R E G U L U S

THE NEWSLETTER OF THE

ROYAL ASTRONOMICAL SOCIETY OF CANADA - KINGSTON CENTRE

NOVEMBER, DECEMBER, 1985

IMPORTANT NOTICE REGARDING FUTURE MEETING DATES AND LOCATIONS

ALL OUR MEMBERS ARE ASKED TO NOTE THE FOLLOWING:

THE MEETING OF NOV. 22 WILL BE IN ELLIS HALL, ROOM 222.
THE MEETING OF DEC. 13 WILL BE IN MACINTOSH-CORRY, ROOM D-207.
THE MEETING OF JAN. 10 WILL BE IN MACINTOSH-CORRY, ROOM D-207.

THE TWENTY-FIFTH ANNIVERSARY BANQUET AND MEETING WILL BE ON **THURSDAY, JANUARY 23, 1986** AND THE MEETING THAT EVENING WILL BE IN MACINTOSH-CORRY, ROOM D-207.

UNLESS THERE IS NOTICE OTHERWISE, **ALL FUTURE MEETINGS** WILL BE IN MACINTOSH-CORRY, ROOM D-207.

HISTORIC OCCASION FOR ASTRONOMY IN KINGSTON

It was a beautiful autumn afternoon, the kind more typical of late September rather than early November, and Kingston's City Park was the setting for an historic occasion commemorating the first astronomical observatory in this part of Canada. On Sunday, November 3, 1985, about thirty astronomers and interested citizens gathered for a pleasant afternoon of activities honoring the establishment of the first optical observatory in Ontario. On a site that had been overlooked for many years and was almost forgotten, an historic plaque would finally be unveiled marking the location where the first observatory in Upper Canada was erected in 1855 one hundred and thirty years ago.

As a result of the work done by a number of people particularly Professor Victor Hughes of the Queen's Physics Department, the Ontario Heritage Foundation had set up a plaque to preserve the memory of this important location, and representatives of various levels of government joined the astronomical community in saluting the pioneers of a hundred and thirty years ago for their enthusiasm and dedication to what was, certainly, in its day a very significant undertaking.

Guests at the occasion were given copies of an early map of the city of Kingston - one showing the observatory structure located in the west end of City Park about fifty metres east of the junction of Barrie and Stuart Streets, almost exactly where the plaque was located. The original structure, a frame building, and its replacement, a brick one of a later period, have both disappeared, but just to the south-east of the site, guests could easily see four large cylindrical pieces of limestone which were once part of the massive pier that proudly supported the original telescope.

Dr. Duncan Sinclair, Vice-Principal of Queen's University, acting as master of ceremonies, welcomed all present for the occasion.

Mr. Robin Elliott, of the Ontario Heritage Foundation, spoke of the observatory that was being commemorated as one of the area's many historic sites, all of which were important to the history of Canada.

Mr. John Gerretsen, the mayor of Kingston, remarked on both the observations done at that location by the "gentlemen astronomers" of the Kingston area, and the profound changes in the science of astronomy that had occurred since the observatory's construction was undertaken over a century ago. "It would be," he said, "very interesting to speculate on the tremendous changes that might transpire over the next 100 years. Or, could one, in fact, even begin to imagine what they might be?"

The Honorable Ken Keyes, the Solicitor-General of Ontario, referred to the observatory's original connection with the military who were serving in the area and whose officers collaborated with the local amateurs in establishing the facility, and regretted that no members of the current military establishment were present for the occasion; however, it was an important site that should be better known by the residents of the area.

In a very interesting review of the history of the observatory, Dr. Hughes, the speaker for the occasion, noted that it was local interest in the total solar eclipse of May 26, 1854, that led the astronomers of the area to undertake the project to set up an obervatory. The land and materials were acquired for about $600.00 and an equal amount was spent for a 6 1/2 " Alvin Clark refracting telescope. Observations of many kinds were made using this refractor and later a transit instrument was employed in determining precise time of day; some of the early observations assisted in determining the longitude of cities further west in both Canada and the United States even the "location of Chicago was not known to within forty miles" at the time the observatory opened. Among the duties of the astronomer in charge was that of seeing that the clock on City Hall was precisely set from the observations. Besides the "gentlemen astronomers", as the documents of the day called the local amateurs, any member of the public, "for two cents", could use the instrument. A warm applause followed Doctor Hughes' interesting talk and many noted that their interest had been aroused to learn more about the history of the site.

The honour of performing the unveiling was given to Mrs. Margaret Cohoe, an avid amateur historian, who has taken a particular interest in the observatory that once graced City Park and who has published a very detailed study of its history.

After the ceremony, all the guests accepted a gracious invitation from the mayor of the city and joined him in a reception in the council chamber of City Hall, one of the most impressive rooms of its kind in Canada one that has been restored to the elegance of the 1840's when the city was the capital of the united provinces of Canada. During the reception it was most interesting to speculate on what observing projects were being planned over a century ago by the "gentlemen astronomers" who lived in the area and might have used these facilities.

Members of the Kingston Centre was particularly happy to note the number of Society members present. From the local area, there were Mr. Arthur Covington, National Honorary President; David Stokes, Centre President; Sue and Mark Sorensen, Ruth and Terry Hicks, and Leo Enright. From Ottawa there was Mrs. Mary Grey, National First Vice-President, and Dr. Vic Gazauskas of the Herzberg Institute of Astrophysics. What a special delight everyone had in seeing our Centre's Founder and Honorary President, Dr. A. Vibert Douglas, in attendance. She was called the "dean of all of us astronomers," as several of the speakers paid tribute to her pioneering work in astronomy.

All members of the Kingston Centre will, doubtless, be eager to learn as much as possible about this historic location in our midst and to be good hosts for those who may come from other parts of the country to see one of our important historic sites - one that is of particular interest to us as amateur astronomers.

THE INSCRIPTION ON THE PLAQUE

The inscription on the plaque unveiled at City Park in Kingston, Ontario at 2:00 p.m. on November 3, 1985:

"THE KINGSTON OBSERVATORY

> The first optical astronomical observatory in the province, the Kingston Observatory, was established in 1855 after a solar eclipse aroused public interest in astronomical studies. Under the aupices of a committee of British military officers and 'gentlemen astronomers' a frame observatory was built here. It was transferred to the control of Queen's College in 1861 and within a year a new brick structure had been erected on the site. Staffed by Nathan Fellowes Dupuis, an able mathematician, the observatory, in addition to making conventional astronomical observations, produced barometric and thermal

readings, fixed meridians for surveying and provided a time service. In 1881 it was moved to Queen's and today four cylindrical stones, former supports for the telescope, are all that remain of the old observatory building."

REPORT FROM MR. JOHNSON

[EDITOR'S NOTE: Your editor is again pleased to report having received two letters from Mr. Gus Johnson, our very respected observer from south of the border. Part of the second letter is reprinted below. We wish him clear skies for continuing his observations of Halley's Comet and the other comets that are currently sweeping across our skies.]

Swanton, MD,
Oct. 23, 1985.

Dear Mr. Enright,

Slowly the very rainy spring and summer have given way to dry weather, but all too often the skies were still cloudy and hazy. A few nights of September were clear for observing and I tried on two mornings to find Halley, but although the Merope Nebula was visible, the comet was not. Autumn has been mild, for the most part, and until recently quite dry. Observing was still far from ideal, but late last week, I remounted my 8-inch at 1:30 a.m. on the 18th and tried for Halley again, having encountered considerable fog the previous morning after a very clear "mag.-14" night. This time, though the bright stars had halos and the Merope Nebula was NOT visible, I found it! I used my 8-inch at 58X, 75X, and 96X, the last being best. It may have been my imagination, but I suspected a hint of tail extending eastward. Then I tried a 5-inch diaphram and still the comet was readily visible at 58X and 75X. Then to an off-axis 3-inch. diaphram did I go and still the comet was dimly visible at 58X. Had I started with the 3-inch, I might not have found it. I feel that had the night been clearer and the comet nearer the meridian, 2.4-inches or maybe less would have sufficed.

I am planning a public comet-viewing party for the Uniontown, PA. area for early December. Some of the members of the Pittsburgh Club will likely bring telescopes to add to mine. Uniontown does not have an astronomy club; so maybe the Pittsburgh Club will gain a member or two, if they don't mind the 50-mile drive up (half what I travel to get there). I expect the comet to be up adequately by about 8:30 p.m. by early December, but the weather can be nasty on the mountain site I picked.

At 6:42 a.m. October 7th a graze occultation was scheduled for the Leechburg, PA. area, which is close to my home town of Vandergrift. A cousin lives at nearby Apollo; so I went went up the previous day and stayed with my cousin. About a mile away lives a Mr. Reed Moore, who has a 6-inch f/15 refractor and an 18 1/4-inch f/8 reflector. While this latter site was not on the predicted line, if the calculations were in error, it might chance to be ideally situated; so I went there at 6:30. The sky was dark enough for the Pleiades to be visible, but the refractor was iced up on both ends; the moon could be seen at the edge of the field, but no stars did I see. Mr. Moore had been out at 5:30, and finding the refractor iced up, went back to bed, having also seen no sign of the star. He had not brought out the top part of the 18 1/4-inch; so it was not operable. I should have brought my 4 1/4-inch reflector as I originally intended! I can see that occultation work can be frustrating.

I did not see the August auroral display you asked about. My sky is obstructedby forest from SW through N ans SE and my usual observing site takes in mostly zenith and southward; so my intention is in the wrong direction for aurorae. The North Star is just barely visible over one tree; so I can align my photographic mount.

Sincerely,
Gus

COMET NOTES
by David Levy

[EDITOR'S NOTE: I am most happy to print the following article prepared for the A.L.P.O. Journal by our Vice-President, David Levy.]

Alice would have understood; comets get couriouser and couriouser. As of this writing, Comet Halley is lurching toward perihelion a full 2.5 magnitudes fainter than predicted. Cause for worry? Not at all; comets often turn on suddenly and catch up to what we think (or hope) their magnitudes will be. One of the last winter's best observed comets, Levy-Rudenko 1984t, performed admirably brightening to about 7.8 in January. However, in February it got more and more diffuse and faded rapidly beyond the reach of most amateur telescopes.

The year 1985 opened with an interesting cornucopia of comets, among which were Tsuchinshan I (1984p), a normally faint periodic comet that was visible through small amateur instruments for the first time, Shoemaker (1984s), Arend-Rigaud (1984k), and Schaumasse (1984m). Then we had a lull; since early April the only comet which was easily observable was an earlier Shoemaker (1984f), faint in the southern sky but with an easily visible tail.

Discovery Statistics

Early in 1985 Don Machholz, a successful hunter of comets, produced an interesting statistical study of the 33 comets that had been discovered by amateurs between the start of 1975 and the close of 1984. The work he produced provides some helpful statistics regarding amateur comet discoveries, eleven of which I cite here:

1. These 33 comets represent a significant minority of the 162 comets that were discovered or recovered suring the period.
2. During the decade, an average of 3.3 comets was discovered each year by amateurs, out of an average of 16.2 new or returning comets. (Those of us who have seen lots of comets know what 0.2 of a comet looks like.)
3. Conducting a study of the brightnesses of the professional comet discoveries, Machholz determined that "amateur astronomers would have found perhaps five more comets if the professional astronomers stopped discovering all comets." These include, among others, Comet West, which may have been picked up as a 10th magnitude glow at the end of 1975, Comet Hartley-IRAS (1983v), which was indeed discovered independently by Levy, and Comet Shoemaker (1984s), which could have been found through amateur instruments shortly after its discovery.
4. Comets do not get found at regular intervals. The shortest interval was essentially no time at all, 1975j and 1975k being found almost simultaneously; the longest involved two comet "droughts" lasting 18 months each.
5. A large proportion of the evening finds occurred in the period from 3 to 7 days past Full Moon, with a second large proportion occurring just before New Moon. The morning discoveries were more evenly distributed from just before Last Quarter to three days before the next Full Moon, with a peak around First Quarter.
6. The "average" morning discovery took place 30.37 minutes before the beginning of astronomical twilight, while the "average" evening discovery occurred 75.47 minutes after its end.
7. The average comet found in the evening was stellar magnitude 10.2, compared to 8.5 for morning finds. Machholz suggests that, among other factors, the morning sky is less intensely covered by searchers, thus allowing comets to brighten more before discovery.
8. Although the heights above the horizon at which comets are found varied widely, the average for evening finds was 24.6 degrees, and for morning discoveries 28.3 degrees. Machholz makes the interesting point that most discoveries took place when the comet was above typical obstructions and horizon haze; thus a traditional requirement that searchers need absolutely perfect horizons may not always be true.
9. Fully 26 people, all male, discovered comets during the decade. William Bradfield led the list with 10 finds; Rolf Meier followed with 4; Shigehisa Fujikawa had 3; and 5 observers had two each.
10. Although the average hunting time per comet was 281.7 hours, the variation in times was enormous, from no time at all for accidental finds of Berger and Milon, to less than an hour for Mori's second find, to 1700 hours for Machholz's comet.
11. Discoveries were made, for reflectors, once with a 4-inch, once with a 5.8, four times with 6's, once with a 6.2, three times with 8's, twice with 10's, five times with 16's, and once with a 19. With refractors, discoveries happened once with a 3.3-inch, once with a 5, and 11 times with 6's. Only one discovery took place with an 8-inch Schmidt-Cassegrain.

These are but some of the statistics contained in this remarkable book. In addition, Machholz has presented stories and circumstances for the discoveries of each of the comets. This work is available by sending a cheque for $8.00 to Don Machholz at 5234 Camden, San Jose, CA 95124.

A BOOK REVIEW

by David Levy

[EDITOR'S NOTE: Your editor is very pleased to print another article by our Vice-President, again one originally prepared for the A.L.P.O. Journal.]

Halley's Comet, 1755-1984: A Bibliography. Compiled by Bruce Morton. Greenwood Press, Post Road West, Box 5007, Westport, CT 06881, 1985. 280 pages, price $35.00.

How timely it is for a general reference source about Halley's Comet! Published just last March, Halley's Comet, 1755-1984: A Bibliography will probably become one of the most useful of the dozens of Halley books now orbiting the comet sphere.

This bibliography covers books, articles, newspaper editorials, poems, and scientific papers. Arranged by year, each entry contains standard bibliographic data, as well as having a consecutive number for easy finding and cross referencing.

Obviously, the compiler, Bruce Morton, has done an enormous amount of research in his field. Head reference Librarian at Montana State University, Morton has brought his dual expertise in bibliographic methods and in comets to perform a valuable service. The 1301 entries bring to the reader the dimension of the scope of literature about this famous comet.

Perhaps the most valuable part of this reference is the annotations. Each entry contains several lines of description, normally in the style of the work cited, so that we can understand both the content and the style of each cited reference. The annotation does something else, however; it gives us the chance to read through this source as a book on its own, rather than as an index that refers us to something else. An evening spent reading these annotations helps us to follow the road of progress of our understanding of comets, from both scientific and social standpoints.

The only problem that I encountered was the compiler's decision to list all entries chronologically without regard to their genre. The result is, on some pages, a hodgepodge of entries in which serious scientific studies are listed along with articles of lesser importance. For example, entry 1271, Stephen Edberg's famous International Halley Watch Amateur Observer's Manual and entry 1275, Donald Yeomans' classic The Comet Halley Handbook, are followed by references, of equal length, about a Halley's Comet Society which toasts the comet every year (entry 1277) and several entries relating to selling comet memorabilia. I realize that these entries are important to our understanding the social effects of the comet's many appearances, and do not object to their inclusion, but I wish that some way could be found, perhaps even through the numbering system, to differentiate the scientific and educational entries from those more frivolous.

That one difficulty aside, I recommend this book highly. It provides fascinating reading, which is most unusual for a bibliography. If you have a serious interest in any of the scientific or social aspects of comets, this book is an absolute must for your library.

FOR YOUR COMPENDIUM OF ESOTERIC FACTS

When we earthlings think of comets, we often think of the size of cometary nuclei and regard them as quite insignificant objects because of their relatively small size in comparison to the size of the earth or other planets of our solar system. Did you know, however, that there is one way in which the earth and other planets cannot match comets - cannot, in fact, come close to matching them? Yes, it is certainly true, and that is in regard to the speed at which they move when the bodies are at perihelion. When at perihelion the earth swings through space at a little over 100 000 kilometers per hour. In the case of comets that approach relatively close to the sun, there are often speeds near time of perihelion that exceed 1 000 000 kilometers per hour - ten times the speed of the earth. In fact, some comets that ventured unusually close to the sun, such as Comet Ikeya-Seki and the Great Comet of 1882, have been calculated to have reached

speeds in excess of 1 600 000 kilometers per hour. Mind boggling speed! Yet it has its effects upon the comets, as though nature were warning them of the dangers of speeding. Comet Ikeya-Seki split into at least two parts after emerging from perihelion, and the Comet of 1882 was seen smashed into four distinct cometary particles proceeding in single file after it had dared to venture so close to the sun with such reckless abandon!

REPORTS AND OTHER ITEMS

1. Observing logs owned by amateurs all across the country are currently receiving entries relating to the viewing of Halley's Comet. While the comet was disappointingly faint two months ago, it has brightened nicely in the last few weeks and is now approaching, though not precisely at, predicted magnitudes. Your editor managed to photograph P/Halley on the night of October 11-12 when it was at magnitude 12.0 and about 1 degree from the star Chi-2 Orionis. Very rapid brightening of the comet occurred in the first week of November, so that my estimate of it on the night of November 8-9 was magnitude 8.0.

The Kingston Centre Public Halley Observing Session at the Fort Henry Parking Lot on the night of November 15-16 could be regarded as a success in some ways. There was considerable interest from many members of the public, but unfortunately the skies were very hazy and dulled by cirrus cloud for a good part of the evening. For most observers the view was necessarily very disappointing. Your editor had a good view of the centre of attention while looking through a couple of 4 1/2" telescopes, but the conditions made binocular viewing almost impossible. Under good conditions exactly one week before, I had recorded seeing it "easily in a 6X30 finder scope"; yet the horrible haze at the public viewing session made it virtually impossible to detect in tripod mounted 11X80 binoculars.

Comet Hartley-Good has been a bright and interesting object very easily seen on several occasions both in binoculars and telescope. Another member of the current comet group and another bright one, is Comet Thiele, but poor weather has prevented its being seen during the "viewing window" near the November New Moon.

Poor weather conditions made observing the Draconid Meteor Shower totally impossible between October 8 and 10. What a disappointment that was! Your editor has not heard, either, of anyone locally who observed the Orionids around October 20. November's cloudy, rainy, generally very dull weather also prevented the viewing of the Leonid Meteor Shower.

Among of the most interesting observations since our last newsletter was one missed by your editor but reported to him by about sixteen people. At about 2:32 UT on October 24 an extremely bright fireball, probably between magnitude -15 and -20, was seen by many people as it travelled across the sky from south to north. Dr. Ian Halliday has confirmed that there were widespread sightings in Eastern Ontario, and that, as a result, there was a possibility of some meteoritic material in Quebec north of the Ottawa River.

Solar observers have noticed that their sunspot numbers have been low in recent months with totals being very low in September and in early and late October; in mid-October several large but unstable groups crossed the solar disk. On October 21 my number reached a high of 84, a remarkable change from a number of 47 the previous day.

2. It was a pleasure to receive the The Observer's Handbook 1986 and to peruse another excellent and improved (the seventy-eighth) issue. At 208 pages, it is the biggest one ever produced by our Society. The amateur photograph of Comet West was an excellent choice for a year that features P/Halley among the objects that will be most observed. Again, our hats go off to Dr. Roy Bishop for the absolutely enormous amount of work that has gone into this publication.

To encourage our members to become better acquainted with this superb publication, your editor is again sponsoring the S.T.E.I.T.H.C.. For the benefit of those who have not been around for the past eight years, it stands for The Spot The Errors In The Handbook Contest. If you see an error or inconsistency of any kind in the Handbook, write it down and submit it. The contest closes at noon on January 15, 1986.

3. Item For Sale: An Edmund 8" f-5 Newtonian reflector, equatorial, with clock drive and new Meade finder - in excellent condition. Asking: $875.00. Contact Anthony Diflorio, 820 Burnhamthorpe Rd., #1205, Etobicoke, Ont., M9C 4W2 (416-621-9017).

4. Over the coming months the following items will be worth watching:
(1) Halley's Comet as it sweeps through the Pisces-Pegasus area and into Aquarius. However, do not to forget to look at Comets Hartley-Good and Thiele, and any others that might come along in this year that has been so generous with comets.
(2) Planetary observers will continue to be able to observe the mutual phaenomena of the satellites of Jupiter. They should consult Sky and Telescope for the times and dates to observe.
(3) In the morning sky in early December, Mercury, Venus, and Saturn form a number of interesting configurations. On the 10th of the month the moon is very close to the group, giving an opportunity for an interesting photograph. Just two days before, the old crescent moon passes extremely close to the planet Mars; in fact, from some locations on the continent, an occultation will be visible.

5. All our members are reminded that the fees for Membership Year 1986 are now overdue. IF YOU HAVE NOT DONE SO, PLEASE PAY YOUR ANNUAL DUES AS SOON AS POSSIBLE.

6. Here is our calendar for upcoming regular Centre meetings:

Nov. 22	Annual Banquet and Annual Meeting
Dec. 13	Halley Reports, and The Observer's Handbook 1986
Jan. 10	OPEN
Jan. 23	SPECIAL 25TH ANNIVERSARY BANQUET AND MEETING WITH DR. ROY BISHOP, NATIONAL PRESIDENT AS OUR GUEST SPEAKER. TOPIC: SS433 A STELLAR SPECTACLE NOTE: THIS IS A THURSDAY NIGHT
Feb.14	OPEN
Feb. 28	OPEN

Our meetings begin at 8:00p.m. See the information at the beginning of this newsletter regarding the location.

7. Our address is: R.A.S.C. - Kingston Centre,
Box 1793,
Kingston, thtario.
K7L 5J6

Clear skies!
Good observing!

Leo Enright