

SUPPLEMENT TO

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ROYAL ASTRONOMICAL

SOCIETY OF CANADA



March 1965

REPORT OF THE NATIONAL PRESIDENT

It is a great honour to be President of The Royal Astronomical Society of Canada at this period in its history. With sixteen Centres across Canada, we serve as sources of information for large numbers of our fellow citizens, particularly young people in their endeavour to keep abreast of current scientific developments.

The sixth General Assembly was held in Ottawa, May 15-17, and was an indication of our activities. Some 120 out-of-town members attended and took part in the three-day programme, which included visits to the Dominion Observatory and to the Springhill Meteor Observatory. Fifteen of the sixteen Centres were represented and the majority of Centres contributed to the exhibition of observational material. The new National Co-ordinator for Observational Activities, Miss Isabel K. Williamson of the Montreal Centre, will be glad to hear from other members who are interested in making astronomical observations in any of a number of disciplines.

Several outstanding developments in the field of astronomy have occurred in Canada during 1964. At the time of the visit of Her Majesty in October, the Government of Canada announced that, to commemorate this visit, the Queen Elizabeth II Observatory would be established with its principal instrument a 150-inch optical telescope. The site of the new Observatory has since been chosen at an altitude of about 6,000 feet on Mount Kobau, a few miles north of the Richter Pass near Osoyoos, British Columbia. As plans are now developing, it is expected that a quartz blank for the large mirror will be ordered in 1965. At the Dominion Radio Astrophysical Observatory in Penticton, a new 10 Mc./s. aerial array is being constructed in co-operation with Cambridge Observatory, and a 2700 Mc./s. solar patrol telescope has been installed by the National Research Council.

During the year, Dr. C. S. Beals, the Dominion Astronomer since 1946, retired. Dr. J. H. Hodgson, Head of the Seismology Division, was appointed Director of the Observatories Branch of the Department of Mines and Technical Surveys, and Dr. R. M. Petrie of Victoria was appointed Dominion Astronomer with the responsibility for the new Observatory.

Plans for five new planetaria in Canada were also announced, located at Calgary, Montreal, Quebec City, Winnipeg and Toronto, the latter being connected with the University of Toronto. Our Society has supported the need for such additional facilities for public instruction in astronomy and it is a matter of great satisfaction that this need will soon be met in more of our larger cities.

Many of our Centres have instituted Star Nights and thousands of visitors have attended demonstrations sponsored by the Montreal, Toronto, Edmonton, Calgary, Hamilton and Victoria Centres. These important gatherings not only provide opportunities for the general public to learn about current astronomical developments, but also make known much better the aims and activities of the Society.

Sixteen hundred astronomers and guests attended the 12th General Assembly of the International Astronomical Union in Hamburg, Germany, Aug. 24 - Sept. 3, to discuss results obtained during the past three years and to make plans for future researches. Three invited lectures were given: "Solar Magnetic Fields" by A. B. Severny of the Crimean Astrophysical Observatory, "Space Astronomy" by Leo Goldberg of Harvard College Observatory, and "Our Galaxy, Its Structure and Evolution" by J. H. Oort of Leiden Observatory. A feature of this Assembly was the report, with photographs, of the results obtained from the Ranger VII which televised and transmitted over four thousand pictures of the lunar surface before it crash-landed. Other developments included the launching of space craft by both the U.S.A. and the U.S.S.R. in attempts to obtain detailed information of the features of Mars when these pass close to the planet in July 1965; the discovery of water vapour on Venus and its measurement in the spectrum of Mars; the balloon observations showing water-vapour bands in the infrared to be the most important features in the energy spectrum of low-temperature M stars; and observations of interstellar OH lines in the radio spectrum (near 18 cm.) late in 1963.

I should like to thank all members of the National Council for their efforts to improve our Society and especially the National Secretary and the Executive Secretary for maintaining the National Office at the high level of efficiency attained during the terms of our past President, Miss Ruth J. Northcott, and former National Secretary, Mr. J. E. Kennedy. Let us work to make 1965, the 75th Anniversary of the founding of the Astronomical and Physical Society of Toronto, a year to remember.



National President.

REPORT OF THE NATIONAL SECRETARY

In the course of the last calendar year, meetings of the National Council were held on January 4, March 6, May 16 and September 19. The Executive Committee met on four occasions – February 7, April 10, July 28 and December 9. The Annual Meeting of the Society was held in Toronto on March 6, with the retiring President, Miss Ruth J. Northcott, as Chairman.

The membership of the Society as of September 30, 1964, was 2,205 (including 124 Life Members), made up as follows:

CENTRES			
Toronto	581	Vancouver	64
Montreal	220	Victoria	58
Ottawa	149	London	51
C.F. de Montréal	117	Calgary	41
Hamilton	79	Niagara Falls	35
Edmonton	77	Windsor	33
Quebec	71	Halifax	16
Winnipeg	70	Kingston	16
UNATTACHED			
U.S.A.	343	Foreign	37
Canada	132	Honorary	15

The General Assembly of the Society was held at Carleton University, Ottawa, May 22-24. Residence accommodation, dining facilities, lecture and meeting rooms and ample display space were all provided in the University and added to the excellence of the programme. The local Planning Committee of the Ottawa Centre, under the Chairmanship of Mr. F. R. Park, is to be congratulated for the thorough work both before and during the General Assembly. Included in the programme were three trips – a visit to the Dominion Observatory, where all buildings and equipment were made available to Society members; a bus tour of the City of Ottawa which was especially attractive at the height of the Tulip Festival; a visit to the Springhill Meteor Observatory where a profitable time was spent examining all visual photographic and radar installations.

Service Awards were presented to the Rev. M. W. Burke-Gaffney, S.J., of the Halifax Centre, to Mr. W. T. Goddard of the Hamilton Centre and to Dr. C. S. Beals of the Ottawa Centre. Honorary Membership in the Society was conferred on Dr. Gerald M. Clemence (see June JOURNAL, p.141). Membership Certificates were awarded to ten members of the Montreal Centre, four members of the Toronto Centre and two members of the Calgary Centre. A special award of the R.A.S.C. was made to Jean Vallières of the Centre Français de Montréal for his winning entry in the Third Canada-Wide Science Fair, Astronomy section. In addition to this, Jean's exhibit received the top award for a boy in the entire Science Fair.

Mr. R. V. Ramsay resigned as Chairman of the Standing Committee on Observational Activities and National Council appointed Miss Isabel K. Williamson to this office. Mr. Raymond R. Thompson resigned as Lunar Co-ordinator and was replaced by Mr. A. Ostrander.

We record the Society's sincere appreciation to all officers and members for their many contributions in advancing the aims and work of the Society throughout the past year.

It is with sincere regret that we record the death of the following members:

Mr. Harold F. Balmer (Toronto Centre)	Mrs. Mona Kelk (Foreign)
Mr. H. Dykesly (Edmonton Centre)	Mr. A. W. MacKenzie (Vancouver Centre)
Mr. G. A. Gaherty, Sr. (Montreal Centre)	Mr. A. Mayer (Canada)
Mr. D. P. Gillmore (Montreal Centre)	Mr. H. J. Montgomery (Edmonton Centre)
Mr. John R. Goudie (Toronto Centre)	Dr. A. Norman Shaw (Montreal Centre)
Mr. W. K. Harris (Hamilton Centre)	Mr. M. C. Trueman (Victoria Centre)
Mr. P. H. Hughes (Victoria Centre)	Mr. T. A. Wagner (U.S.A.)
Mr. D. G. Ingham (Victoria Centre)	Mr. John W. Wordley (Canada)

NORMAN GREEN, *National Secretary.*

REPORT OF THE LIBRARIAN

Items on loan from the Library number 72 at the time of this report, representing 36 per cent of the books, and indicates that a heavy demand continues to be made on this service by our members. Films and slides have been frequently used, with the films circulating 12 times and the slides 11 times. Donations gratefully acknowledged include those from Mr. Wilfred Miller of Gaspé, Quebec, and Mr. C. M. Good of the Montreal Centre.

The active part of the collection has been catalogued with the exception of a few books not examined by the Library Committee. Arrangements with the Library of Congress will greatly ease the cataloguing in future. Material not needed by the Library but received either free or in exchange for the JOURNAL is sent to the Department of Astronomy at the University of Toronto. The transfer to the National Office of the back issues of the JOURNAL formerly stored in the Physics Building, U. of T., has been largely accomplished.

It is recommended that National Council give urgent attention to some means of reducing the routine work load attached to the Office of Librarian; it will then be possible to increase the Library facilities and services to the general membership.

L. A. CHESTER, *Librarian.*

REPORTS OF SECRETARIES OF CENTRES

CALGARY CENTRE

Regular meetings were held on the second Wednesday of each month (except June, July and August) at the University of Alberta, Calgary. Mr. S. Litchinsky provided facilities for Executive Meetings.

Two very important events highlighted the year's activities:

First was the acceptance by the City of Calgary Centennial Committee of our suggestion to build a major planetarium as the City Centennial Project. This decision culminated many months of work by members of the Planetarium Committee of the Calgary Centre. We feel that completion of this project will give astronomy and, of course, the Calgary Centre, very welcome stimulation in the years to come.

The other highlight of 1964 was the astronomical exhibit "Astro-night" held September 25 and 26 at the Southern Alberta Jubilee Auditorium. This featured displays from N.A.S.A. and many major observatories along with many supplied by members of the Centre. A good attendance by the public coupled with many interested visitors at the telescopes during the observing sessions served to reward Mr. John Howell and his Committee for their worth-while undertaking.

The Annual Dinner Meeting was held in December at the Highlander Hotel. Guest speaker was Mr. Harold Bacon of N.A.S.A. whose subject was "Orbiting Astronomical Observatories". Also at this meeting, Mr. Roy Graham and Mr. Walter Stilwell were presented with membership certificates for their services to the Calgary Centre.

Each of the following meetings included talks on the current constellations given by Mr. K. Meiklejohn:

January 8—R. Choquette: "Radio Astronomy".

February 12—J. Grant: "Meanook Meteor Observatory".

March 11—K. Pawson: "Adventures in Antarctica".

April 8—R. Allin: "Cataclysmic Variable Stars".

May 13—S. Wieser: "Field Theory".

September 9—G. Sadler: Programme of astronomical films.

October 14—R. Nelson: "Report on the 1964 General Assembly, and visit to U.S. Planetaria".

November 12—D. J. Fry, Ph.D.: "Stellar Distances".

December 9—H. Bacon: "Orbiting Astronomical Observatories".

G. L. GRAY, *Secretary*,

EDMONTON CENTRE

During the year, the Centre held 11 regular meetings and 4 meetings of Council in the Queen Elizabeth Planetarium, through the courtesy of the City of Edmonton, Parks and Recreation Department.

Some excellent features contributed to the success of these meetings:

November 14/63—Franklin Loehde: "Astronomical Features in Europe".

December 12/63—H. W. Taylor, Ph.D.: "Radio Activity in Meteorites".

January 9/64—Film presentation: "A Light in Nature".

February 13—F/L F. W. McCauley: "Astro-Navigation".

March 12—Robert Allin: "Cataclysmic Variable Stars".

April 9—Rickey Choquette: "Radio Astronomy — Amateur Level".

May 7—Walter Franiel: "Astro-Photography".

June 4—Ann Palm, Ph.D.: "The Moon".

The annual Calgary-Edmonton Speaker Exchange took place in April, with the accent on youth. The Edmonton Centre was represented at the General Assembly of the Society held May 18-20 in Ottawa by Robbie Drinnan, Franklin Loehde, Adrienne and Ian McLennan. On August 16, 1964, members of long-standing gathered at Molson's Edmonton House for a 75th birthday dinner in honour of the wife of the

founder of the Edmonton Centre, Mrs. J. W. Campbell, herself a very popular member.

A new constitution and by-laws, formulated by Dr. H. W. Taylor and Franklin Loehde, was presented to members on July 9 and unanimously accepted on August 13. For the second year, star nights were held in the Jubilee Auditorium, September 18 and 19. The funds realized from these public presentations on Astronomy brought the Centre nearer to its goal of an Observatory.

The Society deeply regrets the death of the following members: Edward Schade, Harold J. Montgomery and H. Dykesly. The passing of the Planetarium receptionist, Mrs. Isabella Courtell, is also noted; her untiring efforts on behalf of the Society were greatly appreciated.

(MRS.) ADRIENNE McLENNAN, *Secretary*.

HAMILTON CENTRE

During 1964 the Hamilton Centre held eight meetings on the first Thursday of each month as indicated in the programme below, and two Council meetings.

January 2—J. Winger: "Looking Through New Windows".

February 9—Junior Night Special: Film: "Theory of the Optical Maser"; Robin Allen: "Rocketry Through the Ages"; Ed. Didzbalis: "NASA Ranger Programme"; Dennis Matheson: "Mars, Our Neighbour".

March 5—L. V. Powis: "Alpha, the Flying Particle".

April 2—F. A. Robinson: "Martian Ecology".

May 7—W. J. McCallion, M.A.: "Galaxies".

October 1—Presentation of Service Award to the Honorary President of the Centre, W. T. Goddard; J. E. Kennedy, M.Sc.: "Solar Eclipse Expeditions"; annual election of Officers.

November 5—G. A. Thede, E.E.: "Artificial Satellites and Interplanetary Travel".

December 3—N. Seville: "Formation of Planets".

Mr. G. Craig has carried out a monthly programme during the year with his Observers group on star and constellation study and other astronomical events as these occurred.

Our Telescope Makers Group have met twice each month under the direction of Mr. S. J. Swannie and Mr. J. A. Winger. A mirror grinding machine capable of handling up to a 16" mirror blank has been constructed. As a first attempt, they are making good progress with a 10" f/8 pyrex mirror, while others in the group are working on the mount. Several members are engaged in hand grinding of mirrors, ranging in size from 6" to 12½", with one 12" already completed.

Our Junior section conducts their own meetings prior to the regular Centre meeting and elect their own officers. Between 12 and 15 members normally attend.

Two star nights were held in September; poor viewing weather and other factors combined in a disappointing outcome.

L. V. Powis, *Secretary*.

KINGSTON CENTRE

Since our membership is made up entirely of university students who have very little time, the main function of our Centre is to provide an opportunity for informal discussion on astronomical topics among these members. With limited free time, projects such as telescope making and prolonged observational programmes are not practical. However, we have trained ten new members in the use of the Queen's University telescope (a 15-inch reflector) and, having all passed their tests, they are allowed to use the instrument whenever they have a free evening for telescope observation. Apart from this, various films on astronomy have been shown in our bi-weekly meetings, among which were the series of "Bell Telephone Hour" films, including "Cosmic Rays" and "The Sun".

For the next few weeks we have planned gas and ruby laser demonstrations together with the presentation of a number of films on astronomy during "The

Engineering Hour" to a large number of engineering students at Queen's from all years.

GARY RATHWELL, *Secretary*.

LONDON CENTRE

Eight meetings were held during the year from January to May in the Hume Cronyn Memorial Observatory, University of Western Ontario, from October to December in Thames Hall, University of Western Ontario.

The programmes were as follows:

- January 17—K. A. Innanen, M.Sc.: "The Distribution of Mass in the Galaxy"; bequests of the late Dr. Kingston to the London Centre.
- February 21—Resolution presented by the President, J. W. Haynes, that the bequest from the estate of Dr. H. R. Kingston be invested and the income used to bring an outstanding astronomer to the Centre as guest speaker for the February meeting; A. J. Watt: "The Aurora Borealis"; J. W. Haynes: "Systems of Telescopes".
- March 20—N. B. Massey, London Teachers College: "The Appeal to Nature"; R. L. Williams: "Handbook Study".
- April 17—J. W. Haynes: "The Birth and Death of a Star"; Robert Wood: "Handbook Study"; Display of optical equipment; out-of-door study of visible constellations and associated bright stars.
- May 15—Albert Sugarman: "Discussion of Celestial Co-ordinates, Right Ascension, Declination".
- October 30—H. Van der Laan, Ph.D., Astrophysicist, Department of Mathematics and Astronomy, U.W.O.: "Radio Astronomy and Cosmology".
- November 20—R. Borlace: "Handbook Study"; J. W. Haynes: "Demonstration of a Home Made Telescope Using a Four-inch Telephoto Lens".
- December 18—An open meeting was held in the Hume Cronyn Memorial Observatory to view the total eclipse of the moon. The response from students and older people was very rewarding; refreshments were served.

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

MONTREAL CENTRE

During the past year six Council meetings were convened at the Observatory and eight regular meetings were held in the Macdonald Physics Building, McGill University, with the following programmes:

- October 17, 1963—Annual Meeting; Bryan Rawlings: "Solar Flare Patrol—the Solar Flare Indicator".
- November 14, 1963—K. O. Wright, Ph.D., National President, Dominion Astrophysical Observatory, Victoria: "The Chemistry of the Stars".
- December 12, 1963—Miss Isabel K. Williamson, assisted by Karl McNamara, Alfred Capper, Terence Ivey, Kenneth Chalk, Mel Pyne, Ben Lapin, and Geoffrey A. Gaherty, Jr.: "Eclipse Symposium", slides and film.
- January 9, 1964—C. S. Beals, Ph.D., Dominion Observatory, Ottawa: "Missiles from Outer Space" and Mines and Technical Surveys display: "Mapping the Moon" (a joint meeting with Sigma Xi, McGill University).
- February 13—John L. Locke, Ph.D., Dominion Observatory: "Exploring the Milky Way by Radio".
- March 12—Film presentation: "The Unchained Goddess", courtesy the Bell Telephone Company of Canada.
- April 9—T. F. Morris, Ph.D., McGill University: "Evolution of the Galaxies".
- May 14—Donald Frappier, Canadian Broadcasting Corporation: Colour slides of interest to astronomers with tape-recorded commentary. The slides and tape were later donated to the Centre.

September 26—A visit from members of Ottawa Centre. Brief talks were given on "Meteors" and "Meteor Showers", followed by a discussion period.

The Centre became a Corporation, under the name of The Montreal Centre of The Royal Astronomical Society of Canada, upon being granted Quebec Letters Patent dated April 20, 1964. Incorporation as a non-profit astronomical and educational organization was necessary to enable the Centre to raise funds for the purchase of property where, with improved facilities, a more extensive programme of activities can be carried out.

Observational activities have included the following: height measurements of lunar features, search for colour phenomena, lunar training programme (25 members); lunar meteor search (14 members); lunar occultations (10 members); two lunar eclipses (37 members); planetary observations: Mercury, Venus, Jupiter, Saturn, asteroids Vesta and Pallas (36 members); naked-eye sun-spots (8 members); solar flare indicator; aurorae (18 members); search for comets or novae (9 members); Nova Herculis 1963 (2 members); variable stars (2 members); variable star training programme (24 members); meteors (32 members); artificial satellites (9 members); Messier Club: identification (76 members to date); notes and sketches (42 members); astrophotography; telescope making.

During the year additions to the library consisted of 5 books purchased by the Centre and 38 donations.

Attendance at the Observatory totalled 2,660 during the year (1,266 on Saturday nights). The annual Christmas party was held the week before Christmas. On March 7, 1964, the Observatory was broken into and considerable observational equipment was stolen; this was covered by insurance. A sun-dial, sextant and 6-in. reflecting telescope have been donated as Observatory equipment.

ELLA DACK, *Secretary*.

CENTRE FRANCAIS DE MONTREAL

Le conseil s'est réuni six (6) fois au cours de l'année, alors que les activités du centre ont été discutées et élaborées.

Les réunions hebdomadaires et mensuelles ont eu lieu au Jardin Botanique de Montréal, Salle Léon Provencher. Cette salle est mise à la disposition du Centre français par la ville de Montréal.

Voici le résumé des réunions mensuelles:

septembre 1963—Soirée d'Astronomie Populaire; sous la présidence d'honneur de

Mlle Ruth Northcott, cette soirée a réuni au moins deux milles personnes.

octobre—Assemblée générale annuelle; Election du conseil; Films; Mme J. P. Jean:

"Recherches sur les Cratères coniques lunaires".

novembre—Jacques Labrecque: "Le Cercle Méridien à miroir de l'observatoire fédéral".

décembre—Hubert Reeves, Professeur de Physique à l'Université de Montréal: "Les Galaxies".

janvier 1964—Wladimir Paskievici, Professeur à l'Ecole Polytechnique de Montréal:

"Les Rayons Gamma dans l'Astronomie".

février—Jean Asselin, Ing.P.: "Mars prochaine étape".

mars—F. J. DeKinder: "Voyages Spatiaux".

avril—René A. Robert, Professeur à l'Ecole Polytechnique de Montréal: "La Spectrométrie".

mai—Jean Vallières: "L'échec de la loi de réciprocité en photographie astronomique".

juin—Dîner annuel.

En plus des réunions mensuelles les réunions hebdomadaires d'observation ont eu lieu tout le long de l'année: Il y a eu en hiver une série de causeries avec présentation de films et diapositives revisant les généralités de l'astronomie. Des soirées ont été organisées dans diverses institutions ainsi que pour les Scouts.

Trois groupes ont aussi été très actifs: Le Club Messier sous l'égide de M. Philippe Mailloux; un groupe a effectué des observations méthodiques de météores

et enfin la construction de deux télescopes de 6 pouces a été terminée durant l'année; tous deux possèdent une monture équatoriale. L'instrument de notre président possède en plus un moteur électrique à vitesse variable et a servi à faire plusieurs photographies planétaires.

Au point de vue documentaire un almanach graphique amélioré a été conçu, calculé et dessiné par deux directeurs du Centre. La demande d'en faire un semblable pour 1965 aura des suites. Le travail préliminaire en vue de publier, dès l'automne prochain un annuaire en français pour l'année 1966 est en voie d'exécution.

Enfin, notre bibliothèque s'est enrichie au cours de l'année d'une centaine de livres de publication récente d'une valeur considérable.

FLEURANGE LAFOREST, *Le secrétaire.*

NIAGARA FALLS CENTRE

During 1964, nine regular meetings of the Centre were held. We were fortunate in having a number of excellent programmes which, coupled with our star nights and field trips, produced a most successful year.

Details of these were as follows:

January 21—K. Hayes: "History of Astronomy".

February 18—C. Spratt: "Variable Stars".

March 20—Field trip and regular meeting at the Board of Education Planetarium, Niagara Falls, N.Y.

April 21—W. Semerau: "Homemade Equipment for Solar Observing".

May 22—Public Star Night.

June 5—Public Star Night.

June 6—Field trip to W. Semerau's observatory.

July 10—Public Star Night.

August 7 and 14—Public Star Nights.

September 15—Nomination of officers and review of the summer activities.

October 20—Election of officers and a 35mm. slide programme by H. Maclean.

October 27—Annual Turkey Dinner. Guest speaker was Rev. N. Green, National Secretary: "Astronomical Grab-Bag".

November 17—H. Maclean: "Interesting Features of the Moon".

December 15—Completion of plans for Lunar eclipse viewing. H. Warner: "Book Review on *The Stars* by H. A. Rey".

ROBERT C. DORAN, *Secretary.*

OTTAWA CENTRE

Seven lecture meetings were held during 1964 as well as a joint meeting with the Montreal Centre, R.A.S.C.:

January 8—Lt.-Col. J. A. Stairs, B.A.: "Man in the Universe".

February 19—L. R. McNarry, M.Sc.: "Why Does the Planet Jupiter Emit Bursts of Radio Waves?".

March 17—Mrs. Helen S. Hogg, Ph.D.: "Globular Star Clusters".

April 23—Mrs. Margaret Bell, Ph.D.: "The Cosmic Ray Puzzle".

September 26—A joint meeting with the Montreal Centre was held in Montreal.

October 21—M. P. Bachynski Ph.D.: "Solar Wind — Magnetosphere Interaction as a Laboratory Plasma Physics Experiment".

November 18—Mrs. Gladys A. Harvey, M.A.: "Some Aspects of Solar Emission".

December 11—R. H. Hardie, Ph.D.: "Astronomical Distances".

The Observer's Group continued with their regular series of meetings. Nine issues of "Astronotes", the local newsletter, were distributed by this group.

The Ottawa Centre was host to the General Assembly in May of 1964. This event was considered an unqualified success from the standpoint of both those organizing and attending. Registration numbered 186 and represented 14 Centres from across Canada.

We are pleased that Dr. C. S. Beals, a member of the Ottawa Centre, was

honoured with a Service Award of the Society. The presentation was made at the General Assembly.

Membership of the Centre numbered 149.

(MRS.) M. W. GREY, *Secretary*.

CENTRE DE QUEBEC

A sa réunion annuelle du 10 février 1965, le Centre de Québec a fait écho au mouvement pour la revision du procès de Galilée, qui a pris naissance à la suite de commentaires émis au Concile du Vatican. Pour la circonstance, M. Alfred Dumont, ancien Président, a fait lecture de la magistrale causerie de M. Paul Couderc, *Galilée et la pensée contemporaine*, prononcée l'an dernier devant les membres de la Société Astronomique de France. Ce fut la seule réunion générale de l'année, les membres en général préférant conserver les réunions plus intimes du samedi soir, à l'observatoire.

En décembre dernier, le Centre a reçu en fidéicomie un montant de \$10,000, premier versement d'un don destiné à l'achat d'un astrolabe impersonnel de Danjon, pour une éventuelle station de recherche qui serait une annexe de l'observatoire de Québec.

Comme d'habitude, au cours des vacances d'été, le Bureau d'Astronomie du gouvernement du Québec a prêté à notre Centre les services d'un groupe d'étudiants qui ont travaillé à Québec, à Trois-Rivières et au stage des cours populaires d'astronomie, à Montmagny.

PAUL-H. NADEAU, *Le secrétaire*.

TORONTO CENTRE

The Toronto Centre held eleven regular meetings in 1964. Speakers and subjects were:

January 17—V. B. Meen, Ph.D.: "The Royal Ontario Museum and Astronomy".

January 31—Sidney van den Bergh, Ph.D., University of Toronto: "Galaxies".

February 14—Demonstrations of telescopes and telescope making techniques by members of the Telescope Makers Group.

March 6—David Sher, David Dunlap Observatory: "Star Clouds of the Southern Sky".

March 20—Progress report on a proposed observatory for the Centre.

April 3—John F. Heard, Ph.D., and Mrs. Heard: "A Retrograde Orbit of the Earth".

October 16—Members' Night at the David Dunlap Observatory.

October 23—Ruth J. Northcott, M.A., and David Hartwick, M.A., reported on 1964 International Astronomical Union meetings.

November 6—Robert C. Roeder, Ph.D., University of Toronto: "Relativity and the Expanding Universe".

November 20—Bernard F. Burke, Ph.D., Carnegie Institution of Washington: "Radio Astronomy and the Expanding Universe".

December 11—Raymond R. Thompson, B.Ed.: "Ranger VII and the Moon".

Six summer Sky-Gazing Nights with telescopes and films were scheduled in Parks; one was cancelled by rain. Of the five, the most successful, with more than 1,000 in attendance, were those held outside the city proper — one in Etobicoke and one in Scarborough township. As a result, it is planned to have at least one more suburban Sky-Gazing Night in 1965, probably in North York.

The telescope display with as many as 10 or 12 instruments was set up each clear evening during the Canadian National Exhibition; several thousand visitors inspected the telescopes and viewed Saturn, double stars and other objects.

The Telescope Makers Group held 22 meetings and completed 27 instruments. In addition to setting up telescopes at the Sky-Gazing Nights and the C.N.E., members provided instruments at gatherings in Metro Toronto Conservation Areas, at a "space show" at the Royal Ontario Museum, and on Saturday evenings on the lawn at the David Dunlap Observatory.

The recent announcement of a \$1,000,000 gift to the University of Toronto by Col. R. S. McLaughlin for a major planetarium at the Royal Ontario Museum was a pleasant surprise to the Officers of the Centre who have supported the establishment of a planetarium in Toronto.

A less happy aspect is that plans for the Centre to have its own observatory have been shelved due to a breakdown in negotiations with the Metropolitan Toronto Conservation Authority which earlier in the year had looked very hopeful. Efforts are still being made to find suitable housing for the 12½-inch reflector, the gift of which is conditional upon the Centre providing permanent housing and completing the telescope.

It is with regret that we record the deaths during the year of Harold F. Balmer, a member of long standing and a former Recorder of the Society, and of John R. Goudie, also a longtime member of the Centre.

FREDERIC L. TROYER, *Secretary*.

VANCOUVER CENTRE

During 1964 the meetings of this Centre, held in the Physics Building at the University of British Columbia, were as follows:

January 14—Annual Dinner Meeting; R. M. Petrie, Ph.D.: "The Astronomical Distance Scale".

February 11—J. A. Jacobs, Ph.D.: "The Discovery of Neptune".

March 10—A. M. Crooker, Ph.D.: "Recent Developments in Astronomy".

April 14—Members' Night: G. Rostoker: "The Origin of the Solar System"; W. D. C. Carson: "Kepler's 4th Law?"; C. F. Schwerdtfeger, Ph.D.: "Activities of the Telescope Section".

October 13—R. D. Russell, Ph.D.: "Dating the Past".

November 10—K. O. Wright, Ph.D., National President: "The Chemistry of the Stars".

December 8—Film Night: "The Flaming Sky" and "Our Nearest Star".

Under the direction of Mr. T. Taylor and Dr. C. F. Schwerdtfeger, the telescope section has been very active, holding monthly meetings at the University of British Columbia.

P. H. REYNOLDS, *Secretary-Treasurer*.

VICTORIA CENTRE

Through the kindness of the authorities at the University of Victoria, the meetings of the Centre were held there. Council met on a number of occasions to plan the Centre's activities.

Lecture meetings, with the following speakers and topics were held:

January 8—H. Richardson, Ph.D.: "Astronomy in Czechoslovakia".

February 12—T. Jacobson: "Stellar Eclipses".

March 11—R. M. Pearce, Ph.D.: "The Canadian Atomic Energy Establishment".

April 8—Activities Night.

October 14—A. B. Underhill, Ph.D.: "Astronomy in Europe".

November 18—B. Kaner: "The Earth's Magnetic Field".

December 16—Annual Dinner and Annual Meeting.

Summer Evenings With the Stars programme included these weekly lectures:

August 3—S. C. Morris, Ph.D.: "The Solar System".

August 10—A. H. Batten, Ph.D.: "The Galactic System".

August 17—Visit to the Dominion Astrophysical Observatory.

August 24—G. J. Odgers, Ph.D.: "The Universe of Galaxies".

August 31—E. H. Richardson, Ph.D.: "Atmospheres of the Planets".

A display provided by the Manned Space Exhibit of the United States National Aeronautics and Space Administration was sponsored by the Centre on October 16 and 17 at the University of Victoria. Exhibits from the Dominion Astrophysical

Observatory, private companies and amateur observers were added to this display. We regret the loss to our membership of Mr. M. C. Trueman, Mr. P. H. Hughes and Mr. D. G. Ingham.

W. DAMER, *Secretary*.

WINDSOR CENTRE

During 1964, eight regular and one Executive meeting were held. The programmes were as follows.

- January 21—L. Staffin: "Globular Clusters and Galactic Open Clusters"; L. Smith: "Copernicus".
- February 18—J. Conrad: Educational talk; C. Helin: Film and talk "Total Eclipse of the Sun 1963".
- March 17—D. Bawtenheimer: "Current Events"; C. Hallam: "Comets and Meteorites"; H. Lee: Meteorite display.
- April 21—M. Hastings-Trew: "Current Events"; D. S. Ainslie, Ph.D.: Demonstration and lecture on Liquid Air.
- May 23—Bus tour to Flint, Michigan, to view the new planetarium; programme "World of Galileo".
- June 6, 7—Fund Fair — members participated in this activity at A.K.O. Centre.
- June 16—The stars viewed through members' telescopes at Poplar Lodge, site of D. C. Bawtenheimer's observatory; H. Lee: "Delegates' Adventures at the General Assembly, Ottawa"; R. Warwick: "Across Canada by Auto and with Camera".
- September 24—J. E. Kennedy, M.Sc., 2nd Vice-President R.A.S.C.: "Solar Eclipse Expeditions".
- November 17—C. Hallam: "Pot Holes, Glacial and Fluvial" with slides taken in 1964 by F. Jones of Royal Oak, Michigan. Business meeting and annual election of officers.

JAMES M. MEREDITH, *Secretary*.

WINNIPEG CENTRE

Eight regular meetings were held during 1964 at either the Shinn Conservatory Building, the Monarch Life Building or the Brooke Bond Tea Centre. The speakers and topics were:

- January 31—B. F. Shinn, L.R.A.M., L.L.C.M.; J. N. R. Scatliff, M.D.; W. W. W. Wright: "Gadgets and Gags — A Demonstration of Astronomical Instruments".
- February 28—W. R. Bullock, M.Sc., Bristol Aero Industries Ltd.: "Solar Phenomena and Their Effects on the Earth's Atmosphere"; Film: "The Flaming Sky".
- March 31—F. Hamden, Bristol Aero Industries Ltd.: "Magnetometers".
- April 24—Junior Members' Night: Unidentified Flying Objects, Observing the Planets, Rockets, Astrophotography, Meteor Observing, the Minor Planets.
- May 30—Ian McLennan, Director of the Queen Elizabeth Planetarium, Edmonton: "Planetariums"; Film: "Day of the Dark Sun".
- October 2—J. N. R. Scatliff, M.D.: "The 400th Anniversary of Galileo Galilei".
- November 13—J. Labelle, Department of Transport: "Meteorology"; Film: "The Unchained Goddess".
- December 11—Annual Meeting; Election of Officers; Film: "Space, Time and Eternity".

Five meetings of Council were held and the same number of observation nights. During the Red River Exhibition, several telescopes were set up on the parking lot of CJAY-TV and the public was invited to observe the lunar eclipse on June 24th.

In the past few months, Centre members were engaged in the planning of an astronomical department for the proposed Arts and Science Centre. Several members of the Centre have participated in the meteor and aurora observation programmes.

JOHN MOHLER, *Recorder*.

THE ROYAL ASTRONO

BALANCE

A S S E T S

CURRENT ASSETS

Cash on hand and in bank	\$ 7,378.76
Accounts receivable	4,082.23
Accrued debenture interest	78.75
Prepaid expenses and deferred charges	615.48
	<u>\$12,155.22</u>

INVESTMENT

Canada Permanent Trust Corporation, 5½% debenture, maturing 1968	\$ 3,000.00
	<u> </u>

FIXED ASSETS (at cost)

Land - 252 College Street	\$17,000.00
Building - 252 College Street	17,500.00
Furniture and equipment	2,958.78
Apartment equipment	630.87
	<u>\$38,089.65</u>
Less: Accumulated depreciation	5,790.22
	<u>\$32,299.43</u>
LIBRARY - Nominal value	\$ 100.00
	<u>\$47,554.65</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, 1964 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 transactions, we test-checked the accounting records and other supporting evidence.

Toronto, Ontario,
February 18, 1965.

APPROVED ON BEHALF OF THE NATIONAL COUNCIL:

K. O. Wright, *National President*
J. F. Heard, *National Treasurer*

SOCIETY OF CANADA

DECEMBER 31, 1964

LIABILITIES AND SURPLUS

CURRENT LIABILITIES

Outstanding cheques	\$ 1,659.05
Accounts payable and accrued charges	11.31
	<u>\$ 1,670.36</u>

DEFERRED REVENUE

Membership fees for ensuing year	\$ 3,476.24
Advance subscriptions to Journal and Observer's Handbook	3,383.55
Advertising for future publications	1,445.00
Unappropriated life membership fees (per statement)	2,924.67
TOTAL LIABILITIES	<u>\$11,229.46</u>

SURPLUS (per statement)	\$32,544.83
LIBRARY FUND RESERVE (per statement)	2,010.00
SPECIAL PURPOSES RESERVE (per statement)	100.00
	<u>\$34,654.83</u>
	<u>\$47,544.65</u>

TO MEMBERS

In our opinion, the accompanying balance sheet and related statements of revenue and expense and surplus present fairly the financial position of the Society as at December 31, 1964 and the results of its operations for the year ended on that date, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

MORRIS ALTMAN AND COMPANY
Chartered Accountants

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
STATEMENT OF GENERAL REVENUE AND EXPENSE
FOR YEAR ENDED DECEMBER 31, 1964

REVENUE

Membership Fees			
R.A.S.C. Centres	\$ 4,770.77		
Individual members	2,200.00		
Life membership reserve — Annual appropriation	<u>217.27</u>	\$ 7,188.04	
Grants and Donations			
Government of Canada	\$ 3,500.00		
Province of Ontario	1,000.00		
Members' contributions	<u>25.00</u>	4,525.00	
Publications			
Journal of the R.A.S.C.	\$ 1,963.90		
Observer's Handbook	6,215.28		
Special issues and reprints	1,365.23		
Publication fees	<u>980.00</u>		
	\$10,524.41		
<i>Add:</i> Foreign exchange premiums	<u>474.25</u>		
	\$10,998.66		
<i>Deduct:</i> Agents' discounts	<u>1,027.20</u>	9,971.46	
Advertising		1,845.00	
Sale of Insignia		87.00	
Debenture interest		<u>157.50</u>	
TOTAL REVENUE		\$23,774.00	

EXPENSE

Publications	\$15,581.31	
Staff salaries	5,200.00	
Stationery, printing and supplies	1,162.73	
Postage and express (less amounts charged)	565.93	
Telephone	162.26	
Annual life membership grants to R.A.S.C. centres	124.50	
General assembly — travel allowances	300.00	
Library expense	10.55	
Miscellaneous expenses	309.44	
Insignia, medals and awards	50.07	
Staff pension fund	<u>382.96</u>	
Contribution to William Hossack Memorial Fund	—	
Contribution to Canadian Science Fair Council	200.00	
Depreciation on office furniture and equipment	295.88	
Bad debts written off	<u>—</u>	
TOTAL EXPENSE		\$24,345.63
EXCESS OF EXPENSE OVER REVENUE		<u>\$ 571.63</u>

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
 STATEMENT OF BUILDING REVENUE AND EXPENSE
 FOR YEAR ENDED DECEMBER 31, 1964

REVENUE

Rentals for space not used by Society	<u>\$2,967.00</u>
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EXPENSE

Property taxes	\$655.00
Fuel	415.00
Light, gas and water	264.20
Maintenance and repairs	686.13
Insurance	60.09
Depreciation on building	437.50
Depreciation on equipment	63.09
	<u>2,581.01</u>

EXCESS OF REVENUE OVER EXPENSE	<u>\$ 385.99</u>
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STATEMENT OF SURPLUS

Surplus at beginning of year	\$32,730.47
<i>Deduct:</i> Excess of general expense over revenue	571.63
	<u>\$32,158.84</u>
<i>Add:</i> Excess of building revenue over expense	385.99
Surplus at end of year	<u>\$32,544.83</u>

STATEMENT OF UNAPPROPRIATED LIFE MEMBERSHIP FEES

Balance at beginning of year	\$ 2,991.94
<i>Add:</i> Life membership fees received during year	150.00
	<u>\$ 3,141.94</u>
<i>Deduct:</i> Appropriation for year to General Account	217.27
Balance at end of year	<u>\$ 2,924.67</u>

STATEMENT OF LIBRARY FUND RESERVE

Balance at beginning of year	\$ 1,010.00
<i>Add:</i> Bequests and contributions received during year	1,000.00
Balance in reserve at end of year	<u>\$ 2,010.00</u>

STATEMENT OF SPECIAL PURPOSES RESERVE

Balance at beginning of year	\$ —
<i>Add:</i> Contributions received during year	100.00
Balance at end of year	<u>\$ 100.00</u>

REPORTS OF

RECEIPTS	Calgary	Edmonton	Halifax	Hamilton	Kingston	London
Balance from 1963	\$164.98	\$ 91.74	\$187.33	\$657.47	\$ 69.32	\$ 127.48
Membership Fees	272.00		62.00		36.00	197.00
Donations	21.00					10.00
Educ. Activities						
Annual Dinner	93.50					
Sales of Handbooks, etc.	.33					
Bank Interest & Exchange					.60	2.72
Income from Investments						17.99
Life Member Grants	10.50				3.00	
Loans						
Government Grants						
Travel G.A.			60.00			
Bequests						766.40
Miscellaneous						
Total	\$562.31		\$309.33		\$108.92	\$1,121.59

DISBURSEMENTS						
Fees remitted to N.O.	181.33		41.34		24.00	131.33
Library						
Meetings	9.50				8.70	66.37
Annual Dinner	121.15					
General Assembly			60.00			
Equipment and Supplies	60.32				18.29	
Office and Admin.						14.50
General Expenses	39.45				5.04	
Handbooks, etc.						
Purchase of Bonds						735.10
Balance carried to 1965	150.56		197.99		52.89	174.29
Total	\$562.31		\$309.33		\$108.92	\$1,121.59

TORONTO CENTRE SPECIAL PURPOSE

Balance on hand from 1963
Annual Grant from C.N.E.
Bank Interest
Balance on hand, December 31, 1964

WORKS OF CENTRES

C.P. de Montréal	Niagara Falls	Ottawa	Québec	Toronto	Vancouver	Victoria	Windsor	Winnipeg
\$3.00	\$121.76	\$ 296.54	\$ 92.16	\$1,320.63	\$437.58	\$1,466.71	\$ 42.58	\$156.06
385.00		657.00	333.00	2,294.00	385.00	296.00	145.00	287.00
213.00		73.03						
169.00		140.00			137.50	319.21		
12.00		95.00				102.25		
		5.42	1.69		8.91	26.00	8.00	2.70
						55.41	2.19	4.93
		18.00		70.50	15.00			1.50
			119.62					
			1,000.00					
						250.00		
	7.00							
1,012.00		\$1,291.99	\$1,546.47	\$3,685.13	\$983.99	\$2,515.58	\$197.77	\$452.19
389.00		437.99	220.20	1,529.33	254.66	154.00	103.34	193.00
		59.68						
159.00		49.90		161.40	52.25		60.00	28.75
102.00		148.36			140.00	132.50		
		114.39						
90.00		24.98	568.50			23.28		35.69
193.00		87.67	609.00	265.90	19.78	40.92		61.86
9.00				10.30	50.40		8.09	47.24
		73.60						
30.00		258.98	148.77	1,718.20	466.90	2,164.88	26.34	85.65
1,012.00		\$1,291.99	\$1,546.47	\$3,685.13	\$983.99	\$2,515.58	\$197.77	\$452.19

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GOLD MEDAL OF THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

The Gold Medal of the Society was established in 1905 as an encouragement to the study of astronomy. It is awarded to the student standing first in first class honours in the graduating year of the Astronomy Division of the Mathematics and Physics course at the University of Toronto. Awards have been made to the following:

1906 — W. E. Harper	1926 — F. S. Hogg	1948 — R. W. Tanner
1907 — R. M. Motherwell	1929 — P. M. Millman	1949 — I. Halliday
1909 — R. K. Young	1931 — W. S. Armstrong	1956 — D. C. Morton
1910 — R. J. McDiarmid	1933 — K. O. Wright	1960 — C. R. Purton
1911 — R. S. Sheppard	1935 — Miss F. S. Patterson	1961 — R. C. Henry
1913 — E. A. Hodgson	1937 — D. A. MacRae	1962 — J. R. Percy
1914 — G. S. Campbell	1940 — W. F. M. Buscombe	1963 — P. H. Reynolds

SERVICE AWARD MEDAL OF THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

The Service Award was established in 1959 and, on recommendation of a special committee of the National Council, this small bronze plaque is presented to members who have performed outstanding service to a Centre or to the National Society. Recipients to date are:

1959 — E. J. A. Kennedy (<i>National Secretary</i>)	1962 — Jesse Ketchum (Toronto)
J. H. Horning (<i>National Treasurer</i>)	Joseph A. Pearce (Victoria)
1960 — Charles M. Good (Montreal)	1963 — Edwin E. Bridgen (Montreal)
Miss F. Laforest (Centre Français de Montréal)	Miss Miriam S. Burland (Ottawa)
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The Chant Medal of the Society was established in 1940 in appreciation of the great work of the late Professor C. A. Chant in furthering the interests of astronomy in Canada. This medal is awarded, not oftener than once a year, to an amateur astronomer resident in Canada on the basis of the value of the work which he has carried out in astronomy and closely allied fields of original investigation. Awards have been made to the following:

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1941 — H. Boyd Brydon (Victoria)	1951 — DeLisle Garneau (Centre Français de Montréal)
1942 — W. G. Colgrove (London)	1953 — Jean Naubert (Centre Français de Montréal)
1943 — Cyril G. Wates (Edmonton)	1955 — Frank J. DeKinder (Montreal)
1945 — Paul-H Nadeau (Quebec)	1956 — Maurice Drolet (Quebec)
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