

# NOVA

# SCIENCE



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## 1978 Halifax Centre Executive

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Saint Mary's Univ., Halifax

UP COMING MEETINGS:

Friday 21 July at the Nova Scotia Museum, Summer St.

Alan Henderson and Randall Brooks will describe some astronomical sites they have visited on their travels in Canada, the US and England. Any dedicated astronomer always seems to make B-lines to the nearest observatory of present or historical interest so if you are planning to take a trip near any of the following places, this may help you decide which are worth going a thousand kms out of the way for. Between them, they will cover Victoria's DAO, Toronto's DDO and MacLaughlin Planetarium, Tuscon's Kitt Peak, Palomar (I think), Royal Observatory Greenwich and Royal Greenwich Observatory (that's two places not just another of my typos), etc., etc., and of course Stonehenge. Perhaps someone else has some slides of astronomical sites they have visited--why not bring them along!

Saturday 12 August at RIDGE PARK WOLFVILLE for a Perseid Party. Weather permitting the Hfx. Centre is heading for darker skies and a look at the Perseid Meteor Shower. With a first quarter moon the observing will be good, especially after midnight. We have invited the Blomidon Naturalists to join us. Bring a thermos of coffee, a blanket or whatever you want to keep you warm, and come for an evening of staking of the meteor kind. The park is up the hill to the left (as you head through town towards Kentville)

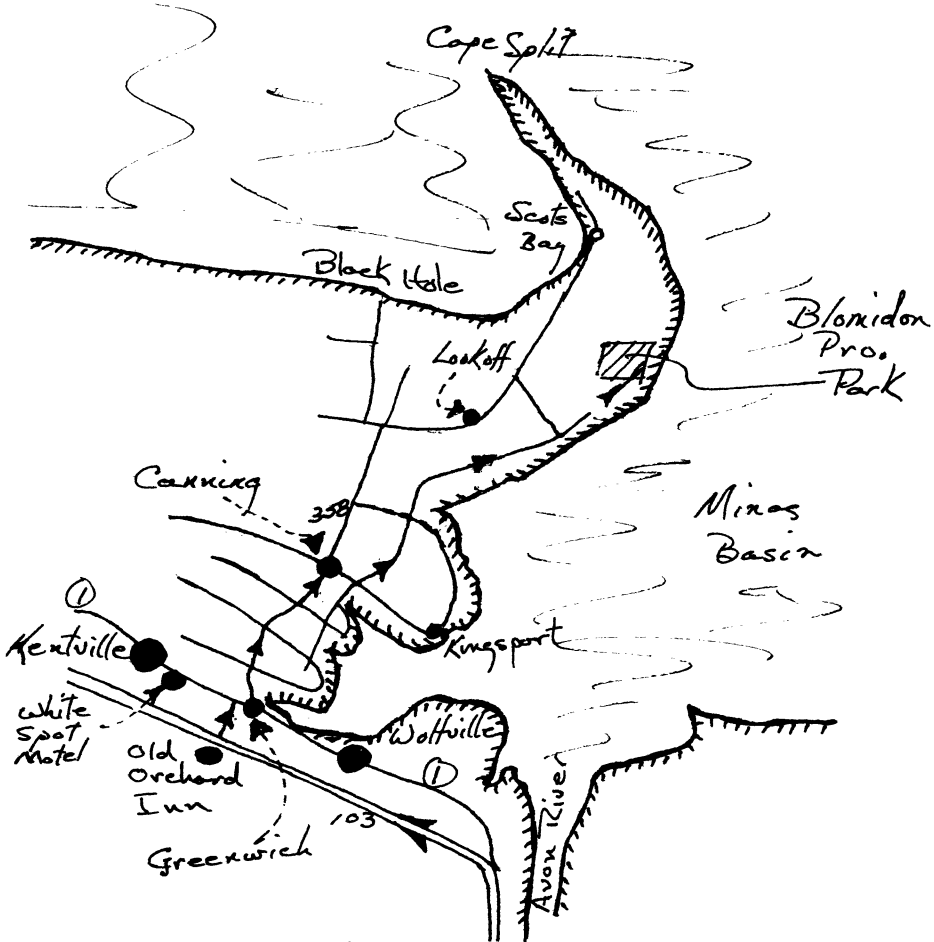
The street before you reach the University campus. 80

Friday 25 August. This is to be a tour of the Mill Village Satellite Tracking Station near Liverpool. We will leave Halifax about 2:00 to arrive there for 3:30. This is a specially arranged tour and should allow you a better opportunity to inspect the equipment than was offered last summer for the general public. Following the tour we will head for Bill Parnell's home for a look at his observatory and a picnic supper (bring your own) in his backyard. If the fog doesn't roll in at dark, we will have an observing session there or if it does we will move to a site further inland at Bill's cottage. If you require transportation call Mike Edwards (835-3615) or Randall Brooks (434-7274).

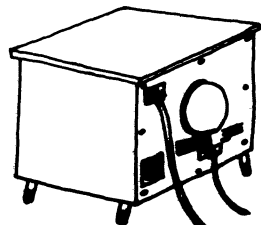
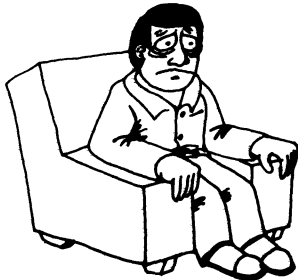
## **OBSERVING/CAMPING**

**JULY 28-30 WEEKEND JULY 28-30**

The second annual OBSERVING/CAMPING WEEKEND is again scheduled for the Blomidon Provincial Park about 15 Miles (24 km) from Wolfville. Last year we had a lot of fun and I think most of those who attended will be back. This year we are promised better observing conditions, however. When you enter the park (regular provincial park fees apply--about \$3. per night for tents) ask where the RASCers are as we will try to reserve spots in a suitable area. The events scheduled are: Fri. evening, Observing; Sat. lunch will be at Black Hole (this one you can get out of, or so it is reported) free time in the afternoon can be taken up with berry picking, shopping in metropolitan New Minas or what ever your pleasure; Observing again Sat. evening; Sun. am we will head out to Cape Split for another picnic. One of the best parts of the Weekend are the communal meals and the chatting about the late night fire as the drizzle of star light falls on your head. And of course there's still last years contest for the observers to be held. Come along and have the time of your life! For those softees needing a bed of more normal style, try the White Spot between Wolfville and Kentville. Map is found on next page for the area.



AND NOW FOR THE LIGHTER SIDE OF THE NEWS... ASTRONOMERS AT THE HALE OBSERVATORIES IN CALIFORNIA TODAY REVEALED THAT IN THREE WEEKS AN ASTEROID HALF THE SIZE OF THE MOON WILL SMASH INTO EARTH CAUSING THE TOTAL DESTRUCTION OF OUR PLANET.



1  
CANNON

## 1978 General Assembly Notes

The '78 G. A. was held during the Victoria Day weekend in May. Four members of the Halifax Center made the long trip to Edmonton: Mike Edwards, Peter Edwards, Larry Coldwell, and Roy Bishop. Several of the items listed below were reported by our G. A. delegate, Larry Coldwell, to the June meeting; however, for posterity and for those who were so unfortunate as to miss the June meeting, some of the highlights of the G. A. were (the Halifax bias is intentional):

John Percy took over from Alan Batten as president of the RASC. Dr. Batten gave an excellent talk at the banquet on May 20. Fortunately it will appear in the Journal later this year.

The Simon Newcomb Award, proposed by the Halifax Center, was adopted by the National Council. Special thanks are due to Peter Edwards who piloted it through two council meetings in Edmonton.

Dues have been raised for 1979: Student \$10, Regular \$16, Life \$200. Considering the value of the dollar, RASC membership is still a bargain.

The Moncton Group has been granted center status subject to the presentation of a constitution. Special thanks are due to Randall Brooks and Mike Edwards who helped to initiate this last fall, and to Peter Edwards who presented the proposal to Council on behalf of the Moncton group.

Due to John Percy's initiative, an RASC Appointment Calendar is planned for 1979.

Randall Brooks has been appointed to the Editing Committee for the Journal (for a

second term) and to the Membership Committee.

Yours truly has been appointed chairman of the Historical Committee, replacing Arthur Covington who has served in this capacity for four years.

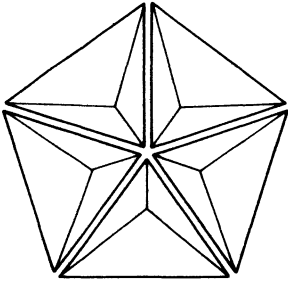
The 1979 General Assembly will be in London, Ontario on the Victoria Day weekend.

The 1980 General Assembly will be in HALIFAX ! Many of you will recall the 1975 meeting here. The 1980 meeting will be unique in that it will be the first time the RASC and the CAS (Canadian Astronomical Society) have held a combined meeting.

R. L. Bishop  
VP/Secretary

Oh, thou beautiful  
And unimaginable ether! and  
Ye multiplying masses of increased  
And still increasing lights! what are ye? what  
Is this blue wilderness of interminable  
Air, where ye roll along, as I have seen  
The leaves along the limpid streams of Eden?  
Is your course measur'd for ye? Or do ye  
Sweep on in your unbounded revelry  
Through an aerial universe of endless  
Expansion, at which my soul aches to think,  
Intoxicated with eternity?

Byron  
1788-1824



# SIMON NEWCOMB AWARD for 1979

R.L. Bishop

At the meeting of the Council of the RASC on May 21, 1978, a proposal from the Halifax Centre, the Simon Newcomb Award, was adopted. The award is named after a native of Nova Scotia, an astronomer who was the foremost man of science of his time in America.

Simon Newcomb (1835 - 1909) was born at Wallace Bridge. At age 18 he moved to Massachusetts and later to Washington D.C. where he spent his entire professional life. In 1861 President Lincoln commissioned him as Professor of Math. and Astronomy in the United States Navy. For 16 years he carried on astronomical observations at the Naval Observatory. From 1877 to 1897 he was Superintendent of the American Ephemeris and Nautical Almanac Office. Newcomb became the world authority on the orbital dynamics of the Moon and planets. Among the many honors which he received were the Gold Medal of the Royal Astronomical Society (1874), the Copley Medal of the Royal Society of London (1890), President of the American Association for the Advancement of Science, the first President of the Astronomical and Astrophysical Society of America (the present American Astronomical Society), and seventeen honorary degrees from leading universities in the United States and Europe.

The Rules of the Award are as follows:

### Topics

Awards will be given for articles relating to astronomy, astrophysics or space science. Topics should interest average to well informed amateurs and may be of current or historical interest.

### Presentation

Articles should be 1000 - 1500 words, written in proper

grammatical form and presented typewritten and double spaced. Diagrams need not be in finished form but should be complete and ready for drafting. Photographs may also be submitted and if possible original negatives should accompany the submission.

#### Eligibility

Any RASC member in good standing may submit articles. The intent of the Simon Newcomb Award is to recognize literary ability among non-professional members of the Society.

#### Submission of Entries

Articles must be received by the Awards Committee of the RASC between 1 January and 31 March. Members of Centres must first submit their entries to their Centre Executive with the Executive then choosing the entries they wish to represent their Centre. It is the responsibility of the Executive of the Centre to ensure the entries are received by the deadline above. Unattached Members will submit their entries to the Awards Committee directly.

#### Judging

Articles will be judged by the Awards Committee. Criteria shall include scientific accuracy, originality, and literary merit.

#### Presentation of the Award

The award will be presented at the General Assembly by the Halifax Centre Representative to the winner (or a representative of the winner's Centre). The award will remain in the hands of the winner's Centre for display and will be returned to the National Office by 1 April of the following year. If the winner is an unattached member, the award will be displayed at the National Office of the RASC. The award will be described at a later date once its design has been executed.

#### EDITOR'S NOTE:

The Burke-Gaffney Award will be awarded to the Halifax Centre member presenting the best article for entry in the Simon Newcomb Award. The rules for the Burke-Gaffney Award have been printed in the Jan/Feb and March/April issues of Nova Notes. Entries will be accepted at any time up to the deadline noted above, and, more than one article may be forwarded by the Hfx Exec. for the Simon Newcomb Award. Make submissions to any Exec. member.



ASSOCIATE CENTRE IN MONCTON

Don Williams  
(President)

Ed. Note: Since this article was sent in, it was decided at the Edmonton General Assembly to grant Centre status to the Moncton group. It is with great pleasure that I welcome them on behalf of the Halifax Centre to the RASC and I hope that a warm rivalry will develop between our Centres with benefit to both.

In October '77, the Moncton area had its first taste of the RASC when Mr. Edwards and Mr. Brooks came to initiate a Centre here. The topic was "Black Holes", the content excellent and the attendance very encouraging (over 40 persons attended). From that meeting, we gained a mailing list of apx. 13 persons. A new meeting date was made for November.

High hopes were held for the Nov. meeting, but, when the last person arrived, the head count was only six. Admittedly, the freezing rain had kept many away; but, it was disappointing none-the-less. Those who did attend were treated to an interesting talk about "Mirror Grinding" by Dr. Kenney. As it was felt by all that Dec. was too busy, the next meeting was scheduled for January.

January's meeting brought Dr. MacDonald with a highly informative talk concerning "Care and Handling of Optics". The attendance increased at this meeting and the question of forming a permanent club was discussed. After the meeting, the group had the opportunity to compare a 3" Questar and an 8" Celestron-P under clear skies--with surprising results!

Dr. F. Girouard was the speaker for the February meeting. His topic "Stellar Evolution", was accompanied by a slide presentation and evoked many questions from the audience. Following his presentation, an election of officers was held. The results were: D. Williams, Pres. Dr. F. Girouard, V-Pres./Sect.; and Mrs. J.D. Whiteley, Treasurer.

An observing night was planned for March but was clouded out at the last minute. Instead, a slide show depicting various nebulae with the individual members encouraged to describe their personal observations, where applicable was presented by myself. Plans are now being formulated on having either observing nights or telescope construction nights on a regular basis.

April brought with it a further increase in attendance. Four of these were new and represented the club's first attempt at reaching outside the present group through Community Interest columns of local papers. The film "To the Edge of the Universe" was shown. Those who attended also voted to apply for Centre status at the RASC convention. Dr. R. Bishop of the Halifax Centre has kindly offered to carry our request with him to Edmonton in May.

We feel that there is great potential for growth in the Moncton area. With a monthly attendance of at least a dozen people, the probability of keeping new people who attend our future meetings is high; indeed, the regular attending members now number 19 and our mailing list has grown to 28.

In conclusion, the executive in the Moncton Centre are deeply grateful for the support it has received by both Moncton and Halifax Centre members. In particular we wish to thank Mr. Randall Brooks for the interest he has shown in our group.

We meet on the third Thursday of the month and wish to extend a warm welcome to all who are able to be present.

Anyone wishing to contact the Moncton Centre may do so through the following:

Don Williams  
PO Box 358  
Salisbury, N.B.  
EOA 3EO

Dr. F.E. Girouard  
Dept. of Physics  
Univ. de Moncton  
Moncton, N.B.

# HINTS for TM's

## AMATEUR BUILT MULTI-MIRROR TELESCOPE

By Larry Coldwell

The Multi-mirror telescope (MMT) is not a new idea. It is believed that Lord Oxmantown, who later became known as Earle of Rosse, was the first person to have conceived the idea of MMT. In 1828, he built a two-piece 6" mirror of speculum metal, consisting of a central disc surrounded by a raised ring  $1\frac{1}{2}$ " wide, both with spherical curvature.

In 1932 Guido Horn d'Arturo, then director of the Univ. of Bologna, Italy, considered the idea as a means of preventing stagnation which might occur, with the peak of telescopic size reached by the newly contemplated 200" Mt. Palomar. During the 1940's and 1950's he designed, built, and put into successful use a 1.8 meter (71") mosaic mirror telescope. The mirror was composed of 61 contiguous glass tiles, all of them with identical spherical curvature. The mirror was mounted in a verticle tower and could observe  $1.3^{\circ}$  of the night sky.

Since then the other MMT's have been constructed--the pair of 22 foot reflectors at Narrabri, Australia, the 10 m. light collector built at Mount Hopkins Observatory for gamma-ray research, and the 4 m. light collector built in the 1960's at the Meudon Observatory in France for infrared studies.

Presently the Smithsonian Astrophysical Observatory is nearing completion of their new MMT at Mt. Hopkins in Arizona. This telescope consists of six-72" primary mirrors which rely on a computer for precise alignment. It is being housed in a revolving four sided observatory. Dedication of the MMT is scheduled for this autumn.

## PROCEDURE:

- 1 A supporting block 10" x 9 x 1 3/4 thick was constructed of aluminium with a central hole 1.8" in diameter.
- 2 Circular metal clamps were built to accommodate each 4 1/4" mirror blank, and could be bolted to the supporting block.
- 3 Spacers were attached to the inside of the clamps to allow for expansion and contraction of the clamps.
- 4 The four mirror blanks were then bolted in a clover-leaf fashion, this created a natural hole an inch and three quarters in diameter. A glass plug was put in the hole during grinding.
- 5 Three teflon chips were epoxied, 120° apart, on the back of each component.

## Grinding Operation

- 1 The multi-component mirror was ground using a sub-size, 8" diameter tool.
- 2 Rough grinding was speeded up by shaving the inside teflon chips, creating a crude concave configuration.
- 3 Rough grinding was done with mirror on top and bottom. An F/4.3 curve was completed in one hour.
- 4 The components were removed from the plate periodically to bevel sharp edges in an effort to avoid chipping.
- 5 Prior to fine grinding, the plates were bolted with epoxy poured around them; this helped to maintain rigidity for the duration of the fine grinding and polishing.
- 6 Fine grinding was completed in 8 hours.

## POLISHING

- 1 A full size 10" square pitch lap tool was constructed. This ensured uniform polishing, and extended the polishing duration intervals.
- 2 A sub-diameter 6" pitch lap tool was constructed for figuring and parabolizing the mirror.
- 3 The mirror was tested using a Foucault test, with a modified Couder screen.

- 4 When the correct figure was obtained and testing complete, the epoxy was chipped away, so each mirror component could be removed, cleaned and aluminized.
- 5 The components were reassembled and aligned. All uncoated glass and metal were painted flat black.

#### DISADVANTAGES

- 1 A super rigid supporting block is necessary to support the combined weight of all 4 mirror components.
- 2 Good fitting clamps are essential to create equal stress on all mirror edges.
- 3 There is a great danger of chipping the mirror along its edges, especially on the inside, where the greatest wear occurs.
- 4 Extra precautions are necessary to prevent scratches caused by loose grit in the grooves.
- 5 Forming a uniform pitch lap surface without clover-leaf depressions, was time consuming. This prolonged the polishing operation by approximately 25%, time wise.
- 6 Surface defects such as an outside and an inside turned edge are highly probable, and need attention by a localized tool.
- 7 Alignment is critical and requires adjusting screws. This system is more prone to miss alignment of components and requires more maintenance.

#### ADVANTAGES

- 1 Rough grinding time can be reduced by 65% simply by lowering the inner edges of each mirror component.
- 2 There is 100% utilization of optical surfaces and no secondary obstruction.
- 3 The MMT objective is lighter in weight per unit of aperture as compared to a conventional mirror.
- 4 There are several modes of operation possible:
  - i) rich field newtonian
  - ii) Cassegrain or Gregorian
  - iii) Binocular operation

- iv) each component can be used separately with off axis focus
- v) diagonal pairs can be used in binocular mode, producing two pairs of binoculars.
- vi) any combination of components can be used

5 Each component could be aluminized separately using existing equipment at Acadia Univ., near home.

6 MMT can increase the possible aperture size range, now confining amateur telescope makers.

7 The cost of the primary mirror is considerably less than a conventional unit of equal aperture.

In summary....it is my belief that the advantages and if diligent care is exercised, the results can be highly rewarding outweighing the disadvantages. I believe that there is the capability among our amateur telescope builders to incorporate this idea of MMT. After all, large observatories are moving in this direction, such as the Smithsonian Astrophysical Observatory, so therefore why not the amateur telescope builder?

Ed. Note: The above article comprised the notes for Larry's paper at the Edmonton General Assembly. He was kind enough to repeat it at the June meeting for those who didn't quite make it to prarieland and is repeated here for those who couldn't summerland-the museum that is.

#### CENTRE LIBRARY NEWS

D.Brooks

First, I would like to thank James Hall for donating a fascinating collection of news clips, articles etc. on the space efforts of the last 15 years. Looking through them drives home the realization that time passes quickly and it seems only yesterday that man first stepped onto the Moon. These have been bound in folders and may be borrowed from the Centre Library. If you have a kid doing a school project they may find the information valuable. Thanks again Jim! We also have a new booklet on Meteorites courtesy of R.C. Brooks recently obtained at the British Natural History Museum. Borrowers are reminded to return books after two months if at all possible.

SOLAR OBSERVING

Steven Morris

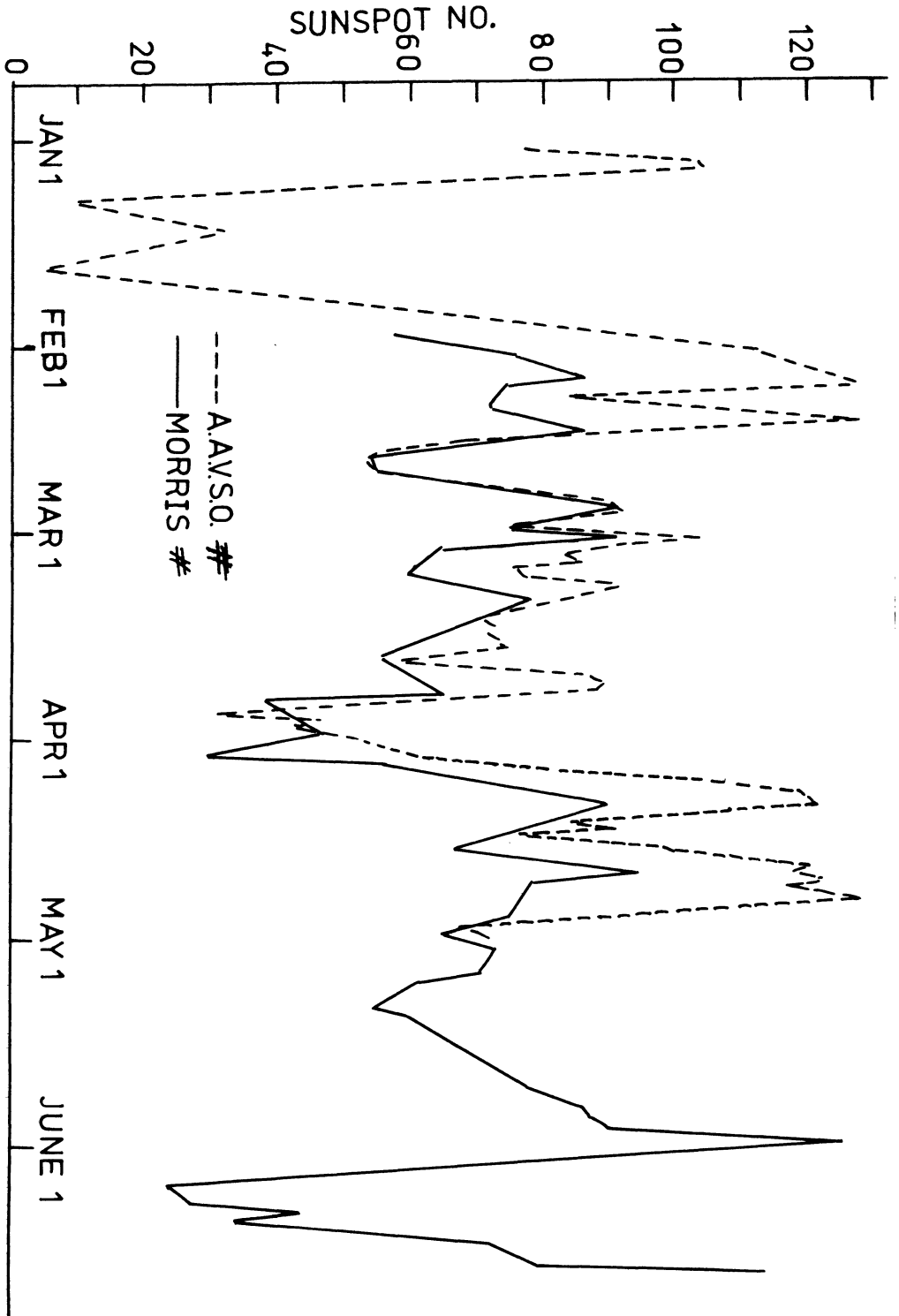
The Sun continued to show a high rate of activity during May and June, with one particularly large sunspot appearing on the limb on May 22, passing the Centre of the Sun's disc on May 27 and passing over the Sun's edge on June 2. Figure 1 shows my own sunspot numbers taken from all my observations with a 2.7" telescope, and the AAVSO sunspot numbers from recent issues of Sky and Telescope. They follow each other very well; it clearly doesn't take a large telescope to track practically all the visible spots.

I have gone through my past observations and picked out all the large impressive sunspot groups that have occurred. There have been six, and I list them below. The longitudes were taken from page 62 of the 1978 Observer's Handbook (it contains more information than you probably realize!). However, the longitudes are very rough, as each group is several degrees wide, and the accuracy of my positions is not great. I have noticed some peculiarities in these groups. For one thing, all have been in

Date of Central Passage (UT)	Longitude
Feb 11.5	34.4
Mar 7.7	75.6
Mar 13.5	358.2
Apr 7.2	32.8
May 1.7	69.3
May 27.8	84.3

the northern hemisphere of the Sun, and in general most sunspot activity, both major and minor groups, have been between  $0^{\circ}$  and  $90^{\circ}$  in longitude (if you kick the March 13 sunspot to  $360 = 0^{\circ}$ ). So one small section of the Sun is responsible for all the major activity, But it seems now that it is not simply a single long-lived sunspot group that is being observed. For example, the Feb 11 sunspot group is at longitude  $34^{\circ}$ , and exactly two solar

FIGURE 1





rotations later, on April 7, there is a sunspot group at  $32.8^{\circ}$ . This seems likely to be the same group, but where was it after only one rotation on March 11? On that date there are two major groups, one at longitude  $76^{\circ}$  and the other at  $358^{\circ}$ ! Halfway between them is longitude  $36^{\circ}$ , where the group should have been, but nothing was to be seen there. I cannot believe that a group could split apart, then reform, but I also doubt that one would fade then reappear. It was still visible on May 2, on its fourth passage across the Sun, and again on May 31. On both occasions it was smaller, but still impressive. We need a spacecraft on the far side of the Sun to keep an eye on things back there! (Haven't you heard of Vulcan, Steve--ED)

I was watching sunspots 'wayback in 1969 at the peak of the last sunspot maximum, and noticed then that one section of the Sun remained particularly active for months on end, yet I have never heard any mention of this behavior in articles on sunspots. Perhaps it is never mentioned because no-one understands it! This active region comes round again on June 27, and from Fig. 1, it can be seen that the sunspot number is rising to meet it. I have not yet seen any auroral activity, but I have heard that on May 1, 2 and 3 Toronto had the best aurorae displays in that area for years. You will notice this occurred just after the central passage of the active region on the Sun, and I do not doubt that the active region was the cause. If any other members are observing the Sun, bring your results for the summer to the Sept. meeting; it would be interesting to see how different observers see the same object.

Cont'd from page 99:

The fact is that, on the whole, there probably is little that can be done about astrology; probably we on the scientific side haven't yet come fully to realize this fact. We tend to think that, in some manner or other, a way can be discovered, if we try hard, to knock the astrology out of those who believe in it. It appears that this, like astrology itself, is mainly a delusion. It probably will take centuries, millenia, to rationalize humanity to the extent necessary to do away with astrology and equally unscientific beliefs.

Nevertheless, all protests against the aforementioned films, sent to Mr. Will Hays, Hollywood, California, should carry due weight in the immediate circumstances and perhaps help to prevent further exploitation of the gullible.

# ASTRONOMY for YOUNG RASCals

## THE RIGHT HAND RULE OF ASTRONOMY

Diane Brooks

I recently came across a simple rule for remembering the time of day that a particular phase of the Moon rises or sets. It appeared in the January/February 1978 issue of Mercury and was identified as "astronomy's right hand rule".

Those of you who associate the first and last quarter of the Moon with the Sun's position in the sky as second nature, should read no further. But if you're like me and are mystified by two-dimensional diagrams of the Earth-Moon system, with the sunlight streaming onto the page from the left to right and two circles, consisting of the Moon as seen from space and the Moon as seen from Earth, then this little rule should help translate those obscure diagrams into a practical method of visualizing the relative positions of the Sun and Moon in your sky.

The right hand rule of astronomy uses three quantities of which one can be determined if the other two are known. These quantities are:

- 1) the Sun's position in the sky, that is, the time of day
- 2) the Moon's position in the sky
- 3) the Moon's phase; that is, the Moon's position relative to the Sun.

Pretend that you are facing south. East and the rising Sun on your left; west and the setting Sun are on your right. Your zenith will represent the Sun's highest point at noon; conversely, your nadir will be midnight. NOW imagine that the thumb of your right hand is the hour hand of a clock. It can be rotated through  $360^{\circ}$

around the face of the sky. If you further pretend that your thumb is the Sun and that your forefinger is the Moon, while holding these two fingers at a  $90^\circ$  angle to each other, then the Sun and the quarter Moon can be seen to rotate around the sky together. Finally notice that when the palm of your hand is facing you, the Moon (forefinger) is to the right or east of the SUN (thumb) and is, therefore, waxing. Conversely, if the back of your hand faces you, the Moon is west of the Sun and waning. The left hand works as well for this exercise but remember that the palm must be turned away from you to indicate a waxing Moon.

If the thumb and forefinger are held together at  $0^\circ$ , the Sun and Moon travel across the sky at the same time and of course, indicate new Moon. If it were possible to stretch your fingers  $180^\circ$  apart, you could demonstrate that the full Moon rises as the Sun sets. Intermediate phases can also be visualized by making an angle larger or smaller than  $90^\circ$ . Furthermore, times of day other than sunrise, noon, sunset and midnight can be used, but obviously, the entire system only approximates the movement of the Moon during the day: exact times cannot be determined.

Let me give you two examples. Suppose that you want to know at what time the last quarter moon rises. Since the Moon is in last quarter, it is waning and, therefore, the palm of your right hand must be turned away from you. Your forefinger points toward the east since the Moon is rising. Your thumb is at right angles to your forefinger because a quarter Moon is in question. You'll notice that, in this position, your thumb is pointing toward the ground indicating that the Sun is below the horizon. Therefore, the last quarter Moon rises at midnight.

Suppose that it is 3 pm. There is a first quarter Moon in the sky, but where? Your palm faces you since the Moon is waxing. Your thumb points halfway between the zenith and the west and forms a  $90^\circ$  angle with your forefinger. As a result, the Moon must be halfway between the zenith and the east. If the Moon is at its highest point in the sky at 1 pm, what phase is it in? Can you see that it is a crescent Moon?

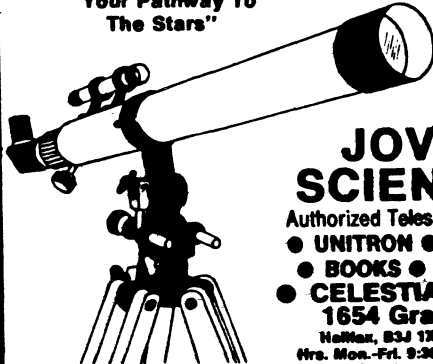
NEW TELESCOPE STORE IN HALIFAX

D.L. DuPuy

Want to buy a telescope? Like to see what you are getting before deciding? You can, now that one of our RASC members has opened a store in Halifax, selling telescopes, binoculars, Sky and Telescope and other astronomical goodies.

Jovian Scientific is located at 1654 Granville, and is run by Barry Mouzar. He is stocking the Celestron line, with a C8, a C5, and the all new C90 on display. He also has Unitrons, in case you prefer the classic refractor. The Celestron 90 is a most impressive Maksutov f/11 instrument. It's available with or without the slow motion controls, and the short tube really minimizes vibrations, including wind sensitivity. Need a Celestron catalogue? Barry has these too! And I should also mention books and astronomical posters. All in all, a good selection of instruments and observing aids for people who appreciate a look at our little corner of the universe.

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The Stars"**



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## WHAT TO DO ABOUT ASTROLOGY

By A.G.I. in "Our Point of View" in *Scientific American*

**A**STRONOMICAL circles—particularly the seventy local groups and clubs of amateur astronomers on this continent—have recently been greatly exercised because a Hollywood motion picture producer is preparing to release a series of twelve films on astrology. They are fighting it.

This, we believe, will be the first large-scale incursion of astrology into the motion picture audience. Astrology's following already is immense, running, we are told, into the millions.

We have added our protests to those already made, simply writing to Mr. Will Hays, motion picture "czar" at Hollywood, that we wish to go on record as stating that scientists stand solidly against the pseudo-science of astrology—which, of course, is a fact.

It would serve little purpose here to try to refute astrology, since we can assume that our readers already oppose it—though each time we have mentioned it in this magazine without much respect, we have, it is true, received letters of protest, but never more than a trifling few. The question is, rather, what can *Scientific American* readers do to fight astrology in other circles where it is accepted?

For years we have given this matter much thought, but no real answer has appeared. It is easy to refute astrology—for those who already regard it as a pseudo-science; but it is not easy to refute it for those who want to believe in it. In fact we feel that, in the main, no direct attack on astrology is likely at all to have more than a limited effect until the general standard of education has been raised—a long, slow process. When that has been done there will automatically be little need to refute astrology.

Two notable attempts in the direction of refutation have been made in recent years, one a rather intellectual paper by Dr. Bart J. Bok and Margaret W. Mayall, astronomers at the Harvard College Observatory, and the other a rather practical if not hard-boiled approach made a year or so ago by our contemporary, *Good Housekeeping*, which probably reaches far more who believe in astrology than does *Scientific American*. *Good Housekeeping* put the astrologers in a truly awful predicament—and then did nothing to save their faces. It offered to place four astrologers, selected by other astrologers, in separate rooms where they were each to cast the horoscopes of two persons to be selected by the editors. It also agreed in advance to publish the findings, regardless of their outcome. That challenge was not accepted—proving that the astrologers are not fools at all, whatever else they may be.

It is probably not correct, however, and it certainly is not good psychology, if one wishes to shake their beliefs, to label the astrologers fakes and frauds, as some have. Individual frauds there undoubtedly have been, and are, within astrological circles, but in the main the astrologers are honest people who sincerely believe what they believe, and are a bit hurt, in fact, because the scientists treat them somewhat roughly. They are also puzzled because science seems so stupidly blind to the obvious truths they claim to possess. Bigotry and intolerance, this attitude from our side appears to them—and, to tell the truth, some of us really have been bigoted and perhaps intolerant toward astrology. We need to cultivate more patience. Most of these people who accept astrology have had no background in the scientific world, and therefore have no way of seeing the difference between science and pseudo-science; to them, each looks about alike. Moreover, the fact is, and we should admit it, that, even within our world of science, there is not and never has been any way to distinguish positively between truth and error—all such things must be considered as relative.

If one merely wishes to have some fun, and to start a believer in astrology off on an hour's sputtering and raving, just call astrology a fraud and a fake. But if the desire is genuinely to alter his state of mind, that sort of approach is only certain to fix it. Arguing with the typical astrologer is not likely to prove very satisfying. You find that his arguments are not so much rational as emotional. And he is shifty—though we do not necessarily mean dishonest. Once, when a group of amateur astronomers in one of our larger cities was preparing to put on a public debate for and against astrology, we warned its officials that they would not get very far. They wrote afterward thus: "Reasoning with the astrologers proved to be just like punching a feather pillow—you sock it in one place and it bobs up in another. You had them figured out to a tee, and everything you promised for us came true. They haggled about definitions. So we got nowhere."

Haggled about definitions—here is the chief rub, but it's something which few except trained logicians understand as sharply as they should. In any argument, of any kind, unless the two sides accept *at least the premises in common*, there has been no real meeting of minds—no real argument. The astrologers argue from a different set of premises than do the astronomers. Probably there is, therefore, little that can be done about it, until we succeed in reaching the general standard of education mentioned a few paragraphs back.

## Minutes of the April & May Meetings

The April 21st meeting took the form of a center dinner at the Brass Rail restaurant at the Halifax Shopping Center. This was the first (annual ?) Center Dinner and proved to be very successful. Good attendance, good food one very efficient waiter and a varied slide show combined to make an enjoyable evening.

The May meeting was held at the Museum one week earlier than usual (May 12) so as not to conflict with the General Assembly in Edmonton. The executive met as usual at 7 pm with the main meeting commencing at 8. Peter Edwards reported on plans for the Assembly. The main speaker was our efficient, enthusiast editor, Randall Brooks. His topic: Beta Lyrae, one of the most interesting double stars in the sky. Randall described the observational data and the models that have been devised for  $\beta$  Lyrae. The meeting closed over refreshments and conversation. One announcement of particular note at the May meeting was that of the existence of Jovian Scientific on Granville Street, next to the Book Room. Is this the first outlet for astronomical equipment in the Maritimes ?

R. L. Bishop  
VP/Secretary

See yonder fire! It is the Moon  
Slow rising o'er the eastern hill.  
It glimmers on the forest tips,  
And through the dewy foliage drips  
In little rivulets of light,  
And makes the heart in love with night.

H. W. Longfellow

THE ASTRONOMERS OF PLANET X

Steven Morris

"I'm amazed", stated Sargon, "that you insist on observing at the Cove."

But his companion, Larnu, only smiled. The beach they were on was a perfectly flat plane of quartz. If one bothered to look down into it, one could see for many feet by the light of the two suns, before sight failed. Upwellings of green and gold were there, with cliffs, yellow streams and delicate veils of blue, formed from impurities in the rock when the land had formed uncounted years ago. The rock had cooled and all was now frozen in place, forever. Behind them, sheer cliffs of marble glowed like living hands in the failing light. Sargon had his back to them, pouring over his star charts. "Do you think we'll see anything tonight?" he inquired.

Larnu looked over the waters at the sky. Night slowly deepened, and the usual battery of comets became visible. Many were particularly large, with bright tails fanning in great archs across the sky. Several meteor showers were in full force, lighting the sky with their uncountable numbers. The east was ablaze with curtains of aurorae. Larnu surveyed it all, then said sadly, "No, I don't think we'll see any stars tonight. There's just too much junk around."

Disappointed, they went home.

\* \* \* \* \*

Sargon did not really want to observe the next evening as it seemed particularly warm out, but Larnu insisted. At the Cove, they waited patiently for the suns to set. The blue dwarf could be seen racing across the surface of the giant, raising a thin bridge of glowing gas. The giant shone a dull red just above the horizon, its surface covered with a delicate web of sunspots. It



passed unnoticed, however; Sargon spent the time making small adjustments to the telescopes, while Larnu scanned the shoreline to the south.

"What are you looking for, Larnu,?" called out Sargon. "Nothing will be out for a while yet". In answer, Larnu hissed and said quietly, "Look over there".

Startled, Sargon did so, and saw a peculiar greyish mass suspended over the southern shore far away. It was enormous and grew even as he watched, seeming to feed off the water below. "What is it?" he asked alarmed.

"They're just particles of water", Larnu was talking excitedly now. "The water evaporates--it's always so warm around here--and rises high into the air. You never see it because the air's always the same temperature up there as down here. But it's been so hot today that there's a temperature difference. The hotter air hits the cooler air, and the water condenses. That's why I wanted to come here tonight. If they'd form anywhere, they'd form here, and they'd form now." The two astronomers stood for a while, watching as the night drew on. The object now filled all the southern sky, formless and featureless, as if one's eyesight were blanked out in that direction.

Sargon said quietly, "They're very rare, but they have a name. They're called clouds." Silence, and then he added, "Well Sargon, what do you think?"

Sargon said nothing, and then, "They're beautiful," he whispered.

SMELTERING THROUGH SUMMER SKIES

Astronomy for the fun of it! Well, I hope so anyway! The teeming rain outside as I write this notwithstanding--we OC's are supposed to be optimistic, right?)

After a long hot July day, some late evening "dilatante" astronomy can be surprisingly relaxing. For a few nights this summer, don't be deadly serious about your astronomy. Don't try and justify whatever you fritter away your clear skies doing ; your enjoyment is justification enough. For once, leave the close doubles, asteroids and hard-to-find Messier objects alone. Enjoy a look at the 'cliches' like M31 and M13. Have a look at such almost embarrassingly easy doubles such as Alberio and Alcor-Mizar or even just a good, long, close look at the Moon. Don't draw it, don't photograph it, don't even worry about which craters are which! Put on a ridiculously high power eyepiece and sweep up and down the terminator, (first quarter is particularly good for this sort of thing) enjoying the spectacular, other-worldly view.

Once you get into the spirit of the thing, you can attempt even more useless things. For instance, I regularly try high resolution (well, relatively high resolution) photography of the Moon--with a department store 60mm and my \$65.00 camera. Crazy, right? How's this for wasting clear skies: disc drawings of Jupiter done with the same 60mm. Now I suppose I could justify both of these activities by saying I'm learning photographic technique and training my eye for planetary viewing, but they're not the real reasons. I do things that I've mentioned because I just plain enjoy them! In fact, you can dream up some really wild things to do. (I'm tempted to say 'the sky's the limit, but several friends who know all-too-well my penchant for bad puns would kill me!) How about building a model of Galileo's telescope "to see what he could see"? Talk about short eye relief! Or even more primitive, and useless, try a naked eye map of the Moon. And at least once this summer, why not spend the night under the stars? Bring a transistor, binoculars and some of your favorite beverage. All you astronomers who "do it" for pure fun, come out of the closet!

Jody LeBlanc, OC

URSA MAJOR

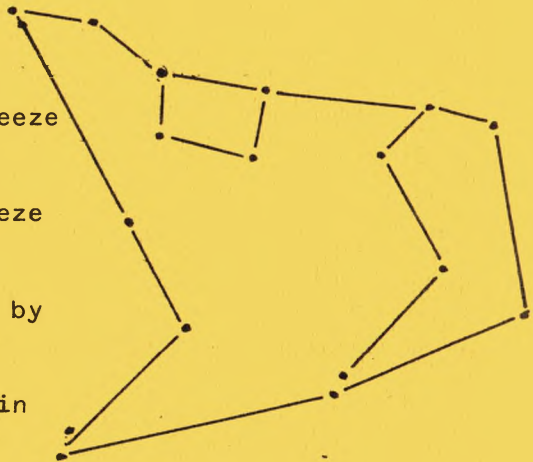
In northern night skies  
 a rambling big bear  
 moves on forever  
 going 'who-knows-where

Indians say Great Bear  
 searches for a place  
 to lie down and rest  
 till Spring warms his face

Along his broad back  
 two stars point toward  
 Polaris, the pole  
 star guiding nor'ward

Nose always lifted  
 to the slightest breeze  
 wary and cautious  
 escape fight or freeze

Some know this bear by  
 a more common name  
 Big Dippers' first in  
 this skylight game



Lynn Dixon

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