REGULUS

SEPTEMBER-OCTOBER 1992

NEWSLETTER OF THE KINGSTON CENTRE
OF THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

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SUBSCRIPTION: Members of the Centre receive **Regulus** as a benefit of membership. Non-members may subscribe for $10 per year.

ADVERTISING: Classified advertisements re items to buy, sell, or trade, are free to members of the Centre. Commercial advertising is $25 per half page, $50 for full page. Commercial advertisers must provide clean, camera-ready copy.

CONTRIBUTIONS WELCOME: Articles, notes on observations, humour, poetry, artwork, anything on astronomy or related topics, are invited. Submitted material may be edited for brevity or clarity. Please send all submissions to the Editor as follows:

Bill Broderick
XXXXXXXX
XXXXXXXXXX, Ontario XXXXXX

DEADLINE FOR MATERIAL IS THE 15th OF THE MONTH PRIOR TO PUBLICATION.

MEETINGS AND EVENTS HORIZON

Regular Meetings of the **Kingston Centre, RASC**, are held on the **second Friday** of each month (unless otherwise noted) at **8 p.m.**, in **Room D-216**, **Macintosh-Corry Hall, Queen's University. Non-members are welcome.** Executive meetings are at 7:30 p.m.

Fri., Sept. 11 — **REGULAR MEETING--MEMBERS' NIGHT. Presentations and slides by members on their observations and activities.**

Sat., Sept 26 — **MALL DISPLAY--KINGSTON CENTRE MALL AND EVENING PUBLIC OBSERVING AT MACDONALD PARK (WEATHER PERMITTING)**

Fri., Oct. 9 — **ANNUAL MEETING & ELECTIONS. Speaker, Stanley Hanna, "Anthropomorphic What? George Greenstein's Contributions to Contemporary Astronomy."**

Fri., Nov. 13 — **REGULAR MEETING Speaker, Leo Enright, "Solar Eclipses in History."**

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See the announcement about our new publicity brochure – on page 2.

THE MOON, MYTHS AND MANKIND

By David Stokes

PART 4 OF 5

In Europe, several ancient stone markers are believed to show alignments of the extreme setting points of the moon viewed on or near to the horizon. Careful observations may have given some of these people the ability to forecast eclipses that recur in periods of roughly 173 days. If records were kept, and we have found none from the period of the Druids, they could have discovered the great cycle when lunar events repeat on the same dates after 18 years.

It became the custom of the early Christian Church to set the more important festivals alongside pagan celebrations. Thus the church celebrated the festival of the Assumption of the Virgin Mary in August while the pagans celebrated a festival to appease the moon goddess. The black virgin, dressed in shiny white clothes, represents to the pagan-Christian convert the phases of the moon. But strangely similar statues are found in Mexican and Japanese cultures, much to the astonishment of the early Jesuit missionaries. The Virgin Mary has been depicted as standing on the crescent moon.

The church festival of Easter is determined as the first Sunday after the full moon following the spring equinox. This period is now synchronized with the season of spring by a solar calendar that is close to the ideal. But the old Julian calendar had been slightly over-corrected with its extra day added every fourth or leap-year. The accumulated error amounted to 3 days for every 400 years elapsed. After some 1500 years Easter was out of step with the spring season and falling nearer to summer. The calendar reform in the 16th century directed by Pope Gregory corrected the accumulated error of 10 days and directed that hence forth only years exactly divisible by four or centuries divisible by four hundred would be years in which an extra day is added. Thus 1600 was a leap year but 1700, 1800 and 1900 were not leap years. This last correction to the solar calendar should serve us well for several thousand years.

Fixing the date for the celebration of Easter provides an interesting exercise. Up until the time of the calendar reform, the time for the Easter celebration was fixed by rules intended to link the occasion with spring and the vernal equinox, since Easter was the Christian continuation of the Jewish Passover, observed on 14 Nisan. The beginning of this month was itself fixed by observation of the crescent new moon nearest to the vernal equinox when the sun crosses the celestial equator from south to north, and by convention the 14th day is when the moon is at the full. Instead of keeping the practise of observing the time of new moon, however, it became the custom to fix the date of the vernal equinox at March 21 and to calculate the date of Easter using the Metonic cycle. This cycle was known to the Babylonians and was introduced into Greece by Meton around 400 BC. It equates 19 years to 235 lunations and to 6940 days. It is the basis for the modern Jewish calendar while still retaining the length of the synodic month determined by the Babylonians. This practice is good only if the date for the vernal equinox is correct, but it was not. Because of the over-corrected Julian calendar the spring equinox came progressively earlier each year. By the 16th century the vernal equinox had fallen back to March 11.

A NOTE TO KINGSTON-AREA MEMBERS ABOUT OUR NEW BROCHURE

A new **brochure** has been developed which outlines the benefits of membership in our Society and the Kingston Centre. You can pick up a copy at the meeting. If you know someone who might be interested in joining with us, please pass it along to them. More brochures are available for the asking.

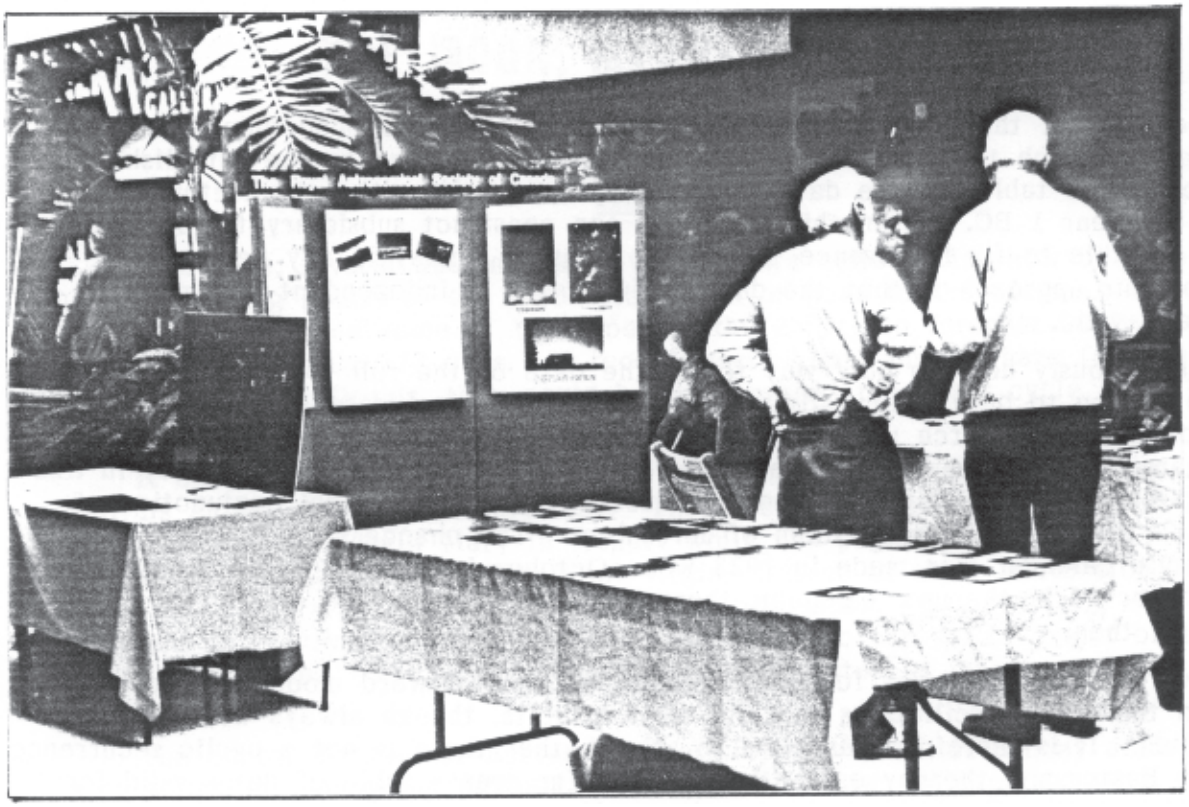
The occasion of the Gregorian calendar reform in 1582 was opportune for revision of the tables on which the date for Easter was based. This lead to the establishment of an Ecclesiastical table for the dates of each new moon based on the Metonic cycle, starting in the year 1 BC. From this table one can construct subsidiary tables from which it is possible to fix in advance the date of Easter Sunday in any year. The advantage of this approach is that the date of full moon is independant of time zone and universally valid.

This is obviously not the only way to fix the date of the full moon, and some groups have chosen to base their estimates on the astronomical data. For example, the Orthodox Oriental Church uses a modified Gregorian calendar in which century years are leap years if divisible by 9 with remainder 2 or 8, to keep the tropical year in line with the season. The time of new moon is based on the astronomical conjunction of sun and moon referred to the meridian of Jerusalem. The change from Julian to this Gregorian style calendar was made in 1923 when October 1 in the Julian calendar became October 14 In the new calendar, there being an accumulated discrepancy of 13 days by then.

Thus we see involved rules for keeping track of the wayward moon have focussed attention on the subtle oscillations that its orbit exhibits, though always within well-defined bounds. It is therefore pertinent to ask whether there is not a cyclic recurrence of dates for Easter and thereby establish once and for ever a table of dates valid for all time. Alas, in the Gregorian calendar the cyclic recurrence of Easter dates will occur only alter a theoretical period of 5,700,000 years! There is no space here for generalities.

(To be continued.)

A young potential astronaut checks out how the Solar System works at our Frontenac Mall Display on Astronomy Day, May 9th.



A view of our Astronomy Day Mall Display at Frontenac Mall, Saturday, May 9th.

Grade 4 students at H. H. Langford Public School south of Napanee, observe the Sun through Bill Broderick's Astrophysics refractor, on Friday, May 22nd. They were back again in the evening, with their parents, to look at Jupiter, etc., and see a slide presentation by Leo Enright.

KINGSTON CENTRE
ASTRONOMY DAY REPORT

By Bill Broderick

The Kingston Centre's Astronomy Day activities were announced with media releases to the Whig-Standard plus several Kingston-area weeklies, also to the 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 Kingston Centre members. Originally scheduled to be held at the Cataraqui Town Centre Mall, we were forced to make other arrangements when the Cat 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, astro-photos, 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. And of course, there were a number of telescopes on display, including the Centre's 10" Dobsonian.

As well as those named above, a number of other members showed up during the day to lend a hand or just be there, including Ian Levstein, Stan Manna, Peggy Torney, John Eustace, Ruth and Terry Hicks, etc. A warm word of thanks to everyone who helped in any way..

Our evening public observing session was rained out, although several members went to the observing site "just in case".

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 at the Kingston Centre Mall on Saturday, September 26th.

ADDENDUM TO ABOVE REPORT

Three new members joined the Kingston Centre as a result of our Mall display on Astronomy Day. Also, we were invited to a school near Napanee (H.H. Langford) to give a presentation to a Grade 4 class. This was done on May 22nd. Bill Broderick 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 50 kids and adults and Bill and Leo provided telescopes for observing Jupiter, etc.

"THE SKY'S THE LIMIT FESTIVAL"--SATURDAY, SEPTEMBER 12

We have been invited to participate in this event, which is being held at Grass Creek Park, off Highway #2 east of the Joyceville Road. Participants are asked to bring a telescope for solar observing or materials for a display. The hours are from 10 a.m. to 3 p.m.

International Dark Sky Association
3545 N. Stewart, Tucson AZ 85716 U.S.A.

Oh Beautiful for Spacious Skies – Not Near a City!

Oh Beautiful for Spacious Skies --- Not Near a City!

Karen K. Lilley

I remember, as a young girl in Jeffrey City, Wyoming, (population 100 maybe) lying outside in 40 below zero weather wrapped in blankets and using my father's binoculars to watch the moon because we couldn't afford a telescope. Sometimes I'd just lie on my back, regardless of the season, to watch the constellations wheel about above my head. The air was crisp, even in the summer, and, out where I lived with no street lights to obscure the view, that view was clear and unrestricted from horizon to horizon.

I've never forgotten those nights, and while the crush of growing up, raising a family, etc. have left me precious little time to watch the stars, I have grabbed at every chance I could do just that.

When I moved to Tucson two years ago, the drive from Wyoming at night was an awesome experience for me. While driving through the desert, I was struck with the solitude and the brilliance of the night sky. The air was clear (and gratefully NOT 40 below zero), and the individual stars were brilliant pinpricks of light against the sable blackness of space. I stopped for a while beside the road, somewhere between Hatch and Deming, New Mexico, and was transfixed by the beauty of the sky. It was a magnificent moment.

Several hours later, as I drove toward Tucson, I noticed the yellow glow on the western horizon. I was still over 30 miles away. The closer I came the greater the glow, and the fewer stars that were visible. I remember wondering If Tucson would be like Denver, where the lights are so bright that NONE of the stars are visible in or around the city. It was a terribly depressing thought.

When I finally reached Tucson, I was relieved to see quite a few of the brighter stars still visible. However, after the beauty and grandeur of the desert sky, the comparison left much to be desired.

I've learned that, being the country girl I am, I have a need to get out of the city periodically and make time for myself to commune with the real world, especially that of the night sky. I cherish those moments spent many miles away from Tucson, with the constellations doing their celestial dance above me. It is a shame I have to drive so far just to see God's handiwork in all its brilliant glory. I am glad that, if I must live in a city, it is one like Tucson, where there are other concerned people who are actively working toward a solution to save that precious view we have of the heavens.

My fear is that the time will come when there is nowhere left forme to go, for everywhere the nighttime sky glow will obscure the view of those spacious skies.

[Karen is an IDA member from Tucson, not an amateur astronomer, but someone who loves to see the universe at a dark sky site.]