R E G U L U S

THE NEWSLETTER OF THE

ROYAL ASTRONOMICAL SOCIETY OF CANADA - KINGSTON CENTRE

NOVEMBER, DECEMBER, 1986

THE LITTLE LENS: DELPHINUS

by Gus Johnson

[**EDITOR'S NOTE:** Over the past year I have received from our most active observer in Maryland, Mr. Gus Johnson, a very interesting collection of writings on the objects to be observed with a modest-size telescope in a number of the constellations. The constellations covered includes Scutum, Leo, Scorpius, and Delphinus, the latter of which is printed here. I sincerely hope, that for the benefit of observers worldwide, Mr. Johnson has these articles (and his many other similar ones) collected together and, at some future date, published in book form.]

As the nights lengthen and stars become visible earlier, you will find this little constellation remaining long in a comfortable-to-observe position in autumn. It does not take much imagination to envision a dolphin there, or maybe you prefer a small kite (Bootes being a larger kite and increasingly getting too low to observe well). On a clear night the Milky Way star fields are rich and there are some fine double stars, but otherwise you won't find much for the deep sky observers.

Near the northwest corner of Delphinus is Burnham 987, a quadruple, two components of which are easily seen (mag. 7 & 7 1/2; 106" apart; B9) in 16 x 65 binoculars, and more easily in a 2-inch telescope at 25 power. The stars are blue-white and bluewhite. 8 X 50 binoculars can resolve it also. It and two other dim pairs make a triangle of pairs as seen in the 2-inch at 25 power. A few degrees to the east-south-east is where a bright nove ocurred in 1967, now known as HR DEL. Heading south-east, you pass the yellowish star U Del, an irregular variable that can be followed with ordinary binoculars throughout its cycle.

You are now at the top of the "kite", Gamma Del, a favorite double star of many observers (mag. 4 1/2 - 5; 10"; K2,F8). The New Handbook of the Heavens calls it "golden, blue-green". For many years I saw the stars as of similar colour, but then in 1978 with George Kelley's 12 1/2" at 160X I saw a real contrast. Since then I have seen the contrast, even with small apertures. To detect both stars my 10 X 40 succeeds, and 8 X 50 hints at them. In the same field is Σ 2725 (mag. 7 1/2 - 8; 5.7"; KO) like a neat little distant twin of Gamma, even with a similar colour contrast. A 2-inch 25X resolves it, while a 2.4-inch at 25X but with a prism of lesser quality failed. Alpha is a very wide pair for binoculars and optical, the companion being Burnham 288, not suitable for small scopes. Beta is a multiple, the close components taking about 27 years and very close, plus two wide dim companions needing bigger apertures, but Beta and Zeta make a very wide binocular pair, but in 20 X 60 and larger telescopes you will note a fascinating little triangle of near-equal stars, Σ2703 (mag. 8 - 8 - 8; 25" - 74"), between Beta and Zeta. A 4 1/4-inch at 38X gives a nice view. It's double in 8 X 50 binoculars.

Some charts show a larger triangle just east of Theta. Then a little to the west is Eta. In 1982 Paul Brown of Goderich, Ontario, alerted me to there being six pairs close to Eta, which I confirmed with my 6-inch at 188X, excluding some wide, likely optical pairs. A little later I tried my 8-inch at 116X and saw nine pairs in the one field, with one possibly being triple. This is what I meant by Delphinus having a rich Milky Way star field. A 2.4-inch at 60X will not see all of those pairs, but will have a field with four times the area and will include wider pairs to make up for that and so may well give just as attractive a view.

Between Eta and Epsilon and to the east is Σ 2701 (mag. 8 8; 2.1"), a close pair, but my 4 1/4-inch f/7 Newtonian at 109X gets it. Close to the west of Epsilon is Σ 2690 (mag. 7 7 1/2; 17"), a multiple, but two components are visible in the 16 X 65. Star A is blue and star B is orange as seen in the 2-inch at 25X and the 4 1/4-inch at 38X. A bit south of Epsilon is a dim equal pair in the 4 1/4-inch at 32X.

Almost due south of Epsilon 4 to 5 degrees is the globular cluster NGC 6934, which I swept up by accident with my 4 1/4-inch at 30X, and wondered if I had a comet! A small star is next to it and two more farther away in the same line. It is dim in a 2-inch 25X refractor, and listed at around magnitude 9. While in the area, sweep to the southeast past 13, almost to Gamma Equ where you find Σ 2735 (mag. 7 1/2 - 8; 1.8") which was not hard for the 4 1/4" at 109X; even a 2-inch f/12 refractor at 86X gets it! When so close slip over and visit Epsilon Equulei, a multiple, but with two easily seen components (mag. 5 1/2 - 7; 11") that show in the 2-inch at 25X. (It pays to be neighbourly.)

Return to the main constellation from Alpha to Gamma almost to the 21 hour R.A. where two stars and NGC 7006 make a triangle. The southwest corner is Σ 2738 (mag. 7 - 8; 15"), an easy pair. The other star is a wider pair, one of whose stars is itself double, in the 4 1/4-inch at 38X. Globular Cluster NGC 7006, like NGC 2419 in Lynx, is almost as far away as the Magellanic Clouds, about 185,000 light years, and is hard to find, even with a 6-inch, but worth seeking due to its remoteness.

(signed) Gus Johnson

A LETTER FROM GUS JOHNSON

Swanton, Maryland,
October 31, 1986.

Dear Mr. Enright and Centre Members,

My observing has had its ups and downs. Few nights have been suitable for good observing. October 7th proved an exception and I took a couple of photographs and visually saw some fine sights. Of course, the two Veil Nebulae showed in my 2" at 25X. I had read in an old Deep Sky Monthly that a 6" is likely a minimum to see the spread out galaxy NGC 6946 on the Cep-Cyg border. I saw it directly in my 4 1/4-inch at 38X and then with averted vision in the 2-inch 25X refractor. I had never seen the ancient cluster NGC 188 before but it showed directly in the 2-inch and even my 10 X 40 hinted at it. I was doing a constellation study of Cepheus mostly working my way southwards, except for that galaxy which otherwise I wouldn't likely get to that night (or the next). Clouds and moonlight stopped the study in central Cepheus for weeks. I came upon a bright likely-optical double, very colourful, but later found no reference to it in my catalogues or books. It was likely one of the brighter (OΣΣ pairs, about 70" wide, blue and orange, resolvable even in 7 x 35 about magnitudes 5.5 and 6. So I wondered if I could have encountered a nova; so a false alarm started.

Over a week later, when my film was developed, I found one of the stars noticeably brighter than either the Stern Atlas or the Atlas Borealis had it; so I felt it ought not to be ignored. At least the Atlas Borealis had it shown as an orange star, which it was, whereas the orange component of the former "double star" was shown as a dim blue star in the Atlas Borealis. I am assuming that blue-sensitive film is the cause of the second object in question, but as to the first I just don't know. Has no one laid claim to that attractive double star?

Although recovering from a bad cold, I went out last night and took two photos of that double and tried to to get a few variables, since it has been a poor month for my AAVSO work. I have neglected my duties to work on the Cepheus study. After two months I finally got my Aquila study typed up, because of repeat observations that seemed needful, mixed with cloudy weather.

Two Fridays ago I attended open house at the Allegheny Observatory. The club members had telescopes set up on the lawn. An elegant 4-inch Unitron gave a fine view of Jupiter, as good as any. The club had an 8-inch Cassegrain that did quite well, but no more belts on Jupiter did I see. A 10-inch Schmidt-Cassegrain was rather disappointing but dew was forming on its lens; so I can't properly judge. Inside, the 13-inch f/18 refractor was studying Jupiter, but a bad blue blur accompanied the image, "hopefully"

just the eyepiece, not chromatic aberration in the lens. I was disappointed. The 31-inch Cassegrain at 400X also had Jupiter, but still no more belts did I see than in the 4-inch refractor, but the view was not bad, better than expected. The 30-inch refractor had M15 at about 125X, but due to bad city light pollution plus a full moon, I felt my 8-inch at home could give a better view, but no chromatic aberration was evident.

Clear skies!
(signed) Gus

OUR CENTRE'S EXECUTIVE FOR 1987

At our Annual Meeting which was held on November 28,1986, the following Executive Officers were elected for 1987:

Honorary President: Dr. A. Vibert Douglas
President: Ruth Hicks
Honorary Vice-President: David Levy
Vice-President: Hein VanAsperen
Secretary: Sue Sorensen
Treasurer: Murray Anderson
Librarian: David Stokes
Newsletter Editor: Leo Enright
National Council Rep.: Hein VanAsperen
Alternate Rep.: David Stokes

In addition, Mark Sorensen continues to assist in the production of the newsletter.

All our members extend a sincere "Thank you!" to David Stokes for the several years during which he has served so well as President of the Centre, and we offer our heartiest "Good wishes!" to Mrs. Hicks as she accepts the challenge of leading our group for 1987.

As usual the Annual Meeting provided the occasion for looking back on the past year and forward to the future. Reports from our Executive Officers showed that the past year had been a very successful one, when we celebrated our twenty-fifth anniversary, and 1987 promises to be a very interesting one as well.

To those members who have taken on the tasks of our Executive Council members for the coming year, we say, "Your offering your services, whether for the first time or the "dozen-th" time is much appreciated and we look forward to what you can do to maintain this as one of the most active Centres of the Society."

A CLOCK FOR ALL SEASONS

[**EDITOR'S NOTE:** The following paper from David Stokes is an abstract of a talk he gave at our Centre meeting on October 10. I hope that this idea of submitting the text of talks given at our Centre meetings, or abstracts thereof, will catch on and become standard practice. There have been many fine talks given over the past couple of years; it would be great to have at least a written summary of them.]

The amateur astronomer makes good use of the digital clock displaying solar time and may even have a wristwatch showing sidereal time. Many amateurs are also familiar with the personal computer for controlling equipment or reducing observations. Recently there has appeared on the market a small electronic clock that combines timepiece and computer in an unusual way that will appeal in design and function. Enter the prayer times clock.

This clock can be programmed very simply with the user's latitude, longitude, and time zone. The date and local time are then entered and the clock runs conventionally showing current time, a.m. and p.m., in a clear liquid crystal display. There is a wake-up alarm and provision for snooze control. So far all functions are homely and familiar. However, inset on the top of the flat clock case are six control buttons marked in Arabic-(English): Fajr (Dawn), Shuruq (Sunrise), Zuhr (Noon), Asr (Afternoon), Mahrib (Sunset), and 'Isha (Night). This is where the internal computer chip weaves its magic. Press the Fajr button amd the display shows FAJR for a few seconds followed by the time of the beginning of astronomical twilight; pressing 'Isha produces the time of

the end of evening astronomical twilight. The exact time of local noon appears at the touch of the button marked Zuhr while the other buttons will produce sunrise and sunset times in the display, and then revert to displaying standard time.

If you have not set the wake-up alarm, the clock will announce these significant moments in solar time during the course of the day by sounding a five-second steady tone five minutes before the event. At the exact time of, say, dawn, the clock shows the word FAJR followed by the time and sounds five short tones. A similar performance is repeated during the day at the appropriate times. If you leave the wake-alarm set, then these signals are skipped but the times can be reviewed by simply pressing the appropriate button and watching the time displayed.

The clock was designed primarily for the convenience of Muslims throughout the world who observe the five canonical daily prayers, but it is particularly useful to those who travel by air across several time zones. This clock also solves one further problem for the travelling Muslim, namely, locating the direction of Makka, in Saudi Arabia, the place to which Muslims turn at the times of prayer. This could have been solved easily in the on-board computer and the result displayed as the azimuthal angle measured from true north. However, true north is not easily ascertained by the traveller arriving in a strange city at night. So the clock's designers have embedded in the clock's case a magnetic compass that is easily detached and set up on a flat surface away from magnetic materials. The outside ring on the compass dial is divided arbitrarily into forty parts. To find the correct direction of Makka, the user has only to press twice quickly any one of the six buttons and the clock displays COMP nn. The compass is then turned until the needle tip points to sector numbered nn on the outer case. The zero mark, extended as a long arrow on the compass base, then points in the direction of Makka.

The prayer times clock is packaged in a hard, ivory-coloured case about 10 by 14 cm and 3 cm thick with a display window 5 by 1.5 cm, powered by three AA cells. The owner's manual is written in English, French, and Arabic, and a set of abbreviated instructions in English can be attached to the bottom of the clock. A gazetter showing principal cities and their geographic coordinates is provided with zone numbers for use with the compass. The price is Cdn$30 to $45 depending on one's ability to bargain in Arabic.

So how well does it work? I programmed my personal computer to calculate the position of the sun in Right Ascension and Declination, and Greenwich Mean Sidereal Time, using algorithms developed by Jean Meuus "Astronomical Formulae for Computers" (Willmann-Bell, Virginia, USA). This allows an approximate time for sunrise to be calculated and then a more accurate position of the sun is calculated for sunrise and sunset. From this data one can then calculate accurately the local times of rise and set, allowing 34' for refraction and 16' for semi-diameter, and local noon. The progran was tested against tabulated data in The Observer's Handbook, and the results agreed within one minute.

The computed data for Kingston (N.44.°25, W. 76.°5) was then compared to the clock output for 1986 October. The clock appears to compute Dawn 6 minutes late, consistently, but the time for evening astronomical twilight is accurate. The clock times for sunrise, noon, and sunset are accurate to within one minute. Writing the program gave an idea of the work that went into programming the clock's chip. The clock's performance was checked against time signals from Ottawa, Fort Collins, Colorado, and the BBC, London, and found to be consistently accurate over the short term, even better than Ontario Hydro time. The compass indicates the correct direction to Makka, based on the shortest great-circle route, but it does require care to avoid hidden magnets including computer equipment. This clock for all occasions makes the ideal gift for the astronomer who has everything except time!

David M. Stokes

CITATION FOR LARRY MANUEL,

1987 WINNER OF THE KINGSTON CENTRE'S

DR. A. VIBERT DOUGLAS AWARD

"All the members of our group aware of the fact that Larry Manuel has contributed significantly to the R. A. S. C. - Kingston Centre over the past two year. He is the

type of amateur astronomer whose work and dedication are too often neglected but need to be recognized. The criteria for the Dr. A. Vibert Douglas Award states that it may be given for service to the Centre or Society and/or an astronomical achievement. What Larry has done could be categorized as both a service to our Centre and an achievement. Restoring the Centre's 10-inch telescope by completing a handsome Dobsonian mount for it and making it much more useable than it has ever been is an important accomplishment in line with what many astronomical groups are doing to increase observing time for themselves and the general public, and it is a service to our Centre whose members have long had a good telescope but one which had been virtually unuseable because of a faulty mount. It was Larry who had the initiative to undertake a project that was completed very successfully. Unless he had done it, our scope would probably have remained in its former condition for many more years, and that would have been pity.

A recent presentation to our Centre of Larry's personal project to build a 3-inch refractor also represents a considerable achievement. It has been a long time since our Centre had a member who has been involved in a telescope-building project of any real significance and the expertise which Larry is gaining first-hand is also a service to our Centre because he has shared his learning experience with us and is always most willing to talk about the vast amount of information he has gleaned in this area - one that is often shunned by many astronomers today, who usually prefer to buy everything off the shelf and neatly prepackaged. Larry indicates that his refractor-building project is only the first of several. This initiative is something that promises to make a good many of our future meetings very interesting as we follow the construction of increasingly larger refractors. There seems to be something about such projects that is inherent in the way that true amateur astronomers were meant to practise their craft. The members of the Kingston Centre are, therefore, most proud to make the second presentation of the Dr. A. Vibert Douglas Award to Larry Manuel.

FOR YOUR COMPENDIUM OF ESOTERIC FACTS

Most people have no valid idea whatever concerning the relative sizes of our solar system and our galaxy, and they tend to think of our sun's system as being a somewhat significant part of the Milky Way Galaxy. In point of fact, if we could make a scale model of the twoand fit the entire solar system, including the orbit of Pluto into a teacup, the Milky Way Galaxy would be the size of the North American continent! This scale model (!!) shows how false most people's opinions are. From star system to galaxy is a quantum leap, indeed!

THE PRESIDENT'S REPORT - 1986

[EDITOR'S NOTE: The following is the text of the report read at our Annual Meeting on November 27 by our outgoing president, David Stokes. I am very pleased to print it in its entirety.]

In looking back over the year now passing, I am impressed most by the variety of subjects we touch on at these meetings. Of course, 1986 will best be remembered for the visit by a distinguished celestial visitor, Comet Halley. Many members followed this famous comet on each and every occasion, and they have shown their slides here. I noted with some satisfaction that Comet Halley was found where it was calculated to be and that it followed very exactly the course computed for it, based on Newton's Laws of gravitation. The theoreticians seem to have got something right.

The Kingston Centre celebrated its twenty-fifth anniversary this year with a visit by the R.A.S.C. National President, Dr. Roy Bishop, in January. You will recall that Dr. Bishop spoke on "SS433: A Stellar Spectacle." The twin stars seem to be waltzing around at nearly the speed of light.

Early this year we had two interesting talks on the history of astronomy. One was given by Leo on "Champlain's Astrolabe", and the second was by Margaret Cohoe on "The Kingston Observatory." In April, Ruth and Terry Hicks gave us an excellent slide tour of New Zealand and an account of Comet Halley as seen from down under." This year we have also been privileged to receive four speakers from other Centres: Dr. Roy Bishop, Peter Jedicke of the London Centre, Doug George of the Ottawa Centre, and Peter Cerevolo

of the Edmonton Centre.

During this memorable year of both Comet Halley and our twenty-fifth anniversary, our active observer, Larry Manuel, has refurbished the Centre's Dr. A. Vibert Douglas Telescope by building a Dobsonian mount for it. We now own an excellent telescope we can be proud of and one that is a pleasure to use. In keeping with these heroic efforts, Larry also gave an excellent talk on building his refractor "from scratch", so to speak!

I have touched on only the highlights of the year, but I must not forget to mention in passing that we represented "Astronomy to the Public" on Astronomy Day, displayed Comet Halley to the public when the weather cooperated, and we have responded to requests for talks and information on radio and television, even advising on UFO's. As usual, the Kingston Centre was well represented at the General Assembly in Winnipeg where once again Hein van Asperen made a distinguished presentation.

Throughout the year Leo has steadfastly worked hard to write and publish Regulus, our newsletter, which everyone enjoys but which few contribute to. We are most gratetul to Leo for his tireless efforts but we should not take this hard work for granted. Leo also puts in long hours as National Recorder.

Warren Morrison, our member at large living near Peterborough, was awarded the Chant Medal for long sustained contributions to astronomy in the field of variable star observations. A well-deserved reward, indeed! Nearer home, Leo received the Service Award at the G.A. in Winnipeg, in well-deserved recognition of his long, continued efforts here in the Kingston Centre.

It has been a pleasure to serve this Centre as President for two years because of the support I have received from the Executive. I would like to thank our busy secretary, Sue Knight Sorensen, for handling efficiently the corrsepondence, and Mark for preparing membership lists and duplicating and mailing Regulus. Martyn McConnell, our Treasurer, has worked efficiently and effectively balanced the budget. I am glad to thank Terry Hicks for representing us at the National Council meetings in Toronto, and thank you, Hein, for doing the same in Winnipeg.

In stepping down, I would urge you all to review why we meet here and what makes our meetings a success. I feel that the present level of committment by the small number of members who attend regularly would best be focussed on one meeting per month here at Queen's. Another monthly could be a gathering of the keenest observers at some mutually agreeable time based on the lunar calendar. I would like to see that meeting open to the public and by invitation to schools and clubs and others who want the "hands-on experience" of observing. Lastly, I would urge you all to make a personal committment to contribute to the gatherings here, or outside, and to become involved in the activities of this small but dynamic Centre.

(signed) David M. Stokes

NOVEMBER 28, 1986

THE ANNUAL REPORT FOR 1986 OF THE EDITOR OF

REGULUS, THE NEWSLETTER OF THE R.A.S.C. - KINGSTON CENTRE

1986 has been a successful year for Regulus, our centre's newsletter. Trusting that the November-December issue will be out before our next meeting, I can report that the number of issues this year has been maintained, and though the average number of pages is down from that of the last few years, the average number of articles has not decreased significantly. Regulus continues to be quoted in the National Newsletter of the Society with entire articles or excerpts thereof being used. The most recent National Newsletter, for example, carried the article on the National Council Meeting held at the time of the General Assembly, an article that had previously appeared in Regulus. The National Newsletter feature known as "Across the R.A.S.C." regularly refers to or summarizes items carried in our Centre's publication.

Following a year of considerable change and experimentation with format in 1985, I have settled on a format that I think is pleasing, cost efficient, and professional looking. With the November-December 1985 issue, I began a format that had 75 lines per page and a horizontal indexing that allowed considerably more words per line than ever

before; both of these changes have meant a tremendous increase in the number of words per page over that seen at any previous time. There have been no complaints whatever in regard to those changes of a year ago, and I assume that the readership is pleased with them and recognizes that a great deal more reading material is being sent to them with a savings on the amount of paper that must be purchased and mailed.

A look at the figures for the number of pages and issues over the past seven years presents the following information:

YEAR	NO. OF PAGES	NO. OF ISSUES	AVERAGE NO. OF PAGES/ISSUE
1980	42	10	4.2
1981	26	6	4.3
1982	59 *	7	8.4
1983	70	6	11.6
1984	50	6	8.3
1985	57	6	9.5
1986	34 (to date)	5 (to date)	6.8

* - including a 7-page index of the articles of the previous five years.

As in the past several years, there have been no complaints whatever about the fact that there are six issues per year, and the practice of producing six per year seems to be a happy compromise (if there is such a thing) between what we would desire for a publication that we hope is "newsy" and on the other hand what we can afford and find time to produce with some quality.

It is now over four years since an index of Regulus articles has been published. I am inclined to think that there is no great urgency in producing one for some time yet. However, I hope to consider the matter over the coming year and may be inclined to follow suggestions if I receive any in this matter. Otherwise, I may consider producing within the next couple of years an index of the articles that have appeared since 1982.

If I should happen to be chosen as our Centre's newsletter editor for the coming year, I would hope to increase slightly the number of pages for the 1987 volume and to have the same number of issues, namely, six.

I wish to thank Mr. Mark Sorensen who continues to do a fine job of photocopying and mailing each issue.

If I am chosen to remain in this position, I shall continue to welcome suggestions concerning the newsletter from any members of our Centre, and to hope that I shall receive from them, the members of our Centre, whose newsletter Regulus is, a supply of articles, letters and any other items, long or short, that could be used. The contributions received from Mr. Gus Johnson, who is among our geographically most distant members, are currently far more frequent and more numerous than are those of our nearby members.

To all of our members I say again: "It is your newsletter and I invite your regular and frequent contributions." I hope that Regulus can continue as a worthwhile method of communication for a group of interested astronomers spread over a vast area of the North American continent but centred on Kingston, Ontario.

REPORTS AND OTHER ITEMS

1. Since our last newsletter we have had an unusually long spell of bad weather. Your editor did manage to have a few worthwhile observing sessions. In one of them, on the night of November 29-30, Comet Wilson was easily seen in a 350mm instrument. It was small but certainly "comet-like" with a very distinct tail. It was located almost due south of Eta Aquilae and was about 10th magnitude, somewhat fainter than the predicted magnitude published in Sky and Telescope. As many as possible of our members should try to observe this comet, the first one ever discovered by a Canadian female. Indeed, this comet promises to be very bright, reaching third or possibly second magnitude next March

or April; however, it will be in the far south by that time and not visible from any part of Canada.

A few nights also provided opportunities to view various phenomena of the satellites of Jupiter, as the giant planet has been brilliantly prominent in the southern evening sky for the past several months.

Solar observations by your editor and by Hein Van Asperen have shown that the new cycle of sunspots has begun with groupings appearing at relatively "higher" latitudes on the solar disk.

2. We wish to congratulate David Levy, our member in Tucson, who is now recognized as an astronomy writer to such an extent that he is currently involved in producing eight (Count 'em!) regular columns for various publications. That would seem to be enough to keep anyone busy, not to mention David's working on several books and his doing several other things, as well as his job and his observing. (Please don't forget the observing!) We all look forward to the column which will be appearing in every issue of our R.A.S.C. National Newsletter. It will be entitled The Observer's Cage, and if the first one can be taken as a sample, it will be very good, indeed!

3. We are proud to say that we now have nine Life Members of the Society in our Centre, a higher percentage of the Centre's total membership than in any other Centre in the country. In our last issue we extended a welcome to Mrs. Ruth Hicks, our incoming Centre President, who had become a Life Member; this time our congratulations go to Sue Sorensen, our Secretary. With great pride we announce that Mr. Arthur E. Covington, our National Honorary President, has become a Life Member of this Centre.

4. Recent meetings have been very stimulating and exciting occasions. On November 14, Larry Manuel, recent winner of the Dr. A. Vibert Douglas Award, gave a very extensive talk,with slides, on his refractor-building project. On November 28, following the Annual Meeting of the Centre, Mr. Arthur Covington, gave an extremely fine talk on the history of the development of radio astronomy. It was almost exactly 40 years since the first major steps were made into this twentieth-century science. How could we be more fortunate than to have a gentleman and true pioneer of radio astronomy give us the first-hand details of its early years? Some of the slides that he showed are real treasures from those "early days".

5. In the coming months several objects will be worth observing: (1) try to catch a few glimpses of both Venus and Mercury which are now easily seen in the morning sky. The former planet has been extremely brilliant and will continue such throughout the next two months, fading only slightly in late January and February, 1987. (2) Mars and Jupiter have been doing a stately waltz in the winter sky of the crisp December evenings and the sight should not be missed. Mars which has been west of the giant planet moves to the other side on December 19 and will continue to move eastward. (3) The Geminid and Ursid Meteor Showers peak in December on the 14th and 22nd respectively, and should be observed if weather conditions permit. One of my favorites, the Quadrantids, which peak on the weekend night of January 3-4, may provide some very fascinating "fireworks". A couple of years ago this shower, which often is neglected because of cold weather, provided a simply stunning display which was easily photographed. This year's very young moon on that date will set early and be no serious problem for observation.

6. Mr. Gus Johnson has sent along information about an organization founded in 1982 and made up of people interested in the study of the moon. He himself is on the Board of Trustees, serving as Secretary. For those who wish more information, I have it. The Annual Fee is US $5 per year. There is a monthly newsletter and a twice-yearly journal called Selenology. The Address is: American Lunar Scciety, P.O. Box 209, East Pittsburg, PA 15112.

7. Some consideration has been given to the idea of having one monthly meeting instead of two, but no definite decision has yet been made. If such a step is taken, it will be announced in these pages. For the present, our scheduled meeting dates continues as usual:

December 12	(tentatively) Mr. Covington continuing the topic Forty Years Of Radio Astronomy
January 9	OPEN
January 23	OPEN

All our meetings begin at 8:00 p.m. and are held in Macintosh-Corry Hall, Room D-207, on the Queen's University campus.

Please write about your observing or any other project, or ANYTHING astronomical. Your editor would be very glad to hear from you.

R.A.S.C. - Kingston Centre,
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Best wished for Happy Holiday Season!

Clear skies!
Good observing!

Leo Enright