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The Royal
Astronomical Society
of Canada

BULLETIN

La Société
Royale d'Astronomie
du Canada



The group photo of delegates to the 1992 Calgary G.A. All people are listed from left to right. **First row (sitting):** Cam Fahrner (Cal.), Maurice Langpap (Cal.), Alister Ling (Edm.), Jonathan Buchanan (Ott.), Daniel Paulson (child) (Edm.), Peter Broughton (Tor.), Dennis Goodman (Cal.), Todd Lovinenko (Tor.) **Second row (sitting):** Nonna Russ (Tor.), Betty Rankin (Edm.), Grace Nelson (Cal.), Roger Nelson (Cal.), Michael Watson (Unatt.), Murray Paulson (Edm.), Christine Kulyk (King.), Susan Jurczak (Edm.), Russ Sampson (Edm.) **Third row (sitting):** Bruce McCurdy (kneeling) (Edm.), ShirLee Adamson (Edm.), Valerie Ling (Edm.) **Fourth row (kneeling):** Gord Falconer (Unatt.), Barry Olson (Leth.), Peter Sim (Cal.), June Kircaldy (Van.), Arthur Persson (behind) (Reg.), David Lane (Hfx.), Stan Runge (kneeling) (Winn.), Joanne Paulson (standing) (Edm.) **Fifth row (standing):** Grant Dixon (Ham.), Geoff Kennedy (Cal.), Ed Matheson (Reg.), Mamie Lee (Wind.), Henry Lee (Wind.), Jim Kinnaird (Cal.), Jack Newton (Vic.), Helen Morris (Cal.), Steven Morris (Cal.), Roland Deschesne (Cal.), Sylvia Smith (Edm.), Doug Hube (kneeling) (Edm.), Mel Rankin (Edm.), Alan Hildebrand (Ott.) **Sixth row (standing):** Andrew Jones (Cal.), Terry Hicks (King.), Sid Lee (Cal.), Paul Campbell (Edm.), Frank Shepley (Wind.), John Howell (Vic.), Carol Howell (Vic.), Heinz Berrys (Unatt.), Cathy Hall (Ott.), Phil Johnson (Cal.), Ulrich Haasdyk (Cal.), Alice Newton (Vic.), Randy Puetz (Vic.), Ian Levstein (King.), Rosemary Freeman (Nat. Off.), Gil Raineault (Winn.), Leo Enright (King.), Carol Kennedy (Sask.), Jimmy Letourneau (Mtl.), John Kennedy (Sask.), Ed Airey (Cal.), Blair Colborne (seated) (Cal.) **Seventh row (standing):** Fr. Lucian Kemble (Cal.), Don Scarlett (Cal.), Robert Dick (Ott.), Gertrude Berrys (Unatt.), Ellen Jackson (Edm.), Franklin Loehde (Edm.), Lloyd Higgs (Ott.), Brian Chapel (Vic.), Doug Uffen (Cal.), Frederick Smith (St.J.), Paul Comision (Ott.), Ruth Hicks (King.), Don Hladiuk (Cal.), Ruth Lewis (Cal.), Ron Forth (Cal.), Hilka Miller (Van./Tor.), Sally Baker (Van.), Glenn Skene (Cal.), Rick Marsh (Cal.) **Eighth row (on rim):** Jim Zeleny (T. Bay.), Bob Bishop (T. Bay.), Mel Head (Cal.), Glenn Hawley (Cal.), Bea Letourneau (Mtl.), Lise Lemay (Qué.), Wendy Nesbitt (Cal.), John Nesbitt (Cal.), Mark Zalcik (Edm.), Damien Lemay (on top step) (Qué.), Bob Nelson (Cal.), Eugene Milone (Cal.), Martin Connors (Edm.), Patrick Kelly (Hfx.), Jeremy Tatum (behind) (Vic.), Keith Janke (Edm.), Gary Florence (Cal.), James Himer (Cal.), Robert Loblaw (Cal.), Karl Miller (Van./Tor.), Bruce Shier (Cal.) **Ninth row (above Rosemary Freeman's left shoulder):** Bob King (Cal.), Mary Anne Harrington (Tor.), Jeremy MacKenzie (Cal.), Mary Grey (Ott.), Fred Troyer (Tor.), Michael Daly (Tor.), Ken Pawson (Cal.), Randy Attwood (behind) (Tor.), Len Gamache (Winn.), Robert May (Tor.) **Tenth row (above Jeremy MacKenzie):** Eric Clinton (Lon.), Art Holmes (Van.), Steven Spinney (Tor.)



BULLETIN

is a publication of the Royal Astronomical Society of Canada and is distributed together with the society's *Journal*. It contains articles on current activities of the R.A.S.C. and its centres across Canada, as well as articles from members and non-members which are of general interest to members of the society. Manuscripts (in English or French) should be submitted to the editor at the address below. Inquiries about the society should be directed to its National Office at 136 Dupont Street, Toronto, Ontario, Canada M5R 1V2.

Supplement to the *Journal*
Supplément au *Journal*

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Deadline for the October issue is October 15th.

Event Horizon

October 3 (10:00 A.M.)

National Council Meeting
Offices of Smith Lyons Solicitors
Scotia Plaza, Suite 6200
40 King Street West
Toronto, Ontario

October 17

The Vancouver Centre is planning a north-west U.S.A./southwest Canada astronomical "Gathering of the Clans". Interested individuals and clubs are encouraged to contact:
Vancouver Centre, R.A.S.C.
c/o H.R. MacMillan Planetarium
1100 Chestnut Street
Vancouver, British Columbia V6J 3J9
phone (604) 736-4431, FAX (604) 736-5665 ☉

Membership Surveys Needed!

At the time of the G.A. less than 400 membership surveys had been returned. Although this represents about a 10% return, there were serious concerns raised that there could be an internal bias in the survey if only long-time and "dedicated" members of the society were returning theirs. At that time, no analysis had been done on the third part of the survey, which concerned personal data, and as a result it was felt that the "silent majority", including members who had only recently joined, would not have their concerns and opinions included in the final results. The final deadline for receiving surveys has been set at December 31st, but it would be greatly appreciated if all members could complete and submit their surveys as soon as possible. The survey and the address to send it to, can be found in the June BULLETIN. ☉

Letters to the Editor

Annual Report Glitches

Please note that in the list of deceased members on page 22 of the 1991 Annual Report, W. J. Stephenson did not have a doctoral title. Also, J.V. Wright was a member of the Toronto Centre, not the Ottawa Centre as shown in the list.

On the National Council Representatives list for Toronto Centre, on page 27, Tom Quigley should be replaced by Randy Attwood.

Thank you for your attention in this matter.

B. Ralph Chou
Secretary, Toronto Centre

To Centre or Not to Centre

On behalf of the North York Astronomical Association I would like to thank the National Council of the R.A.S.C. for publicizing STARFEST in the BULLETIN. Without your support our annual observing convention would not be as well attended.

While publicity is always welcome, the N.Y.A.A. is a little concerned when photographs of our conference appear in your Annual Report under the heading of "Centre Activities". Although many members of the society, from several centres, participate in STARFEST, it is not an event organized by the society. The heading and captions do not clearly indicate this, which may give the impression to someone who is not familiar with STARFEST that this event is organized by the R.A.S.C.

I am certain that this was merely an oversight on the part of the editors of the Annual Report. The only intent of this letter is to draw this matter to your attention and express our concern.

Andreas Gada, President, N.Y.A.A.
26 Chryessa Avenue, Toronto, Ontario M6N 4T5
[The reason that the photos were included was more an act of desperation than one of trying to

(continued on page 8)

Items of Interest

Endowment Fund Renamed

Article 9 (Finances), paragraph 9.04 of By-Law Number One of the society states that "the Society shall maintain an Endowment Fund, the income of which shall be for the promotion and advancement of the objectives of The Society".

On recommendation of the Awards Committee, National Council has voted to rename the Endowment Fund as a permanent memorial to Dr. Millman. At the time of his death on December 11th, 1990, he had been a member for approximately sixty-five years, which must surely be a near-record. For many of those years Dr. Millman had actively served the society both locally and nationally. (A detailed biography written by Dr. Ian Halliday has been published: *J. Roy. Astron. Soc. Can.*, Vol. 85, No. 2, pp. 67-78, 1991.)

Members of the society are encouraged to recognize Peter Millman's service to the society and to the promotion of astronomy to the general public by contributing to the fund which now carries his name.

Telescope Honours Society Member

On the 19th of June of this year, at a ceremony held at the David Dunlap Observatory in Richmond Hill, Ontario, the 61 cm telescope operated by the University of Toronto in Chile, was officially named the Helen Sawyer Hogg Telescope. Dr. Hogg's illustrious career includes being president of the R.A.S.C. from 1957-1959.

Donation Gratefully Received

On January 31st of this year, the society was advised by the solicitor of the late Clara E. Haldenby that the society had been given a bequest of \$1,500 in memory of the late Dr.

(continued on page 8)

Astronomy Day Reports

Unlike previous years, there were not sufficient responses to allow Steve Dodson to write a separate article summarizing centre Astronomy Day activities. Instead, what follows are Astronomy Day reports gleaned from several centre newsletters, progressing from east to west.

Montreal

This year's Astronomy Day took place on May 9th at the Dow Planetarium. It ran from 1:00 to 9:00 P.M. and was, by all indications, a resounding success. Six local astronomy clubs were present, including the Montreal Centre, two retailers and I'A.G.A.A. We all put on a great show and filled the place to capacity.

However, even if I do say so myself, the undisputed hit of this year's Astronomy Day was the Montreal Centre. Sure, you can accuse me of being partial, but the facts speak for themselves. We were the only group to demonstrate astronomical computer programs such as *The Sky*, *EZ Cosmos* and *Dance of the Planets*. We were also the only group to offer a slide presentation illustrating the growing problem of light pollution, and we were the only ones showing astronomical video tapes. Add to that the professional appearance of our booth, complete with its colorful posters, mechanical orrery, graphic representation of the solar system (to scale), and our friendly staff of fifteen people, and it's easy to see why our group commanded so much attention.

All five of our recently refurbished RAScope instruments were on display, and let me say, they looked mighty impressive with their sparkling fresh coats of paint, brand new mounts and tripods. We handed out literature, sold publications, answered questions, recruited new members and collected signatures for our light pollution petition.

Ironically, attendance was down this year to about 700 visitors, mostly due to the warm, though cloudy weather. It appeared that most people didn't want to attend an indoor exposition on what turned out to be the season's first really mild day. Yet, despite the drop in numbers, the Montreal Centre made quite an impression on the public and the planetarium staff.

On behalf of all of us present, I would like to thank Marc Jobin and Pierre Lacombe of the Dow Planetarium, for helping us to set up our booth exactly the way we wanted it. As well, I would like to thank those members who contributed to the success of Astronomy Day.

I would also like to thank this year's centre Astronomy Day coordinator, Khurram Syed, for the terrific job he did organizing the event and creating our new look. Thanks also to Bill Stropole for borrowing the mechanical orrery from McGill University. It proved to be a great hit with the kids again this year.

Kingston

The Kingston Centre's Astronomy Day activities were announced with media releases to the *Whit-Standard*, several area weeklies as well as local radio and television stations. These activities were to consist of a mall display during the day and an evening public observing session.

The mall display was quite successful due to the efforts of various members. Originally scheduled to be held at the Cataraqui Town Centre Mall, we were forced to make other arrangements when the Cataraqui Centre management informed our coordinator, Stan Hanna, that they would be unable to accommodate us on May 9th after all. Stan was able to do some "fancy footwork" and get us into the Frontenac Mall, also in Kingston, with less than a month's notice.

A three-panel display stand on which several posters on light pollution were placed, was provided by Bill Broderick, our publicity chairperson. Numerous display items – posters, astrophotos, books, etc. – were provided by Leo Enright, Bill Broderick and others. Hein van Asperen brought his solar system model on which can be displayed the positions of the planets. We also had a large "blow up" of a petition on light pollution, plus copies for signing, which many people stopped to read. Some thirty-five or so signatures were obtained throughout the day.

Steven Manders provided a computer and astronomy software, among them *Dance of the Planets*, which proved quite an attraction. Leo Enright did a fairly brisk business selling thirty-some copies of the new *Beginner's Observing Guide*. Of course, there were a number of telescopes on display, including the centre's 10" Dobsonian. Our evening public observing session was rained out, although several members went to the observing site "just in case".

As well as those named above, a number of other members showed up during the day to lend a hand or just be there. A warm word of thanks to everyone who helped in any way. All in all, we had a good day. We are looking forward to a similar mall display and (hopefully) a public observing session, to be held September 26th.

Toronto

Astronomy Week '92, May 2nd to May 9th, enjoyed far better skies than last year's cloud

and rain-outs, although our two planned solar observing sessions were clouded out. Congratulations to organizer John Ginder for his efforts in bringing together so many people to "bring astronomy to the people".

The McLaughlin Planetarium ran a stargazing workshop, tours of the Astrocentre as well as a series of family workshops, run by Ian McGregor, entitled "Exploring the Sky". Ian also spoke on "Voyages to Other Worlds" at the Albert Campbell Library on Saturday, May 2nd. Sunday, May 3rd featured an "Astronomical Adventure" as part of Family Sunday at the R.O.M. The clouds, which cancelled the solar observing this day, had no effect on the many other programs offered, including a Starlab Planetarium (an inflatable silver dome which participants crawl into) operated by Cathy McWatters, an origami starmaking workshop (yes — making tiny little paper stars), storytelling – dealing with various legends of the night sky and a special program by Terri Ottaway and John Kenny entitled "Meteor-Rights and Meteor-Wrongs" which was designed to give people a better understanding of meteors — how to recognize them and how to distinguish them from other unusual or "earthy" rocks.

Over the course of Astronomy Week, evening observing sessions were held at Morningside Park on Sunday, May 3rd; Bayview Village Park on Tuesday, May 5th; and Humber Bay Park West on Thursday, May 7th. Clouds rolled in as the observing was to begin at Morningside Park and the people who came out, although they could not observe celestial objects, were able to spend the evening talking astronomy. The skies were actually clear over North York this year for the observing session at Bayview Village Park. Nine telescopes, including Bob Chapman's 17-inch Dobsonian and Don Dwight's 6-inch home-made planetary Newtonian, showed several dozen members of the public various astronomical objects. Clear skies AGAIN for the observing session at Humber Bay Park West in Etobicoke. There were fifteen telescopes set up this evening, five were 10-inch or LARGER! This evening had the highest attendance of the week with some fifty members of the public taking in the "view". The favourite objects to observe over the week were the Moon and Jupiter. This was certainly a far more successful list of observing sessions than last year – during the week of rain!

Last, but certainly not least, was the program organized by the Ontario Science Centre. Saturday, May 2nd started off with clouds, which cancelled the planned solar observing at the O.S.C. as well as the evening observing ses-

(continued on page 7)

Thoughts on "Thoughts on the JRASC"

John R. Percy
Toronto Centre
reprinted from *Scope*

The March/April issue of *SCOPE** contained an article by Philip Mozel, which dealt with the "impact factor" of the *JRASC* as determined from citations to papers published in it. By coincidence, on the very same day that I received *SCOPE* (April 22nd), the *Globe and Mail* published a letter from D.R. Wiles, cautioning against the over-interpretation of citations. For instance, "a paper is likely to be cited if it is in a popular field of research – however trivial the paper may be". Ironically, a definitive paper may seldom be cited. There is also a tendency for authors to cite papers by their graduate supervisors, their former graduate students, their colleagues, friends and countrymen/women.

I also looked through the last twelve issues of the *JRASC* to see what kind of papers had been published. They included nine papers on history, biography and sociology of science, and ten papers on asteroids, auroræ, calendars, comets and meteorites – all fields of some interest to the general reader, but not ones which attract a lot of citations. There were five papers from our centennial symposium in Ottawa, which are surely of general interest, but unlikely to ever be cited in mainstream research journals. There were the texts of two Plaskett Lectures and one Northcott Lecture. I counted about twelve pure research papers, of which eight were invited conference papers. This little exercise suggested to me that the low "impact factor" of the *JRASC* relative to pure research journals does not mean that the articles are uninteresting or unimportant. Indeed, each paper may be read by a larger fraction of subscribers than the papers in the *Astrophysical Journal*!

*Reprinted in the June **BULLETIN**. ☼

*Slowly, gently
night unfurls its splendour...
Grasp it, sense it –
tremulous and tender...
Turn your face away
from the garish light of day,
turn your thoughts away
from cold, unfeeling light –
and listen to
the music of the night...*

The Phantom

From the opera "Phantom of the Opera"

More Thoughts on "Thoughts on the JRASC"

Michael Daly
Toronto Centre
reprinted from *Scope*

I read with dismay Philip Mozel's "Thought on the *Journal of the R.A.S.C.*", published in the March/April issue of *SCOPE**. My dismay was due to the fact that this article will, no doubt, sway the opinions of many members of the Toronto Centre against the *Journal*. Unfortunately, Mr. Mozel's analysis is meaningless.

In the article, Mr. Mozel refers to the "impact factor" used in the *Journal Citation Reports*. This impact factor attempts to measure the value of a scientific paper by determining the number of times the paper was cited in other journals. He goes on to show that the impact factor for the *R.A.S.C. Journal* is quite low, implying, of course, that the *Journal* is of little value.

What the impact factor really represents is a measure of popularity. The major publications in the field of astronomy are highly sought-after as sources of information. Only the "best and brightest" (or well connected) get to publish in these journals on a regular basis. Due to the nature of these journals, the articles in them, as in all professional journals, tend to support mainstream research topics.

Unfortunately, mainstream science is not always the source of the most noteworthy science. As Thomas Khan has pointed out in his oft-quoted book "The Structure of Scientific Revolutions", the major advances in science come not from the mainstream but from the periphery – the odd experiments and theories that arise and challenge the established paradigms. We are more likely to see these topics in a lesser journal than a mainstream one.

There are many examples of how research on the border of conventional science – the theories and experiments that few care about – have dramatically changed the way we think about the universe. Copernicus wrote "De Revolutionibus Orbium Celestium", a book on the heliocentric theory of planetary motions. Almost no one read the book – even Galileo, who was a vocal supporter of the Copernican theory, is said to have never seen a copy. Its impact factor, as it would have been measured by Copernicus' contemporaries, would have been negligible. The long term impact of its central proposition is tremendous.

A further contribution to science is made by publishing those articles that, taken individually,

(continued on page 8)

Across the R.A.S.C.

Victoria

At the first Victoria Centre meeting of 1992, member Frank Ogonoski presented old and new programmes from the N.A.S.A. channel. Videos on Mars, the space station, Miranda and radar images of Venus were shown. At the February meeting, Dr. Alan Batten, recently retired from the D.A.O., spoke on Columbus' voyages and astronomy of the day. In his talk, Dr. Batten questioned some commonly held views about the Earth and astronomy in the days of Columbus.

Dr. Roberto Abraham, a post-doctoral researcher at the D.A.O., was the guest speaker at our March meeting. Dr. Abraham gave an animated presentation on exotic quasars called BL Lac objects. The activities of these rare objects seem to stretch the laws of physics. Dr. Abraham presented very plausible explanations as to how these objects could act the way that they do and still stay within the limits of physics.

It was members' night at the April meeting. Jack Newton showed wonderful colour images of galaxies and nebulae taken with his new ST6 CCD. Centre librarian Sid Sidhu and Dan Gentile displayed beautiful wooden equatorial mounts they had made. Frank Shinn and Don Moffat also gave presentations.

Dr. Robert McClure, from the D.A.O., was the guest speaker at the May meeting. Dr. McClure spoke about the High Resolution Camera, an instrument that was designed and built at the D.A.O. and is in use at the Canada-France-Hawaii Telescope. The HR Camera has enabled Dr. McClure to calibrate bright cepheids in the Virgo Cluster and thereby determine the distance of the cluster more accurately.

Our speaker for June was Dr. Anne Cowley of Arizona State University, who has been a regular summer visitor to the D.A.O. for twenty years. Dr. Cowley gave an informative talk on stellar black holes. At this juncture, suspected black holes can only be detected by their X-ray emissions. There are only a handful of these steady, bright X-ray sources in the galaxy. Dr. Cowley's talk brought to a close another good year of speakers at the Victoria Centre.

Kingston

Three new members joined the Kingston Centre as a result of our Astronomy Day mall display. Also, we were invited to a school near Napanee to give a presentation to a grade four class. This was done on May 22nd. Bill Broderick

(continued on page 8)

Friends of the Society

Peter Broughton
National President

By the time you read this, you will probably have heard that the proposed increase in membership fees was defeated at the annual meeting. There was a great deal of discussion, but one point emerged clearly – many members feel that the benefits of membership in the society are worth more than \$32.

I am writing this note to ask those who feel that way to make a tax-deductible donation to the society. If you were willing to pay \$8 more, you could donate \$16 to the R.A.S.C., get a tax receipt and save roughly \$8 on your income tax. In other words, you could help the society doubly by making such a donation. Of course, I don't want to suggest any limit – larger donations would be gratefully received.

One serious concern of many members is that the interest earned by the newly-named "Peter MacKenzie Millman Endowment Fund" may end up being routinely used to bolster the society's revenue, and thus the real value of the fund will be eroded. If you share this concern and would like to honour the memory of one of the greatest friends the society ever had, please indicate that your donation is to go to the Peter MacKenzie Millman Endowment Fund.

You could, if you prefer, donate to the Centennial Fund, the funds from which are intended for special projects, or direct that your contribution, or any portion of it, should go to the centre of your choice. If no indication is made, the money would be credited to the general revenue of the society. Whatever you decide, your cheque should be made payable to the Royal Astronomical Society of Canada and mailed to:

National Office, R.A.S.C.
136 Dupont Street
Toronto, Ontario
Canada
M5R 1V2

Your support as a friend of the society will be gratefully acknowledged and a tax receipt will be sent to you. ☺

The chessboard is the world, the pieces are the phenomena of the universe, the rules of the game are what we call the laws of Nature. The player on the other side is hidden from us, we know that his play is always fair, just and patient. But we also know, to our cost, that he never overlooks a mistake or makes the smallest allowance for ignorance.

Thomas Huxley
English biologist/evolutionist (1825-1895)

Thanks from Calgary

Mel Head
Calgary Centre

The 1992 Calgary General Assembly of the Royal Astronomical Society of Canada is over, and we Calgarians can now all look forward to going to the Halifax one in 1993, where we can relax and let someone else do all the worrying and working that organizing a G.A. takes. Our best wishes go to all you Haligonians to whom we throw the torch!

Thanks for the success of the Calgary G.A. must go to the host of people, who in the true western spirit of cooperation volunteered their time and effort to accomplish the myriad of tasks, big and small, that had to be accomplished. Planning for the G.A. started more than three years ago, when the campaign was launched to bring it to Calgary for 1992, the year of our planetarium's 25th birthday. The momentum then grew, although slowly at first, as more and more people were drawn into the team. The Organizing Committee started to have formal meetings in the spring of 1991, once per month. The majority of the people who worked on the G.A., though, were recruited over the last few months before the event, and assigned to various specific tasks, under the coordination of those who had already been on the committee.

The presence of so many volunteers to operate equipment, help people find their way, sit at the registration desk, welcome delegates, run errands of all sorts, etc., etc., allowed the committee members to run off at the drop of a hat to squelch glitches, extinguish bureaucratic brushfires, defeat impending chaos and so on. The effect of having large numbers of volunteers, even if individually they may have put in as little as a few hours of their time, cannot be understated. The Calgary Centre and G.A. '92 Organizing Committee is extremely grateful to all those who came out to lend a hand.

There were 127 full delegates and 40 associates registered for the 1992 General Assembly, making it one of the best attended western ones ever. Prizes were given out in a number of areas. The best centre display was won by the Calgary Centre. The best individual display was won by Robert Dick of the Ottawa Centre, who presented his eclipse shadowband work. The best youth display was won by the Calgary Centre Youth Group for their "scale model" of the solar system. The best instrumentation award went to Dave Lane of Halifax for his Micro-Guider electronic setting circles. Astrophoto
(continued on page 8)

The Many-Body Problem

Michael Attas
Winnipeg Centre

When lovers come together, two things can happen:

Either they love, and come apart;
Their paths entwining for a brief moment, then
Soaring off, never to meet again;
Else their paths settle into constant orbit,
Re-tracing time after time the smooth ellipses of
Kepler:
Dynamics well-understood by astronomers and
professors of love.

But add to the pair of lovers a third or fourth body,
Say a couple of children, and
All Hell breaks loose.
No Kepler, Newton or Einstein can formulate
Their convoluted tracks in space,
The intertwining loves and scraps of a family
Of three or more;
No equation can tame that energy, tap that fury.

The Many-Body Problem lives on,
In home after home, galaxy after galaxy;
Surprises spin about like fiery pinwheels:
In one house a child enters, in another a parent
leaves;
A boyfriend moves in, a rebel jumps ship, a baby
is born,
A grandfather dies.
And still the stars turn. ☺

Council Highlights

The following is a summary of those items of discussion and actions taken at the G.A. National Council meetings that will probably be of most interest to the general membership. For details, please contact your centre's National Council Representative or contact a member of your executive to see the minutes of the meetings, once they are available

On the finance scene, several recommendations that were put forth concerning council travel grants, refusing to accept any more life memberships and the elimination of the senior membership class were deferred to the Finance Committee. That committee was also instructed to recommend to National Council a budget for 1993 which is balanced. (Note that National Council still has final say on the budget, but this will force the council to make a conscious decision to enter into a deficit.)

The National Library has been changed to a reference library only, due to the fragile and irreplaceable nature of its contents. However,
(continued on page 8)

Rainbows Over Woolsthorpe

Patrick Kelly
Halifax Centre

Of all of nature's earthbound spectacles, if there were to be a competition to determine which one was the most beautiful as well as the most widespread, surely the rainbow would be a prime contender. Although it has been observed since antiquity, it was Sir Isaac Newton who first published a correct explanation of the physical causes which produce the striking band of colour. Newton presented his explanation in his classic text *Opticks*, which was first published in 1704. In addition, he pointed out that objects on Earth do not have colour as an intrinsic property. Instead, the beautiful range of colours seen in a rainbow is a construct of the human mind; the brain's way of differentiating radiation of differing frequencies.

On October 7th, 1979, Dr. Roy Bishop and his wife were in England visiting Woolsthorpe Manor, the house in which Isaac Newton was born. No doubt, many of you have recognized the name of Dr. Bishop. He has been a past president of the R.A.S.C. as well as editor of *The Observer's Handbook* since 1982. By profession, Dr. Bishop is a professor of physics at Acadia University in Wolfville, Nova Scotia. This will have relevance, as we shall shortly see. The manor was not open that day (it being

a Sunday), and they were the only ones there. The weather that day consisted of an overcast sky with intermittent breaks in the cloud cover. While waiting for an opening which would allow enough light through for them to take a picture of the manor, a light rain began to fall.

Thus, when the possibility presented itself of getting a picture of the house with a rainbow included, he was able to position himself so that the rainbow (if one developed) would appear over the manor house. Sure enough, a few minutes later, as the rain got heavier, the Sun began to shine through a gap in the clouds in the western sky. Not only did a rainbow appear, but the fainter secondary rainbow, which forms outside of the primary bow, also became visible. As he was taking the picture, Newton's words came to his mind:

Thus shall there be made two bows of colours, an interior and stronger, by one reflexion in the drops, and an exterior and fainter by two; for the light becomes fainter by every reflexion. And their colours shall lie in a contrary order to one another, the red of both bows bordering upon the space... which is between the bows. (Opticks, p.131)

As it turns out, this is the only known image of a rainbow and Newton's birthplace in the same picture, and it's a double rainbow at that! News of the photo spread throughout the physics community and it was first published (in colour) as a frontispiece to the August 1981 issue of the *Notes and Records of the Royal Society of*

London (36, 1, 1981, frontispiece and p. 3). Since that time it has appeared in the following places:

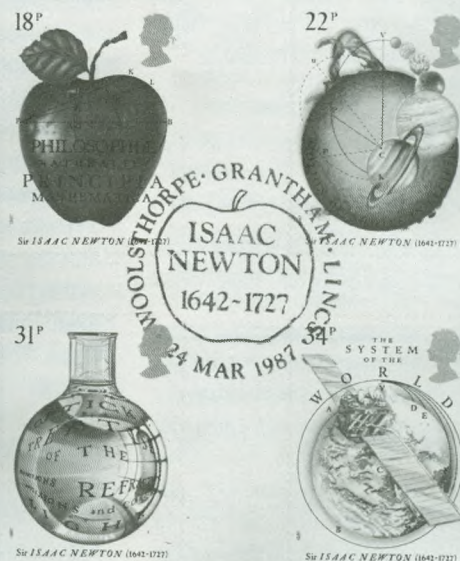
- Christmas Card, The Royal Society of London, 1982.
- **Discovering the National Trust**, John M. Parry, Macmillan, London, 1983, p. 23.
- **Color Vision: Physiology and Psychophysics**, Mollon and Sharpe (ed.) Academic Press, 1983, p. xxi.
- Calendar (1985): Some Fellows of the Royal Society, Ferranti Computer Systems.
- **Physics Today**, 39, 2, February 1986, p. 25.
- First Day Cover, Isaac Newton Tercentennial Stamps, 1987.
- **Natuur & Techniek**, 55, June 1987, Netherlands, p. 447.
- Postcard, The National Trust, 1987.
- **Principals of Physics**, 5th ed., F. Bueche, McGraw-Hill, 1988, p. 364.
- **The Greenwich Guide to Astronomy in Action**, Carole Stott, The National Maritime Museum, 1989, p. 19.

As an avid stamp collector, my greatest interest lies in the sixth item in this list. In 1987, Great Britain issued a set of stamps to commemorate the 300th anniversary of Sir Isaac Newton's *Principia Mathematica*, which is considered by many to be the greatest single scientific achievement of all time. Mr. A. G. Bradbury of Leicester, England obtained Dr. Bishop's permission to use his photograph as part of a first day cover which he designed for this stamp issue. Only 1000 such covers were produced, each one with its own serial number on the reverse side. The



WOOLSTHORPE MANOR
Birthplace of Isaac Newton

THE NATIONAL TRUST
Photograph by Prof. R. L. Bishop.



A.G. Bradbury, 2 Fairholme Road, Leicester. L.F.D.C. No. 58

cover that I received as a gift from Dr. Bishop is reproduced on the bottom of the opposite page. In Dr. Bishop's photo, the secondary rainbow (which may be hard to see in the reproduction) is to the right of the primary rainbow and ends at the top of the large apple tree to the right of the manor. (No, it's not the apple tree as apple tree's don't live to be 300 years old!). Also visible in the photo is an effect called Alexander's Dark Band. It is the region between the two rainbows and is noticeably darker than the rest of the sky. In effect, the light from this area is the source for the extra light that makes the rainbow so bright.

The 31p stamp shows the title page of the first edition Newton's *Opticks* as viewed through a flask full of water. This is rather fitting as the shape of the flask is similar to that of a raindrop. The differing refraction of light passing through such a shape produces the distortion of the text behind it. Also seen through the flask is a window with a beam of sunlight streaming through it. The sunlight is also distorted to produce the familiar spectrum of a rainbow which dominates the left side of the flask. The combination of the photo with the stamps makes this cover one of the treasures of my stamp collection. ☼

Astronomy Day Reports

(continued from page 3)

sion, and evolved into an incredible storm with torrential rains, strong winds and an incredible lightning show! All that glass in the Great Hall literally shook with each crack of thunder! (Brrr...) Not exactly the ideal way to kick off Astronomy Week (or anything else for that matter)! Fortunately an ambitious **indoor** program had been arranged. Displays included a collection of astronomical photos by the Deep Sky Observers as well as a computer displaying astronomical images. The Toronto Centre display was also present along with a wide collection of reading material, a computer running an interactive solar system program and also a video of last summer's big eclipse. Members of both the Toronto Centre and the Deep Sky Observers had many telescopes set up to view ...well... nothing astronomical unfortunately. There were some trees, buildings, money taped to the wall – you know, the usual things you show people when it rains during Astronomy Week.

The O.S.C. provided tours of the new Space Hall which features the marvellous Challenger Learning Centre. As well, special Starlab shows were held. Children were used to demonstrate the relative distances of planets by holding a rope at the positions of the planets. (This is also

known as the "Solar System Rope Trick.") In addition, a new astronomical party game was demonstrated called the "Planetary Twister". Believe it or not, orbits of inner and outer solar system objects were marked on the floor of the Great Hall. Then, participants — no make that agile participants — would, for a specific date, spin and then have to touch either hand or foot (or both) to the selected planet or object, sometimes on opposite sides of the Sun – simultaneously! Fun, eh?

There was also an impressive display of telescope mirror grinding by both the O.S.C. and the Toronto Centre's optical workshop. Cathy McWatters and a group of young students were busy grinding "pocket Newtonians". These are three-inch mirrors made from glass furniture casters! Bill Gardner and the centre's group brought out the centre's six-inch mirror which members of the public (and members too) were able to try their hand at grinding. Over one hundred people took turns at the mirror and were then able to sign the "cast" of the future telescope tube. When this telescope is finished it will be used for public education events.

The last event at the O.S.C. was held on Friday, May 8th when the Toronto Centre held a regular Members' Night in the main auditorium. The meeting was chaired by Guy Nason and the theme for this special evening was "Blinded by Light — Coping with Light Pollution in Toronto". The speakers for the evening were: Ivan Semeniuk - "Observing from the City", Randy Attwood - "The Problem of Light Pollution" and Paul Delaney - "CCD's and Computer Image Enhancement".

Well, another successful Astronomy Week has come and gone. I think John Ginder is planning "Astronomy Month" for next year! (Only kidding John!) Many thanks to all of the participating organizations and their staff and/or members for making possible this opportunity "to bring astronomy to the people". See you next year!

Saskatoon

Following five weeks of sunny weather, Astronomy Day dawned gloomy and cold. Over the course of the day weather varied from drizzle to rain, then freezing rain, and even a period of snow! How disappointing!

Prior to Astronomy Day, Sandy Ferguson was interviewed by centre member Carol Blenkin, who co-hosts the morning show "Two for the Show" on CFQC-TV, the CTV affiliate here in the city. The interview included a discussion on light pollution, with some slides showing the detrimental effects on our skies and promotion of the centre and our Astronomy Day activities.

On the day itself, despite the poor weather, our members were out and about anyway. We set up our centre display tables at the Lawson Heights Mall in the north end of the city, where we would be able to take advantage of the Saturday shoppers (perhaps more inclined to go shopping indoors, since the day was so poor). Our display included astrophotography by centre members, variable star project results, descriptions and photos of some of the observatories and other facilities available to the centre. As well, a good variety of astronomical literature and publications were available, including one publication in Braille for the visually impaired. We also displayed some items of interest to astronomy enthusiasts (such as planispheres and star charts).

Adjacent to the display tables were five telescopes and a set of large binoculars, including Rick Huziak's solar scope. Had the day been cooperative, it would have been set up in the parking lot so the shoppers could get a peek at some sunspots. Scott Alexander set up his 14" Dobsonian, which certainly drew a lot of attention! A few children considered climbing it! Other scopes ranged from 6" to 12".

A slide presentation on light pollution was shown throughout the day, using the package of twenty slides available from the Astronomical Society of the Pacific. We also presented a variety of astronomical slides showing deep sky objects and activities of the centre.

The planned public star night was to have been held that evening in Diefenbaker Park under relatively dark skies, overlooking the Saskatchewan River. However, it was not to be, again due to the inclement weather. The centre hopes to host another public star night in July.

All in all, we feel Astronomy Day was very much a success here in Saskatoon. Although it was disappointing not to be able to bring to the public the opportunity to view the Sun or experience the pleasure of a stargazing session in the evening, we feel we were certainly successful in drawing to everyone's attention the problems all astronomers have with light pollution. We were also able to bring to everyone some of the joy we experience in the night sky, through the presentation of slides of deep sky and other objects. ☼

Let both sides seek to invoke the wonders of science instead of its terrors. Together let us explore the stars, conquer the deserts, eradicate disease, tap the ocean depths, and encourage the arts and commerce.

*John F. Kennedy
American president (1917-1963)*

Items of Interest

(continued from page 2)

Charles Norman Haldenby. The cheque was received at National Office on March 3rd. Dr. Haldenby had been a member of the Toronto Centre from 1940 until his death in 1983.

Canada Scholarships Program

Canada Scholarships are awarded annually to outstanding students entering full-time undergraduate studies in eligible natural sciences, engineering and related disciplines. Over the past three years, Canada Scholarships have been awarded to over 12 000 students.

Now, two new aspects of the program are being introduced to meet a need for role models and resource people who can help elementary and secondary students develop their interests and aspirations in the fields of science, engineering and technology. *Frontrunners* encourages Canada Scholars to visit schools, while *Innovators in the Schools* is a program intended to get engineers, scientists, technicians and technologists into the schools to talk about their professions and prospects for studies and careers in their fields. *Wizards* is a special aspect of this program for retired professionals.

If you, as a teacher, parent, student or potential visitor, would like more information or a training kit, "Selling Science to Students", contact (613) 993-7597 or write to:

Canada Scholarships Program
Industry, Science and Technology Canada
235 Queen Street, West Tower, 8th floor
Ottawa, Ontario
K1A 9Z9

1992 Theodore Dunham Jr. Grants

The Fund for Astrophysical Research invites applications for the seventh annual award of small research grants to assist in the support of current research endeavors. Grants are awarded primarily for the acquisition of astronomical equipment, computer time or software. Due to limited resources, only a few grants can be made each year. They normally range from \$500 to \$2,500. For more information, contact:

Fund for Astrophysical Research, Inc.
875 Third Avenue, 23rd floor
New York, New York 10022

Applications for 1992 grants must be received by October 1st. ☛

For in the concept of matter I do not think of its permanence, but only its presence in the space which it occupies.

Immanuel Kant
German philosopher (1724-1804)

Across the R.A.S.C.

(continued from page 4)

treated the youngsters to a short talk in the afternoon followed by a session of solar observing through his 120 mm refractor. Leo Enright gave a talk and slide presentation in the evening to approximately fifty kids and adults and Bill and Leo provided telescopes for observing Jupiter, etc. ☛

Thanks from Calgary

(continued from page 5)

awards went to John Mirtle of Calgary for prime focus photography, and to Bruce Shier, also of Calgary, in both the piggyback and eyepiece projection categories. The Murphy Slide prize was won by Steven Spinney of Toronto, for his "double eclipse double exposures", and the Edmonton Centre's "Scope Doctor" presentation took the song contest. ☛

Council Highlights

(continued from page 5)

under unusual circumstances, items would be permitted to leave the library. The library's inventory will be computerized so that lists of materials available can be easily customized and produced. In addition, a small video loan section will be set up so that centres can borrow tapes provided that they pay for the postage.

On the publications scene, all prices for the 1993 Observer's Handbook will be the same, except for the single copy **retail** price which goes from \$14.50 to \$14.95. There are new lower **display** ad rates for the **BULLETIN**. Also, to meet a standing motion, starting in 1993 there will no longer be a separate April **BULLETIN** and Annual Report. The Annual Report will be the April **BULLETIN**. Concerns over the possibility of losing money on the Beginner's Observing Guide resulted in the forming of a new committee to oversee its marketing.

Final approval of the model centre by-laws was deferred to the October meeting to allow for all centres to submit any recommendations.

An official seal and logo (in both black & white and colour) were approved. The new seal can be seen on page 2, while the logo is to consist of the inner part of the seal but will allow for flexible lettering. The Seal Committee was disbanded after these were approved.

Astronomy Day for 1993 will be held on May 1st. The theme is to be determined by each centre. ☛

Letters to the Editor

(continued from page 2)

make the R.A.S.C look as though it were responsible for hosting STARFEST. I had room left for two photographs (one horizontal and one vertical) and as luck would have it, the only ones that I had left were several slides that had been sent to me along with the write-up of STARFEST'S 10th anniversary. As I had not used these in the article, I felt that since a large number of R.A.S.C. members attended STARFEST that it was definitely an "event", even if it wasn't an R.A.S.C. one. I apologize for any confusion that might have resulted, although I would hope that most society members are already aware that STARFEST is not organized by the R.A.S.C. I wish that I could get as many photographs submitted from a lot of the centres as I received from your group! - PMK]

Editor's Mailing List Update

As I am still receiving centre newsletters, correspondence and articles that are being routed from my old address, please check to make sure that you have updated my address. The new one can be found below. I really would hate to miss a good article!

Patrick Kelly, **BULLETIN** Editor
RR#2 Falmouth, Nova Scotia B0P 1L0 ☛

More Thoughts on "Thoughts on the JRASC"

(continued from page 4)

do not contribute greatly to the body of knowledge we call science, but taken collectively, will record a vast store of information for future researchers. While there are probably very few papers in the R.A.S.C. *Journal* that will ever rival Copernicus' controversial work, there are many that will fall in the category just described. We would be remiss to remove from circulation a scientific journal, however unpopular with the masses, that offers a voice to those researchers who make these many smaller contributions.

There is more to science than popularity. Given the small cost of the *Journal* to each member, I cannot accept suggestions that it disappear. If, in a century of publication, a major paper or collection of many lesser ones yields but a single significant contribution to astronomy, it will have been money well spent.

*This article was reprinted in the previous issue of the **BULLETIN**. ☛

The only hope of science is genuine induction.
Francis Bacon
English philosopher/essayist (1561-1626)