NOVA NOTES

BI-MONTHLY JOURNAL OF THE HALIFAX CENTRE

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1979 Halifax Executive

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UP COMING MEETINGS:

Friday 21 Sept. 1979 at the Nova Scotia Museum, Summer St.

7:00 - 8:00 pm A special business meeting to discuss the constitution which has been drawn up as the first step to incorporation under the NS Society's Act. We are just starting a project to build an observatory and to carry it out we must be incorporated. If you are interested in this important step in the history of the Halifax Centre and if you want to know what it entails, please try to attend. We would like your input now.

8:00 pm The regular part of the meeting is all about building you own telescope--at least the mechanical parts which is a change from the more often presented mirror grinding demonstration. The mirror may be perfectly formed but if the frame and mount are not up to par, then you've wasted all that effort. If you have a commercially made instrument, you can also profit from this topic as the speakers will show how to "stiffen" up the mechanical parts. the speakers will be Russell Heffler, John MacNeil and Mike Edwards. But if you have some words of wisdom on the topic, I'm sure you'll have a chance too!

October Meeting: Astronomical Seeing: Causes, CURES & Effects.

3rd ANNUAL CAMPING/OBSERVING WEEKEND

Glen Graham

The Camping/Observing Weekend this year was an unqualified success. Clear weather blessed us for the entire weekend and the skies so beautifully clear, dark and transparent, they had to have been seen to be believed. The fact that Kejimkujik was filled to capacity before any of us arrived turned out to be a blessing in disguise. The alternate park which had been chosen beforehand (due to the quick thinking of our President and Observing Chairman) turned out to be a much better observing site. Friday afternoon and evening was mainly a confused mixture of getting settled, socalizing and swatting flies. Friday night was marvelous. There were several telescopes -one Celestron 8, one homemade Newtonian 6 inch and a Celestron 90 among others. I think everyone saw at least one new Messier object he hadn't seen before and I personally saw a great many. The seeing was quite spectacular.

Bill Calnen and Steven Morris showed up quite by accident around midnight in Gail Jamieson's Vega after having searched Keji for the rest of us; and having been given the boot there, came to Maple Grove Park where the rest of us just happened to be. Around one in the morning, everyone in our group was in for the night trying to get some sleep to no avail because of the blaring eight track half way across the campsite in the hands of some drunken idiots. About 3 o'clock our OC courageously and very peevishly went down and told them to be quite. (Brave boy--Ed.)

Saturday morning arrived only too soon! After breakfast most everyone went down the road to Keji to enjoy the facilities, such as swimming, canoeing, hiking and a decent though over priced, canteen, all of which were unfortunately missing at Maple Grove Campground.

Saturday evening saw the arrival of several more members so somebody decided to work on the Centre's observing song. The first couple of lines run as follows I's the bye who builds the scope and I's the bye who grinds her..."

From there it gets rather hazy. We were led in our singsong by the great baritone Steve Morris. When the telescopes started appearing late that evening, there was a bit of confusion. There, side by side, were two identical C 8's and the owners with identical coats, pants and shoes. It was known that one of them was Michael Edwards and one was Dale Ellis, but who was who?

After another productive and entertaining night of observing, in which I managed to view both Uranus and Neptune (either of which I would be very hard pressed to tell from just another star) and in which four more telescopes joined the scene. Michael Edwards prepared to leave--alas it seemed something was wrong with his exhaust system. Yes that was his muffler trailing along under the car. After much sweat and many hours of trying to tie the muffler up, he finally left the park at about 3am without a muffler. Many lights popped on in the trailers as with a deep throated roar he quickly departed the vicinity.

The next morning I think the earliest riser among the observers group was apx. 10:30 am. After brunch an impromptu game of softball was played and then it was time to "Auf Wiedersehen" until next year.

P.S. Thankfully no one got lost this year!

Minutes of the August Meeting

Members of the Halifax Centre were treated to a tour of the weather office in Bedford Towers, during the regular monthly meeting on the seventeenth.

Mr. Ken MacDonald gave an introductory talk on the purpose and function of the weather office, and the equipment used to fill the roles of collecting, analysing and distributing data in the task of weather forecasting. His informative discussion was supplemented by slides, numerous photographs of natural and computer enhanced satellite views of weather patterns, and a display of a radiosonde, a small, non-reusable device to measure the pressure and

temperature of the upper atmosphere.

After the preliminary discussion, Mr. MacDonald took the spectators upstairs to the offices where the business of weather analysis takes place. Here the group was divided into two sections, and Mr. Mike Datsun assisted in the tour of the computer room, where weather maps are created automatically; the sections where specialized forecasts are prepared for public, marine, agricultural and aviational consumption; and the new radio station from which continuous and accurate forecasts will be available. It was revealed that weather reports heard on the radio are frequently abbreviated beyond recognition, and participants were assured that telephone inquiries about the correct forecast are always welcome.

The group broke up about 10:30, after a very interesting and comprehensive two and one-half hour tour.

Diane Brooks
VP/Secretary

MEMBERSHIP RENEWAL TIME

It's that time of the year again when you want to renew your RASC MEMBERSHIP! Again we will be presenting what we hope will be an interesting program of events, lectures, etc. We are planning an astrophotography day some Saturday in November, we will be hosting the General Assembly in June which will be the first joint meeting between the Canadian Ast, Soc. and the RASC, and perhaps most importantly we will be continuing our first steps to acquire a Centre observatory. And of course there will be the usual observing sessions, Camping/Observing weekend and Member's Nights.
MAKE YOUR CHEQUE PAYABLE TO: HALIFAX CENTRE, RASC and SEND IT TO: RASC Treasurer, c/o 1747 Summer St, Halifax, N.S., B3H 3A6

FEES: life $200.
regular $16.
student $10.

THE SKY IS FALLING AGAIN...?

Mike Edwards

One day in early July this summer I received a call regarding a first hand observation of an extremely bright meteor. The caller was Mr. Vince Beck of Dartmouth.

At approximately twenty minutes past ten on the evening in question Mr. Beck happened to stroll outside. Upon gazing towards the heavens he saw one of the brightest fireballs he had ever seen. His estimate was that the fireball was of magnitude -14 or-15.It crossed the sky very fast. It passed through Cygnus from north to east at an altitude of approximately 45 to 60 degrees, with an azimuth of 20 to 30 degrees from north. About six minutes later he heard a sonic boom. Mr. Beck's observation has a high degree of crediblity as he has more experience in the field of meteor sightings than most of us. He had spent three years at the DAO in this field.

This was the meteor which grabbed front page coverage in the Mail Star. The headline the next day read "Meteor lights up sky over province" According to the paper "A large fiery ball believed to have been a meteor lit up the skies over a most half of Nova Scotia Tuesday night and finally exploded in a shower of debris."

The weather forecaster at CFB Greenwood, Gary Kierstead,estimated the weight of the meteor as much as half a ton.

Recall in early July the most known celestial event wihch was predicted,and re-predicted was the return to earth of Skylab. Most who saw this meteor must have wondered if this light was the ill fated Skylab, which fell about one week later.

This was not the first bright meteor to pass over the sky of our province by the sea. A rather lengthly article appeared in a mid summer issue of the Mail Star in approximately 1935. This article,headlined "Flaming Ball of Fire Sweeps Across Sky and Plunges into Ocean off N.S. Coast", described another bright meteor which happened our way. Some of the article appeared as follows.

"A gigantic meteorite, appearing nearly twice as bright as the full moon and composed of thousands of tons of substance flashed across the skies over N.S. last night and seemingly plunged into the cold rolling water of the North Atlantic Ocean, a few hundred miles off shore.

For four seconds at 11:20 pm the tremendous white hot ball of fire swept from NW to SE. According to observors it had a steel blue tail behind it.

In Halifax observers saw the awesome ball of fire end its startling orbit to the tune of screeming women in a briliant flash of multi colored streams of light.

At Sydney, C.B., residents saw the blue meteorite flash across the sky for four seconds but no explosive aftermath was reported,as in Halifax.

Mrs. Harold S. King, wife of H.S. King, a professor at Dalhousie University, an astronomer in his own right, told the Herald that undoubtily the phenomenon was a hugh meteorite composed of thousands of tons of material which had probably broken away from some comet,spun through space around the sun until it was attracted by earth's garvity and atmosphere.

White-Hot Mass

Speeding through the resistance of atmosphere,caused by flight, would turn it white hot, the blue tail showing the presence of a metal substance like iron. Few meteors have fallen in populated areas, few have been preserved in museums, Mrs. King added that the meteor of size as was reported by observors would be a great source of information to scientists, astronomers, and physicists. She was unable from descriptions to give an actual size of the meteor due to the fact that it would shrink due to burning material in gaseous flames.

Russell Pickerm, 28 Lady Hammond Rd.,saw the body flash across the sky (blue light) before it struck the water. A briliant flash replaced the intense

glow and tendrills of lights of many colors flashed upwards from the horizon to the south-east....."

This article continues for some length. It lists people who saw the rear celestial event and some of the expexiences when the event was seen. Further on in the article the date associated with observations of the event made in Sydney was August 9th. As this article was found in an old scrapbook the actual year is not known. (The date was not attached to the clipping, but judging by the other articles a reasonable year would be 1935.)

One section must be included for fear of being barred form BOG.

"Residents of Bedford saw the briliant light and blue trail of light flashing over Halifax, 10 miles away. The comet seemed to disappear well to the south east. No explosion was noted."

Should you like to see this article you might search the Provincial Archives for the newspaper in question. My copy of the article lost some effectiveness by way of my shorthand when I copied it a number of years ago.

One other meteor we of the Halifax Centre will recall is that which passed over Halifax on the evening of one of our observing sessions at the N.S. Museum, following a meeting about two years ago. This was very bright and moved relatively sloely. In this case we also heard no explosion as we were all too excited and noisy in telling each other where to look. However we did hear that it was seen in Musquodoboit.

Then there was the story of the great meteor fall at Karney Lake about three years ago during the Christmas season. The end result of that caper was the lady who saw some christmas-tree "like" object fall to earth felt that the little she had to drink at the party earlier that evening had had no effect....

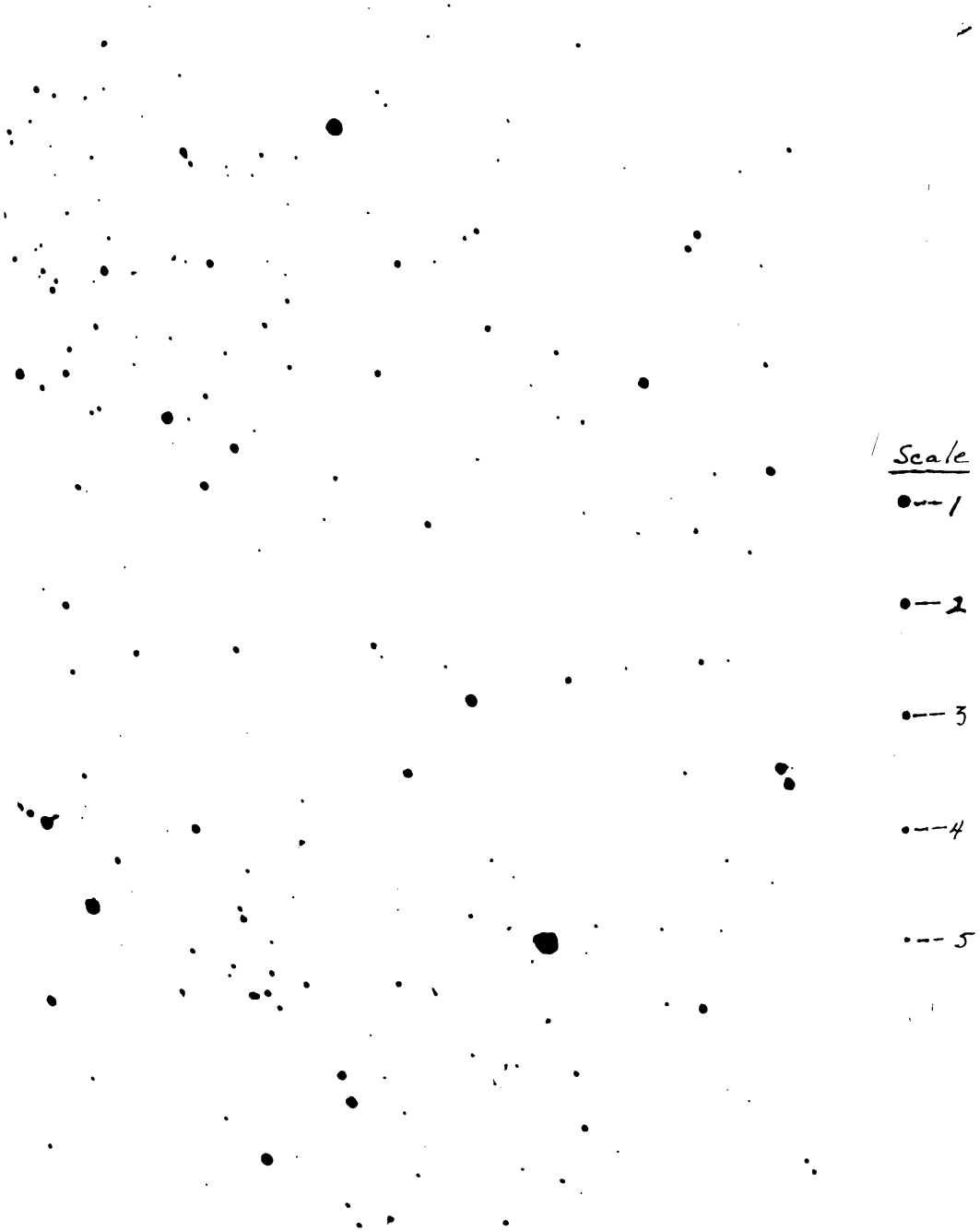
So you can see that we do see some bright meteors from time to time. Keep watching the sky for the next one ... it could come at any time, but you can be sure that it is not Skylab.

ASTRONOMY FOR YOUNG RASCals

Dark Nebulae

The observing sessions of the Camping/Observing Weekend reminded me of that class of object we call dark nebulae. In the dark of the country skies, the rift in Cygnus--that band which interrupts the progress of the Milky Way across the sky--stood out magnificently. Wm Herschel was the first to investigate telescopically the distribution of stars by what he termed "gageing". Star gageing as he carried it out was the counting of stars within certain magnitude ranges (perhaps mag. 2-3.5) within the field of view of his telescope at different points on the sky. He did this to increasingly faint magnitudes using his 10 foot, 20 foot and finally his giant 40 foot telescopes. He of course found the distribution uneven regardless of the magnitude range investigated and he also noticed that the number of stars one should expect within a given range fell short. From the 1780's until he died he contemplated these and other observations in an attempt to decipher the structure of the cosmos.

An example of a dark nebula that virtually all of you are familiar with is the Horsehead Nebula in Orion. Such dark nebulae are found predominantly along the plane of the Milky Way and make their presence known by dimming the light of more distant stars. They rarely have bright stars nearby to illuminate the dust particles. Typically they contain 50 or more solar masses of matter and are 10 parsecs in diameter. Many are relatively nearby--300 to 500 light years--with some as distant as 5,000 light years. Except for a few examples, they are quite irregular in shape. The two photos on the next pages are "obscured" and "unobscured" fields less than 2^{o} apart in Cepheus and will be the subject of study. They have been copied from Vehrenberg's Atlas Stellarum North. The scale has been magnified several times to facilitate the counting of the stars. The original images and the methods of reproduction are not ideal but should allow us to see the desired effects.


Scale
1
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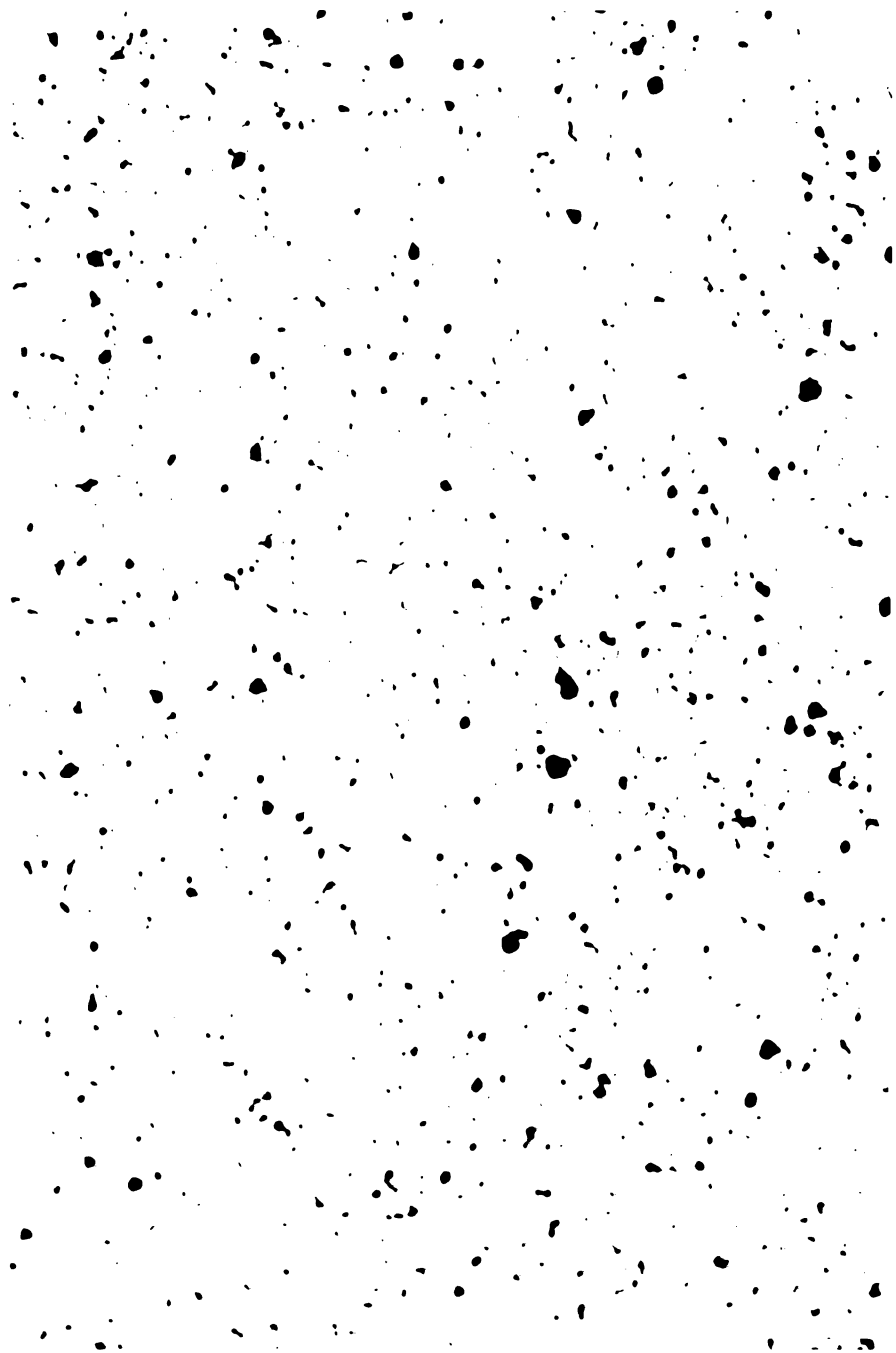


To facilitate the star 'gageing' divide each photo into a number of strips. When counting, do one strip at a time recording the number of stars in each range. The ranges are indicated by the scale between the photos and have no relation to magnitude scales. When measuring, count rank 1 stars as all those larger than the dot given and marked 1. Rank 2 stars are all those larger than dot 2 but smaller than dot 1, and so on. A magnifier would be useful for this. To obtain a satisfactory sample you will have to measure virtually all s rs on both photos. In the reproduction care has been taken to ensure that both photos are the same size in square degrees and that they reach the same magnitude limit. It would be helpful to make a trial run in the counting before recording the data. Try to reach even the faintest stars. Record the data as:

Brightness	1	2	3	4	5
Strip					
1					
2					
3					
etc.					
Total	...	...	...	...	...

Repeat for the other field. Plot the numbers in each brightness rank and draw a curve through the points smoothly if necessary. Can you draw any conclusions yet? Now for each brightness rank calculate:

$$V_1 = \frac{\text{No. stars (obscured)}}{\text{No. stars (unobscured)}}$$

$$V_2 = \text{.... etc.}$$

You now require the following table of m vs. log A(m)

m	log A	m	log A	m	log A
3.5	8.22	6.5	9.35	9.5	0.673
4.0	8.45	7.0	9.57	10.0	0.889
4.5	8.67	7.5	9.79	10.5	1.10
5.0	8.90	8.0	0.016	11.0	1.31
5.5	9.12	8.5	0.236	11.5	1.53
6.0	9.13	9.0	0.455	12.0	1.73

It is preferable to use $\bar{A}(m)$ as an average over the whole sky at the same galactic latitude which in our case is nearly 0^{o}. Next make a plot of log $\bar{A}$ vs m as given in the table. From your V_1, V_2 ... (observed) determine your log $\bar{A}'$ and plot on the graph as well. This is now termed the Wolf Diagram. From the plots of log $\bar{A}$ and log $\bar{A}'$ can you find at what magnitude the dark nebula starts to affect the brightness of the stars or does it appear to affect all stars in the region? If the latter is the case the nebula is very near the Sun. If it is further away what formula would you use to find the distance and what is the distance?

There are a number of statistical factors which could affect results. A professional astronomer studying the Cepheus region would have to investigate each of these carefully before drawing any conclusions. However, this relatively simple exercise can show you the basic steps. Some of the problems one might encounter are: the unobscured region was not completely 'clear'; there may be two clouds in line in the obscured area; something may have triggered a round of star formation within the nebula; too few stars may have been counted or the number of stars may fluctuate considerably from area to area particularly for the less numerous bright stars, etc.

NOMINATIONS FOR THE 1980 EXEC

Not only is it time to pay your annual RASC dues, but it is also time to consider the nominations for the elections to be held in November. The present Executive is looking for a few new faces to help run the Centre. All positions are fair game this year, so if you want to get in on this powerful machine and the direction it takes over the next few years, then here's your chance! We hope to have the slate of nominees complete by the beginning of the October meeting so if you would be willing to put in a couple of extra hours a month on Centre activities, please phone or drop a note to the President or any other Exec member. If you wish to nominate anyone else drop a note to Mike as well.

Pioneer Near Saturn

The Pioneer spacecraft which photographed and studied Jupiter in 1975 has almost completed its 1½ million mile journey to Saturn and is scheduled to approach the ringed-planet within 13,300 miles on Sept. 1 (11:00 am PDT). At present(mid-August) it is travelling at 20,000 mph but will accelerate to over 70,900 mph. One of the 11 instruments has already begun ultraviolet observations of Saturn and the others will begin as it gets closer. Two other experiments use the spacecraft and its radio as its equipment, these being designed to study the properties of the rings. The total scientific package weighs 300 kg.

The Pioneer spacecraft has recovered to some extent from its encounter with Jupiter when its Asteroid-Meteor detector ceased to function as did the solar wind instrument. The later, however, was rejuvenated in April 1978 and is ready for Saturn. Between encounters with the two largest satellites of the Sun, Pioneer flew about a million miles above the plane of the Solar System to study the magnetic field of the Sun. It turns out not to be as complicated as was thought and in many respects is very similar to the Earth's, ie. a north-pole, south-pole configuration and not the complex pattern of sectors postulated.

Pioneer has begun to experience the tremendous gravity of Saturn. It has already taken more than a dozen photos and will take about 100-most of which will have higher resolution than any taken by Earth-bound telescopes. From 26 August the photos will equal those taken from Earth, on the 30th twice as good and on the 1st of Sept. 20 times the resolution of present photos. The most critical time in the mission will occur on 1 Sept. 9:01 am PDT as the Pioneer crosses the plane of the rings at 70,000 miles above the planet's surface. At this time it will be travelling at 53,000 miles per hour and pass through the rings' plane in a few seconds. Being outside the visible rings, it is hoped that no unseen debris will damage the equipment. Failing a catastrophe, the Pioneer will pass beneath the rings taking measurements to determine its structure. It will pass the rings on the outward journey

in the afternoon of the same day. The next day (Sept. 2) will see Pioneer in the vicinity of Titan and this encounter may yield the most interesting of the photos. Titan, you will remember, is the largest moon in the Solar System and is larger than Mercury. It is expected that Pioneer will be in position to view 9 of the 10 moons. As Pioneer leaves the Solar System it will be travelling roughly in the direction in which the Solar System itself is moving in the galaxy, ie. towards Vega.

The Following are the objectives of the mission.

1) Show whether or not Saturn has a magnetic field and radiation belts.

2) Determine Saturn's interior structure, including the presence of liquid metallic hydrogen, a non-Earth material.

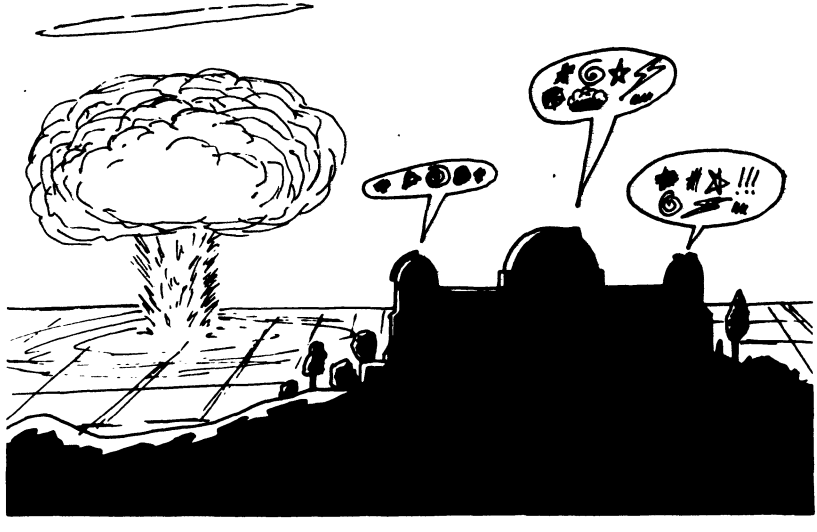
3) Determine atmospheric temperature, density, structure and composition as well as for the ionosphere.

4) Find the strength of Saturn's internal heat source.

5) Map the distribution of Saturn's atmospheric heat and chart the flow of its planet-circling streams of atmosphere.

6) Measure the mass of Saturn's rings and determine their general composition.

7) Study the curious moon Iapetus (6 times brighter on one side than the other), Titan with its methane atmosphere (possibly as dense as Earth's) & study Titan for life-related molecules which conceivably could sustain life itself.



MACHINING SERVICES OFFERED TO RASC

Should you be the innovative designer type of amateur astronmer and by an odd co-incidence a member of the Halifax Centre, then let the good news be known. Anyone who requires some equipment built or machined and is in demand for very high quality workmanship, then contact Mr. Angus Macpherson at 463-7907.

Upon contact with Mr. Macpherson, you will probably asked to provide drawings and a meeting will be set up at which a fee will be negotiated by the parties concerned.

This is your oppertunity to design and prepare to market that Celestron accessory you have had in mind for so long!

LUNAR DRAWING

Barry Mathews

(Ed. Note: This is reprinted from NN's Sept.'73 and fits in nicely with Jody's article which follows)

Drawing various features on the surface of the Moon need not be a tedious task left to the dedicated but a leisurely way to learn our nearest neighbour. First to dispell a misconception "you do not need to be an artist".

Supplies: It is my opinion that starting out, one should use a pencil. By using a pencil one has 2 methods to choose from--for either the observer should have a selection of various grades of pencils with some sharp and some dull. Also he should have 1 or 2 good erasers some sharpened to a point. Another useful device is a shading pencil or Q-tip. Finally a relatively good grade of paper, a dim light and a smooth working space.

Methods of drawing: The actual methods of drawing are numerous, vary in complexity, and require time and patience. To mention a few, line, the artictic drawing and the notational sketch. The line drawing is done to record topographical features but not the shadow or tone changes, by means of solid or broken lines. The notation sketch can be

explained as an incomplete sketch with the numbered and written notes on the face of the drawing.

The artistic drawings are done to depict accurately and truly as they appear on the Moon. A drawing that shows what the observer sees using the eyes' resolving power, the ability to distinguish contrast and some interpretation, lends itself to the production of a photographic like result. This type can be done in pencil, ink, paints or combination. The "shading-erasure" method is described in S & T 1959 June.

The observer starts by making a basic line drawing showing only the outline of obvious features. One can trace the positions from an atlas acceptably. Work from the largest feature to the smallest visible in your telescope, do the shading and tonal reproduction leaving the bright areas white. It takes practice and observational ability, but the end result is well worth the effort. The most important thing to remember is capture the relative position, and shapes as accurately as possible. The one common pitfall is the ability to keep craters and craterlets to the proper relative size.

When your are finished check all regions to make sure you have left nothing out. Compare your finished drawing with the view through your scope to see if they really do look the same. Remember you must be as fast as possible, as accurate as possible in the shortest possible time. The lighting on the Moon's surface is continually changing.

Lastly, data of the following nature should be shown on the drawing. Aperature used, magnification, filters, if any, used, Universal time, Sun's colongitude (see Observers HdBk) Julian day and last but not least, your name signed proudly on the piece of work that has scientific as well as training value.

Suggested List of Materials

Pencils--
- 1--#1 Eagle alphabet
- 1--#2 " "
- 1--Ebony 6325
- 1--2B pure charcoal
- 1--white lead pencil
- 1--shading pencil or Q-tips

- 1--can Fix-it spray (non-gloss)
- 1--clip board
- 1--photographic atlas (optional)
- 1--pad quality paper

(Ed. final note: I've seen some of Barry's drawings and they are beautiful! GREAT to frame and hang up!)

A PLEA FOR THE PLANETS

Jody LeBlanc, OC

To a would-be amateur astronomer, perhaps nothing is so disappointing as his first look through a telescope. Nothing except the Moon or perhaps the Sun provides anything approaching the wealth of detail that is usually expected. Nebulae and star clusters are bad enough, but even the neophyte is aware that the pictures he is familiar with are the results of long exposures taken through the world's largest telescopes and the disappointment upon seeing only a small, misty patch through the telescope is somewhat tempered by this.

But the planets? Surely that tiny fuzzy dot isn't Jupiter? There must be something drastically wrong with the telescope, or the atmosphere, or the eyepiece--I mean where's the red spot? This initial disappointment is heightened by the fact that most people who are interested in amateur astronomy realize that amateur telescopes are capable of revealing quite a bit of detail on the planets. Many have seen drawings made with 12", 8", 6" or smaller telescopes but find most if not all of the detail shown on these drawings to be invisable. What's wrong?

I'm sure we've lost as many potential recruits due to their initial disappointment as we have due to 300 x 50 telescopes. The saddest part is that, as far as the planets are concerned, this initial disappointment could be cured with some simple training of the eye. Most people are unaware that they must make more of an effort than simply getting used to using high power eyepieces if they want to see something on the planets, and sadly, few people make the effort.

This training of the eye is almost ridiculously simple: just keep on observing the planets. The best way to do this is to make drawings of what you see. Even if you have no artistic talent (I don't) and your first efforts come out looking terrible, don't give up; you'll be amazed at the dramatic improvement in your "seeing power". The details that you at first strained to see will now "leap out" and you'll regard them as major features and

be straining after a whole set of finer details. I kid you not: the improvement really is that dramatic and short term. When I started, I saw a marked increase in detail after only a few drawings. Even if you're like me and never progress beyond the rough sketch stage, I think you'll find drawing the planets fun.

Of course there are a few small problems that can occur, such as being unable to see through the tears on the eye lens because your eye is continuously watering (something to do with the ice-cold wind) and the mount that seemed more than adequate at a nebula-hunting 60 x doesn't seem quite that steady at powers approaching 200 x and finding out that when they say a 6mm Ramsden has little eye relief they mean LITTLE. Just when you force your half-frozen fingers (it's impossible to draw wearing gloves) to grasp the pencil the paper with your almost-finished drawing blows away at damn near the speed of light. All this can be bourne, but you feel like chucking the whole thing and maybe taking up coin collecting when, after the one night you decide to stay in and watch Laverne and Shirley, you decide to look outside and find out that the seeing, which had been terrible for the last 4 days, was virtually perfect. Arrgh!

But really it can be fun. All you need is a blank outline of the planet (don't forget the polar flattening) a steady telescope and a fairly high power eyepiece. Don't overdo the magnification, but some objects such as Saturn and the Moon can bear more magnification than, say, Jupiter. Experiment until you find a power you like. Small refractors can take a lot more magnification per inch of aperature than can larger refractors. I usually use my 60mm at 130x for Jupiter and between 150 and 170x on the Moon and Saturn. On the other hand, I seldom use more than 200x with HWAC's 8" Newtonian, so it pays to try several powers--any given night may be different.

This fall, why not give the planets a try? Planetary observing may have its problems, but it has one undisputable advantage--even I can find Jupiter.

Most embarrassing revelation at Keji. Glenn Graham bellowed out "Jody LeBlanc observes the Moon at 600x!" What can I say? How about "Glenn Graham snores!" Not the same, is it?

BURKE-GAFFNEY AWARD for 1980

RULES:

1) 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.

2) Presentation: Articles should be 1000 - 1500 words, written in proper grammatical form and presented type-written (if possible) 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 the original negative should accompany the sub-mission.

3) Eligibility: Any member of the Halifax Centre in good standing may submit articles with the exception of those with graduate degrees (any field of study).

4) Judging: Articles will be judged on scientific accuracy, originality and with a strong emphasis on the overall literary merit. Judging will be carried out by the President, Editor and one other person appointed by the Halifax Executive.

5) Prize: The award will be given once annualy with the winner having a choice of one of the following: Ottwell's Astronomical Calendar (1980); a year's subscription to the Griffith Observer; or The Amazing Universe by Freidman (published by the National Geographic Society).

SUBMISSION OF ENTRIES:

For 1980, all articles must be obtained by 25 March with the winner being chosen by 1 April. Mail entries to:

R.C. Brooks
Editor, Nova Notes
71 Woodlawn Rd.
Dartmouth, NS
B2W 2S2

NOTE ALL ENTRIES FOR THIS AWARD WILL ALSO BE CONSIDERED FOR THE SIMON NEWCOMB AWARD (SEE NN's p.84 JULY/AUG '78)