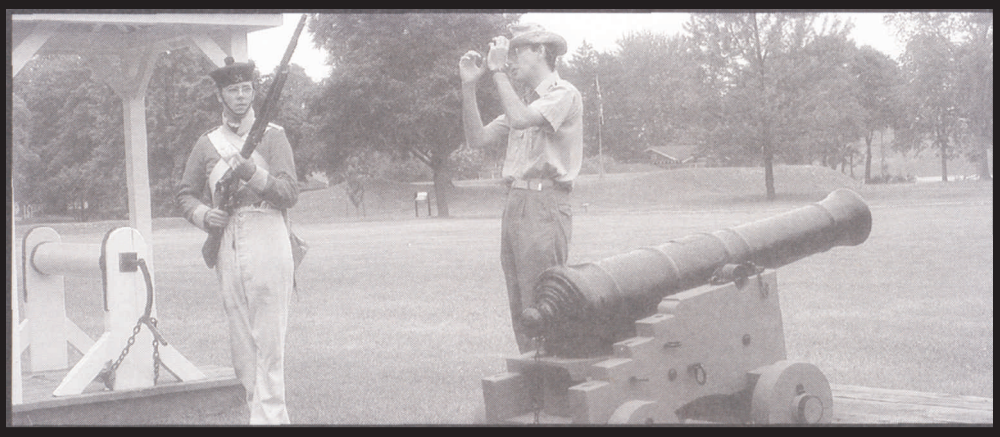

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The Royal Astronomical Society of Canada

BULLETIN

La Société Royale d'Astronomie du Canada

Supplement to Volume 89/6 of the Journal of the Royal Astronomical Society of Canada

Reflections: Society Objectives

Raymond Auclair

(This article continues the ever-heated debate about the future of the Journal and the restructuring of the RASC's publications and services. Sorry about that!)

The RASC is a society created to promote interest in astronomy and allied sciences. When we join a society as members, we should, in theory, be interested in helping the society to fulfil its objectives.

In reality, many of us joined the RASC as customers. We wanted to receive information and services to maintain our existing interest in astronomy. I know I did. This dichotomy is not exclusive to the RASC.

Many societies lump both customers and members into one homogeneous group. The best known, to many of us, is the National Geographic Society where, in order to subscribe, you become a valued member. The power of a word is such that, even though I have never participated (in person or by proxy) in any annual meeting or General Assembly of the National Geographic Society, I feel that the quality of the information that is made available through their magazine—not just to members but also to our leaders who make decisions affecting our lives, health and environment—would not have been the same without my few dollars and that of other valued members.

So maybe I am sentimental. I feel the same way about the RASC. I certainly do not get the same feeling from my subscription to other magazines, like *Sky & Telescope*, where for them (and in my own mind) I am only a customer. I do not feel the need to comment on what their objectives are nor how they work towards their attainment; if the magazine stops pleasing me, I cancel my subscription.

Being a member of the RASC, I have always felt that I had a role—albeit very minor at first—in helping the society achieve its goal of promoting interest in astronomy. As time rolled on, luck and circumstances allowed me to be involved more and more in the workings of the RASC.

I have been following the recent debate about the *Journal*, and the future of both our publications and of services. I found the arguments confusing and often felt that various participants were engaged in parallel debates, not quite on the same planes.

In order to clarify the debate, I have invented, for myself, two categories of arguments: those aimed at improving the attainment of the society's objectives and those aimed at providing better services to our customers.

The desires of the second category are easy enough to determine. Client surveys have been around long enough to be reliable. The problem is that the objectives of the society has never been clearly interpreted in a manner allowing the members to determine if (and how) they have been attained.

Without a proper interpretation of the society's objectives (I do not say there is not one, only that I do not know of one), I have decided to create my own. Being, in my third career, a statistician, and generally a decimal kind of guy, I made it a ten step statement:

To promote interest in astronomy means:

1. Taking people who do not know that astronomy exists, and making them aware of astronomy.
2. Taking people who are aware of astronomy, and making them interested.
3. Taking people who are interested in astronomy, and making them take up the hobby.
4. Taking astronomy hobbyists, and giving them tools to become budding amateur astronomers.
5. Taking budding amateur astronomers, and helping them work with others on team projects.
6. Taking seasoned observers, and helping them contribute to scientific projects.
7. Taking contributors, and helping them manage and propose projects for others.
8. Taking project managers, and helping them have an impact on astronomy itself.
9. Taking people who have made an impact, and helping them reach the limits of the science.
10. Taking those at the limit, and helping them explore beyond... and taking us with them.

When discussing the proposed strategies the RASC should use, as a customer I realize that I do not belong anywhere near 9 or 10, and I will insist that services should be tailored more to 4,

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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. Inquiries about the Society should be directed to its national office at 136 Dupont Street, Toronto, Ontario, Canada M5R 1V2 (416) 924-7973.

Cover Picture: Fort Malden National Historic Site, in nearby Amherstburg was visited by many who attended the Windsor GA. Photo by David Lane.

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Letters to the Editor

Donations Needed for Brazil

It is a great satisfaction to inform you about the foundation of the astronomical observatory at the city of Amparo. This is the fifth Brazilian municipal observatory. The activities of the observatory will be the following: astronomy classes, conferences, observations, research and other activities with scientific and cultural objectives in the astronomy field.

We would be grateful if you could send us free instruments (telescopes, binoculars, eyepieces, filters), books, posters, pictures, video, slides and any information related to the subject. Any donation will be useful to us.

Our address is:

DR JOÃO BAPTISTA CINTRA
PREFEITURA MUNICIPAL
PRAÇA BARÃO DO RIO BALNCO, 50
13900-902 AMPARO SÃO PAULO
BRAZIL

Waiting to hear from you soon, we remain, yours truly,

Dr. João Baptista Cintra
Prefeito Municipal de Amparo ✪

Is Enya an Amateur Astronomer?

As Bruce McCurdy pointed out in his article on astronomy in musical lyrics (February 1995), Enya has an overabundance of astronomical references in her songs. Her newest release, The Memory of Trees, is no exception. Perhaps the one that is most appropriate for active observes is a verse from the song Anywhere Is:

I look up to the heavens
but night has clouded over
no spark of constellation
no Vela no Orion ✪

Okanagan Centre Born!

At the last national council meeting, the society added its twenty-third centre. Contacts are:

President:
RON BELL
470 DOUGALL ROAD NORTH
KELOWNA BC V1X 3K7
(604) 765-1752
E-mail: bellstar@ogopogo.com

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RON SCHERER
11450 DARLENE ROAD
WINFIELD BC V4V1Y4
Ph: (604) 766-0566
E-mail: rscherer@awinc.com

Best wishes to the Okanagan Centre and we hope that their centre and the society will benefit each other in the years to come. ✪

Event Horizon

June 18th-21st: Lucerne, Switzerland

Congress on "Amateur Astronomy Today"

The congress will be held in conjunction with the general assembly of the International Union of Amateur Astronomers (IUAA) and the general assembly of the European Section of the IUAA. Contact:

A. TARNUTZER
HIRSTENHOFSTRASSE 9
CH-6005 LUZERN
SWITZERLAND

July 8th-12th: London, England

New Trends in Astronomy Education. Contact:

DR. D. MCNALLY
UNIVERSITY OF LONDON
OBSERVATORY
MILL HILL PARK
LONDON NW7 2QS
Phone 44-(0)-181-959-0421 ✪

Questionnaire Results

David Lane
Chair, Publications Revitalization Committee

The publications revitalization committee is pleased to announce the results (as of January 19th) from the publications questionnaire which was included with the prototype issue of *Astronomy Canada*. The replies to the question concerning approval of the new publication based on the prototype are:

Total:	660	(100%)
Yes:	590	(89.4%)
No:	68	(10.3%)
Spoiled:	2	(0.3%)

The name preferences for the "Yes" votes:

Astronomy Canada	397
Astronomy in Canada	66
Leave it the same	103
Suggested name	24

The name preferences for the "No" votes:

Astronomy Canada	2
Astronomy in Canada	2
Leave it the same	56
Suggested name	8

The name preferences for the total votes:

Astronomy Canada	399	(60.6%)
Astronomy in Canada	68	(10.3%)
Leave it the same	159	(24.2%)
Suggested name	32	(4.9%)

Astronomy Canada and *Astronomy in Canada* when added together account for 71% of the total votes.

We were very pleased with the support from the membership for our proposal and as a result, the committee will be proposing approval of the new publication at the March national council meeting. ✪

Letter from the National President

Doug Hube

Dear fellow members of the RASC,

It is with regret that I write to inform you that our executive secretary, Miss Rosemary Freeman, has submitted her resignation effective June 30th, 1996. Rosemary has served the society since 1972. For almost a quarter-century, she has looked after membership matters, has dealt with publishers and bankers, has provided an essential link between the society and the general public, has provided continuity and guidance as national councils have come and gone, and has done countless other things for us which we could not imagine. I encourage all of you to attend GA '96 in Edmonton, and to join us in thanking Rosemary for her years of loyal and effective service.

With Rosemary's departure, important and difficult decisions will have to be made soon regarding her replacement and the structure of the national office. Those decisions may be linked to the important decisions which must be made—also **very** soon—with respect to the society's publications.

It is important that all members return the pre-addressed postage-paid cards which were included in the prototype issue of *Astronomy Canada*. Please, remind members of your centre to drop those cards in a mailbox now! The decision as to whether or not to replace the *Journal* and the **BULLETIN** with *Astronomy Canada* will be made by the national council, but it is desirable that the council act in accord with the clearly expressed wishes of a substantial majority of all members.

I also remind you that 1996 is an election year for the society. As of July 1st, 1996, you will have a new president, first vice-president and second vice-president. They will be leading the society into a new era: without the valuable support which I have enjoyed from Rosemary; and perhaps, with a new publication which will present a new and very different face to the astronomical community.

Given all of the above, I strongly encourage you to send your national council representative to the next meeting on March 23rd, 1996, and to the meetings which will be held at GA '96. (I expect that the decision on publications will be made at the March 23rd council meeting.)

Again, I especially encourage all members to attend GA '96 in Edmonton for astronomy, fun, tough decisions... and for that 'Thank You' to Rosemary. ✪

Items of Interest

Updated E-mail Address

The E-mail address for the Canadian Space Research Centre that handles the Atlantic Provinces has been changed to:

space@hercules.stmarys.ca

Financial Astrology

This editor recently received a rather intriguing piece of junk mail. A Hong Kong company called Financial Astrology claims that their astrologer, Rebecca Nolan, could use astrology to forecast the stock market! Not only are predictions made for such standard items as the Dow Jones Industrial Average and the Nikkei Index, but forecasts are also available for twenty other stock market indices; twenty-five currencies (including the Canadian dollar); fifteen commodities including gold, oil, copper, and coffee along with economic and political forecasts for over thirty countries!

According to the promotional material, her predictions normally have an "accuracy" of 75% and in some months they can be up to 95% accurate. There are charts included that show several graphs of her predictions, which have a similar shape to the actual values. For those who want to test her predictions, there are even several charts for the next two months, with an invitation to check their accuracy.

Also of interest is the Rebecca Nolan's background. According to the literature, before being convinced by some wealthy Chinese and European businessmen to start a private astrological practice, she was a professor of math at several American universities and had been challenged by a student to disprove astrology mathematically. "Within days she became convinced of its authenticity and... soon discovered that astrology was based on pure mathematics but was almost universally misunderstood."

I was also offered the opportunity to purchase several issues of the company's publication. The cost: $US 135 for one issue, or I could receive the next four editions for only $US 395. I probably would have tried one, but fortunately, I am governed by a higher sense of principles, namely the Ferengi Rules of Acquisition, one of which clearly states: Never pay more for an acquisition than it is worth. ✪

Science is facts. Just as houses are made of stones, so is science made of facts. But a pile of stones is not a house and a collection of facts is not necessarily science.

Jules Henri Poincaré
French mathematician/philosopher (1861-1947)

National Council Report

Rick Wagner
Ottawa Centre
reprinted from *AstroNotes*

A meeting of the national council was held in Toronto on November 25th. In spite of the internal wrangling within the RASC over the past few years, there are still people who feel that the society is worth belonging to. The society now has an Okanagan Centre. There has also been a request for information on joining the society from a group in Vernon, B.C.

A proposal was put forward by the long range planning committee for a new structure for the national office. The University of Toronto Press, which does the printing of the *Journal*, *Bulletin*, and *Observer's Handbook* also provides a membership maintenance service to societies. As part of this service they maintain membership lists, mailing lists and collect dues. Contracting for such a service would reduce the workload on our executive secretary and allow her to concentrate on other functions which cannot be contracted out. The proposal will be discussed at the next national council meeting.

A Messier Certificate was awarded to David Dunn of the Ottawa Centre. An NGC Certificate was awarded to Father Lucian Kemble of Edmonton. It was noted by Leo Enright that Father Kemble has also observed and drawn every one of the 3,000+ objects in the Herschel Catalogue.

There was some discussion about the idea of adding the National Museum of Science and Technology's publication, *SkyNews*, to the package included with membership in the RASC. It is felt that it would make an important addition for the beginners and would help attract new members. Furthermore, with such a large bulk subscription would likely come rights to a certain amount of space and coverage for the RASC in each issue. This could be an important advertising facility to reach beginning amateurs across the country. Discussions will be held with *SkyNews* editor Terence Dickinson, after which a formal proposal will be brought forward.

The only contentious issue that came up concerned the solicitation of unattached members to join a centre. The Kingston Centre has recently sent letters to a large number of unattached members asking them if they would not be better served by becoming a member of their centre. Approximately eighty members from across North America and around the world agreed. Kingston is now getting 40% of those

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Should Cat Owners Receive Certificates?

Doug Hube
National President

At the GA in St. John's, and at the meeting of the national council in October of 1994, quite innocent changes were made to the regulations governing both the Messier and Finest NGC Objects Certificates. As a direct result of the discussions which took place at these two meetings—but quite unconnected with the changes that were made—objections have been raised to one condition which is common to the published criteria for these two awards. The objections—and very strongly stated they were!—came from some Edmonton Centre members initially, but subsequently they also came from members in other centres.

As presently stated, computer-aided telescopes (CATs) may not be used to find the objects. In other words, an awardee must use the method of star hopping to find the objects. This is not a new regulation: it was the original intent and has been in force formally for more than seven years. I thank Randy Attwood for providing me with a copy of the minutes of the national council meeting which was held on September 26th, 1987. The relevant portions are quoted here:

> **11. Computerized Observations of Messier Objects**
>
> Dr. Scrimger read a letter expressing concern that the traditional spirit of the search for Messier Objects might be compromised if astronomers used computer-aided telescopes in their quest for these objects.
>
> [87419] It was moved by Dr. Bishop and seconded by Dr. Higgs that the awarding of the Messier Certificate be restricted to those who go through the search for the 110 Messier Objects in the traditional manner, that is, without the assistance of computer controlled telescopes.
>
> The motion was carried.

When the Finest NGC Objects Certificate was introduced, the criteria that had already been established for the Messier Certificate were carried over.

Over the past few months, I have conducted an informal poll of members for whom I hav e-mail addresses, and during my travels as president, I have taken polls at several centres. I have received opinions spanning the full spectrum. The comments/arguments I have received include the following, which are paraphrased:

- With a CAT one could find all of the objects in two nights. What is the point of giving an award for that?
- The challenge of the hunt is the most important thing.
- The important thing is not the hunt, but the observations.
- Why put effort and money into high-technology equipment if you are not allowed to use it?

This exercise has demonstrated, yet again, that it is **impossible** to satisfy all members of such a diverse organization! On some matters a compromise may be adopted, however, the nature of this principal may be such that compromise is not possible and some will have to live with a situation with which they disagree.

The suggested solutions to the "problem" include:

(i) offering two classes of Messier and Finest NGC Certificates: one for those using CATs and one for those using traditional methods;
(ii) having a single certificate for each award with an explicit statement of the procedure used;
(iii) leaving the regulations as they are;
(iv) having no restrictions, thereby leaving the awardee to decide with their friends the value of the award, and;
(v) not having any such awards.

Other solutions have also been suggested.

On the basis of the very limited and informal poll, there is an overwhelming majority on one side of the argument... but it is not my wish to reveal which side! Even so, there is no single solution which, in my view, will satisfy everybody, nor perhaps, satisfy even a majority.

I invite individual centres which have not done so, to poll their members on the question and to send the results directly to me. The question to ask is a simple one: "Do you, or do you not, believe that CATs should be allowed in the awarding of the Messier Certificate and the Finest NGC Objects Certificate?"

Members who feel strongly about this matter are encouraged to express their opinions in the **BULLETIN** for the benefit of all. ✪

The real question in everybody's mind is why the universe seems to be made of matter, when on a cosmic scale, antimatter is just as easy to make. It's one of the outstanding big mysteries.

Robert L. Forward
American engineer (1987)

Shakespeare Was No Astronomer

Rob Roy
Hamilton Amateur Astronomers
reprinted from *Event Horizon*

The Bard of Avon, unlike Chaucer, Dante, or Milton, seldom made use of astronomy or astrology. He never employed horoscopes, for example, to emphasize the traits of his characters. For all his writings there are but few astronomical references, some of which are given below.

There's not the smallest orb which thou behold'st But in his motion like a angel sings, (Merchant of Venice, V, i)

Saturn and Venus this year in conjunction! What says th' almanac to that? (Henry IV, Part2, I, iv)

Hung by the heavens with black, yield day to night! Comets, importing change of time and states, Brandish your crystal tresses in the sky... (Henry VI, Part 1, I, i)

The fault, dear Brutus, is not in our stars, but in ourselves. (Julius Caesar, I, ii)

When beggers die, there are no comets seen; The heavens themselves blaze forth the death of princes. (Julius Caesar, II, ii)

The exhalations whizzing the air Give so much light that I may read by them. (Julius Caesar, II, i)

Since the Greeks thought that comets were exhalations of the atmosphere, this latter passage shows that Shakespeare knew some astronomy. We find, however, in Julius Caesar, Act III, Scene 1, that the Bard is guilty of a great blunder. Caesar is quoted as saying:

But I am as constant as the northern star,
Of whose true-fix'd and resting quality
There is no fellow in the firmament.
The skies are painted with unnumber'd sparks,
They are all fire and every one doth shine,
But there's but one in all doth hold his place:

In Shakespeare's time, Polaris was about 2° from the north celestial pole, close enough to appear fixed. Julius Caesar, though, is supposed to be speaking in 44 BC, some 1650 years before Shakespeare put those words into his mouth. Polaris was, at that time, 10° from the pole. In Caesar's time, both Polaris and β Ursae Majoris described circles of 10° radius.

Therefore, one must conclude that even though Hipparchus had discovered precession in the first century BC, Shakespeare did not know anything about this phenomenon. ✪

The Astronomy of Native Americans

Diane Brooks
Halifax Centre
reprinted from *NOVA NOTES*

Historic native North Americans used earthly structures, both natural and artificial, and objects in the sky to determine their calendar and the time for their ceremonies. Rituals were very important events in their lives and had to be timed precisely, not only for their physical prosperity, but also for their spiritual well-being. Some of the ways various tribes used astronomical observations will be described.

The so-called medicine wheels, stone patterns on the ground, may be the most familiar structures, believed to have been built by the Plains Indians in the west. The wheel in the Bighorn Mountains, northern Wyoming, consists of cairns, spokes and a rim. The number of spokes is close to the number of days in a lunar month. Two cairns can be used with the central cairn to sight the sunrise and sunset at the summer solstice. Other cairns can be used to sight Aldebaran, Rigel and Sirius in the following way. The heliacal rising of Aldebaran marked the summer solstice at the time the wheel was believed to have been built, 200 to 400 years ago. Then, Aldebaran would have been visible only a few minutes before the predawn glow from the Sun washed it out. Twenty-eight days later, Rigel would rise in the same way over a second line of cairns. Sirius would repeat this pattern over a third line of cairns 28 days after that. The odds against chance alignments to the measured accuracy have been calculated at greater than 4000 to 1. These solar alignments would have been useful for millennia. The wheel resembles the plan of the Cheyenne medicine lodge which was built to celebrate the Sundance ceremony, the most important Plains Indian ritual held in the summer, and practised at the summer solstice by some. The wheel may have been used to mark the calendar, especially the summer solstice, so that the Sundance ceremony could be timed to occur on the solstice.

There are other medicine wheel sites east of the Rockies, across the Great Plains, and primarily north of the Bighorn Wheel. They appear to have been constructed above about 45° latitude. Ten have been found in Saskatchewan and at least 30 in Alberta. One of the most noteworthy Canadian wheels is at Moose Mountain, Saskatchewan, an area that was associated with the sky in native legend. With five spokes and no rim, its structure is simpler than the Bighorn Wheel, and may be an earlier version. It is twice as large in diameter. The significant point is that it contains the same number of cairns and in the same relative positions as the Wyoming wheel. The cairns show the same alignments with Aldebaran, Rigel and Sirius, but for 2 000 years ago, allowing for precession. Its age has been verified by radio-carbon dating of charcoal at the bottom of the central cairn where the ground was burned before construction. The evidence is that the fire occurred about 2 600 years ago. Incidentally, one of the cairns would have aligned with Capella when it was far enough south to rise and set. For several hundred years this star would have been an ideal marker for north. At the end of the summer solstice sunrise spoke there is a small, stone Sun symbol.

This Sun symbol has been found at two other candidates for astronomical wheels in Saskatchewan. More than half of the wheels examined in Alberta have spokes or other features that align within 2° of sunrise at the summer solstice. They also tend to point to the rising places of Aldebaran, Rigel and Sirius. The ages of these wheels are almost completely unknown. Medicine wheels in Canada are theorized to have been built by different peoples over a long period of time. The most elaborate structures appear to have astronomical associations.

The Wichita Indians of Kansas had structures, known as council circles, that were unique to Great Plains archaeology. They are the main feature at five sites. Consisting of a central mound surrounded by a ditch, most are situated on a ridge with a clear view of the horizon. An observer positioned strategically at one circle could see other circles, as well as the winter solstice sunrise. Another position revealed the summer solstice sunset on the horizon. Human bones have been discovered at two sites. Their presence may suggest that sacrifice was included in a ceremony held at the time of the solstice. The Pawnees of Nebraska are known to have sacrificed a female captive during their Morning Star ceremony, held in summer, and usually when Mars rose in the east. The ritual was meant to ensure fertility and successful crops. This event may have been a solstice ceremony, since a version without the sacrifice was performed at the time of the winter solstice. The Pawnees' earth lodge was sometimes used by the priests to observe the positions of the stars and constellations through the door and smokehole. Observations of the sky guided the timing of ceremonies for a people who had no calendar but who did recognize a ceremonial year. Their year began with the First Thunder ceremony, around the spring equinox, and the evening star was significant. If past years were referred to at all, they were mentioned by being linked to an unusual event.

The Pueblo Indians of New Mexico, also known as the Anasazi, used a variety of artificial and natural structures to observe horizon positions of the Sun in order to determine ceremonial and agricultural dates. The Sun also played a role in the ceremonies themselves to lend additional drama. Two possible solstice markers and one possible equinoctial marker have been identified in Chaco Canyon. At Casa Rinconada there is a structure with two sets of wall niches and a window. Sunlight shining through the window illuminates a specific niche for four or five days at the summer solstice. The building's geometry appears to be an attempt to reflect celestial phenomena. A building at Pueblo Bonito has several corner doorways which are rare in Anasazi architecture, and may have been intended for astronomy. At least two doorways permit a view of the winter solstice sunrise. It has been speculated that they may also have been used to time rituals. A third site in the canyon, Hovenweep, features towers with small openings suitable for observing not only the Sun but also bright stars, notably, Sirius, Vega and Arcturus. This site is the first clear example in the southwestern U.S. of stellar observatories.

Two natural structures in Chaco Canyon are also believed to have been used to watch the sky for the purpose of determining the solstice. Wijiji and Penasco Blanco are both said to have been perfect for viewing the winter solstice sunrise. The former site features a natural rock chimney only a few minutes of arc narrower than the apparent diameter of the Sun, while at the latter site, the edge of a cliff face could have been used as a solar marker. A Sun glyph, or rock painting, has been identified at both sites. Also at Penasco Blanco, a pictograph of a crescent and star configuration was discovered on the cliff wall above the Sun symbol. It has been theorized that this pictograph could represent the supernova of AD 1054.

Possible records in the Western Hemisphere of this supernova number more than 15, and include sites in Arizona, Baja California, New Mexico, Texas, and Utah. The case for rock art representations of the supernova is circumstantial. A major obstacle is lack of accurate dates for the sites. Tree ring dating of logs used to construct Village of the Great Kivas, New Mexico. place the pueblo in the early 11th century. The petroglyph at Capital Reef National Park, Utah, is from the Fremont Culture region; the nearby area was believed inhabited at the time of the supernova. Finally, the pictograph in Baja Cali-

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Lightwaves: Putting Our Own House in Order

Bill Broderick

Before we get on our high-horse and go galloping off in all directions to spread the word about light pollution, it might be a good idea to take a look at our own front and backyards. After all, it is not just "other people" who contribute to the light pollution problem. Chances are, many of us are guilty as well.

Do you have exterior lights around your home? Security lights? Yard lights? Decorative lights? Do you live in a condominium or apartment complex with such lighting? How about your place of business? If any of the above applies to you, now is a good time to take a critical look at your outdoor lighting situation and see how it measures up with respect to light pollution.

Common Lighting Problems

A very popular form of outdoor lighting for homes, apartment buildings, etc. is the large globular light fixture. These look quite attractive by day, but they are generally not very efficient for illumination at night. The large bright globes can be quite blinding if higher wattage light sources are used. Of course, there is lots of light emitted horizontally and upwards. Really, globes are not recommended for outdoor lighting.

Another very common light used for parking lots and security lighting is the 175 watt, dusk-to-dawn mercury vapour lamp, usually installed in a poorly-designed fixture. It spews light in all directions, including upwards. These lights produce a lot of glare and deep shadows, making them very inefficient for their purpose. Although better-designed lighting is available, this type of light is still used extensively, probably because people simply do not know any better.

Do You Need Light?

If you are using lighting that contributes to the light pollution problem, probably the first question you should ask yourself is: "Do I need any lighting at all?" Probably, the answer is: "Yes, I do." As homeowners, we have a need for some exterior lighting. In an apartment building or condominium, there will almost certainly be a requirement for some outdoor lighting and most places of business will also have a need for such lighting. So yes, there is a place for outdoor lighting.

Unfortunately, in our brave new "live better electrically" world, most of us (or at least far too many of us) have proceeded on the assumption that if a little of something is good, then more is better and a lot more is better still. Certainly, that seems to be true with outdoor lighting.

Country Living

For the last ten years I have lived in a rural area northeast of Belleville, Ontario. When I came out here, one of the first things that I noticed was the occasional beacon-bright mercury vapour lamp or metal halide light shining in someone's farmyard. Some of these lights were mounted on a high pole, on the side of a barn or on a high point of ground. This made them visible for kilometres in all directions. Most of these had been installed by people who had always lived in the country. Why did they find it necessary to light up the night like that?

Over the last ten years, I have seen more and more building of new homes out here in the country. Presumably, many of the people building these homes were moving out to the country from the city. They too found it necessary to install bright mercury vapour (and more recently high-pressure sodium) lights in their yards. Why? Presumably, they feel somehow safer with all-night lights burning around their homes.

Nevertheless, to me one of the joys of living in the country is being able to look up on a dark, moonless night and see the stars and the Milky Way. Why people deliberately deprive themselves of that spectacle is a mystery.

A Word About Security

According to a popular fallacy, lots of light deters crime. That is not necessarily true. In fact, most break-ins of homes occur in broad daylight when the robbers are able to see what they are doing—and taking. When we install all-night "security" lights, what we are really doing is lighting up our properties for the convenience of burglars and extending their hours of operation. After all, no self-respecting burglar is going to break into a house when the occupants are home so the trick is to convince would-be robbers that someone is (or may) be in the house, not to light up the world for them. If you are going to be away, have your mail picked up or held at the post office, have a few timer-operated lights turning off and on inside the house, have a radio or television (also on a timer) going, cancel all deliveries and have a friend or house-sitting service come in regularly to check on things, water plants, mow the grass and just generally give the appearance that someone is around.

Some of the same ruses can be employed if you are away just for the day, evening or weekend. If you are really concerned about security, you can also install motion-activated burglar alarms inside the house. This will give you a lot more security that any dusk-to-dawn outdoor "security" light could ever do.

A Few More Suggestions

If you feel that you need light so that you do not bump into things in the dark, then some simple porch lights or other exterior lights that can be turned on and off with switches from inside or outside of the house are the simple answer to that problem. These can also be put on timers to have them on at times when we know that we will normally be needing them. Light fixtures are also readily available that are activated by infrared motion detectors. These make great security lights, not only in homes, but for places of business too.

The same principles that apply to good lighting elsewhere also apply to lighting around the home, apartment and workplace. Full cutoff fixtures, recessed lighting, concealed lighting, shielding, all help to reduce or eliminate glare and increase visibility. Eliminating the glare often means that you can make do with a lower wattage light source, which also saves on energy costs. The point is that by using lighting that is appropriate for the task, we get better lighting and we can reduce the energy bill as well. As a bonus, we get the stars.

Let Us Show the Way

Whether we live in the town or in the country, we astronomers—amateur and professional—can lead the way and show others how to do it. We all need outdoor light at times but we do not need outdoor light all the time! There are good, quality ways of getting the lighting we want and need in ways that do minimal harm to the nighttime environment. Wherever possible, let us use low-pressure and high-pressure sodium lights in good quality fixtures, shielded to direct the light to where it is needed and to eliminate glare and light trespass. We should also strive to use timers and motion detectors to activate home and business security lighting.

To conclude, let us observe the three principles of good lighting:

- only when needed;
- only where needed, and;
- only the kind needed. ✪

Readers are invited to share their news and views on this subject. Send correspondence to:

BILL BRODERICK
RR#1
SHANNONVILLE ON K0K3A0

The rainbow is the repercussion or refraction of rays of the sun in a concave aqueous cloud.

Robert Grosseteste
English bishop/educator (1168-1253)

Reflections: Society Objectives

(continued from page 1)

5 and 6, and somewhat in 7. As a member, I realize that to achieve its objective, the society must also spend resources in 8, 9 and 10—even though the majority of our members may not spend all their time at that level. The society must also worry about 1 , 2 and 3 where we have very few members (but many future members). Do we have any members in level 1? Probably close to 0%. Does that mean we should spend 0% of our resources at that level? I think not.

Using the list (1 to 10) as a guide, we can look at what the RASC presently does to achieve its goals. For example, the Messier Certificate is an example of a tool used to achieve step 4. For those who have started to practice astronomy as a hobby, the quest for the 110 objects will help them acquire some observing skills, such as maintaining a log book, reading charts, using setting circles, aligning a mount, checking the weather, and planning observing sessions (refraining from making dinner reservations on New Moon weekends).

Where do our publications fit in that scheme? Some will cover more than one level (in the same way that individuals may belong to different levels, depending on what aspect of astronomy—a wide field indeed—is considered). The *Observer's Handbook* is certainly useful at all levels (from 2 to 9, let us say) and may directly promote interest at levels 4, 5 and maybe 6. (I remember contributing to observations of lunar occultations which were used to correct the lunar tables of the Nautical Almanac I later used as a navigator.) The **BULLETIN** I will assign to a special objective: internal communication among members so we can discuss, for example, how the society should function and better attain its objectives. Even so, the **BULLETIN** could prove very useful, at levels 5, 6 and 7, in helping us find out what team projects are out there waiting for our participation.

Where does the *Journal* fit? I say it covers (or should cover) 8, 9 and maybe 10. To the question: do we need a *Journal*? , the member in me answers, without a doubt, yes, we do. Is the *Journal*, in its present form, the best way for the RASC to attain steps 8, 9 and 10 of its objective? I give you a resounding "I don't know!" Until this week, I had not understood the question in its proper perspective; I was looking at it as a customer wondering why my money went to something aimed elsewhere than my main interest. Now that I know why we need a *Journal*, I may be in a better position to say what it should look like. ✪

The Astronomy of Native Americans

(continued from page 5)

fornia is from a region known as the Great Mural Heartland, whose art is characterized by depictions of real objects, almost to the exclusion of abstract symbols. Furthermore, representations of crescents are rare in rock art. Therefore, their appearances are likely depictions of unusual events. The pictograph could represent the crescent Moon and Venus. Morning and evening stars were and still are important deities in Puebloan mythology, but it is unclear if they were portrayed in rock art. One theory is that the tradition of associating the Moon and morning or evening star began with the appearance of the 1054 supernova.

Moving to the eastern U.S., the Seneca Iroquois mark the day by the Sun's highest position. The beginning and ending of the day is midway between two noons. Meridian noon divides the day into two parts with very different natures, which affect most of their ceremonial practices. Almost everything can be defined as being appropriate before noon, the time of day considered sacred, or after noon. Ceremonies in the fore noon, which vaguely begins in the pre-dawn and ends when the Sun passes the zenith, include most public rituals or thanksgiving rituals. Afternoon, that is evening, ceremonies include most medicine rituals.

The Iroquois did not traditionally recognize the week. The month was determined by observing the Moon. The year was divided like the day, with an emphasis on middles; it vaguely began around winter solstice. Distinct seasons, associated with traditional activities in hunting and agriculture, as well as ceremonies mark the year. Yearly ceremonies are determined by observing the stars and the Moon's phases. For example, the time of the midwinter ceremony is set for the Full Moon following the rise of the Pleiades, and is slightly reminiscent of the way we set Easter. Summer is marked by the Green Corn ceremony.

Sunrise is a time of great importance to a ceremony of the Mescalero Apache of New Mexico. The ceremony is performed over several days and approaches a conclusion during the last night, culminating in the rising Sun. Songs are sung throughout the last night and must be timed to "pull" the Sun up. The timing is accomplished chiefly by Arcturus, stars of the Big Dipper, and Capella, with Spica, Saturn, Mars and the Full Moon playing minor roles. Mountains visible on the horizon from the ceremonial site make the timing by these celestial objects possible. Arcturus sets one hour before timing begins with the Big Dipper. Alkaid, a star in the Dipper, moves 10° each hour and provides an accurate clock. Other stars in the Dipper "set" behind the mountains between 10:30 p.m. and 4:30 a.m. Capella's position at 4:00 a.m. cues the singers to paint Sun symbols on their hands. An hour after the Sun rises, it is drawn by the singers into the ceremonial arena where it shines on the Sun symbols on their hands. The entire round of songs must be sung or the ceremony is incomplete. If the songs are mis-timed during the night, the Sun will already be up before its rays can strategically fall into the arena. Without the mountains on the horizon, the circumpolar Big Dipper could not be used to time this ceremony. Either other celestial objects would have to be used to measure the songs, or the ceremony would have to be held at another site. The natural setting and an awareness of objects in the sky come together to produce a dramatic event. ✪

Obituary—Peter Moor

Clive Gibbons

I am deeply saddened to announce the passing of Hamilton Centre member, Peter Moor. He died of a massive heart attack on the morning of Friday, December 15th. Peter was my colleague at the Scope Shop in Toronto from 1986 until 1990, when I left the business. He continued on at the store until it ceased operations in early 1995. Peter was always more than a colleague, he was a close friend.

His sensitivity and integrity, wonderful sense of humour and encyclopaedic knowledge were just a few of the qualities that made him so special. Peter may not have been a record-breaking observer or a well-known popularizer of the hobby, but he was a great student of astronomy. He was also a man of his word. If a client had a problem or question about a piece of equipment that Peter could not immediately answer (a rare instance!), he would always follow through and arrive at an answer or solution, no matter how difficult the task. Peter was always sensitive to the feelings of others, never wishing to cause offence or embarrassment—he was the most humane person I have ever had the pleasure of knowing.

Apart from astronomy, Peter's many interests included film studies, classical music, photography, philosophy, political science and natural history, just to name a few. He was a "gentleman scholar" in the truest sense. Myself and everyone who knew Peter will always remember and dearly miss him. ✪

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National Council Report

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members' membership fees and has doubled in size. Several people were upset both about this having been done and about the way it was done. The discussion got quite heated. This will be brought up again at the next meeting.

New RASC home pages are springing up on the web and there will be a new mail redirection facility and an RASC mail server. Lastly, the light pollution committee was given a budget of $3,000 for the year. ✪