NOVA NOTES

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1979 Halifax Centre Executive

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Centre Rep.	Peter Edwards, 8 Sullivan's Hill, Bedford
Editor:	Randall Brooks, Dept. of Astronomy, Saint Mary's Univ. or 71 Woodlawn Rd. Dartmouth

UP COMING MEETINGS:

Friday 19 January at the Nova Scotia Museum, Summer St.

Speaker: Dr. David Tindall, Dalhousie Univ., Halifax

Topic: Eclipses, Past and Present

Eclipses, especially total eclipses of the Sun, have excited man from the very earliest days. As the last solar total eclipse visible in Canada this century takes place next month, this seems an appropriate time to take a close look at this phenomenon. The talk will focus on the mechanics of eclipses and attempts from earliest days to predict them. It will conclude with slides of two eclipses of this decade.

Saturday 20 January

Observing session (if clear) will be held at Brian Guest's in Fall River. We will meet at 7:00 SHARP at the Inn on the Lake at the intersection of the Bicentennial Hywy and Waverley Lakes Rd. You will be guided to Brian's from there. Dress warmly!! And bring a thermos of coffee.

March 25: Deadline for Burke-Gaffney and Simon Newcomb Awards. Submit to the Editor or President.

March 3 to April 15: Museum's Societies Show. Got any old astronomical equipment or navigational apparatus? If we could use it, please contact Randall Brooks or Mike Edwards. We can also use your original astrophotos ideas and manpower. If you can assist let either of us know.

The President Writes

By looking at the history of the Halifax Centre, we find that 1978 was the 23rd year of its existence (as a group within the RASC), having overcome a shaky period in the mid 1960's.

In 1978 our Centre may have become older, but it also became better. We finalized plans for proposing the institution of an award for excellence in astronomical writing to the National Council. By the acceptance of the proposition, we became the only Centre to have instituted a National Award. This award, The Simon Newcomb Award, encourages writing by amateur astronomers in the RASC, pays recognition for the resulting excellence and sets up a competitive spirit between centres. It also gives the Halifax Centre representative to the Annual General Assembly an official function at future GA's by way of presentation of this award.

Our presence at the GA in Edmonton this past May was well noted. Of the five people from our Centre who travelled to the west, three presented papers at the paper sessions. (Roy Bishop, Larry Coldwell and Peter Edwards). Larry was the Centre Representative to the General Assembly. We sent as a display, an enlarged version of the "Brightest Nova" (see NN's Vol. 9, No.1, Jan-Feb, 1978 P.30). Individual displays by Larry and myself occupied areas of the display room as well. Larry's display, the MMT, won the Special Instruments category of the Competition. It was following a special executive meeting that Peter, as Representative to National Council, was armed with new amo with which to secure the institution of the Simon Newcomb Award, at the second Council meeting. At this time Roy Bishop received the position of Chairman of the RASC Historical Committee, and though not present, Randall Brooks, our Editor of NN's, was appointed to the Membership and Editorial Committees.for our region. Further notice was paid to the Halifax Centre by acceptance of an invitation to host the 1980 GA, with having an unprecedented time between hosting a GA of five years. Not only will the 1980 GA be unique, as it will be a joint assembly between

the Canadian Astronomical Society (CASCA) and the RASC. It will also serve to commemorate the silver anniversary of the Halifax Centre, as we will be 25 years in existence that year.

Back at the Centre level, we will recall that the first annual Centre dinner was held at the Brass Rail in the Halifax Shopping Centre. Most seem to agree that this was a successful function. The Camping/Observing Weekend took place in July, again at Blomidon and surrounding area (ie. Black Hole). In August an observing session took place at Rotary Park in Wolfville for a look at the Perseid Meteor Shower. In late August a specially arranged and very detailed tour of the Mill Village Earth-Satellite Tracking Station took place. This was arranged by Bill Parnell, who hosted an observing session following the tour at his home in Liverpool. Throughout the year monthly observing sessions were held at various locations, such as Allen Heights Observatory, Uniacke House in Mount Uniacke, in Fall River at Brian Guest's home and in the Nova Scotia Museum parking lot. The regular monthly meetings started out in January on the double, due to snow storms. In January you will recall that we had the pleasure of hearing about the Mount Megantic Observatory from Dr. Rene Racine (president of CASCA). The listing of meeting dates , topics and speakers appear below.

Jan 19	King's College Observatory	Dr. Bishop
Jan 26	Mont Megantic Observatory	Dr. Racine
Feb 17	Measurement of Light Pollution	Steven Morris
Mar 17	The Practical Side of Astrophotography	John MacNeil
Ap 21	Centre Dinner/Members' Night	
May 12	Beta Lyrae	R.C. Brooks
	Astronomical Trivia	Walter Zukauskas
June 16	Review of the GA	Larry Coldwell/Roy Bishop
July 21	Astro Europe	R.C. Brooks
	GA Recap	Michael & Peter Edwards
Aug 25	Mill Village Tour	David Stewart
Sept 15	The Milky Way	Dr. G. Welch

Oct 20	Stellafane--1978	Bill Parnell
	Tides of Fundy	Dr. R. Bishop
Nov 17	Variable Stars	Dr. G. Kilambi &W. Zukauskas
Dec 15	Asteroids/Observing in Chile	Steven Morris

It is easily seen by the above list of topics that our Centre is fairly active and that we have had a busy year. This coming year, however, will be even busier, as we are to participate in the Museum Societies Show and begin to make ready for the 1980 GA, in addition to all of our other activities.

Michael P. Edwards
President
Halifax Centre

STATEMENT OF RECEIPTS AND DISBURSEMENTS

Balance	December 25, 1977		$ 603.23
Receipts	Interest	.36	
	Memberships	1125.50	
	Life Grants	25.00	
	Handbook Sales	113.50	1264.36
			1867.59
Disbursements	National Office	778.50	
	Trip to General Assembly	216.00	
	Handbooks	248.61	
	Dinner loss	27.40	
	Advance to Moncton	25.00	
	Equipment - Mirror	28.50	
	Stamps & Envelopes	100.40	
	Refreshments	69.05	
	Publications	50.09	
	Service Charge, bank	2.00	1545.55
Balance	December 17, 1978		$ 322.04

Respectfully submitted,
Alan Bent
Treasurer
R.A.S.C. Halifax Centre

Minutes of the October and November Meetings

The October meeting of the center took place on the 20th at the Museum. One news item during the executive meeting was that the proposed Moncton Center will not be formed, apparently due to the departure of one or two of their key members.

The main meeting was in two parts: Bill Parnell gave an illustrated account of his visit to the 1978 Stellafane meeting. According to Bill, the good attendance and the enthusiasm of the participants was offset somewhat by inclement weather and a less than outstanding display of telescopes. Bill also showed some slides of the Halifax Center's July picnic at Black Hole.

The second portion of the meeting was presented by yours truly; the topic: The Moon & Fundy, an illustrated account of the physics and scenery of the Bay of Fundy, and the engineering, economics and problems of tidal power.

Nominations for the 1979 executive were called for at the October meeting (and by mail up to October 28). The following individuals agreed to accept nomination:

President: Mike Edwards
VP/Secretary: Diane Brooks, Glenn Graham, Sherman Williams
Treasurer: Alan Bent, Brian Guest
Editor: Randall Brooks
Obs. Chairman: Jody LeBlanc
Rep. to Nat'l.Council: Peter Edwards, Steven Morris

The November meeting also followed the usual format: third Friday at the Museum, executive at 7, main meeting at 8. The topic for the evening was Variable Stars. Dr. Gopal

Kilambi, research associate at Saint Mary's University Department of Astronomy, spoke on some of the theoretical aspects of variables including RR Lyrae type pulsations. He was followed by Walter Zukauskas who described the observational side of variables, illustrating his account with light curves, HR diagrams and the place of several types of variables such as the two types of Cepheids, W Virginis stars, RV Tauri stars, etc. Life on Earth will be stimulating when our star enters the hydrogen shell burning phase!

Both meetings closed over the 3 c's: coffee, cookies, and conversation.

R. L. Bishop
VP/Secretary

CANIS MAJOR

The great Overdog.
That heavenly beast
With a star in one eye,
Gives a leap in the east.

He dances upright
All the way to the west
And never once drops
On his forefeet to rest.

I'm a poor underdog,
But tonight I will bark
With the great Overdog
That romps through the dark.

Robert Frost

(Contributed by RLB)

Of Lobsters and Scallops

In the December issue of Scientific American is a fascinating article entitled Animal Eyes with Mirror Optics by M. F. Land of the University of Sussex. Up until barely 20 years ago no one had suspected that mirrors might form the images in certain animal eyes. Assuming that mirrors must involve metallic surfaces, this was a reasonable conclusion since organisms do not make metal surfaces. However, excellent mirrors can be constructed of a stack of alternating quarter-wave layers of two transparent materials having quite different refractive indices. For man, the associated technology is relatively recent and has led to devices such as laser mirrors, hydrogen alpha filters, and coatings for very low or very high reflectivity. It so happens that several rather insignificant fellow creatures have this ability coded in their DNA. Precise, multi-layer mirrors of optical quality are not unique to man.

One of the creatures described in Land's article is Gigantocypris, a deep-sea crustacean barely one centimeter in length. It possesses a pair of eyes each of which contains a large bowl-shaped mirror, making its eyes appear like the headlamps of an antique car. These mirrors direct incoming light onto a specially shaped retina. Photographers are pleased to own a lens with a focal ratio as fast as perhaps f/1.4 . The mirror optics of the eyes of Gigantocypris operate at about f/0.3 , nearly 5 stops faster than f/1.4!

Another mirror-based eye, but with totally different optics is that of crustaceans of the suborder Macrura, such as shrimps,

crayfishes and lobsters. Their eyes somewhat resemble the multifaceted eye of a house fly; however, the facets are in a square (not hexagonal) array, the facets are lined with mirrors (not occupied with lenses), and the whole complex, right-angle mirror array acts optically like an isotropic stack of saucer rim mirrors to form a single, upright, rather bright image of the external world on a retina within the eye. (See Land's article for a detailed description.)

A third type of eye, and one which combines lens and mirror optics (catadioptric, no less!), is that of the humble scallop. An electron micrograph of a cross section of the mirror in one of a scallop's eyes (it has about 60 eyes!) appears in Land's article. Over fifty alternating quarter-wave layers are there, all properly stacked to form a mirror a mere 6 micrometers thick. For an astronomer, however, the most incredible thing about an eye of a scallop has got to be that it consists of a concave spherical mirror, a curved focal plane concentric with the mirror, and an aspheric lens at the front. i.e. It is a classic Schmidt optical system. (Or, to put matters in chronological order, Bernhard Schmidt's design is a classic scallop optical system!) The next time you order scallops, contemplate the fact that the former owner of each small morsel on your plate has constructed perhaps sixty Schmidt optical systems.

R. L. Bishop
Maktomkus Observatory

COMPANION TO THE SUN??!

Some pulsar observations, it has been suggested by E.R. Harrison, might be explained by the effect on the Sun's motion through space of a nearby companion. But how could such an object elude detection? Well it might be a faint dwarf, a neutron star or black hole. Either of a white or black dwarf would be so bright in the infrared that it would have been detected, hence one must conclude that such an object, if it existed, would be a neutron star or black hole. Serge Pineault (PhD from U of Toronto) now working at the U of BC has worked out some of the problems associated with this idea.

As you know, such massive stars as neutron stars and black holes, are thought to originate as a result of nova or supernova explosions. Such explosions probably cause a binary star system to break up sending the two components in opposite directions. Hence, Serge has assumed that the Sun's companion has been here only temporarily not worrying about the reason why. (Recent observations of neutron stars and black holes indicate that there are any more than can be explained by the present rate of supernova explosions. This suggests that these types of objects may be formed in other ways which would thus solve the problem of binary disruption.) Dr. Pineault identifies 14 celestial X-ray sources in the direction that the companion is calculated to lie. Of these, 6 are probably associated with the galactic nucleus. Of the other 8, the best candidate appears to be 3U1832-23 (third catalogue from Uruhu satellites--object at 18^h 32^m RA and -23^o Dec).

If any of these sources is to be a solar companion, it is a low mass (1 solar mass) object at about 800 astronomical units. If it were larger, it would accret mass rapidly thus shining brightly in the X-ray spectral region. Because of this mass restriction, a neutron star hypothesis is most desirable since they can be explained more easily. So, how will we be able to prove if any of these X-ray objects is the solar companion? just watch for its proper motion relative to background stars. If the distance is as close as these calculations suggest, then we should know for certain within a few months or couple of years. That would be the major astronomical discovery of the century!

ASTRONOMY AT KING'S COLLEGE, WINDSOR

Wm. Calnen & Gail Jamieson

Ed. Note: This article has been submitted for the Burke-Gaffney Award. Other submissions must reach the Halifax Executive by 25 March for the 1979 competition.

King's College was founded by Rev. Charles Inglis (the first Bishop of Nova Scotia) in 1789. A royal charter was granted by King George III in 1802. King's campus (now King's Collegiate and Edgehill) is located on a hill on the western edge of Windsor. The remains of the observatory are located behind the school near the sports field, latitude 44.984° north, longitude 64.138° west (Bishop,1978).

Sir John Wentworth, Baronet, then Lieutenant Govenor of the province, and a member of the King's Board of Govenors, presented a number of astronomical instruments to the College in January of 1810. These first recorded astronomical instruments at the college included;

2 theodolites with tripods (both reported to be quite useless by Oram in 1872

1 Ramsden altazimuth, with telescope of 1¼ inch aperature, 4 eyepieces (diaphram wires and rusty in 1872)

Pierce (Perez) Morton, a student of Sir Ge orge Airy, received his Bachelor of Arts at the Trinity College in Cambridge, England in 1825. Dr. John Inglis, rector of Saint Paul's Church, Halifax, went to England on a business trip regarding the transfer of the College to Halifax. Pierce Morton, being strongly recommended by Bishop Inglis on his return from England, was appointed Professor of Mathematics and Natural Philosophy in November of 1825. James Cochran Esq., of the College presented funds for an ample supply of books and instruments for Morton's various lectures. It was an unexpected shock when, in April of 1826, Professor Morton suddenly disappeared and sailed back to Cambridge to continue his scientific studies. Dr. Cochran, member of the Board of Govenors, stated to the Board:

> I considered him as a young man of the highest and most incongruous talents that I ever met in my life--

> of the most honourable and disinterested principles --and of such candour and simplicity as none can conceive who were not intimately acquainted with him.

Sir George Airy, on November 27th, 1851, said the following of Pierce Morton:

> I had much correspondence about sending Morton (formerly a pupil of mine at Cambridge, a clever gentlemanly man, and high wrangler, but somewhat fighty) as magnetic assistant to the Cape Observatory.

At a convocation held on January 24th, 1827, Professor Morton presented the Govenors a valuable donation of books and mathematical instruments. Some instruments are listed below from an 1872 report by John Oram (Professor of Math.):

> 1 Ramsden's transit instrument with telescope of 1½ inch aperature, 2 eyepieces and detached spirit-level (in good order, 1872)
> 1 sextant and artificial horizon (in perfect order)
> 1 portable planetarium, W. Jones, Orrey (in good order

The total value of the instruments donated by Professor Morton was ≮500..

John Stevenson, a graduate of the College, a brilliant mathematician, and a Master of the Academy, was appointed Professor of Mathematics and Natural Philosophy in 1826. During the year1842, in Mr. Stevenson's incumbency, he was authorized to go to the United States to select telescope apparatus and other instruments to the amount of ≮150. Below is a description of one of the instruments, "one of Carey's best and largest telescopes", as described in the 1872 report by Oram.

> 1 Carey's 2½ inch aperature, achromatic telescope with 4 eyepieces, and darkglass (in good order).

Not many instruments were added to the collection After the 1810, 1827 and 1842 donations and purchases. The remainder of the instruments is listed below:

> 1 Quadrant--Jones (in good order)(perhaps from the Morton donation)
> 1 Camera Lucida, with lenses and dark glass (in perfect order)

1 solar microscope--Carey (1 double convex lens and two double concave lenses missing; remainder in good order)
1 magic lantern (lamp broken; lenses in good order)
12 astronomical slides (3 broken)
1 copper slide
1 pictorial slide
1 astronomical clock (pinion broken)
several large artificial globes (no purchase recorded)

In 1858, J.C. Cogswell presented a sum of money to the College for a solid stone pillar to support the altitude and azimuth, plus other instruments, while in use. As a result, in 1860, a fine block of hewn granite arrived at the College, which was prepared by Mr. Robert Davis, a Master Mason of Halifax.

In King's first calendar, in 1855, Rev. John M. Hensley appeared as Professor of Mathematics, Natural Philosophy and Astronomy. A professor was needed to replace Hensley, whose health had failed. Correspondence began with Prof. Anderson of Glasgow, to whom the College was already indebted for the selection of Dr. How (Professor of Chemistry and Natural History at King's).

Joseph David Everett, M.A., of the University of Glasgow, as a result of the correspondence, was appointed Professor of Mathematics, Natural Philosophy and Astronomy; he arrived in Windsor in September, 1859. Everett had an interest in Windsor, where he had a number of friends. He had previously published two papers: "Philosophy of Teaching" (1858) and "Essay on Mathematical Study" (1859) from which the following is a quote:

> In the science of astronomy, the telescope itself owes all those refinements upon which its great power depends, to mathematical investigations, which have shown the correct form for the speculum in the reflecting telescope, and the combination of lenses necessary for producing achromatism in the refracting telescope; and it is by analytical investigations of the profoundest kind that modern astronomy is able to predict the motions of the heavenly bodies with that unerring accuracy which is of such inestimable value to the modern navigator.

The professor was elected a Fellow of the Royal Society of Edinburgh during his tenure of office at King's College. In August of 1860 Everett submitted an application at a Board of Govenors' meeting, for the construction of an observatory. The govenors could not honour the application due to the lack of funds which persisted for some time.

In the fall of 1860, Everett taught his students Practical Astronomy and Spherical Trigonometry. He taught them the use of the theodolite, the sextant and the artifical globes. Everett reported at Christmas of 1861 that "...the Observatory is now in course of erection. The funds for this building are principally derived from the liberality of a few friends".

In the spring of 1863 the calendar stated:

> Astronomical and other instruments: Large sums have been expended on this department. We have some fine Astronomical Instruments, including amoung several others, Ramsden's Altazimuth, Transit, Sextant and Artificial Horizon, one of Carey's best and largest telescopes, a Planetarium, Whirling Table, Solar & Microscope, and large Globes. The revolving building erected to answer the purpose of an Observatory is found very serviceable, being well adapted for such instruments as we possess.

The whirling table had four adjuncts for showing centrifugal force (in perfect condition in the 1872 list). The spring report of 1863 also stated:

> The two instruments for observing atmospheric electricity, which were furnished last year, one of them by the liberality of Edward Binney, Esq., and the other by the Royal Society of London, have been in constant use by the Professor, who is engaged in preparing an abstract of his observations for the Royal Society.

In the same report was the following:

> The observatory is in frequent use, and the various Astronomical, Meteorological and other philosophical instruments are constantly employed and explained. Professor Everett, F.R.S.E., in compliance with a

> request from New Haven, made arrangements with a number of the students for observing the shooting stars of Nov. 13th, and for marking the observed tracks upon a chart forwarded for the purpose.

The shooting stars referred to are the Leonid meteors.

In October of 1864, Everett left Windsor to take the position of Assistant Mathematics Professor at the University of Glasgow. After Everett's departure from King's, astronomy faded out.

After his resignation, Professor Everett was succeeded by Professor McLeod. Professor Sumicharist had brought charges against the college, saying that certain pieces of scientific apparatus were damaged and neglected, for which Prof. McLeod was blamed. McLeod's stay was very short, partly due to his unwillingness to give proper attention to his department.

Professor McLeod was succeeded by Professor Hunter, of whom little is known. He left within two years. A graduate and gold medalist of Queen's College in Galway, then filled the position. It was John E. Oram, who soon raised his department to a high position of esteem in the publics' eye. Great harm was undoubtedly done by the attacks on the college by Prof. F.C. Sumichrast in 1872. He was a brilliant and ambitious man, who saw that many things needed to be reformed. He needed backing up for his schemes, but didn't receive it from students nor members of the staff. His term as a King's professor came to an end in 1874.

The following are a few of the charges brought against King's by Prof. Sumichrast:

> The Philosophical and Astronomical instruments belonging to the college, had, I found, shared the neglect which had fallen on every other collection. Most of the instruments are so damaged as to be useless, while others could only be repaired in England at very great expense.
>
> Authorities at a college and university in which such things are tolerated, not for a short time only but for a series of years? Especially when these authorities, with full knowledge of these facts,

print, publish and assert to the world that 'the revolving building erected to answer the purpose of an observatory is found very serviceable, being well adapted for the instruments have been in constant use by the Professor', when all this is not true? When the observatory is never used? What can be thought of the character of these authorities when year after year they publish the stereotyped repetition of these statements?

The observatory afterwards was converted into a metecrological station by Oram. The following are instruments used by Oram:

2 barometers with attached thermometers (Carey)
1 self-registering barometer
1 apparatus for observing atmospheric electricity
1 mountain barometer
1 wheel barometer
1 apparatus for showing pressure of the wind
1 anemometer

King's had about 60 different instruments present in the college in 1872. In 1978 two of these exist and survived the fire of 1923 which destroyed the main King's building in Windsor. Parts of the tube of the transit instrument have been recovered at the site of the observatory on the school grounds. The mountain barometer (mercury vessel broken) remains in the King's University Library in Halifax.

We wish to thank Dr. Roy Bishop and Randall Brooks for their comments and assistance during the preparation of this article.

LIBRARY NOTES

Dale Ellis has given the library something which students might find useful in preparing papers for school on astronomical topics. It's a Subject Index to Articles on Astronomy Found in Physics Today; 1948--1977. Randall Brooks has also donated Discoveries and Opinions of Galileo by Stillman Drake. If you are interested in these or any other of the Centre's books you can pick them up at any meeting. Borrowing period is ONE MONTH.

FROM the CENTRES

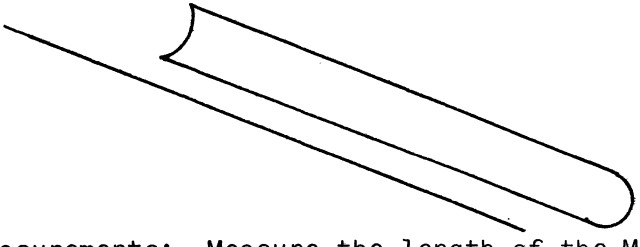
A PROJECT FOR BEGINNERS

Derek Baker
(from ORBIT, Hamilton)

Determining the Moon's orbital speed:

Here's an interesting project--one that is both simple to do yet gets you thinking a little bit. You will need the following pieces of equipment: a 35mm camera, a tripod for the camera, a cable release, a roll of medium speed black and white film, and a ruler or scale graduated in millimeters or 1/64" divisions.

Method: Select a night when the Moon is crescent or at first quarter, and when it is close to a reasonably bright star. Set the camera assembly up and poirt the camera at the Moon, making sure that the star and Moon are centered in the field of view. Focus the camera at infinity and theexposure should be set for time. Set the lens at F/3 and open the shutter for exactly one hour. When the film comes back, examine it. This is what you should see....



Measurements: Measure the length of the Moon's streak along the top and bottom twice each. Average the results. Measure at five points, the width of the Moon's streak and average. Make several measurements of the length of the star's streak and average. Note those three numbers and the fourth measurement you made, the length of the time

exposure.

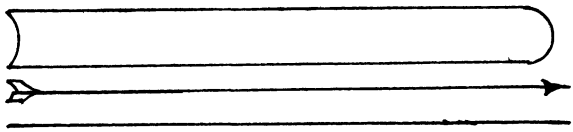
Observations: Take a look at the numbers that you have. You should note that:

a) the length of the Moon's trail is shorter than the star trail.

b) the width of the Mcon is equal to the difference in length of the Moon's trail and the length of the star's trail.

Discussion: The first thing that must be decided is why the images of the Moon and the star are trailed. As you know, the Sun slowly moves across the sky, to set in the west. The stars do exactly the same for the same reason. As the Earth rotates on its axis (much like a spinning top) we are presented an illusion that the stars are moving but this is actually just perspective. So that explains the streaked images of the Moon and Star(s). But why is one streak shorter than the other? Obviously, with the Earth doing the turning, the streaks should be the same length! It does not add up.

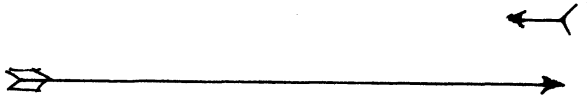
Consider this fact. The Moon also moves in an orbit around the Earth. Would that make a difference? Yes it would. If the Moon moves around the Earth, it would move across the sky. Let's examine the motions that we have discussed...
Here's the motion caused by the Earth's rotation....



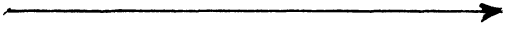
Here's the motion caused by the Moon's orbit around the Earth.....

Note that the star doesn't move because it doesn't orbit the Earth.

Because both motions occur at the same time, we will add the two lines together.....



And this is what we get.....



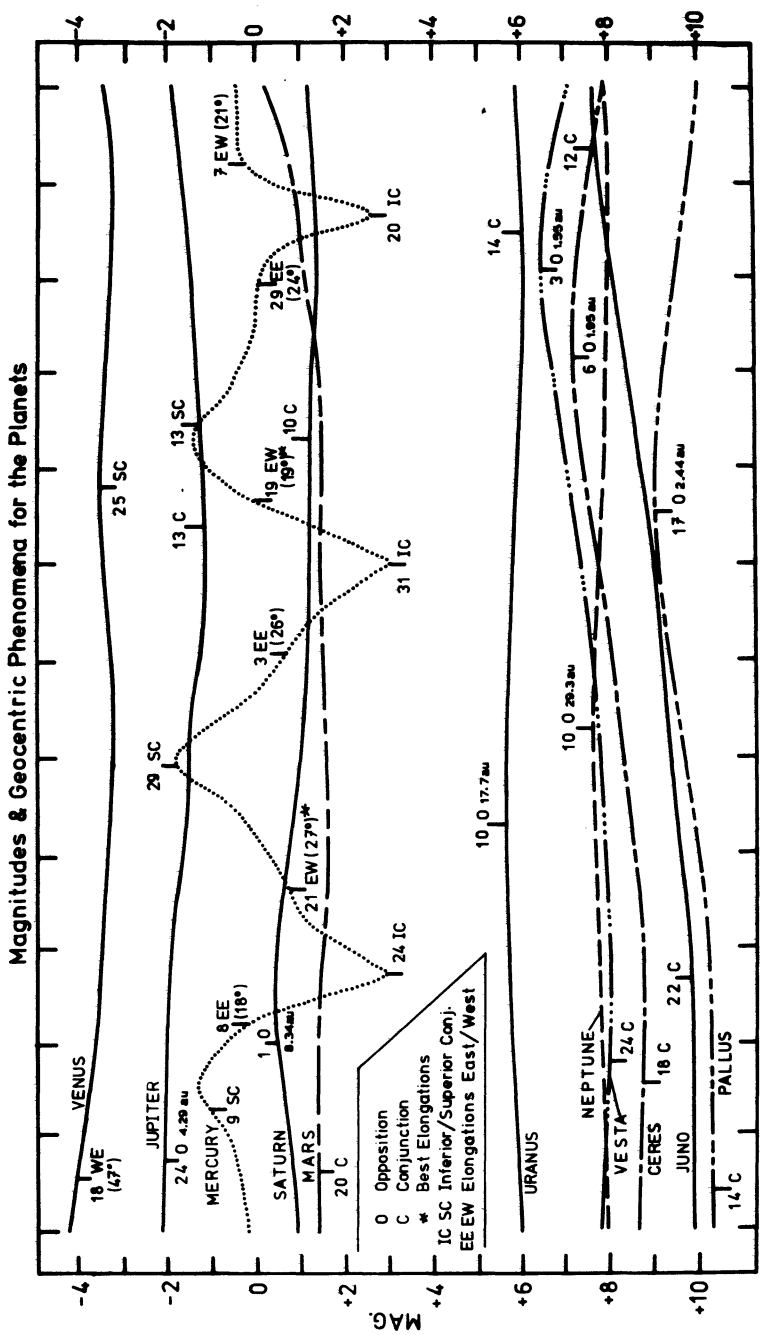
As you can see, the Moon's streak is shorter than the star's streak. That is exactly what the camera recorded. The difference between the length of the Moon's streak and the star's streak is equal to the amount the Moon has moved in its orbit. The Moon's diameter is about 3500km. Since the Moon moves one "Moon width" in your one hour exposure, because of its orbital motion, one must conclude the Moon is orbiting the Earth at about 3500km/hour!

Ed. Addendum: Since you have already gotten a photo, here's another very short experiment you can use it for. Draw a line between the cusps and measure the angle between this line and the edge of the Moon's streak. This will give you the difference in altitude of the Moon and Sun. If you were to repeat the photos monthly, you would soon be able to predict the months of eclipse occurences with a fair degree of accuracy.

EXPLANATION OF PLANETARY PHENOMENA

DIAGRAM

The diagram on the next page shows the variation in brightness of the planets and asteroids which have mags. greater than 10^m. The 'tick' marks give the dates of oppositions, conjunctions, etc. The distance of the planet is given for that date and is in astronomical units from the Sun. Early evening (first half) observing can be arranged for these objects after opposition dates.


Magnitudes & Geocentric Phenomena for the Planets
MAG.
-4
-2
0
+2
+4
+6
+8
+10
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
VENUS
18 WE (47°)
25 SC
JUPITER
24 O 4.29 au
13 C
13 SC
MERCURY
9 SC
8 EE (18°)
1 O
SATURN
0.34au
3 EE (26°)
19 EW (19°)*
10 C
7 EW (21°)
29 EE (24°)
20 IC
MARS
20 C
29 SC
21 EW (27°)*
31 IC
24 IC
10 O 17.7au
14 C
URANUS
10 O 20.3au
31 O 1.99 au
12 C
NEPTUNE
6 O 1.99 au
VESTA
24 C
CERES
18 C
22 C
17 O 2.44 au
JUNO
PALLUS
14 C
O Opposition
C Conjunction
* Best Elongations
IC SC Inferior/Superior Conj.
EE EW Elongations East/West

PROBLICOM PRIZE

Michael Boschat

How interested are you as an amateur to make $500.00? Yes, that's the going prize for the first amateur to discover a comet, nova or new asteroid.

Before you can claim this prize you must build or have use of a blink comparator. Then you must fill out a pledge card supplied by the sponsor of the contest, Mr. Ben Mayer, and in return he will assign four sections of the sky for you to photograph. I photograph my parts once a week. Only a 35 mm camera can be used with standard lens or 135 mm telephoto lens with guiding permitted. The rules are explained when you send for your card and sky areas. Send 15¢ and a self-addressed envelope to:

Mr. Ben Mayer
1940 Cotner Ave.,
Los Angeles, CA
90025, USA

At the same time, it would be a good idea to get the publication "Tonights Asteroids". It can be obtained by writing to:

Tonights Asteroids
1411 North Mangun St.
Durham, North Carolina
27701, USA

Include ¢15 for postage and a self-addressed envelope. This will show where certain asteroids are so you won't mistake them for novas. So far I've found a few on my photographs. For comet positions write:

Dr. Joseph Marcus
750 Legion Ave.
New Haven, Conn., USA

Again include 15¢ and a self-addressed envelope.

These publications will help you when you start to photograph your sections. So far there are about 10 amateurs doing this in Canada. They include two in Quebec, Jack Newton and the rest out west. Good luck.

PROCRASTINATING THROUGH HOLIDAY SKIES

Jody LeBlanc, OC

Procrastinating? Think about it--how often do you spend an evening outside"communing with the stars" during Dec.? I'm not taking a "holier than thou" stance however, because the school club has had two observing sessions all month. As I imagine most of you are doing, we're spending our time on indoor activities--most notably trying to erase our "egghead" image by challenging other clubs and groups in school (mainly our archrivals, the radio club) to such unusual sporting events as human wheelbarrow races and wild and wooly basketball games. I don't know what they've done for our image but we do have a reputation for the most unusual uniforms. For example, yours truly is X^2, while our new co-presidents are $\propto$ and π. What's an Astronomy Club doing playing basketball? (Or even worse, playing it badly!). We rationalize it as "public relations".

But I digress. Astronomy does seem to take a secondary role in December, which is rather unfortunate considering how interesting the December sky is, what with many spectacular M objects and a few planets being available at a resaonable hour, such a shame.

The only way I seem to get anything done is to try and incorporate the astronomy with whatever I'm doing. For instance, if I'm coming home from a Christmas concert with something like Ectachrome 400 in the camera, I'll go to the bother of finishing the role with astronomical pictures.

Another way to sort of trick yourself into spending more time at the telescope is to invite some interested people over for an evening (it's best to make these invitations on a mild afternoon). With me, this means elementary or Junior high students. When a dozen or so kids don't mind the cold, how can you? I've noticed that a person seems to be affected by cold in direct proportion to their age. Considering my tender years and the amount I complain, perhaps I should move to Florida!

Despite all my complaints about how the cold adversely affects the observer, this can be overcome by the right clothing and the right attitude--not necessarily in that order. A more serious problem is that of equipment failure due to the cold. A good case in point is the club's 8" Meade. During July the clock drive worked fine. It continues to track accurately in my 20°C bedroom, but distains to work outside in the cold. Since my bedroom is a poor location to observe from and July is six months away, this becomes a problem. The moral of the story? Equipment manufactured in California does not always adapt well to our winter climate, and therefore it is wise not to wait until some special event to find out which items don't work in the cold.

One last bit of advice which I mentioned to you last year and which is worth repeating. Any metal part of the telescope, mounting or accessory such as a camera that comes in contact with hands or eyes should be covered in masking tape. Not only does this prevent the extreme case of actually losing skin, but it makes those controls that much easier to work.

Please, no funny UFO reports late Christmas Eve! I'll probably be out looking northwards myself.

FINAL NOTE OF THANKS

The Centre elections are once again complete and the outgoing executive would like to thank all those who have assisted in the last year to make the Centre's activities so successful. We would especially like to thank those who allowed their names to stand for positions in the recent elections. With a couple of major activities approaching in the next year or so, we hope you will give freely of your time and expertise for the benefit of our members, the public at large and of coarse, for yourself.

As Mike Edwards mentioned at the December meeting, we all owe a great vote of thanks to Dr. Roy Bishop for his efforts on behalf of the Centre over the last few years. This is the first year in some time in which he is not directly involved with the executive. He,however, remains Chairman of the RASC Historical Committee.

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