 10 décembre—Hubert Reeves, Ph.D., Professeur de physique à l'Université de Montréal: "L'Atmosphère terrestre".
- 14 janvier 1963—René A. Robert, B.Sc.A., Ing.P., Professeur agrégé de physique à l'École Polytechnique: "La route du ciel".
- 11 février—Raymond Desroches, B.Sc.A., Ing.P.: "Un cherche étoiles" (à trois dimensions).
- 11 mars—Marc Durand: "L'astronomie et les recherches spatiales".
- 8 avril—Pierre Lemieux, Directeur des observations du Centre français: "Quelques considérations sur l'annuaire, le graphique du ciel et l'astrolabe".
- 13 mai—Pierre Lemieux: "Commentaires sur l'éclipse totale de Soleil de juillet 1963".
- 8 juin—Dîner annuel au Restaurant Hélène de Champlain.
- 24 septembre—Soirée d'Astronomie populaire au Jardin Botanique de Montréal.

De plus, les réunions hebdomadaires ont été tenues au Jardin Botanique, sous la direction de M. Pierre Lemieux, directeur des observations. Lorsque le temps le permet ces réunions sont suivies d'une période d'observation.

Un cours d'astronomie élémentaire a été donné, suivi de cours plus avancés traitant de sujets tels que la mécanique céleste, les lois de Képler et celles de Newton, etc.

Ces réunions se sont avérées très fructueuses et ont contribué à l'augmentation des adhérents.

FLEURANGE LAFOREST, *Secrétaire*.

## NIAGARA FALLS CENTRE

During 1963, eight meetings were held which were supplemented by six observational or "Star Nights". As a stimulus to initiating serious observing, the star night programmes were based on talks presented earlier in the year.

Details of the meetings were as follows:

January 15—Frank Campbell: "The Moon".

February 19—Hugh N. Maclean: "The Milky Way".

March 19—J. Forbes Booth, M.B., B.Ch.: "Deep Sky Objects".

April 16—G. C. Gardner: "Circumpolar Constellations"; Hugh N. Maclean: "Mariner II Spacecraft with Model".

October 15—Election of Officers.

November 12—Annual Turkey Dinner; Miss Ruth J. Northcott, M.A., National President: "Observatories Across Canada".

November 19—Hugh N. Maclean: "Astronomical Objects".

December 19—G. C. Gardner: "Life and Work of Charles Messier"; V. C. Jones and Hugh N. Maclean: "Coloured Slides of Recent Solar Eclipse".

Star Nights: May 30—Host to 17th Niagara Scout Troop; June 15—Deep Sky Objects; July 13—Milky Way; July 27—The Moon; September 20—Circumpolar Constellations.

An additional observation night was held on February 4, the main feature of which was the opposition of Mars. All Star Nights and regular meetings were well attended.

J. F. HAUZER, *Secretary*.

## OTTAWA CENTRE

Eight lecture meetings were held during 1963; the membership of the Centre is 126.

January 9—G. P. Holland: "Primitive New Guinea".

February 21—Major C. I. Taggart: "Meteorology and Ice Reconnaissance from Space Photography".

March 14—R. M. Petrie, Ph.D.: "The B-Stars and the Galaxy".

April 18—Members of the Observers' Group: "The 1963 Solar Eclipse".

May 23—Ian C. McLennan: "The Queen Elizabeth Planetarium".

October 16—Miss Ruth J. Northcott, M.A., National President: "The David Dunlap Observatory".

November 20—G. Herzberg, Ph.D.: "The Interstellar Medium".

December 11—P. M. Millman, Ph.D.: "The New Look in Japanese Astronomy".

As with many Centres, the major event of the year was the total solar eclipse of 20 July. Several members of the Centre, both amateur and professional, participated in observing the eclipse. The Centre rented a field near Grand'mère, Quebec, where about 50 members and friends were fortunate in having an opening in a generally cloudy sky for a perfect view of the eclipse. Many fine photographs of the partial and total phases were obtained.

The Observers' Group organized its second public Star Night in September, held on the grounds of the National Museum. Ten Issues of the Centre's newsletter "Astronotes", were distributed by the Observers' Group.

The Centre was pleased that one of its members, Miss Miriam S. Burland, was honoured with the Service Award of the Society, presented at the General Assembly in Toronto in May.

The Centre records with regret the death of one of its long-time members, Rev. N. R. D. Sinclair. For many years, Mr. Sinclair attended our annual meetings and asked the Lord's blessing on our banquets.

E. H. DUDGEON, *Secretary*.

## CENTRE DE QUEBEC

En cette année d'éclipse totale de soleil, d'intérêt particulier pour le territoire du Québec, notre Centre s'était proposé, avec la collaboration de divers organismes et sociétés de créer un réseau de postes d'observation, à une cinquantaine de milles les uns des autres, à partir de la frontière de l'Ontario à celle des Etats-Unis. Au stade de l'organisation, l'entreprise fut très satisfaisante. Presque sans ressources pécuniaires, nos chefs d'expédition ont dû accomplir de réels tours de force pour transporter un matériel lourd et encombrant dans des régions parfois désertiques comme l'Abitibi et le Haut-Saint-Maurice. Quant aux résultats, ce fut moins brillant. En plusieurs endroits, l'état du ciel a empêché l'exécution du programme établi et en général il y eut aussi un manque évident de préparation chez nos observateurs. Néanmoins, les documents rapportés des expéditions ont été jugés dignes d'être présentés au public. Une exposition des travaux d'éclipse a été ouverte tout l'automne, à l'observatoire de la tour Martello, où elle a vivement impressionné les visiteurs. On la transportera sous peu au Pavillon de physique, à l'université Laval, et un professeur de la faculté en fera l'appréciation. Cinq catégories de travaux seront primés.

Pour le reste, notre Centre a dû s'en tenir à son programme coutumier, de plus en plus forcé d'étendre son action au reste du Québec et même au delà. Une seule réunion générale a été tenue au cours de l'année, la présente réunion annuelle. La causerie est faite par le Président sortant, M. J.-Alfred Dumont, et a pour titre: "Astronomie et Culture".

*Le secrétaire, PAUL-H. NADEAU.*

## TORONTO CENTRE

Twelve regular meetings were held in 1963, including one joint meeting with The Royal Canadian Institute. Six "Sky-Gazing Parties" were arranged in City parks during the summer and the traditional telescope display was operated by the Centre each evening (weather permitting) during the 15 days of the Canadian National Exhibition. The Centre shared in the arrangements for and the hospitality at the General Assembly held in Toronto in May.

The Observers Group under D. J. FitzGerald continued its observing and discussion activities; many members spent considerable time on the preliminary work of planning an observatory for the Centre. Several members of the Group were hosts to out-of-town members at the General Assembly.

The Telescope Makers Group under Jesse Ketchum held 21 meetings during the year and members completed 26 telescopes. This group materially assisted in the programmes by setting up their instruments at the Sky-Gazing Parties, the C.N.E. and on Saturday evenings for visitors to the David Dunlap Observatory.

Many members of the Centre travelled to Northern Ontario, Quebec and the New England States to view the total solar eclipse on July 20. Some were successful in their choice of locale, others not.

Speakers and subjects at the regular meetings of the Centre were:

January 25—Rev. Francis J. Heyden, S.J., Georgetown College Observatory: "The Scientific Evidence for Life on the Planet Mars".

February 8—J. L. Locke, Ph.D., Dominion Observatory: "The Milky Way from Penticton, B.C.".

February 22—Raymond R. Thompson, B.Ed., Presidential address: "An Amateur's Observatory".

March 8—Thomas A. Matthews, Ph.D., California Institute of Technology: "Recent Developments in the Study of Radio Sources".

- March 22—Members' Night: "The Cassegrainian Telescope".  
 April 5—Film programme and "preview" of General Assembly programme.  
 October 4—Members' Night at David Dunlap Observatory.  
 October 18—Reports by various members on July 20 eclipse observations.  
 November 1—Allan F. Cook II, Ph.D., Smithsonian Astrophysical Observatory: "Saturn's Rings".  
 November 9—John L. Locke, Ph.D., Dominion Observatory: "Total Solar Eclipses".  
 (A joint meeting with The Royal Canadian Institute.)  
 November 22—Ivan King, Ph.D., University of Illinois: "Star Clusters — Guideposts of Astronomy".  
 December 13—Film by Walter Semerau, Kenmore, N.Y.: "An Amateur's Solar Tower Telescope"; Annual Meeting of the Centre.

We regret to note the deaths during the year of several active members. These include: Mr. George Arnott, Mr. F. Cecil Carley, B.A.Sc., Dr. E. J. Lehman; Mr. Herbert L. Moyer; Mr. Arthur T. A. Young; Mr. James L. Proctor.

FREDERIC L. TROYER, *Secretary*.

#### VANCOUVER CENTRE

The following meetings were held during 1963 in the Physics Building at the University of British Columbia:

- January 8—Annual Dinner Meeting; A. H. Batten, Ph.D.: "Algol — the Double Star".  
 February 12—W. F. Slawson, Ph.D.: "Visitors from Space — the Story of Meteorites".  
 March 12—Film presentation: "The Mastery of Space".  
 April 9—Members' Night: M. H. Parry: "The Clock Paradox"; H. N. Ross: "Amateur Variable Star Observing"; A. M. Crooker, Ph.D.: "Some Modern Developments in Astronomy".  
 September 5—Miss Ruth J. Northcott, M.A., National President: "Astronomy at the David Dunlap Observatory". Miss Northcott presented a Science Fair Award to Hugh Ross on behalf of the National Society.  
 October 8—M. A. Chinnery, Ph.D.: "The Rotation of the Earth".  
 November 12—J. F. Kenney, Ph.D.: "The Zodiacal Light".  
 December 10—A. H. Batten, Ph.D.: "Exploding Stars".

Under the direction of Mr. T. Taylor, the telescope section has been active throughout the year, holding regular monthly meetings at the University of British Columbia.

M. A. CHINNERY, *Secretary*.

#### VICTORIA CENTRE

The Victoria Centre held seven regular meetings during 1963 at the University of Victoria through the kindness of its authorities. The Council met on several occasions to plan these programmes and conduct other business of the Centre. A special meeting was held at the Dominion Astrophysical Observatory on the presentation of the R. S. Evans telescope. Speakers and topics during the year were:

- January 9—E. H. Richardson, Ph.D.: "The Atmospheres of the Planets".  
 February 13—W. R. H. White, Ph.D.: "The Internal Structure of the Earth, Moon and Planets".  
 March 13—G. Walker, Ph.D.: "Gas and Dust in Space".  
 April 10—Activity Night.  
 October 9—R. A. Ghobros, Ph.D.: "Astronomy in Egypt from the 5th Dynasty to the Present Day".

November 13—G. Ball, J. Climenhaga, Ph.D., D. Ingham and G. Walker, Ph.D.:  
 “The Solar Eclipse 1963”.

December 6—Annual Dinner and Annual Meeting.

Membership in the Centre was 68, consisting of one Honorary Life member, 12 Life members, 46 regular and 9 student members.

W. R. DAMER, *Secretary*.

#### WINDSOR CENTRE

Eight regular meetings (with an average attendance of 26), a bus trip, participation in a successful fun fair and three executive meetings were held. The programmes were as follows:

January 15—Lambert Huneault: “Review of Astronomical Highlights of 1962”; Leslie Smith: “Galileo, The Man”; Film presentation: “Science and Space” and “Photography of Navy Science”.

February 19—Dan Bawtenheimer: Current Events—First Magnitude Stars”; Cyril Hallam: “The Observer’s Handbook”; E. E. Habib, Ph.D.: “Energy Transformation in the Sun and the Stars”.

March 19—James M. Meredith: “Current Events”; Jack Metcalf: “Astronomy and Navigation”.

April 16—Lambert Huneault: “Current Events — Chinook Winds”; Larry Pohjola: “Construction of the Milky Way”; Film presentation.

May 25—Members took a bus trip to Ann Arbor, Michigan, to view the University of Michigan 85-foot diameter Radio Telescope, then to Monroe, Michigan, to see the Enrico Fermi Nuclear Reactor.

June 1 and 2—Participation and astronomical displays at Fun Fair.

June 18—Viewing the stars through members’ telescopes at Poplar Lodge, site of Dan C. Bawtenheimer’s Observatory; refreshments.

September 17—Cameron Montrose: Viewing the Total Eclipse of the Sun on July 20, 1963”; Film presentation: “The Fossil Story” and “The Petrified River”.

October 22—Henry Lee: “Current Events”; C. D. Marshall: “New Skins for New Wines”.

November 19—Annual Reports and Election of Officers; Dan Bawtenheimer: “Twenty Years of the Windsor Centre”; refreshments.

JAMES M. MEREDITH, *Secretary*.

#### WINNIPEG CENTRE

Nine regular and one special meeting were held during 1963 at either the Shinn Conservatory of Music or the Norquay Building. The speakers and topics were:

January 25—W. R. Bullock, Bristol Aero Industries Ltd.: “Upper Atmospheric Phenomena and Measurements”; Film: “The Development of the Black Brant III High Altitude Research Rocket”.

March 1—R. J. Lockhart, B.A., F.R.A.S., F.B.I.S.: “Comets and Some New Theories Regarding Them”; Film: “The Strange Case of the Cosmic Rays”.

March 29—K. G. Standing, Ph.D., University of Manitoba: “Gamma Ray Astronomy”; Film: “Universe”.

- April 26—B. G. Whitmore, Ph.D., University of Manitoba: "Radio Astronomy"; John Stewart: "What's in the Sky This Month".
- May 31—J. N. R. Scatliff, M.D.: "The Astronomical Aspects of the July Eclipse"; E. Matthews: "Photography and the Eclipse"; B. Evans, C.P.R.: "The Expedition to Wivenhoe"; B. Rotoff: "Outline of the Summer Observation Programme".
- July 22—Special Eclipse Meeting; reports were given by several members and guests who observed the eclipse from Wivenhoe and from Assiniboine Park, Winnipeg.
- September 6—Miss Ruth J. Northcott M.A., National President: "Astronomy in Canada". Miss Northcott also presented the R.A.S.C. award of the Second Canada-Wide Science Fair to Norman Wilde, a member of the Winnipeg Centre, for his entry in astronomy.
- September 27—B. Rotoff: "The Motions of the Moon"; J. N. R. Scatliff, M.D.: "Observing Features of the Moon".
- November 8—B. F. Shinn, President of the Centre: "Telescope, Target and Time"; Film presentation: "Space, Science and Time".
- December 6—Annual Meeting; Election of Officers; "A Symposium on the 1963 Eclipse of the Sun".

The Council met on nine occasions and ten observation nights were held. There have been several developments of interest in the Centre this year:

- (i) Dr. J. N. R. Scatliff, Past President of the Centre, donated his observatory building to the Winnipeg Centre and the Moffat Broadcasting Ltd. granted permission to erect the building on the grounds of CKY Radio Station.
- (ii) Mrs. E. R. Gardner donated the entire astronomical equipment, including a mirror grinding machine, owned by the late Mr. Gardner, to the Winnipeg Centre.
- (iii) The Winnipeg Centre and the C.N.R. organized an excursion to Wivenhoe in Northern Manitoba to observe the total eclipse of the sun on July 20. About 120 amateur and professional astronomers made this trip.
- (iv) An exhibit by the Winnipeg Centre at the Red River Exhibition resulted in an increase in membership. The Centre has now 74 regular and student members and one Life member.

JOHN MOHLER, *Secretary.*

THE ROYAL ASTRON

BALANCE

A S S E T S

CURRENT ASSETS

Cash on hand and in bank . . . . .	\$ 4,540.00	
Accounts receivable . . . . .	4,184.79	
Accrued debenture interest . . . . .	78.75	
Prepaid expenses and deferred charges . . . . .	<u>630.87</u>	\$ 9,434.41

INVESTMENT

Canada Permanent Trust Corporation, 5% debenture, maturing 1968 . . . . .		3,000.00
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FIXED ASSETS

	<u>Cost</u>	<u>Accumulated Depreciation</u>	<u>Net Book Value</u>	
Land - 252 College Street . . . . .	\$17,000.00	\$ --	\$17,000.00	
Building - 252 College Street . . . . .	17,500.00	2,937.50	14,562.50	
Furniture and equipment . . . . .	2,958.78	1,945.29	1,013.49	
Apartment equipment . . . . .	373.42	110.96	262.46	
	<u>\$37,832.20</u>	<u>\$4,993.75</u>	<u>\$32,838.45</u>	\$32,838.45
Library - Nominal value . . . . .				100.00
				<u>\$45,372.88</u>

A U D I T O R S' R E P O R T

We have examined the balance sheet of The Royal Astronomical Society of Canada as at December 31, 1963 and the statements of revenue and expense and surplus for the year ended on that date. Our examination included a general review of the accounting procedures and, without performing a detailed audit of the transactions, we tested the accounting records and other supporting evidence.

Toronto, Canada,  
February 24, 1964.

APPROVED ON BEHALF OF THE NATIONAL COUNCIL:

J. F. Heard, *National Treasurer*  
J. E. Kennedy, *National Secretary*



TY OF CANADA

MBER 31, 1963

LIABILITIES AND SURPLUS

CURRENT LIABILITIES

Outstanding cheques . . . . .	\$2,022.42	
Accounts payable and accrued charges . . . . .	<u>139.84</u>	\$ 2,162.26

DEFERRED INCOME

Membership fees for year ended September 30, 1964 . .	\$2,983.71	
Prepaid subscriptions to Journal and Observer's Handbook	1,649.48	
Prepaid advertising for 1964 Publications . . . . .	<u>1,845.00</u>	6,478.19

LIFE MEMBERSHIP RESERVE (per statement) . . . . .		2,991.94
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LIBRARY FUND RESERVE (per statement) . . . . .		<u>1,010.00</u>
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TOTAL LIABILITIES . . . . .		\$12,642.39
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SURPLUS (per statement) . . . . .		32,730.47
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\$45,372.86

T O M E M B E R S

In our opinion, based upon our examination and the information and explanations given to us, the accompanying balance sheet and statements of revenue and expense and surplus present fairly the financial position of the Society at December 31, 1963 and the results of its operations for the year ended on that date.

MORRIS ALTMAN AND COMPANY  
Chartered Accountants

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA  
STATEMENT OF GENERAL REVENUE AND EXPENSE  
FOR YEAR ENDED DECEMBER 31, 1963

REVENUE

Membership Fees		
R.A.S.C. Centres . . . . .	4,647.99	
Individual members . . . . .	2,137.50	
Life membership reserve — Annual appropriation . . . . .	209.77	\$ 6,995.26
Grants and Donations		
Government of Canada . . . . .	\$ 3,500.00	
Province of Ontario . . . . .	1,000.00	
Members' contributions . . . . .	68.70	4,568.70
Publications		
Journal of the R.A.S.C. . . . .	\$ 1,666.60	
Observer's Handbook . . . . .	6,155.49	
Special issues and reprints . . . . .	1,452.70	
Publication fees . . . . .	690.00	
	<u>\$ 9,964.79</u>	
Add: Foreign exchange premiums . . . . .	381.30	
	<u>\$10,346.09</u>	
Deduct: Agent's discounts . . . . .	950.20	9,395.89
Advertising . . . . .		1,670.00
Sale of Insignia . . . . .		66.00
Debenture interest . . . . .		150.81
		<u>\$22,846.60</u>
TOTAL REVENUE . . . . .		

EXPENSE

Printing of publications . . . . .	\$14,605.48	
Staff salaries . . . . .	4,940.00	
Stationery, printing and supplies . . . . .	1,073.71	
Postage and express (less amounts charged) . . . . .	586.00	
Telephone . . . . .	173.51	
Grants to R.A.S.C. centres for life members . . . . .	115.50	
Annual assembly — travel allowances . . . . .	280.00	
Library expenses . . . . .	274.11	
Miscellaneous expenses . . . . .	303.96	
Insignia, medals and awards . . . . .	258.05	
Staff pension fund . . . . .	473.96	
Contribution to William Hossack Memorial Fund . . . . .	100.00	
Depreciation on office furniture and equipment . . . . .	295.88	
Bad debts written off . . . . .	85.00	
	<u>TOTAL EXPENSE</u>	\$23,565.14
EXCESS OF EXPENSE OVER REVENUE . . . . .		<u>\$ 718.54</u>

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA  
 STATEMENT OF BUILDING REVENUE AND EXPENSE  
 FOR YEAR ENDED DECEMBER 31, 1963

REVENUE

Rents received for building space not used by Society . . . . .	\$3,010.00
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EXPENSE

Property taxes . . . . .	\$619.40
Fuel . . . . .	305.00
Light, gas and water . . . . .	319.51
Maintenance and repairs . . . . .	698.65
Insurance . . . . .	71.17
Depreciation . . . . .	437.50
Depreciation on apartment appliances . . . . .	37.34
	<u>2,488.57</u>
EXCESS OF REVENUE OVER EXPENSE . . . . .	<u>\$ 521.43</u>

STATEMENT OF SURPLUS

Balance at December 31, 1962 . . . . .	\$32,927.54
<i>Deduct:</i> Excess of general operating expense over revenue for the year 1963 . . . . .	718.50
	<u>\$32,209.04</u>
<i>Add:</i> Excess of building revenue over expense for the year 1963 . . . . .	521.43
Surplus — December 31, 1963 . . . . .	<u>\$32,730.47</u>

STATEMENT OF LIFE MEMBERSHIP RESERVE

Balance at December 31, 1962 . . . . .	\$ 3,001.71
<i>Add:</i> Life membership fees received during 1963 . . . . .	200.00
	<u>\$ 3,201.71</u>
<i>Deduct:</i> Appropriation to General Account for year ended December 31, 1963 . . . . .	209.77
Balance at December 31, 1963 . . . . .	<u>\$ 2,991.94</u>

STATEMENT OF LIBRARY FUND RESERVE

Request by the late Carl Reinhardt . . . . .	\$ 1,000.00
Contributions received from other sources . . . . .	10.00
Balance at December 31, 1963 . . . . .	<u>\$ 1,010.00</u>

RECEIPTS	Calgary	Edmonton	Halifax	Hamilton	Kingston	London	Montreal
Balance from 1962	\$149.30	\$159.81	\$204.69	\$ 637.16	\$ 69.01	\$137.43	\$ 41.10
Membership Fees	164.00	262.00	85.15	400.00	49.00	192.00	110.00
Donations	4.00					35.00	9.00
Educ. Activities				149.87			1.70
Annual Dinner	84.75			2.25			
Sales of Handbooks, etc.	1.00			35.05		1.00	
Bank Interest		6.00		16.80	1.60	4.12	
Income from Investments							
Life Member Grant				4.50			
Loans							
Government Grants							
Miscellaneous	25.00			.30			
<b>Total</b>	<b>\$428.05</b>	<b>\$427.81</b>	<b>\$289.84</b>	<b>\$1,245.93</b>	<b>\$119.61</b>	<b>\$369.55</b>	<b>\$42.80</b>

DISBURSEMENTS							
Fees remitted to N.O.	\$107.33	\$174.67	\$ 64.67	\$ 86.67	\$ 30.67	\$128.00	\$ 7.00
Donations to N.O.							
Meetings	8.50	139.40	12.00	119.09	1.95	97.80	1.70
Annual Dinner	123.65			3.97			
Handbooks, etc.	1.00					.67	
Equipment and Supplies			14.84	41.25	13.72		
Office and Admin.	21.74	10.00		88.20	.85	5.30	5.00
General Expenses	.85	12.00	11.00	249.28	3.10	10.30	4.00
Observers Group							
Library							
Balance carried to 1964	164.98	91.74	187.33	657.47	69.32	127.48	4.00
<b>Total</b>	<b>\$428.05</b>	<b>\$427.81</b>	<b>\$289.84</b>	<b>\$1,245.93</b>	<b>\$119.61</b>	<b>\$369.55</b>	<b>\$42.80</b>

TORONTO CENTRE SPECIAL PURPOSE FUND

RECEIPTS	DISBURSEMENTS
Balance from 1962 . . . .	Purchase of Power Megaphone \$ 94.00
Annual Grant from C.N.E. . . . .	Balance November 30, 1963 . . . . .
Bank Interest . . . . .	
<u>\$2,896.18</u>	<u>2,896.18</u>

OF CENTRES

Niagara Falls	Ottawa	Québec	Toronto	Vancouver	Victoria	Windsor	Winnipeg
\$ 89.92	\$ 367.69	\$ 63.53	\$1,193.64	\$479.39	\$1,475.28	\$ 41.47	\$107.98
141.00	643.00	392.35	2,239.35	253.56	245.50	196.00	289.50
	21.63						
120.00	152.00			113.12	132.75		
4.50	98.00				12.00		4.40
1.31	10.64	2.35		15.15	55.74	2.35	3.81
			33.00	7.50			1.50
		408.41					
		1,000.00					
1.63							
\$358.36	\$1,292.96	\$1,866.64	\$3,465.99	\$868.72	\$1,921.27	\$239.82	\$407.19

\$104.68	\$ 406.67	\$ 288.01	\$1,493.00	\$172.04	\$ 239.74	\$134.00	\$191.33
			82.40				
	58.80		129.30	32.25		20.52	5.50
113.75	164.89			113.85	158.92		
	69.60						4.75
2.00	68.00	360.98		100.00			34.92
15.41	144.03	1,125.49	169.70	12.85	55.90	31.52	
.76	2.80		20.60	.15		11.20	14.63
			250.36				
	81.63						
121.76	296.54	92.16	1,320.63	437.58	1,466.71	42.58	156.06
\$358.36	\$1,292.96	\$1,866.64	\$3,465.99	\$868.72	\$1,921.27	\$239.82	\$407.19

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA  
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