REGULUS

NOVEMBER-DECEMBER 1992

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

REGULUS is published six times per year. Views and opinions expressed herein are those of the writers and do not necessarily represent the official position of the Royal Astronomical Society of Canada or its officers and members, unless so indicated.

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**, **Mackintosh-Corry Hall, Queen's University. Non-members are welcome.** Executive meetings are at 7:30 p.m.

Fri., Nov. 13	REGULAR MEETING. Speaker, Leo Enright, "Solar Eclipses in History."
Fri., Dec. 11	REGULAR MEETING. Speaker, Peggy Torney, "The Winter Solstice." (Also, see notice, page 4.)
Fri.. Jan. 8	REGULAR MEETING. Speaker, Kevin Kell, "The Solar System: Then, Now and Later."

IN THIS ISSUE...

PRESIDENT'S REPORT

This past year has been one of continued growth for the **Kingston Centre**. Our meetings have been both interesting and enjoyable, and we have enjoyed the visits of two members from other Centres--**Jobn Mirtle** from Calgary who spoke to us in January about his dabbles in astrophotography, and **Ed Kennedy** from Saskatoon who in March, spoke to us about the 1835 Moon Hoax.

I was privileged to travel to Calgary twice this year--once in April to speak to the members of the **Calgary Centre** as part of our speaker exchange, and again in July where I had the honour of representing **Kingston Centre** in Calgary, at the **RASC General Assembly**, where I was finally able to put faces to many of the names which I had read about over the years.

With the continued efforts of **Bill Broderick**, our Centre newsletter **Regulus** continues to be an outstanding publication which reflects well on everyone involved: editor, writers and photographers. It is both interesting and easy to read, and in my humble opinion, vigorously rivals the newsletters of larger Centres. **John Eustace**, our Observing Chairperson, has put together a number of observing sessions, which in spite of inclement weather, was a step in the right direction, and I look forward to many more sessions to which we may invite the public. Public relations have been very good this year with increased media coverage in **Kingston This Week** and the **Whig Standard**, our mall displays both on Astronomy Day and on September 26th, were well-attended and helped to increase public awareness of astronomy in general and light pollution in particular, and also helped to secure new members, and our attendance at the Pittsburgh Township "Sky is the Limit" Festival, did much to bring solar observation to the public eye.

This year also saw the publication of **Leo Enright's Beginner's Observing Guide**, a very fine book full of many helpful strategies to make observing a rewarding experience for the novice. We wish him continued success for his future projects. I'd also like to thank **Leo** for his role in bringing light pollution to the awareness of the Minister of the Environment. I was privileged to attach my name on behalf of our Centre to a letter which **Leo** drafted concerning light pollution and its relationship to a new Bill of Environmental Rights which the Ministry was overseeing. In other news, we also acquired a new Telrad for the Centre scope which, according to those that have used it, makes observing with the Centre scope much easier and more enjoyable.

Finally, in the area of electronic media, there are now three RASC support bulletin boards in Kingston, run by members of our Centre--**Mark Kaye, Kevin Kell**, and myself. As more of our members discover the joys of computers and computer-related telecommunications, we have been able to keep in touch not only with members of our own Centre, but also with Calgary, and hopefully in the near future, Vancouver, Ottawa, and the east coast. It is our intent that eventually all 22 Centres will be linked by computer. Thanks go to **Mark Kaye** who volunteered to provide the mail link to these other Centres.

As I reach the end of my second term as President, I'd like to say that I have very much enjoyed the role, and although I had originally intended to be President-for-Life, I find that for reasons of a personal nature I must finally stand down and let someone else take up the reins. To the incoming President whoever that may be, I can say that the role of running this Centre is made very easy because of the efforts of the other executive members and the chairpersons of the various committees. They have made my job much easier and I thank them for their unfailing support over the last two years.

Respectfully submitted,

IAN LEVSTEIN

President, RASC - Kingston Centre

THE MOON, MYTHS AND MANKIND

By David Stokes

PART 5 OF 5

Almost all cultures that have determined their months by observation of the New Moon's thin crescent in the sky at sunset have quickly found that the lunar calendar moves out of step with the yearly solar calendar and with the seasons. The practise of intercalating an extra month in certain years, to synchronize the two calendars, was most simply achieved at year's end by repeating the last month. This was probably the custom in Babylon and we know this formed the basis for the ancient Jewish calendar. But as we have seen, dates in the lunar calendar repeat almost exactly in cycles of 19 years. In such a 19 year cycle there are 12 common years and seven years in which an extra month must be added. The synodic month, from new moon to new moon is either 29 or 30 days in length. The common lunar year is thus 12 times 29½ or 354 days while the intercalated year will be 354 plus 29 or 30 days making a total of either 383 or 384 days. In 19 years there will have been 12 times 12 or 144 lunations plus 7 times 13 or 91 lunations making a total of 235 lunar months. The sum total of the days elapsed will be 6940.

This Metonic cycle adopted for the fixed Jewish calendar sometine in the 4th century CE made it possible to observe religious festivals at about the same time each year in the solar calendar. Furthermore, the start of the new year was shifted from Nisan 14 in early spring, to Tishri 1 in the autumn. Yet in spite of this tinkering rather complicated rules are still required to ensure that these fixed festival dates do not fall at some inconvenient day of the week.

In Islamic communities, the end of each day is marked by the setting of the sun, and a new day begins as darkness settles over the land. If the thin crescent of the new moon is observed at sunset then that day begins the new month. Provided careful watch is kept from a favourable location at the expected time of each new moon the monthly calendar is self-regulated by sighting and there is no need for interpolation. If weather prevents clear observation of the thin crescent, then the month is prolonged no more than 30 days, and the new month is declared after that time. This simple lunar calendar fulfills the needs for any local community to observe the principle religious obligations of fasting the month of Ramadhan and the month for making the Hajj, or pilgrimage to Makka. Over the years the average length of the lunar month is about 29½ days, and as we have already seen the lunar year of 12 months will not synchronize with the solar year. Thus each year lunar months begin, on average, 11 days earlier in the solar calendar. In the course of about 33 solar years the lunar new year will retrograde through the solar year and return to the same starting point. This has the effect of changing the start of Ramadhan or the Hajj about 11 days earlier each year and of slowly moving the period of fasting or travelling from summer to spring to winter and back to summer again.

The Islamic years are also reckoned according to the lunar calendar, taking as starting point the occasion of the flight of the Prophet from Makka to Medina. Since this calendar was instituted some 14 years after its chosen epoch it is interesting to determine whether it was based on observation and record or whether it was chosen arbitrarily. In other words, was the first day of the first month, Muharram, of 1 AH a day on which the new moon was observed? With a modern computer and a knowledge of the moon's motion it is relatively easy to calculate the time of conjunction of sun and moon, or astronomical new moon, for any period past or present. Not only can we do so very accurately but such times can be verified from the historic record, for they are sometimes the occasion for a solar eclipse. The conjunction nearest in time to 1 AH is 622 CE, July 14 in the Julian calendar. The time of conjunction was 6h 53m. At sunset in Makka on that day, about 7 p. m., the moon would have been about 12 hours old and certainly not visible to the unaided eye. On the following day, July 15, the crescent moon would have appeared high in the sky at sunset and easily visible, being around 36 hours old.

That day was a Thursday and would have marked the beginning of the new month. On this particularly day it marked the beginning of the new Islamnic era and also the beginning of the day of Friday congregation, or Jumu'ah. For historic records we have to note the Julian calendar would have been in error by three days and the date in the proleptic Gregorian calendar would have been Friday, July 19.

The moon continues to mark the Islamic months, and several other calendars too, but civilized people no longer regard its influence as either benign or baleful. It's taken for granted. But this too is a mistake of our times for the moon certainly holds sway over the vast oceans of the earth and regulates exactly the lives of many creatures that live in the littoral zones of the world. We can even measure the minute 'tide' created by the moon's pull on the solid earth, and there is many a farmer and a gardener who follows the lunar calendar for planting seeds in the soil. Perhaps the moon still regulates the plant growth and maybe even the weather to some small degree. If so, then we have come full circle from the Bronze Age to the Atomic Age and we have advanced only a very little in knowledge and maybe that step is in the wrong direction!

Now man has stood on the surface of the moon and has looked out to the stars beyond dreaming of distant voyages someday to worlds unknown. We want to know are we alone in this vast universe that has changed from the earth-centred cosmos of the late Bronze Age, with man in the centre, to an exploding domain with no centre, and no special place for mankind. Scientists are seriously asking are we alone. Can we communicate with another civilization? Space-ships from earth now drop endlessly through the cosmic depths carrying on board hieroglyphs to tell from whence they came, what manner of people sent them and where they live. All this began with that voyage to the moon. Perhaps this first small step for mankind into the material universe was the wrong way to go. Had we travelled spiritually, inwardly, then we would know we are not alone. This astronomical waste of energy and precious resources on space exploration is the ultimate lunacy.

NOTES:

1. The abbreviation CE is Christian Era, and AH is Anno Hegeira, or year of the pilgrimage.
2. The word 'proleptic' is from the Greek and is used here in the sense of 'anticipating' the Gregorian date at a time when the Julian calendar was used. In other words, it's a date obtained by extrapolation.
3. The outrageous opinions are those of the author and in no way do they reflect 'politically correct' opinions of the RASC Kingston Centre.

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AUTHOR! AUTHOR! AUTHOR! AUTHOR!

HOT OFF THE PRESSES!

TERENCE DICKINSON will be on hand at the meeting on DECEMBER 11 to autograph copies of the just-issued fully updated, revised expanded NEW EDITION of the lavishly illustrated THE UNIVERSE... AND BEYOND. Copies of the new book will be available for purchase at the meeting, as well as copies of all of Terry's previous titles, including NIGHTWATCH, EXPLORING THE NIGHT SKY, and THE BACKYARD ASTRONOMER'S GUIDE. (All will be sold at a special discount price for RASC members.)

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THE RECOVERY OF A MOST INTERESTING COMET:

SWIFT-TUTTLE IS IN OUR SKIES

Perhaps every comet has a story attached to it. However, few comets have more or more interesting stories attached to them than has Comet Swift-Tuttle, which is currently making an appearance in the northern part of our skies.

Until several weeks ago, this famous comet had not been seen since before Confederation. It was July 15, 1862, when Lewis Swift, an amateur astronomer in Marathon, New York, took out his telescope to show some friends a comet that he had heard had been discovered thirteen days previously. The newspaper reports which he had read said that a comet approaching naked-eye visibility was in the northern part of the sky -- Comet Schmidt, discovered by Julius Schmidt in Greece on July 2, 1862. The object that Lewis swift very quickly saw in Camelopardalis was certainly in the northern part of the sky, but it was not quite as bright as he had expected it to be. It was not yet near naked-eye visibility. On July 18, Horace Tuttle at the Harvard observatory in Cambridge, Massachusetts, discovered a comet, soon recognized as the same one that Swift had seen just three nights earlier. Before long it bore the hyphenated name, and would long carry the story of the comet discovery by a person who thought he was looking at a comet discovered by someone else.

By mid-August 1862, Comet Swift-Tuttle considerably outshone Comet Schmidt. It was near Polaris and was an easy naked-eye object at third magnitude. By the end of August, just a month and a half after its discovery, it was gleaming at second magnitude and sporting a 30-degree tail, one of the many very bright comets of the nineteenth century.

Little wonder then that there was some interest in the calculation of its orbit and its period. Would it be returning soon? And when? Its orbit was obviously at high inclination to the ecliptic, since it was seen so close to the pole. The calculations were that its period was about 120 years. An analysis of its orbit revealed something else; there was a similarity between its orbit and the path of the Perseid Meteor Shower meteors which had flashed in the sky in mid-August for many centuries. For the first time astronomers made the connection between meteors belonging to a regular shower and debris in the orbits of comets. This was a significant step in the understanding of the solar system.

In 1982, 120 years after its last appearance, there was considerable interest in the recovery of this comet, and comet hunters were alert for its reappearance, but no recovery of Swift-Tuttle was made. Several years passed and still no recovery was reported, in spite of increasing awareness in the astronomical community that "the Perseid Meteor Comet" should be in the inner solar system. As the late 1980's approached, and the puzzle was still not solved, several comet experts took a second look at the records of comets, especially of those that had appeared in previous centuries and could be possible candidates for former appearances of this comet. Dr. Brian Marsden, certainly one of the foremost comet experts, noted that in 1737, a Father Kegler, a Jesuit missionary in China, had quite carefully recorded the appearance of a fairly bright comet on eight consecutive nights in that part of the world. For Kegler's comet to be equated with that of Swift and Tuttle, Marsden would have to recognize that its period was indeed longer than 120 years and that it was in the process of having its path perturbed by one of the outer planets. So, with these facts in mind, Dr. Marsden did a calculation that showed that the comet would reach perihelion in late December, 1992, ten years later than previously expected. His estimates of where it might first appear in the sky were published in a popular astronomy magazine during the past summer. The race was on once again to rediscover the bright comet last seen by Swift and Tuttle in 1862.

On the night of September 26-27 this year, the comet hunter, Surohiko Kiuchi in Japan using his 25X150 binoculars, located a diffuse fuzzy object above the bowl of the Big Dipper. It was ninth magnitude and before long it was confirmed as Comet Swift-Tuttle. Several professional astronomers were involved in the confirmation process, one of the first of them being Dr. Jeremy Tatum at the Dominion Astrophysical observatory near Victoria, British Columbia. Dr. Tatum, who is the editor of our **Journa**l, deserves our congratulations for being the first Canadian in the present century to observe this significant comet.

As the news of the confirmation flashed around the world, there was a rush in the last few days of September and the first several of October to be the first amateur in the region to spot this "long-lost" visitor.

I was quite pleased on the evening of Thursday October 1, at 00:34UT to spot the object shining at a bit brighter than ninth magnitude about two degrees north—east of

Megrez (Delta Uraae Majoris) and exactly one degree north of M40, Messier's mistaken object which is just a multiple star system. It was large and diffuse and showed movement after 30 minutes, but there was no evidence of a tail. On October 4, 5, and 7, I again saw Swift-Tuttle, but in the very early morning since that part of the sky was a bit higher just before the beginning of morning twilight than it was at the end of evening twilight. It was slowly moving along the "top of the Big Dipper's handle" and toward M101, heading toward Hercules, and slowly brightening to a predicted sixth magnitude, which should be realized in about a month or so. Its perihelion date will be December 12, only several days different from that predicted by Dr. Marsden before its recovery.

Like many others, I look forward to numerous future observations of this famous comet before it fades and moves to the southem part of our skies. I also share the anticipation about what next August's Perseid Meteors will be like. With the parent comet in the inner solar system, will the Perseid Shower be spectacular and have numerous fireballs? Will there be a storm of meteors in some parts of the world? The anticipation is bound to grow as next August approaches.

Leo

A NEW INCENTIVE TO BUY THE BEGINNER'S OBSERVING GUIDE

At the National Council Meeting of our Society in Toronto on October 3, a new plan was announced to encouraged continued sales of **THE BEGINNER'S OBSERVING GUIDE.** It was recognized that some people would see the year "1992" on the cover of the book and conclude that it had a considerable amount of dated material, and so they might not purchase it in the last few months of 1992 while awaiting a "1993 edition".

In fact, less than 5% of the material (only 5 1/2 pages out of 116 pages) specifically relates to 1992, namely those pages referring to the positions of the planets in the sky and dates of eclipses and moon phases. All the other information is applicable for hundreds, even thousands, of years.

Recognizing the mistaken impression that some people might have, and trying to encourage the sales of the remaining copies, since there are several hundred unsold copies (though fewer than the unsold copies of the Observer's Handbook), a committee of National Council decided that we would include 1993 data with copies of the book sold between now and the end of the year. In other words, if you purchase, as a Christmas gift for a novice observer or for any other reason, a copy of **THE BEGINNER'S OBSERVING GUIDE**, you will receive with it an updated version of Chapters 11 and 12, which give all the necessary information for observing the planets in 1993 and for observing solar and lunar eclipses in 1993. As well, the chart of dates of moon phases in 1993 will also be included. This additional information will be included with all copies sold after September 15, 1992 and until all copies of the present edition are sold. At that time the next edition of **THE BEGINNER'S OBSERVING GUIDE** will be printed.

Everyone is encouraged to purchase this book in order to promote observational astronany, especially among those of our friends and relatives who are just beginning this wonderful endeavour. What an excellent idea for a Christmas present! Copies may be obtained from our Centre Treasurer, Peter Kirk. Be sure to see him at our next Centre meeting and purchase a copy or two. The very low price at which the present issue sells will not be repeated for the next edition.

Leo

EPITAPH INTENDED FOR SIR ISAAC NEWTON

Nature and Nature's laws lay hid in night:
God said, Let Newton be! and all was light.

-- ALEXANDER POPE

SECRETARY'S REPORT

Another year has come and gone in the **Kingston Centre, RASC**. It has been a year of many interesting meetings, speaker exchanges and a year of many rained out star nights.

The **Kingston Centre** was lucky to have **John Mirtle** from the **Calgary Centre** to talk to us about Astrophotography and **Dr. Kennedy** from the **Saskatoon Centre** to talk to us about "**The Great Moon Hoax**". Our very own President, Ian Levstein, went on the Speaker Exchange Program to the **Calgary Centre** in April.

Our Centre has had 10 regular and executive meetings. The **Kingston Centre** also has 43 members, 31 Regular members, four Associate members and eight Life members.

All of our members have been treated to many excellent speakers from our membership. From Archeoastronorny and Lore to observing without a Telescope to the wonders of Astronomy Programs using Computers.

Many of our members from the **Kingston Centre** have had a wonderful year. **Terry Hicks** has become the **National Treasurer** for the next three years. The author of **The Beginner's Observing Guide**, **Leo Enright** saw one of his dreams come true with the publication of his book. This is now available for everyone to enjoy. And our Newsletter Editor **Bill Broderick** had a letter published in the June issue of **Astronomy.**

To further the **Kingston Centre's** introduction to the public, there was a **mall display** for **Astronomy Day**, May 9, 1992, with a showing interest in the **Light Pollution Display** as well. There was an observing session for that night, but it was rained out. The Centre also held a Public Star Night for June's Lunar Eclipse. This too was clouded out, however seconds before 75% totality the clouds moved and showed the beauty of our satellite. A public meeting night was held in July at our regular meeting. There was a good turn-out of both young and old. Our Centre was also represented at the **Annual GA** in July by five members. Pictures and slides were brought back for all to enjoy.

The 1992 year has held a lot of enjoyment and pride for the **Kingston Centre**. I hope that for the future of astronomy and for our Centre, we can bring to the public our combined knowledge and show them that the wonders of the universe are as close as looking up to the sky and seeing the night-time jewels glistening bright.

KIM HAY

Secretary
Kingston Centre, RASC

FOR SALE

CELESTRON/VIXEN 90mm (3½-inch) f/11 Achromatic Refractor, available with either Vixen altazimuth mount with slow, motions or Polaris equatorial with pulse motor drive. Includes upgraded 1¼-inch focusser with diagonal, 22mm Celestron Plossl and Celestron Deluxe Barlow for 45X, 90X and 135X. I have seen Jovian satellite transits and resolved stars in the 8th magnitude globular M56 with this telescope. It has perfect optics and will outperform a Questar 3½ in every respect. Altazimuth version $650, equatorial version $1125, with both mounts $1275. Equatorial mount is 3 years old, all other components mint. **Terry Dickinson, 377-6364**, day or evening.

TREASURER'S REPORT

Year End Treasurer Report
Kingston Centre - RASC
1992

Revenue	1992	1991
Membership Fees	1690.00	1617.00
Life Members Grants	102.40	80.00
Donations	125.00	51.25
Educational Activities	---	---
Interest & Dividends	16.86	11.19
Sales of Handbooks	119.39	43.34
Advertising	25.00	191.55
General Assembly(incl. Travel Grants)	372.43	274.85
Miscellaneous	47.44	923.11
Total Revenue	2498.52	3195.25
Expenditures		
Fees Remitted to National Office	1105.60	821.44
Library	24.93	---
Meetings and Newsletters	509.73	552.97
Annual Dinner Net	---	---
General Assembly(incl. travel Grants)	372.43	274.85
Office Administration		
Equipment and Supplies	235.79	305.64
General Expenses and Audit	202.44	---
Educational Activities	---	---
Insurance	---	---
Awards and Donations	76.65	66.66
Operating Expenses Observatory	---	169.98
Miscellaneous	143.65	844.11
Total Expenditures	2670.67	3075.28
Surplus or (Deficit) on Operations	(172.15)	120.01

Centre Treasurer P Kirk

Date 09 oct 92

EDITOR'S REPORT

lt's hard in some ways to separate my several jobs: editor, publicity person, and light pollution chairperson. They all interweave. There are times when I seem to be wearing all three hats at once. So although this report is headed "Editor's Report," it will cover all three functions.

Editing **Regulus** continues to be a nice challenge and a pleasure. Most of the time, I can never say with any great certainty just what will be in the next issue. The material comes in and sometimes I have too much and have to carry some over to another issue. At other times, I can be chewing my nails wondering just what I'll put in the next issue. But one way or another, every issue seems to get filled. Rarely do I ever have to write something. So to everyone who has contributed to **Regulus** over the last year, my heartfelt thanks. Somehow, collectively, you always come through for me. **Regulus** pretty well puts itself together. I just supply the typing, scissors, and rubber cement--and maybe a little imagination.

The publicity role is also a challenging one. The goal here is to publicize the meetings and events of the Centre, particularly those geared to the public such as the public observing sessions, mall displays and Astronomy Day activities. The final objective, of course, is to attract new members.

Over the last year, news releases were issued to the area radio and television stations and weekly and daily newspapers in advance of several meetings and all of our public observing sessions and the two mall displays. We also developed a new publicity brochure which gives information about our Society and Centre, and tells when and where we meet. We had a quantity on hand for the "Sky Is The Limit" Festival at Grass Creek Park on Saturday, September 12, practically all of which were picked up or handed out. At our September 26 mall display at the Kingston Centre, almost 100 were picked up. It's probably too early to tell how effective the brochure is, but it does give people something that they can take away with them and possibly act on.

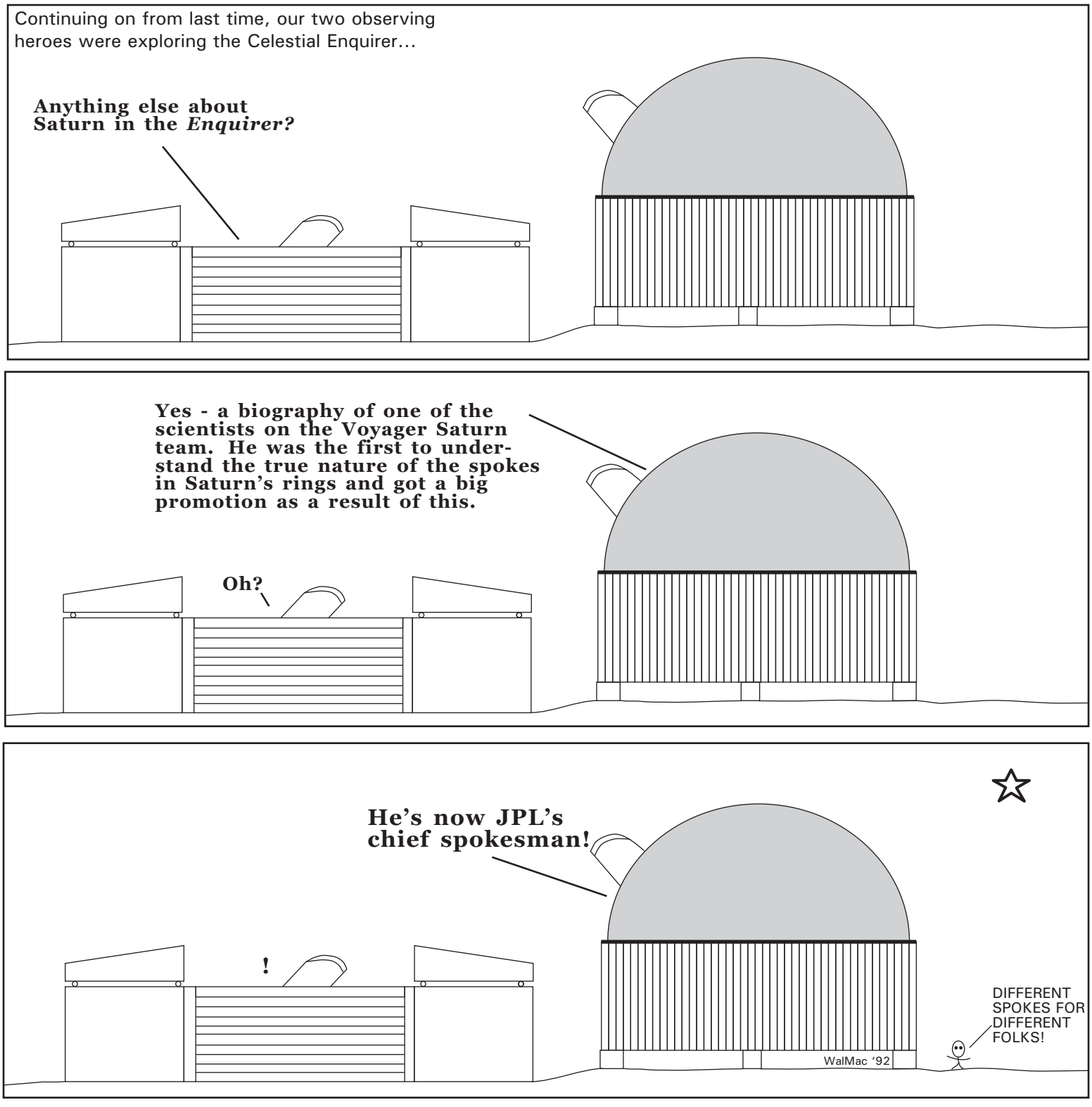
On The light pollution front, the last year has seen some positive activity. On January 16, 1992. I was privileged to give a talk and slide presentation on the subject to the Kingston Field Naturalists. I also had a two-part article in the February and March issues of **The Quinte Naturalist**, newsletter of the Quinte Field Naturalists in Belleville. On February 28, I met with Paul Johnson, MPP for Prince Edward-Lennox-South Hastings, in his office in Napanee. On April 23, I spoke to children at Our Lady of Fatima Separate School in Belleville, as part of their Earth Day Workshop. There have also been a number of letters to the editors of **The Whig-Standard** in Kingston and **The Intelligencer** in Belleville. As well, a letter and package of material on light pollution was sent to Her Worship Mayor Shirley Langer in Belleville. And we have started petitions on light pollution in both Kingston and Belleville.

If there is one thing that I can say stands out as the highlight of my effort on light pollution in 1992, it's Ontario Hydro's information sheet on the subject for municipalities, which they published in August. Ontario Hydro people invited my input back in May and used practically everything I gave them, almost verbatim.

All in all, the last year has been a busy one for your editor. I look forward to the challenges of 1993.

Respectfully submitted,

BILL BRODERICK



May peace be your gift at Christmas
and your treasure throughout the New Year