

**THE
ROYAL ASTRONOMICAL
SOCIETY OF CANADA
ANNUAL REPORT
1965**



**SUPPLEMENT TO THE JOURNAL
March 1966**

STATEMENT OF POLICY OF THE EDITING COMMITTEE

The Society renders a valuable service to astronomy by publishing a JOURNAL which has international recognition through its circulation to astronomers in many countries. Our JOURNAL provides Canadian scientists at the various observatories, government departments and universities with a suitable means of publishing certain of their research results. Indeed it is for this reason that the Government of Canada makes an annual grant of a substantial amount to the Society; in addition, various departments in the federal service, as well as the universities, effectively subsidize this publication by paying page charges and purchasing reprints. It is important, therefore, that the JOURNAL continues its tradition of publishing discoveries and original researches in astronomy from these and other sources. The JOURNAL must also be of value to the non-professional astronomer who is not concerned with the technical details of research but wishes to be informed on progress and activity in astronomy. These two primary aims to provide a means of publication for the professional astronomer and to keep the non-professional astronomer well informed, can be achieved only through a careful selection by the Editor of the material which appears in each number.

To accomplish these two objectives, a policy was adopted when the JOURNAL was founded and has been closely followed by the successive Editors. A statement of policy was published in the 1962 Supplement to the JOURNAL; the Editing Committee believes that a revised statement should now be presented.

1. Material submitted for publication is accepted subject to the approval of the Editor. Following receipt and acknowledgement of a manuscript, each is reviewed by one or more competent referees. Although the author is not required to accept the suggestions of the referee, experience has shown that improvements in the paper almost always result if the author gives careful study to these comments and utilizes them. Standards of printing, illustrations, and style of an international journal impose certain limitations which may require the author to accept a number of revisions suggested by the Editor.
2. Subject to the conditions stated in (1), papers in the following categories will be accepted:
 - (a) Research papers in astronomy and related topics. Such papers should place the emphasis upon methods and results and long tabulations of measurements with extensive calculations should not be included;
 - (b) Non-technical articles and reviews of progress in various branches of astronomy. These should be authoritative, of general appeal, and contain a minimum of highly-specialized technical material;
 - (c) Brief reports of original observations and new scientific projects undertaken by members; these are in addition to the sections in the JOURNAL on Meteor News, A.A.V.S.O. reports, and the work of the R.A.S.C. Committee on Observational Activities.
3. The Committee welcomes the submission of material within these limits by all astronomers, professional and non-professional.

All manuscripts received will be considered by the Editor or Assistant Editor for publication in the JOURNAL. In encouraging submission of articles of the types outlined in 2 (a), (b) and (c), and in the selection of articles for each number, every reasonable effort will be made to meet the requirements or primary aims given above for this publication. The Editing Committee supports the view that the Editor can produce issues of high standard and general appeal to our readers only with the continued support and frequent contributions of articles by members of the Society. Assistance to an author in preparing a manuscript for publication is given wherever possible.

Beginning with Volume 60 of the JOURNAL in 1966, a revised standard of style will be adopted. For the benefit of authors who will be submitting material to the JOURNAL in the future, an outline of instructions follows this statement of policy.

REPORT OF THE NATIONAL PRESIDENT

The year 1965 was one in which all branches of astronomy continued to show major advances. In space research the United States Ranger VIII and IX moon shots were very successful and the photographs obtained showed a multitude of markings, some as small as a few inches in diameter; the Mariner fly-past of Mars also greatly extended our knowledge of the "red" planet and the pictures showed that the surface is more similar to the moon than had been considered; the Russian moon-probe series was continued and additional features on the far side of the moon were discovered. Radio astronomy and optical astronomy have been combined to study some of the apparently most distant objects in the universe, the quasi-stellar radio sources (of which the object 3C-9 appears to be receding from us at 80 per cent of the velocity of light) and Sandage's "quasi-stellar galaxies". In the fields of more conventional astronomy, many very cool stars are being discovered, some astronomers are attacking the problem of the peculiar A-type stars, and others continue to increase our knowledge of stellar atmospheres and their interiors, using high-speed computers. For the non-professional astronomer the bright new Comet Ikeya-Seki was of great interest; although it was difficult to detect in our northern latitudes under late-October weather conditions, several of our members are to be congratulated on observing it.

The Royal Astronomical Society of Canada had another eventful year. At the General Assembly in Toronto, we were pleased to meet with the American Association of Variable Star Observers. Several A.A.V.S.O. members combined with our own members to make the Saturday morning session for papers one of the best we have had. Dr. C. S. Beals gave the feature Friday evening address on "Impact Craters of the Earth and Moon". On Sunday many of the participants visited the Royal Botanical Gardens at Hamilton and McMaster University. Thanks are due to the Hamilton Centre, and especially to the National Executive and the Toronto Centre for a most enjoyable and successful meeting.

In May the membership approved an increase in annual fees to \$7.50 in order to provide greater revenue for the Centres as well as to cover increased costs of administration and publication of the JOURNAL. The Committee on Constitution and By-Laws has prepared its report and it is hoped that the new Constitution will be adopted soon. Policy concerning the content of the JOURNAL was discussed not only by National Council but at meetings of the National Committee for Canada of the International Astronomical Union. The Editing Committee trusts that the high standard of research papers published in the JOURNAL will be maintained, but that more articles of special interest to the amateur will be included. The Centennial Committee recommended, and Council adopted, the publication of a book on "The History of Canadian Astronomy" as a Centennial Project for the Society.

I was most pleased to visit nearly all Centres of the Society during the past year and to be able to report great enthusiasm for the Society from coast to coast. I was particularly impressed by the large numbers of young people who attended the meetings and would like to express my thanks to the members of the executives of the Centres who give much encouragement and many hours developing the interest and expanding the education of the younger generation.

Finally I should like to thank all members of the National Council and the Executive Committee and especially the National Secretary and the Executive Secretary for their help and co-operation during my term of office. The healthy state of our Society at the present time is chiefly the result of their continued zeal and often time-consuming efforts.



National President.

REPORT OF THE NATIONAL SECRETARY

There has been a steady growth in every aspect of the work of the Society in the past year. The statistics show a substantial increase in total membership; several enquiries have been received from groups interested in the formation of new Centres.

During 1965, meetings of the National Council were held on January 9, March 12, May 21/22 and October 16. The Executive Committee met on April 6, August 3 and December 7.

The Annual Meeting of the Society was held in Toronto on March 12 with the First Vice-President, Mr. Malcolm M. Thomson, in the chair (see June JOURNAL, p.136).

As of September 30, 1965, the membership of the Society was 2,256, including 129 Life Members; these were distributed among the sixteen Centres as follows:

Halifax	22	Toronto	543
Quebec	72	London	44
Montreal	249	Windsor	27
Français de Montréal	137	Winnipeg	79
Ottawa	162	Edmonton	77
Kingston	13	Calgary	47
Niagara Falls	24	Vancouver	76
Hamilton	72	Victoria	73

Unattached members were located geographically in:

U.S.A.	347	Foreign	32
Canada	146	Honorary	14

Toronto was the location for the 1965 General Assembly, held from May 21-23. This was a joint meeting with the A.A.V.S.O., the first such meeting since 1940. Accommodation for out-of-town delegates and friends was arranged at the University of Toronto residences, while Committee, Council and other meetings were held in the well-appointed Education Centre at 155 College Street. The General Assembly Planning Committee under the chairmanship of Mr. J. E. Kennedy and including members of the Toronto Centre, are to be congratulated for an onerous task very well arranged and carried out. In addition to the sessions for papers, feature addresses were given by Dr. C. S. Beals, Dr. Helen S. Hogg, Mrs. M. W. Mayall and Dr. K. O. Wright. At the opening of the Assembly on Friday evening, a portrait of the late Walter J. Helm was unveiled by his daughter, Mrs. J. S. Greer of Vancouver, and accepted by Dean Allen of the University of Toronto. This portrait has been hung in the Library of the David Dunlap Observatory. Social occasions, an evening visit to the David Dunlap Observatory, a bus trip to the Royal Botanical Gardens and McMaster University, Hamilton, completed a busy week-end. Five Service Awards were presented: Mr. D. C. Bawtenheimer (Windsor); Dr. A. M. Crooker (Vancouver); Dr. John F. Heard (Toronto); Professor E. S. Keeping (Edmonton); Mr. W. S. Mallory (Hamilton). Membership Certificates were awarded to six members of the Edmonton Centre, ten members of the Montreal Centre and ten members of the Ottawa Centre.

The winning entry in the astronomy section of the Fourth Canada-Wide Science Fair, held in Winnipeg, was submitted by Pierre Bellefleur of the Centre Français de Montréal, who was presented with the Society's special awards.

In several urban areas across Canada great interest has been shown in the planning for, and establishment of, planetariums. Perhaps the most ambitious effort in this regard was made possible through a generous gift to the University of Toronto by Col. R. S. McLaughlin. At a dinner sponsored by the Department of Astronomy on June 17, the Society presented a special award to Col. McLaughlin in acknowledgement of his benefaction to astronomy in Canada.

It is a happy duty to record the Society's appreciation to all members of our

Centres, and especially to the local and national officers, for a year of continued co-operation in advancing the efforts and aims of the R.A.S.C., both in the professional and non-professional spheres.

With sincere regret we record the death of the following members and extend the sympathy of the Society to relatives and friends—

Mr. R. G. Britton (Montreal)	Mr. C. Ostrom (Toronto)
Mr. W. T. Caine (Canada)	Mr. O. M. Prentice (Victoria)
Mr. C. F. Hall (U.S.A.)	Mr. N. Seville (Hamilton)
Mr. C. D. Hanover, Jr. (U.S.A.)	Dr. W. H. Steeves (London)
Mr. F. Hartmann (U.S.A.)	Prof. A. Sumner (U.S.A.)
Dr. Bertil Lindblad (Hon. Member, Sweden)	

NORMAN GREEN, *National Secretary.*

REPORT OF THE LIBRARIAN

During 1965, 25 new books have been acquired by the National Library, 15 through purchase and 10 through donation. Other additions to the Library include: 1 Ranger VII motion picture film, 6 Ranger VII photographic prints, 23 35mm slides (many in colour) and 23 reprints of Scientific American articles.

A total of 65 books have been catalogued, bringing this number to 200. The collection of 35mm slides has also been catalogued, labelled and filed. Copies of both the book catalogue and the slide catalogue have been mailed to the Centres. Some reorganization of the library has begun, with a view to making important material more accessible; this work will continue during 1966.

Books and other library holdings continue to be in heavy demand. However, there is a considerable amount of useful material, slides for the most part, which could be used more frequently. I would welcome any suggestions from the Centres as to how the library could provide them with more service.

On behalf of the Society, I wish to thank the many members and friends who have made donations to the library. To the members of the Executive, in particular the Executive Secretary, who have made my first year in this Office a pleasant one, my sincere thanks are extended.

JOHN R. PERCY, *National Librarian.*

REPORT OF SECRETARIES OF CENTRES

CALGARY CENTRE

Eleven general meetings were held in the Science Building of the University of Alberta at Calgary, sponsored by Dr. C. D. Anger and Dr. D. J. I. Fry of the Department of Physics; nine Council meetings were held during the year. Programs were as follows:

- January 13—Students' Symposium: C Ozkowski: "The Red Shift"; G. Fry: "Mars"; M. Hunt: "Orion"; Wm. Peters: "Amateur Telescope Making".
February 10—D. R. P. Coats: "Building a Telescope".
March 10—K. Pawson: "Exact Latitude Measurements"; D. Carswell, B.Sc.: "Planetary Atmospheres".
April 13—J. F. Wright: "Tour of Astronomical Observatories".
May 12—B. Bohannon, B.Sc.: "Neutron Stars"; S. Wieser, B.Sc.: "Religion and Astronomy".
June 10—M. M. Thomson, M.A.: "P.Z.T. for Alberta".
August 25—T. Vrebalovich, Ph.D.: "Ranger Photographic Mission".
September 8—B. Hval: "Librations of the Moon"; S. Wieser, B.Sc.: "Features of the Moon".
October 13—K. Bais: "Noctilucent Clouds"; T. A. Oliver, Ph.D.: "Meteorites".
November 10—G. Gainer, B.Sc.: "Astro-Navigation".
December 10—J. Schaer, Ph.D.: "Structure of Space and Time".

At each meeting from August 25, films from the Jet Propulsion Laboratory Pasadena, California, were shown.

During the year, the following special events took place: May 29: Star Observing Night at Mr. Sadler's Dam View Ranch; July 25: Joint Star Party with the Edmonton Centre at Aspen Beach Park; August 6: Public Star Night publicizing the Centennial Planetarium site; November 16: Meteor Count at the Dam View Ranch.

Further publicity was given to the Calgary Centennial Planetarium at the Astro-Night exhibition held at the Southern Alberta Jubilee Auditorium on September 24 and 25. The exhibition featured a NASA display, public lectures and film shows, photographs from observatories throughout the world and a half-scale model of the Mariner spacecraft constructed by J. Howell.

The Centre co-operated with the Adult Education Division of the Calgary School Board in offering a 15-lecture course "Astronomy for Beginners" (Lecturer S. Wieser). Also, the Centre held classes and observing sessions for Scout groups and school classes on request.

S. WIESER, *President*.

EDMONTON CENTRE

Ten regular meetings and five meetings of the Executive and Council were held during the year. With one exception, all were held in the Queen Elizabeth Planetarium through the courtesy of the City of Edmonton Parks and Recreation Department. The features included:

- November 12, 1964—Eldon Rogers: "Satellites and Satellite Tracking".
December 10—E. Kanasawich, Ph.D.: "Radio Active Datings"; (Mrs.) Joy Franiel: "Women in Astronomy".
January 14, 1965—C. Tennant: "Photons and Halides of Silver".
February 11—H. W. Taylor, Ph.D.: "Neutrino Astronomy"; C. Heath, Ph.D.: "Some Aspects of Space Medicine".
March 11—B. Bohannon: "Problems of Short Wave Astronomy"; G. Finley and M. Blachut: "Astronomical Photography by Observers".
April 8—G. Hodgson, Ph.D.: "The Downfall of Extra-Terrestrial Life".
May 11—D. R. P. Coats: "One Hundred Years of Astronomy".
June 3—B. Fogle: "Establishment of an Observing Station for the Study of Noctilucent Clouds"; Helen S. Hogg, Ph.D.: A poem commemorating the joint meeting in Toronto of the A.A.V.S.O. and R.A.S.C.

September 9—I. C. McLennan: "Mariner IV".

The Observers' Group completed a small observing shelter in January, erecting it 9 miles north-west of the city on the south shore of Big Lake.

A number of the officers and members of the Centre accepted positions in other cities; we regret their loss and extend our thanks to those who assumed these duties for the balance of the year.

(MRS.) ADRIENNE McLENNAN, *Secretary*.

HAMILTON CENTRE

During the past season, 8 regular meetings were held in the Physical Sciences Building of McMaster University. Each meeting featured the forthcoming astronomical events for the month. Four Council meetings were held and the junior group held 8 meetings separately with an adult proctor in attendance. A Committee has been appointed to attempt to correlate activities with the proposed new Salada Foods Planetarium. The program for 1965 was as follows:

January 7—R. McCallum: "Evolution of a Star"; Film presentation: "Solar Batteries, Quartz Crystals and The Transistor".

February 4—Junior Night: R. Paikin: "The Planets"; Miss L. Seville: "Relativity and its Possibilities"; R. Allen: "Man and Astronomy".

March 4—S. Buntain: "Space Age Astronomy".

April 1—J. Winger and J. G. Craig, B.Sc.: "Electromagnetic Radiations".

May 6—C. A. McDonald: "Satellites I Have Known".

October 20—K. O. Wright, Ph.D.: "The New Astronomy".

November 4—E. Ostrosser: "An Introduction to Astronomy"; C. A. McDonald: "Solar Flares".

December 2—D. A. MacRae, Ph.D.: "Are There Pingos on the Moon?"; R. A. Nielson: "The Edge of the Universe".

The two star nights held on June 4 and 5 were disappointing again this year.

L. V. POWIS, *Secretary*.

KINGSTON CENTRE

Our membership is made up principally of university students who have very little time, therefore the main function of our Centre is to provide an opportunity for informal discussion on astronomical topics among its members. With limited time, projects such as telescope making and prolonged observational programmes are not practical. However, we have "checked out" most of our members on the university's 15 inch reflector, which they are allowed to use. This year, our president has been able to obtain for us some particularly interesting films, which we have shown at meetings.

GARY RATHWELL, *Secretary*.

LONDON CENTRE

Eight regular meetings were held during 1965, all in Thames Hall of the University of Western Ontario. Observations were made with the ten-inch refractor of the Hume Cronyn Memorial Observatory when weather permitted. The programs for the meetings were as follows:

January 22—Albert Sugarman: "Refraction"; A. J. Watt, M.D.: "Handbook Study".

February 23—R. Hardie, Ph.D., Director of the Dyer Observatory, Nashville, Tennessee: "Determining Stellar Distances".

March 26—Wm. Roger Inch, M.D., Victoria Hospital, London: "The Important Molecule in Cell Inactivation by Radiation and Nitrogen Mustard"; Graydon Symonds: "Handbook Study".

April 23—Richard Huffman, Dominion Astrophysical Observatory, Victoria, B.C.: "Research Equipment at the Dominion Astrophysical Observatory"; Graydon Symonds: "Handbook Study".

- May 28—J. Livingstone: "The Mariner IV Satellite".
 October 18—G. E. D. Alcock: "Spectroscopy"; Amelia Wehlau, Ph.D.: "The Comets Ikeya and Seki".
 November 19—Peter Manuel, Ph.D., University of Western Ontario: "The Sun".
 December 17—Annual Meeting; Election of Officers; Film: "Ranger Moon-shot".

W. GORDON GRAHAM, *Secretary-Treasurer*.

MONTREAL CENTRE

During the past year, six meetings of the Board of Directors were held at the Observatory and eight regular monthly meetings were held in the Macdonald Physics Building, McGill University, with the following programs:

- October 22, 1964—Annual Meeting; Officers' Reports; Film: "1963 Solar Eclipse" (courtesy, Edmonton Centre); Refreshments.
 November 12—A. E. Covington, M.A., Radio & Electrical Division, N.R.C., Ottawa: "Radio Astronomy of the Sun".
 December 10—Margaret Bell, Ph.D., Pure Physics Division, N.R.C., Ottawa: "Cosmic Rays".
 January 14, 1965—Robert H. Hardie, Ph.D., Stellar Physics Division, D.O., Ottawa: "Astronomical Distances".
 February 11—F. J. Osborne, Ph.D., R.C.A. Victor Company Research Laboratory, Montreal: "Plasma Research and its Relation to the Sun".
 March 11—Film presentation: "The Inconstant Air" and "The Inquisitive Giant".
 April 8—Film presentation: "Ranger VII Moonshot" and "The Flaming Sky".
 April 23—35 members joined with the members of the Ottawa Centre to hear Donald A. MacRae, Ph.D., of the David Dunlap Observatory, Richmond Hill, on "New Views of the Moon".
 May 13—Astronomical Quiz, directed by T. F. Morris, Ph.D. and George Wedge.

A total of 41 members of the Centre attended some of the sessions of the General Assembly in Toronto, May 21-24, where a wonderful program was coupled with the pleasure of having members of the A.A.V.S.O. hold its convention in conjunction with the Assembly.

The Library of the Centre has grown in size with 33 donations, two purchases, and the binding of JOURNALS and OBSERVER'S HANDBOOK; a valuable service to both members and non-members has been provided throughout the year.

On behalf of all the Centre members, thanks are expressed to Dr. T. F. Morris as program chairman, Mrs. W. Clarke as Convenor of the Social Committee, and to McGill University for providing us with meeting facilities for the past year.

The report of the observational activities for the year ending 30 September was given by Miss Isabel K. Williamson and includes the following: total eclipse of the moon on December 18 (43 observers); forty timings and one "honest try" of twenty predicted occultations were recorded for the Lunar Occultation Section, as well as eleven timings of the unpredicted occultation of fainter stars during the lunar eclipse (9 members); 16 members participated in the work of the Lunar Section; regular naked-eye observations of the sun were made (13 members) with instruction in this field given by Louis Duchow and George Wedge; six observers recorded seven sun-spots in May and one observer reported one spot was visible on four consecutive days in September; seven auroral displays were reported in the Montreal area with reports on total observations being sent to the Aurora Centre of the N.R.C., Ottawa; observation of Mars was active in the Planetary Section as well as Jupiter and Saturn; 158 observations (mostly in the form of disk drawings) were received; a total of 54 observations by four observers in the Double Star Section were recorded with a total of 645 magnitude estimates of variable stars being reported. In the meteor section, 14 observing sessions totalling 27 hours recorded 302 meteors and, in one night, observation of the Delta Aquarids recorded 564 meteors, these reports are also sent to Ottawa. Eleven observers checked on Echo I and Echo II and the

sky is being patrolled in 28 assigned areas for comets or novae. Notes and drawings to a total of 111 Messier objects were added to our files. In the telescope making group, 7 members attended the classes and several others worked on instruments at home.

Two Star Nights were held on October 14, 1964 and September 30, 1965. On these occasions more than 20 instruments were in operation and the programs included films and illustrated talks. Deep Sky Wonder Night was again held at the home of the Sidney Sundells in Vermont; 23 members availed themselves of this opportunity for a night of observing.

Attendance at the Observatory was increased this year to 2,782 (1,328 on Saturday nights); fourteen groups of students visited the observatory with a total of 246 attending. The Wednesday night observational meetings for members were attended by 636 and 106 members attended the observational group meetings. New additions to the observational equipment include a finder for the telescope to replace the one stolen last year, a Herschel Solar wedge, Sunglass, Deutron and Star Diagonal.

(Miss) ELLA DACK, *Secretary*.

CENTRE FRANCAIS DE MONTREAL

Au centre français de la Société Royale d'Astronomie du Canada, les activités ont, comme par le passé, manifesté la vie de notre groupement et le Conseil d'administration s'est réuni six fois en assemblée. Nos réunions hebdomadaires et mensuelles ont toujours lieu au Jardin Botanique de Montréal, à la Salle Léon-Provencher, gracieusement prêtée pour nos activités, par la Ville de Montréal. Conférences mensuelles:

3 octobre, 1964—Assemblée générale annuelle avec élection du Conseil et de la direction.

10 novembre—Lucien Coallier: "La Sélénographie".

8 décembre—Fête: Pas de réunion.

12 janvier, 1965—Mlle F. Laforest: "Galileo Galilei".

9 février—H. Simard: "La Précession des équinoxes".

9 mars—F. J. DeKinder: "Delta Cephei et la mesure de distances galactiques".

13 avril—P. Lemieux: Soirée de films commentés.

11 mai—Pierre Bellefleur: Démonstration de la 3e Loi de Kepler au moyen d'observations photographiques du système des satellites de Jupiter.

8 juin—Louis Hâbets: "La Radio-Astronomie".

Chaque mardi, ceux des mois d'été compris, 14 de nos membres se sont chargés des 39 causeries hebdomadaires que nous avons appréciées. Quand la température était clémente, des séances d'observation terminaient la soirée.

Autres Activités:

Notre Soirée d'Astronomie Populaire eut lieu le 15 septembre 1964, sous la présidence d'honneur de M. André Champagne, directeur du Service des Parcs à la Ville de Montréal. Nous y avons accueilli tout près de 2,000 personnes.

Il y eut au cours de l'automne 1964, visite au convent d'Hochelega.

A l'occasion de l'éclipse totale de la lune, le 18 décembre dernier, trois groupes d'observateurs étaient postés, le premier au Jardin Botanique, le second à Pierrefonds et le dernier à Ste-Thérèse, avec comme responsables, respectivement, MM. H. Simard, P. Lemieux et J. Vallières. Ce dernier fit la synthèse des rapports compilés par Mlle F. Laforest et M. R. Noel de Tilly.

Notre dîner annuel du 13 juin, très bien organisé par Mme E. Cléroux, au restaurant chez Butch Bouchard, réunissait 50 membres et amis.

Au début de l'été, le Club Messier se réunissait deux fois chez M. P. Mailloux, à sa résidence d'été, à Ste-Dorothée. Ce club composé de 17 membres remettait 19 rapports sur 9 objets observés.

Le 31 juillet, huit des nôtres se rendaient à l'exposition annuelle de télescopes à Stellafane aux Etats-Unis.

Mlle I. Gauthier, de l'équipe d'atome et galaxies avec les réalisateurs de cette

émission, nous recevait, à Radio-Canada, le 17 août dernier.

Le 2 courant, nous recevions, 2,000 visiteurs à l'occasion de notre Soirée d'Astronomie Populaire. M. Rolland Boulanger, délégué officiel du Ministère des Affaires Culturelles du Québec, représentait l'honorable ministre Pierre Laporte.

(MME) ROLLANDE MATTEAU, *le secrétaire*.

NIAGARA FALLS CENTRE

During the past year, in addition to our regular meetings, members presented one outside program, three public star nights (June 4, 18 and July 9) and took one field trip.

One of our goals for 1965 was to present a program for the benefit of the general public. This program, on "Telescopes and Telescope Making", was well received. As a result, the Centre has planned a program for the public in 1966 and hopes to continue with others in the future. Meetings for 1965 were as follows:

January 19—H. N. A. Maclean and R. Winder: "Ranger Photographs" and "Slides on the December 1964 Lunar Eclipse".

February 16—R. Lonsdale and A. G. Kindy: "Prominences of the Moon".

March 16—Field trip to the Buffalo Museum of Science.

April 27—Public Night at the Niagara Falls Library auditorium; J. F. Booth, M.D., and H. N. A. Maclean: "Telescopes and Telescope Making".

May 18—Planning activities for the summer.

October 19—Nomination and election of officers; review of the summer's activities; slides on various celestial objects.

November 11—Annual Turkey Dinner. Dr. K. O. Wright, National President of the R.A.S.C., and Mrs. Wright were guests of the Centre. Dr. Wright lectured on "Spectroscopic Analysis of the Stars" which was followed by slides on the Queen Elizabeth II Observatory.

December 21—A. G. Kindy: "Stellar Parallax"; H. N. A. Maclean: "The Star of Bethlehem".

ROBERT C. DORAN, *Secretary*.

OTTAWA CENTRE

Eight lecture meetings were held during 1965, with the following speakers and subjects:

January 11—R. J. Uffen, Ph.D.: "The Evolution of the Earth's Interior and Its Influence on Biological Evolution".

February 19—Film presentation: "The Clouds of Venus"; "Ranger VII Photographs of the Moon"; "Life on Other Planets".

March 18—D. F. Brunton and D. A. Salmon: "Observations from the Small Dome"; A. H. Gillieson, Ph.D.: "The Solar and Extragalactic Red Shift".

April 23—D. A. MacRae, Ph.D.: "New Views on the Moon" (a joint meeting with the Montreal Centre).

September 24—Film presentation: "Earth and Sky, Parts I and II"; "Time Is".

October 21—J. A. Galt, Ph.D.: "Radio Galaxies".

November 19—J. T. Tothill, B.Sc.: "The Case for a Major Observatory on the Equator".

December 10—P. Demarque, Ph.D.: "Stellar Evolution".

The Observer's Group continued their regular meetings. These provided opportunities for members to give informal talks, to report on observational activities, and to welcome visitors from nearby Centres. Two enthusiastic amateurs from more distant places visited the Observer's Group this year: one from Truro, N.S. the other from Nigeria.

Rick Salmon and Dan Brunton presented a paper covering their observations at the General Assembly in May. Five issues of "Astronotes" were distributed this year.

The activities of six of our younger members were filmed in the Small Dome as an illustration of the varied activities of the youth of our country. This will form a part

of a film on Canada prepared by the Canadian Pacific Railway for showing in their Cominco Pavilion at Expo '67.

A telescope, built by the late Andrew C. Steedman, for many years one of our active members, was presented to the Ottawa Centre by his family.

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

CENTRE DE QUEBEC

L'année 1965 marquera dans les annales de notre Centre une époque de transition. Depuis bientôt vingt-cinq ans, le gouvernement du Québec subventionnait notre société d'astronomie et son observatoire en lui fournissant un personnel et diverses facilités de secrétariat. Il en est venu récemment à la conclusion qu'il devait préciser le domaine de sa contribution et la mettre à la hauteur des besoins présents. Le gouvernement du Québec a donc prié le directeur de son Service d'Astronomie — en l'occurrence le secrétaire du Centre de Québec — de faire une enquête approfondie sur la situation de l'astronomie au Québec et de proposer de nouvelles méthodes d'aide à l'astronomie. Cette enquête a débuté en septembre et durera vraisemblablement jusqu'au milieu de la présente année (1966).

Le comité des réunions mensuelles n'a pu être formé au cours de l'année écoulée, mais un comité spécial a pris la responsabilité d'organiser une grande conférence publique à l'université Laval, le 22 septembre. Pour la circonstance, le Professeur Claude Frémont a traité de *Radio-Astronomie*. La conférence a été suivie de démonstrations pratiques et de la présentation d'un film dont la trame sonore avait été adaptée en français et enregistrée sur ruban magnétique. Cette réunion publique, tentative d'un caractère nouveau à notre Centre, a été un franc succès. A notre seconde réunion générale, celle d'aujourd'hui, il n'y a pas de conférencier d'invité, mais nous avons écouté l'enregistrement magnétique d'une émission de Radio-Canada — Cent Milliards d'Univers — où les maîtres de l'heure, Dollfus, Schatzman, Martinoff et Jean Rostand, discutent de la *Pluralité des Mondes Habités*.

Pour diverses raisons, en particulier celles qui sont apparentes à la lecture du premier paragraphe de ce rapport, le Président de la SRAC, en tournée dans les Centres de l'Est du Canada, n'a pu être reçu officiellement à Québec. Quelques membres ont eu cependant l'obligeance de nous remplacer à cette occasion.

Comme à l'accoutumée, l'observatoire de la tour Martello a été ouvert au public pendant une heure, chaque soir de beau temps, et nous avons publié l'Almanach-Graphique qui compte maintenant plus de 4000 abonnés au Canada français et dans tout le monde francophone. La 21^e édition (1965) comportait une nouveauté, celle de la prévision des périodes de visibilité des satellites artificiels Echo I et Echo II. Les indications à ce sujet, utilisables aussi bien dans l'hémisphère nord que dans l'hémisphère sud, donnent au graphique un caractère d'universalité.

PAUL-H. NADEAU, *Le secrétaire*.

TORONTO CENTRE

The Toronto Centre held ten regular meetings and two joint meetings with the Royal Canadian Institute. Speakers and subjects were:

January 15—Leonard V. Kuhl, Ph.D., Mount Wilson and Palomar Observatories: "Pre-main Sequence Stellar Evolution".

January 29—Colin S. L. Keay, Ph.D., Department of Physics, Canterbury University, Christchurch, New Zealand: "Meteors in the Southern Hemisphere".

February 12—Members' Night — Demonstration of telescope making and astronomical photography.

February 26—Robert H. Hardie, Ph.D., Dominion Observatory, Ottawa: "Determining Stellar Distances".

March 12—Th. Schmidt-Kaler, D.R.N., D.Hab., Bonn University Observatory, Bonn, Germany: "Recent Research in Galactic Structure".

March 27—Thomas A. Matthews, M.Sc., Ph.D., Senior Research Fellow in Radio Astronomy, California Institute of Technology, Pasadena, California: "Extra-

- galactic Radio Sources". (A joint meeting with the Royal Canadian Institute).
 October 1—Visit to David Dunlap Observatory.
 October 15—K. O. Wright, Ph.D., Dominion Astrophysical Observatory, Victoria, B.C.: "The Chemistry of the Stars".
 October 29—Stewart Sharpless, Ph.D., C. E. Kenneth Mees Observatory, University of Rochester: "Galaxies of Various Kinds".
 November 12—Members' Night: a demonstration of various techniques by members of the Toronto Centre.
 November 27—Gerald S. Hawkins, Ph.D., D.Sc., Boston University, Smithsonian Astrophysical Observatory and Harvard College Observatory: "Sun, Moon, Men and Stones" (a joint meeting with the Royal Canadian Institute).
 December 10—Donald A. MacRae, Ph.D., Director, David Dunlap Observatory: "Are there Pingos on the Moon?".

Ten Sky-Gazing Parties were planned in city and Metropolitan suburb parks between May and October; some of these were rained out. On other occasions, there was a very large attendance. Films were shown on an outdoor screen and members set up telescopes for the public to observe the moon, planets in the evening sky and other objects.

The telescope display was provided again at the Canadian National Exhibition. The weather was not favourable and except for the moon, there was no spectacular attraction in the sky; nevertheless, an estimated 5,600 visited our display.

The Telescope Makers Group held 21 meetings in the basement of 252 College Street and completed at least twenty-five telescopes; these included for the first time all four sizes — six inch, eight inch, ten inch and twelve and a half inch mirrors.

C. E. HODGSON, *Secretary*.

VANCOUVER CENTRE

The Centre this year held its monthly lecture meetings in the Hebb Theatre on the campus of the University of British Columbia. In addition, the Centre's Telescope and Observers' Section held regular monthly meetings in the Hennings Building, U.B.C.; about 30 of our members are active in the Telescope Section.

This year the Centre began publication of a monthly Newsletter edited by the co-directors of the Telescope Section, H. Ross and E. Pfannenschmidt. This has been well received and should expand in quantity and quality during the coming year.

Details of the lecture meetings are:

- January 12—Annual dinner meeting at the Ramada Inn; E. C. Roelof, Ph.D., Geostrophysical Section of the Boeing Scientific Research Laboratory, Seattle: "The Solar Wind".
 February 9—Program by the Telescope and Observing Section: Hugh Ross: "Variable Stars of Interest"; George Smith: "Telescopic Photography"; Glen Boire: "Observing Double Stars and Binaries"; Terry Taylor: "Astronomical Slides and Photographs".
 March 9—G. M. Griffiths, Ph.D., Physics Department, U.B.C.: "The Origin of the Solar System".
 April 13—Annual Members Night: R. Kent-Barber: "The Astronomer in Creative Fiction"; D. Fallows: "Photographing a Solar Eclipse"; Film and slides: "Ranger VII".
 October 12—R. I. Schoen, Ph.D., Boeing Scientific Research Lab., Seattle: "The Physics and Chemistry of the Upper Atmosphere".
 November 9—Film presentation: "Four Days of Gemini 4"; "Clouds of Venus".
 December 14—F. A. Kaempffer, Ph.D., Physics Department, U.B.C.: "Some Properties of Time".

P. H. REYNOLDS, *Secretary*.

VICTORIA CENTRE

There were six regular and eight Council meetings held at the University of Victoria; the programs included:

- January 13—J. Tatem, Ph.D.: "Why is it Dark at Night?"
 February 10—H. M. Sullivan, Ph.D.: "The Twilight Sky".
 March 10—W. G. Milne: "Earthquakes in Canada".
 April 14—Activities Night.
 October 13—E. E. Bridgen: "The Importance of Amateur Work in Astronomy".
 November 10—M. Plavec, Ph.D.: "Stars with Rings".

The Centre's proposed construction of a planetarium as a community Centennial Project was well received but not accepted; the model was displayed in the Spring at a Hobby Show.

A Friday evening observing program and an instrument-making section were begun under the direction of Mr. G. Ball and Mr. L. Gerrath.

W. DAMER, *Secretary*.

WINDSOR CENTRE

During 1965, three executive meetings and eight regular meetings were held, with an average attendance of 22. The programs were as follows:

- January 19—James M. Meredith: "Current Events"; John McDermott: "Launching Control, Purposes of Satellites"; Film presentation, commentary by Arthur Rae: "Solar Prominences".
 February 16—D. C. Bawtenheimer: "Current Events"; F. A. J. Weiler, B.A., University of Windsor: "Geology and Astronomy".
 March 16—D. S. Ainslie: "Experiments with High Frequency Electrical Discharges in Gases".
 April 27—L. W. Smith: "The Ancient Astronomer and Astrologer Sosigenes" and "Bailey's Beads"; Richard Lloyd, Past President, Detroit Astronomical Society: "Are We Alone?".
 May 15—Bus trip to Ann Arbor, Michigan, visit to the Computation Centre and Library and Planetarium of the University of Ann Arbor.
 June 15—Telescopic Observation of Stars at Mr. Bawtenheimer's observatory, Poplar Lodge; Henry Lee: "Delegates' Adventures at the General Assembly in Toronto".
 September 21—M. Hastings-Trew: "Current Events"; James M. Meredith: Educational talk; Glen Chapman: "Photography of Meteor Trails".
 October 14—K. O. Wright, Ph.D., National President: "Chemistry of the Stars".
 November 16—Annual Meeting; election of officers; social hour.

JAMES M. MEREDITH, *Recorder*.

WINNIPEG CENTRE

Eight regular meetings were held during 1965. The speakers and topics were:

- January 29—J. N. R. Scatliff, M.D.: "The Observer's Handbook of the R.A.S.C.".
 February 26—E. A. Speelman: "Industrial Lens Grinding and Polishing".
 April 2—J. N. R. Scatliff, M.D.; B. F. Shinn, L.R.A.M., L.L.C.M.; P. Abel; G. H. Marcoux; E. Anema: "Less Than Usual Astronomical Equipment".
 April 30—Basil Rotoff: "Historical Measurements in Astronomy".
 June 4—D. A. Watts; J. Harding; E. A. Speelman; H. O'Connor: Panel discussion: "Prospects for Radio Telescopes".
 October 15—J. N. R. Scatliff, M.D.: "Observation Night".
 November 15—K. O. Wright, Ph.D.: "The New Astronomy".
 December 3—Annual Meeting: Demonstration of the Planetarium by R. J. Lockhart, B.A., F.R.A.S., F.B.I.S.

Five of these meetings were held at the Shinn Conservatory Building, two at the University of Manitoba and one at the Scatliff Observatory. The Council met on four occasions to review the program. Several observation nights were held during the summer months.

JOHN MOHLER, *Recorder*.

THE ROYAL ASTRON
BALANCE
(With comparati

A S S E T S

	<u>1965</u>	<u>1964</u>
CURRENT ASSETS		
Cash on hand and in bank	\$ 6,150.23	\$ 7,378.7
Accounts receivable	7,830.84	4,083.3
Accrued debenture interest	78.75	78.7
Prepaid expenses and deferred charges	664.23	615.4
	<u>\$14,724.05</u>	<u>\$12,155.2</u>
 INVESTMENT		
Canada Permanent Trust Corporation 5% debenture, maturing 1968	<u>\$ 3,000.00</u>	<u>\$ 3,000.00</u>
 FIXED ASSETS (at cost)		
Land — 252 College Street	\$17,000.00	\$17,000.00
Building	17,500.00	17,500.00
Furniture and equipment	2,958.78	2,958.7
Apartment equipment	630.87	630.5
	<u>\$38,089.65</u>	<u>\$38,089.65</u>
Less: Accumulated depreciation	6,586.69	5,790.2
	<u>\$31,502.96</u>	<u>\$32,299.45</u>
 LIBRARY — Nominal value	 <u>\$ 100.00</u>	 <u>\$ 100.00</u>
	<u>\$49,327.01</u>	<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, 1965 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
March 7, 1966.

APPROVED ON BEHALF OF THE NATIONAL COUNCIL:

Kenneth O. Wright, *National President*
John F. Heard, *National Treasurer*

CITY OF CANADA

DECEMBER 31, 1965

(December 31, 1964)

LIABILITIES AND SURPLUS

	<u>1965</u>	<u>1964</u>
CURRENT LIABILITIES		
Outstanding cheques	\$ 2,269.84	\$ 1,659.05
Accounts payable and accrued charges	20.03	11.31
	<u>\$ 2,289.87</u>	<u>\$ 1,670.36</u>
DEFERRED REVENUE		
Membership fees for ensuing year	\$ 3,552.09	\$ 3,476.24
Advance subscriptions to Journal and Handbook	5,131.40	3,383.55
Advertising for future publications	2,095.00	1,445.00
Unappropriated life membership fees (per statement)	2,873.65	2,924.67
TOTAL LIABILITIES	<u>\$13,652.14</u>	<u>\$11,229.46</u>
SURPLUS (per statement)	\$31,375.00	\$32,544.83
LIBRARY FUND RESERVE	2,010.00	2,010.00
SPECIAL PURPOSES RESERVE	—	100.00
	<u>\$33,385.00</u>	<u>\$34,654.83</u>
	<u>\$49,327.01</u>	<u>\$47,554.65</u>

T O M E M B E R S

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, 1965 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, 1965

(With comparative figures for year ended December 31, 1964)

R E V E N U E	<u>1965</u>	<u>1964</u>
Membership fees		
R.A.S.C. Centres	\$ 5,339.75	\$ 4,770.77
Individual members	2,287.00	2,200.00
Life membership reserve — Annual appropriation	226.02	217.27
	<u>\$ 7,852.77</u>	<u>\$ 7,188.04</u>
Grants and Donations		
Government of Canada	\$ 3,500.00	\$ 3,500.00
Province of Ontario	1,000.00	1,000.00
Members' contributions	24.50	25.00
	<u>\$ 4,524.50</u>	<u>\$ 4,525.00</u>
Publications		
Journal of the R.A.S.C.	\$ 1,596.96	\$ 1,963.90
Observer's Handbook	6,827.20	6,215.28
Special issues and reprints	2,960.43	1,365.23
Publication fees	1,470.00	980.00
	<u>\$12,854.59</u>	<u>\$10,524.41</u>
Add: Foreign exchange premiums	481.36	474.25
	<u>\$13,335.95</u>	<u>\$10,998.66</u>
Deduct: Agents' discounts	949.40	1,027.20
	<u>\$12,386.55</u>	<u>\$ 9,971.46</u>
Advertising	1,445.00	1,845.00
Sale of Insignia	125.50	87.00
Debenture interest	157.50	157.50
TOTAL REVENUE	<u>\$26,491.82</u>	<u>\$23,774.00</u>
E X P E N S E		
Publications	\$18,127.64	\$15,581.31
Staff salaries	5,565.00	5,200.00
Stationery, printing and supplies	1,176.51	1,162.73
Postage and express (less amounts charged)	853.92	565.93
Telephone	164.46	162.28
Annual life membership grants to R.A.S.C. Centres	133.50	124.50
General Assembly — travel allowances	330.00	300.00
General Assembly — planning and arranging costs	285.65	—
Library expense	180.22	10.55
General and office expenses	227.67	309.44
Insignia, medals and awards	275.13	50.07
Staff pension fund	381.21	382.96
Contribution to Canadian Science Fair Council	—	200.00
Contribution to Walter J. Helm Memorial Portrait	550.00	—
Depreciation on office furniture and equipment	295.88	295.88
TOTAL EXPENSE	<u>28,546.79</u>	<u>24,345.63</u>
EXCESS OF EXPENSE OVER REVENUE	<u>\$ 2,054.97</u>	<u>\$ 571.63</u>

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
STATEMENT OF BUILDING REVENUE AND EXPENSE
FOR YEAR ENDED DECEMBER 31, 1965

(With comparative figures for year ended December 31, 1964)

	<u>1965</u>	<u>1964</u>
R E V E N U E		
Rentals for space not occupied by Society	\$2,856.00	\$2,967.00
E X P E N S E		
Property taxes	\$ 700.84	\$ 655.00
Fuel	315.00	415.00
Light, gas and water	281.31	264.20
Maintenance and repairs	113.02	686.13
Insurance	60.10	60.09
Depreciation on building	437.50	437.50
Depreciation on equipment	63.09	63.09
TOTAL EXPENSE	<u>\$1,970.86</u>	<u>\$2,581.01</u>
EXCESS OF REVENUE OVER EXPENSE	<u>\$ 885.14</u>	<u>\$ 385.99</u>

STATEMENT OF SURPLUS

Surplus at beginning of year	\$32,544.83	\$32,730.47
<i>Deduct:</i> Excess of general expense over revenue	2,054.97	571.63
	<u>\$30,489.86</u>	<u>\$32,158.84</u>
<i>Add:</i> Excess of building revenue over expense	885.14	385.99
Surplus at end of year	<u>\$31,375.00</u>	<u>\$32,544.83</u>

STATEMENT OF UNAPPROPRIATED LIFE MEMBERSHIP FEES

Balance at beginning of year	\$ 2,924.67	\$ 2,991.94
<i>Add:</i> Life membership fees received during year	175.00	150.00
	<u>\$ 3,099.67</u>	<u>\$ 3,141.94</u>
<i>Deduct:</i> Appropriation for year to General Account	226.02	217.27
Balance at end of year	<u>\$ 2,873.65</u>	<u>\$ 2,924.67</u>

REPORTS OF

RECEIPTS	Calgary	Edmonton	Halifax	Hamilton	Kingston	London
Balance from 1964	\$ 150.56	\$1,441.07	\$197.99	\$ 671.62	\$ 52.89	\$174.29
Membership Fees	271.50	373.50		430.50	58.50	326.50
Donations						
Educ. Activities	572.10	501.20		236.00		
Annual Dinner	87.00					
Sales of Handbooks, etc.	24.00			11.85	1.00	1.00
Bank Interest & Exchange				12.30	1.39	1.62
Income from Investments						36.00
Life Member Grants	4.50			4.50		
Travel G.A.						
Miscellaneous		21.00				
Deficit carried to 1966	253.47					
Total	\$1,363.13	\$2,236.77		\$1,366.77	\$113.78	\$539.41

DISBURSEMENTS

Fees remitted to N.O.	167.30	363.63		206.00	36.90	200.70
Library	20.75					
Meetings & Newsletters	1,002.77	626.43		340.59	6.50	114.90
Annual Dinner	107.35					
General Assembly						
Equipment & Supplies				13.81	15.39	
Office and Admin.	42.29			150.32	2.00	8.30
General Expenses		140.15		12.61		
Handbooks, etc.	22.67					.60
Investments, etc.						
Balance carried to 1966		1,106.56		643.44	52.99	214.91
Total	\$1,363.13	\$2,236.77		\$1,366.77	\$113.78	\$539.41

TORONTO CENTRE SPECIAL PURPOSE

(included above)

Balance as at 31st December, 1964	\$
C.N.E. Grant	
Interest	
Balance 31st December, 1965	\$

OF CENTRES

Niagara Falls	Ottawa	Québec	Toronto	Vancouver	Victoria	Windsor	Winnipeg
120.40	\$ 258.98	\$148.77	\$4,875.28	\$ 466.90	\$2,164.88	\$ 26.34	\$ 85.65
110.00	1,208.00	379.00	3,312.61	381.50	322.50	115.00	335.50
	20.59						
5.50	172.00			140.50	104.00		
2.00	114.00			1.00	7.00	2.00	.35
7.37	10.32	2.73	157.79	16.14	70.85	1.50	1.06
	27.00		37.50	9.00			1.50
							50.00
		132.32	200.00		3.00		
<u>245.27</u>	<u>\$1,810.89</u>	<u>\$662.82</u>	<u>\$8,583.18</u>	<u>\$1,015.04</u>	<u>\$2,672.23</u>	<u>\$144.84</u>	<u>\$474.06</u>

69.49	858.91	252.89	2,013.34	248.52	212.06	83.34	223.65
	74.49				146.23		
47.00	92.41		168.83	63.47	13.38	15.00	20.25
	168.00			161.70	122.50		
							101.00
	76.24	136.22	548.17		78.35		16.04
11.90	24.39	144.88		26.94	52.61	10.23	34.55
10.97	33.00				25.86		20.55
	93.60						
			5,025.66	14.38			
105.91	389.85	128.83	827.18	500.03	2,021.24	36.27	58.02
<u>245.27</u>	<u>\$1,810.89</u>	<u>\$662.82</u>	<u>\$8,583.18</u>	<u>\$1,015.04</u>	<u>\$2,672.23</u>	<u>\$144.84</u>	<u>\$474.06</u>

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
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8 January, 1966.