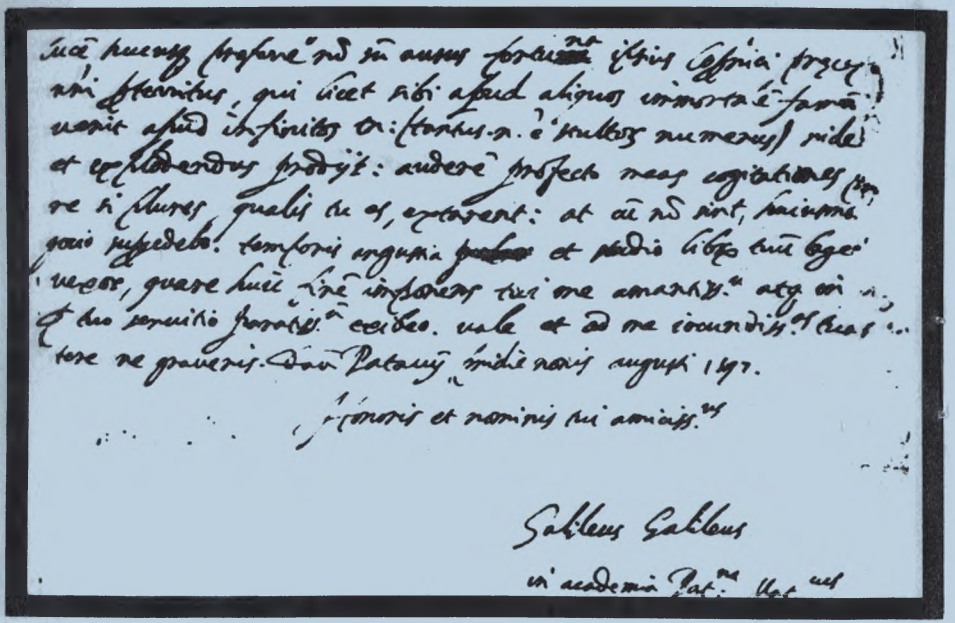
NOVA NOTES



Halifax Centre

Mar-Apr 1986
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Number 2

1986 Halifax Centre Executive

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NOTICE OF MEETINGS

Date: Friday, March 21th : 8:00 P.M.

Place: Nova Scotia Museum: meeting to be held in the lower theatre. Access from the parking lot and side entrance.

Topic: We will have be having 2 speakers at this meeting:

Graham Millar will be talking on Ancient Egyptian and Babylonia astronomy.

Hugh Thompson will be speaking on "invisible" (non-optical) astronomy

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Date: Friday, February 21st : 8:00 P.M.

Place: Nova Scotia Museum: meeting to be held in the lower theatre. Access from the parking lot and side entrance.

Topic: Pat Kelly will be giving a slide presentation on "Astronomy on Stamps"

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NOTE: The above list is tentative and subject to change.

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About the cover: The cover this issue shows a copy of the original letter from Galileo to Kepler ont he 4th of August 1597. Galileo sent this letter to Kepler to acknowledge his receipt of Kepler's "Mysterium Cosmographicum" (Cosmographical Mystery)

President's Report

With 1986 underway it is a good time to review the events of the past year.

Two memorable events for the Halifax Centre occurred in the same month. On May 10th, our centre was extremely pleased to install our third Honorary President at our Annual Banquet. In his address as our new Honorary President, **Dr. Murray Cunningham** reviewed centre's history by focusing on various members' contributions to centre activities. A condensed version of his talk can be found in the July-August 1985 Nova Notes.

On May 18th many of our centre members joined with the hosting **Lunenburg County Astronomy Club** for a meteor display in the Bridgewater Desbrisay Museum. Obtaining this travelling show from the Provincial Museum of Alberta was certainly a coup for the L.C.A.C. A rare occurrence was encountered by the Halifax visitors to Bridgewater at the observing session planned to follow the display: Wilf Morley and the L.C.A.C. had an observing session that was fogged out! Was this their first session that was not clear? (And a not quite so rare occurrence--Ralph ran out of gas.)

We also had our First Finisher in the **Messier** competition. By May 29th, **Bill Thurlow** had found all 110 objects on the list in only 4 months and 12 nights! Congratulations Bill! Also in 1985, **David Chapman** finished his Messier list. Congrat's Dave. The challenge is out: "Who is next?"

The **Camping Observing Weekend** at Kedji was successful again this year with more than 100 guests from the campgrounds joining our own members and their families in the observing sessions. This coming summer the COW is tentatively scheduled on P.E.I. for the first weekend of August (new moon). Plan your participation now.

No one can think about 1985 without remembering **Comet Halley**. Beginning with the April lecture on the Comet by our own **Roy Bishop** (National president of the R.A.S.C.) and the special Halley's Comet issue of Nova Notes (May-June 1985) we all prepared ourselves for the show. Remember the views that we did get of the comet (and those that we tried to get), the public interest and the events (Nova Scotia Astronomy Day in October) that have been both well attended and clouded out? What can we

say? We were ready, but.....there is always 2061! At least some of us got our pictures in the papers. Perhaps in March or April those of us left in the North will get a better view(?) - the eternal optimist - while those flying South will enjoy their "warmer" views of this historic comet. Remember also to keep track of your own comet observations, as we will be having a members' "Halley Night" in June to review all our sights and impressions.

1986 brings two major changes in our executive. We say thanks for the long and excellent service on the executive and a temporary farewell to **Randall** and **Diane Brooks**. We wish them good luck during their time in England as Randall pursues his Ph.D. in Historical Astronomical Instruments. Randall will be replaced as treasurer by **David Tindall**. We also say thanks to **Cathy MacLeod**, who will be stepping down from her post of Vice-President, but will be continuing as an active member of the centre. She will be replaced by **Darren Parker**, our former National Representative. The position of National Representative will be filled by a newcomer to our executive, **Doug Pitcairn**. Welcome back Dave and welcome Doug!

A special thanks from us all must be given to **Pat Kelly** who has provided us excellent newsletters in his capacity of Editor of Nova Notes. Thanks Pat, and keep up the good work.

Norman Scrimger

If God had intended us to stay on the ground, he would have provided us with roots.

Dr. Ken Money
Canadian Astronaut

1985 TREASURER'S REPORT

Revenue:	1984	1985
Membership fees	1577.50	1808.04
Life Members Grant	152.00	168.00
Donations	-	-
Educational Activities	-	22.50
Interest/Dividends	121.79	126.40
Handbook Sales (net)	812.75	454.74
Advertising	-	-
General Assembly (inc. grant)	124.36	337.00
Miscellaneous	12.18	30.00
Total Revenue	2800.58	2946.68
Expenditures:		
Fees to National Office	1084.00	1126.50
Library	111.83	146.95
Meetings/NOVA NOTES	414.99	283.16
Annual Banquet (net)	15.00	(-7.75)
General Assembly (inc. grant)	505.70	818.00
Equipment/Supplies	31.09	1207.47
Office Administration	102.11	-
General Expenses/Audit	-	-
Educational Activities	-	20.00
Insurance	-	-
Awards/Donations	77.75	91.88
Operational Expenses	-	103.42
Miscellaneous	71.24	-
Total Expenditures	2413.71	3789.63
Surplus or (deficit)	386.87	(842.95)
Bank balance from prev. year	1497.38	1884.25
Bank balance to Dec. 31	1884.25	1041.30
Other assets	2125.00	3000.00
Bank balance		1140.30
Outstanding cheques		99.00
Current bank balance		1041.30

Randall Brooks

TREASURER'S OBSERVATIONS

The treasurer's report for last year, as submitted to the National Office for inclusion in the Annual Report of the R.A.S.C. is reproduced opposite. It was prepared by Randall Brooks, but I have a few remarks to make.

1) Obviously, the largest difference between 1984 and 1985 is in the equipment / supplies item of expenditure as we purchased a telescope (Celestron C-8) last December for $1200. How did we get into a sufficiently sound financial position to consider such a purchase, without adding a surcharge to the membership fee (as most of the other R.A.S.C. centres do)? In the past four years, our Observer's Handbook sales have netted $2108 (over $5 per year per member). One could regard this as having been disposed of as follows:

Telescope	$1200
General Operations (including travel to the G.A.)	$ 503
Increase in cash assets	$ 405

Clearly, it is of the utmost importance to the financial health of the Centre that we maintain and if possible, increase this source of revenue. Everyone is strongly encouraged to act as a sales agent. Darrin Parker will be more than happy to supply you with copies for sale. Out of the 20 centres in the R.A.S.C., we easily rank number one in Observer's Handbook sales. In 1984, for example, we netted over $800. Compare this with Calgary ($118) and Victoria ($112), who were the only other centres to exceed $100!

2) In case you are now overly worried that handbook income seems to have decreased from $812.75 to $454.74, you should note that the year to year figures on that line in particular, do fluctuate widely. This is mainly due to the fact that the financial year coincides with the calendar year, but the

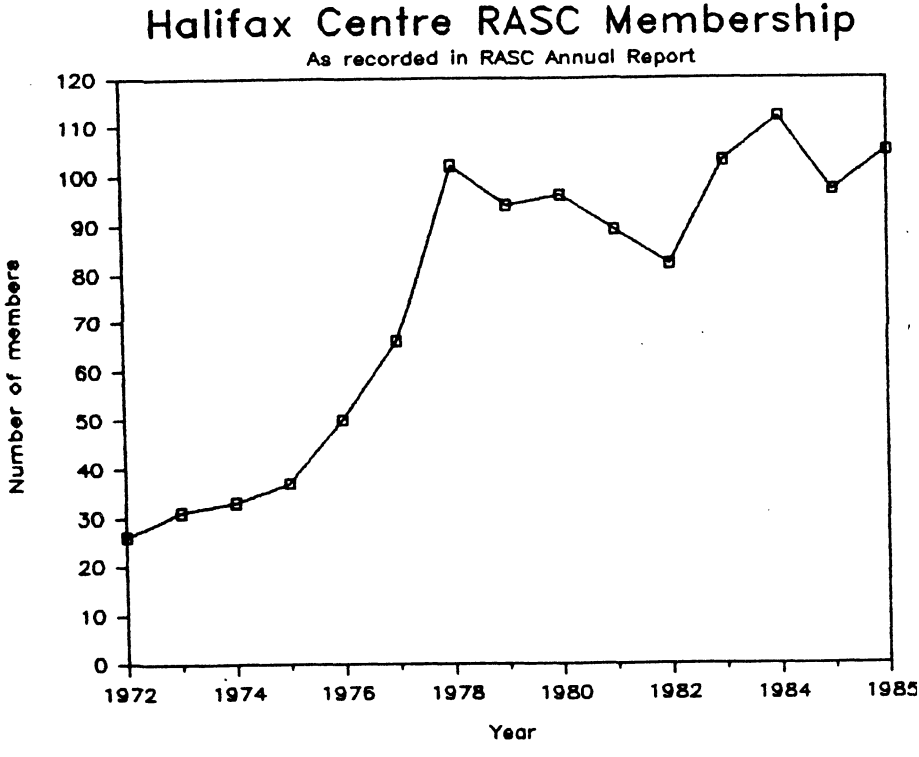
"handbook year" begins in October. Consequently, the value in any one year depends on when we pay for the handbooks and is not reliable as an indicator of how many were actually sold in that year. Darrin Parker and I are attempting to find a way to report handbook sales more realistically. However, do not be complacent! I am quite sure that handbook sales have really decreased (as the price has increased) and we should all make an effort to increase the sales.

3) A similar remark about year to year comparisons also applies to membership fees. Sometimes a lot of people renew early, sometimes they do not. A large number paid late in 1984-85 and an equally large number paid early in 1985-86 and so the revenue for membership fees has shown quite a large increase.

4) Membership: To January 31, 1986, we had a total of 105 fully paid members (21 life, 76 regular, 8 youth). This is to be compared with 97 at the end of the last membership year (September 30, 1985). We have clearly gained some new members, but whether its a result of early renewals or whether we can anticipate another 20 or so to pay before the end of the membership year remains to be seen.

While looking at the membership statistics, it occurred to me that other members might be interested in the growth of the Halifax Centre over the last dozen years. I myself have been a member since 1973 (I think!) but I was not aware that membership had increased as much as the accompanying graph shows. (see next page) The figure for 1985 is tentative (the 1985 Annual Report is not published yet), but is probably within one or two of being correct. The 1986 figure is correct to January 31, 1986 (and may increase between now and September, or not; who knows?).

After plotting the graph, I wondered if we could see any patterns: for example, did the hosting of the General Assemblies in 1975 and 1980 have anything to do with the rise? It is hard to say. However, it does seem clear that the birth of the Bridgewater satellite gave us a boost of about twenty members between 1982 and 1983. Perhaps what we have seen since 1974 or thereabouts is a spread in our membership outside of the Halifax - Dartmouth area - certainly we now have a widely scattered membership. I would be interested to hear any comments other members may have about these figures.



Our percentage of life members is very large (20%), rivaled only by the Ottawa and Victoria centres at 18%. This also gives us a good stable financial base. Why not consider becoming a life member ($300) and save yourself the hassle of finding $20 each year!

Lastly, I would like to add an apology for those of you who have not yet received your 1986 Observer's Handbook. Our supply ran a little low in January mainly because membership is up significantly this year. However, if you paid your membership fees by the end of January, you should have been able to pick up your handbook at the February meeting or already received it in the mail if you live out of town. If you have not recieved it by the beginning of March, please drop a note to Darren Parker. Also note that early payment of your membership fees will ensure that you receive your handbook before the New Year.

David Tindall

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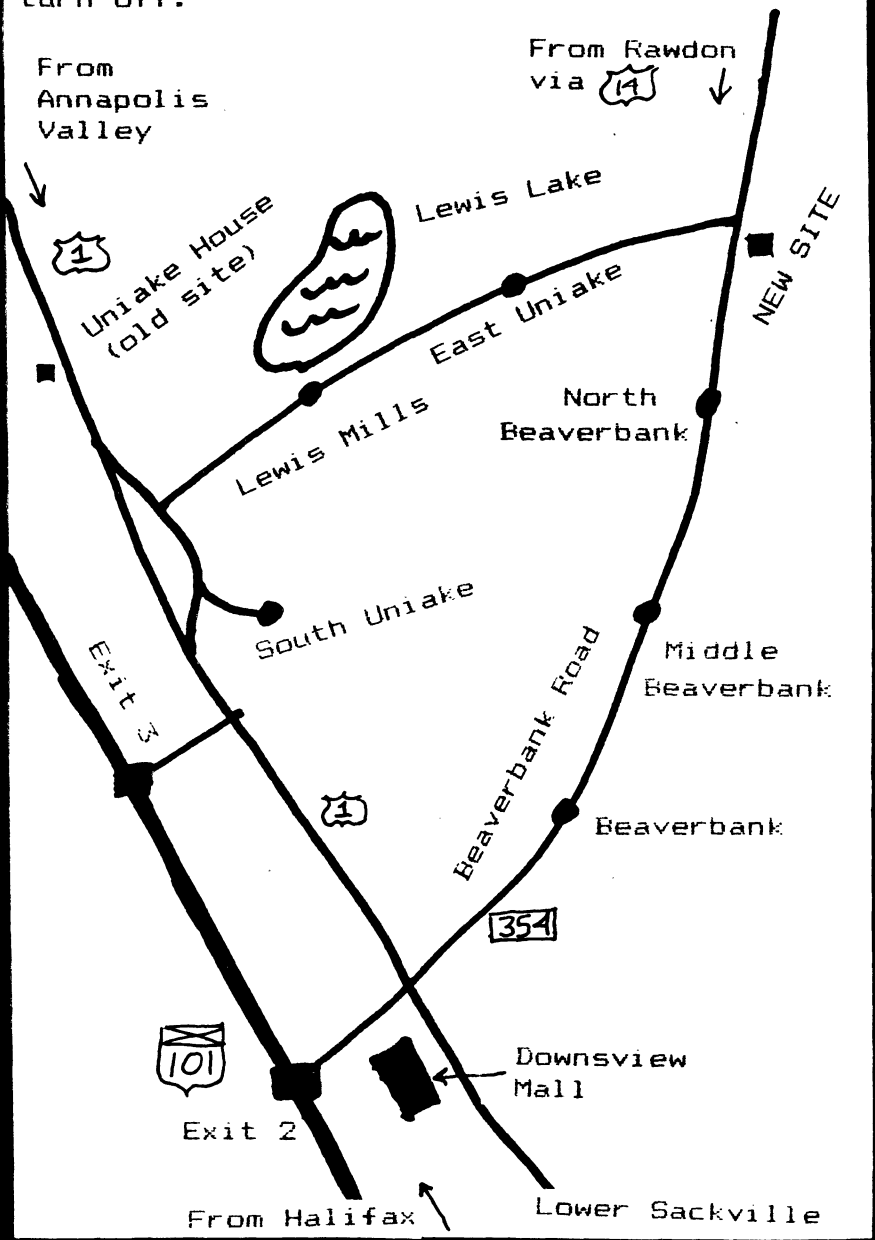
NEW OBSERVING SITE FOR OBSERVING SESSIONS

We have finally found a new observing session site! A study of possible sites was taken over the last several months and the site that was chosen was the Halifax Radio Controlled Flying Club site located on the Beaverbank Road. As can be seen on the map on the opposite page, the new site is no farther from Halifax than the Uniake site was, but has the following advantages: a 360 degree horizon unobstructed by trees, no street or house lights visible from the field, choice of paved and grassy set-up areas, access at any time of the year. There is a medium sized parking lot with a short section of driveway that leads up to a locked gate at the level of the field.

Since we now have a telecope for the centre, you can no longer use the excuse that "I don't have a telescope" for not showing up at observing sessions. If you can't remember when the observing sessions are held, there is a list of dates in the calendar on the inside back cover of each issue of NOVA NOTES or you can give me a call at 434-1787.

Gordon Hawkins

The new site is about 15 km from Exit 2 along the Beaverbank Road. When coming from Halifax, the site is immediately adjecent to a road sign indicating that Mount Uniake, East Uniake and Windsor are left at the next turn off.



THE "METRIC" CALENDAR

To date, over fifty nations have "gone metric" and have accepted the standardized scientifically based system of measurement. Since Canada has gone metric, those of us who have not been brought up on the metric system, have either adjusted to or applauded this straight-forward system. Today in Canada, we go on diets to lose kilograms, fill our gas tanks with litres, and when you give a person a centimetre, they take a kilometre.

Why, then, do we still use the traditional twelve month year; 31,30 29 or 28 day month; and the sixty second minute to tell time? Why not a nice, simple, neat and logically based metric calendar as opposed to the traditional Gregorian year?

Apparently, almost 200 years ago this same question was asked in post-revolutionary France. It had been the French Revolution that had cleared the way for the introduction of the original metric system in 1795 in France. This had also included a metric calendar as an effort to base time on scientific grounds and to do away with the religious connotations of the old system. The following is an account of this fascinating experiment.

The traditional Christian Era was to be replaced by the Republican Era starting on September 22, 1792 (the date of the founding of the French Republic). Obviously, the new year was to begin on September 22, presumably to coincide with the September Equinox. This year was to be 1 Republican Era.

Although the new R.E. year was still to consist of 12 months, they were to be isochronal, with thirty days in each. The remaining five days, called "Sansculottides", were grouped together at the end of the year as in the Old Egyptian Calendar. Not even the metric calendar could escape leap years. Similar to the Gregorian Calendar, the metric leap year was to fall at four year intervals, except that under the Revolutionary Calendar, the leap year would fall on the third rather

than on the fourth year of every group of four years.

Each thirty day month was divided into three "decades" each of ten days. The Christian Sabbath or official day of rest was to be observed only once every ten day period, on the tenth day. This alone caused much unrest among good Christians in France. The names of the days in each decade followed a logical rather than religious pattern: Primidi, Duodi, Tridi, Cuartidi, Quintidi, Sextidi, Septidi, Octidi, Nonidi and Decadi. Each day was divided into ten hours, which in turn were divided into 100 minutes, which were divided into 100 seconds.

Wishing to sever all religious connotations, the Catholic Saints' Days were abolished and renamed after things of nature: trees, roots, flowers, farming implements and fruits. The new months were to be named after the seasonal aspects of nature (at least as they are in France, with the first month starting on Sept 22): Vendemiare (frost); Brumaire (mist); Frimaire (frost); Nivose (snow); Fluviose (rain); Ventose (wind); Germinal (seeds); Floreal (blossom); Prairial (meadows); Messidor (harvest); Thermidor (heat); and Fructidor (fruits). What about those five Sansculotides? They had names all of their own: Virtue, Genius, Labor, Opinion and Rewards.

If this system would have met with acceptance, I would be writing this article on the evening Septidi, the 17th of Brumaire, 193 R.E instead of Thursday, the 7th of November, 1985 A.D. By the way, the time would have been 66 minutes past 8 o'clock (no A.M. or P.M. designation is necessary) or 8:45 P.M. in our system.

This metric time system only lasted twelve years (1793-1805) and probably failed due to three main reasons. 1) It offended the religious sensibilities of the people who were forced to abandon their Christian traditions 2) For the time in which it operated, it was isolated from most of the world. How many nations now, let alone in 1800 would concede that time should be reckoned from the formation

of the French Republic? 3) People do not as a rule enjoy change. This can be demonstrated in the attempted switch over to metric in both the United States and the problems encountered recently in Canada involving metrification. Remember, the French people had just been through a revolution and had already accepted a new system of measurement for mass, distance and volume.

Was metric time a good idea? Traditional time measurement apparently is accepted as metric today. The ISO Standards Handbook defines the second as "9 192 631 770 periods of the radiation corresponding to the transition between two hyperfine levels of the ground state of the cesium-133 atom."

Metric time is now no more than an interesting historical footnote.....for now.

Darren Parker

References

International Organization for Standardization, ISO Standards Handbook 2, Units of Measurement, 1211 Geneve 20, Switzerland

Nelson, Robert. SI: THe International System of Units, American Association of Physics Teachers, Graduate Physics Building, State University of New York, Stony Brook, New York 11794, December 1982

Zerubavel, Eviatar. "The French Republican Calendar: A Case Study in the Sociology of Time" American Sociological Review, 1977:42 p.870

DO, AND WHAT TO DEW ABOUT IT

We have all experienced dew in one way or another. We have admired its beauty when it forms as frost on windowpanes, and cussed its steadfastness on corrector plates and spectacles. To cure this irritating problem (at least in our climate) requires the knowledge of how it forms and under what conditions.

First of all, we must begin with water vapor, a colorless and odorless gas which is a minor constituent of the Earth's atmosphere. Humidity is measured relative to the amount of vapor in equilibrium over a plane surface of water at the particular temperature. The amount is crucially dependent upon the temperature, the higher the temperature, the more vapor fills the air. If we take a box of air and water vapor and chill it slowly, the relative humidity increases until it reaches 100%, the maximum allowed over water. What happens if there is no water to accept the vapor as we continue to chill the air? If the box is very clean, nothing will happen until the relative humidity reaches 400%! Water will then condense out spontaneously from collisions of the water vapor molecules.

In our experience, the humidity never really makes it past 100% because there are enormous amounts of dust, salt and pollution particles suspended in the air which have a great affinity for water. For very large particles, which can dissolve in water, the resulting droplets can be in equilibrium at relative humidities of even 90%, which, you guessed it, form haze.

So the first thing we have learned is that to avoid immediate dew buildup keep your optics clean. Interestingly enough, do not bother buying de-misting fluid to keep your glasses from fogging during the winter; soap and water will do equally well.

When a parcel of air is cooled to the extent where it just begins to form a fog, it has reached its dew point. The drier the air, the lower its dew point will be. Dew will form on

all unclean surfaces when those surfaces (mirror, car window, cold beer) are as cold or colder than the dew point.

Just how does a body get colder than the surrounding air, which is warmer than the dew point. To answer this, we shall delve into the realm of radiation, specifically, the infrared. All objects, including humans, radiate this stuff and our temperature reflects a balance of incoming and outgoing radiation. Inside a room, a corrector plate of a Schmidt - Cassegrainian telescope emits and receives essentially the same amount of energy, because everything is more or less at the same temperature. Outside, however, the situation is different in one crucial factor: the ceiling of our room has been replaced by the open sky, which has an equivalent temperature of roughly -75 degrees Celsius. It is not absolute zero since the atmosphere does absorb some infrared, though not all of it. Our corrector plate is now receiving less energy in return, so its temperature must fall until it reaches a lower equilibrium. Usually, this is below the dew point, and hence dew (or frost if the glass is below freezing) will form.

Smaller terms in the heat budget equation, such as conduction and convection now come into play as the radiation term shrinks. In fact, if the air is above zero, and there is little wind, the ground can actually cool of to -20 degrees under a clear sky! Clouds intercept infrared radiation and reradiate it at a temperature in the -10 to -30 degree range, much warmer than the -75 degrees of the clear sky, which explains the fact that it gets much colder under a clear sky overnight sky than an overcast one.

Newtonian mirrors seem less afflicted than the corrector plates when it comes to dew. Well, they are shielded from most of the sky by the long tube, which permits them to receive radiation from the tube itself, rather than the colder sky. Therefore, the mirrors take longer to cool down, Likewise, the sides of a car receive energy from other cars and the trees,

whereas the roof trunk and hood do not, so it always dews up first. One must keep in mind that the secondary mirror still cools off rapidly, especially considering the fact that it does not have much heat capacity in the first place, due to its small size. A dewcap of roughly two tube diameters will significantly retard dew formation on either secondaries or corrector plates, even finderscopes. A fringe benefit from this simple operation is that parasite light will be kept to a minimum by ensuring that only light from a small patch of sky reach the eyepiece.

A sure fire method of dew prevention on the wettest and frostiest of nights is to "hot-wire" the telescope by placing nichrome heating wires within conduction range of the optics, say, on the cell and gently warming the surface to ambient air temperature. If one overheats one runs the risk of creating turbulence. One of my friends placed a series of resistors around the outside of his 210 mm telephoto lens with an elastic band, used a six volt battery for juice, and the images have never suffered. Under normal circumstances, the lens may have dewed within ten minutes. A distinct advantage here for observers is that one does not have to ruin one's dark adaptation by getting out the dew gun repeatedly to warm the optical surfaces under a brighter light.

Dew ruins photographs, scatters light in the eyepiece reducing contrast, and constraining the limiting magnitude of the instrument and simply irritates us. So just remember to keep those optics clean, use a long dewcap, and if necessary, gently cook those assemblies of precision glass.

Alister Ling
Montreal Centre
reprinted from "Astronomy London"

OFF-AXIS APERTURE

This subject may seen superfluous to many readers, but having met some star-gazers who were unaware of it, I felt it might be of interest. It essentially allows a telescope with a central obstruction (eg. Newtonian, Schmidt-Cassegrainian) to perform like a refractor with one-third the aperture.

Some night you may be giving a public observing session (large or small) and decide to view a few of the double stars available. Alberio and Mizar look nice, but trying closer doubles, for instance, Alpha Herculis, Iota Cassiopeiae (a fine triple system with contrasting colors) or maybe Epsilon Lyrae (a showcase for celestial mechanics) you may be annoyed by fuzzy non-descript star images at moderate magnifications. Your viewers probably will not be glued to the eyepiece to see a couple of irregular blobs of light, and if not given the "atmospheric seeing" argument may entertain thoughts that your mirror would be more suitable as a ships porthole.

If the seeing is good enough for a 200 mm (8-inch) telescope to form stable Airy disks (these nights usually occur once every blue moon), the 300-plus magnifications needed to show the disks does nothing to enhance the impact of the multiple star. You have essentially out-apertured the object. The telescope could be stopped down (on-axis) to maybe half of full aperture, but the secondary obstruction would be so relatively large that the diffraction rings would be bright relative to the central Airy disk.

This is where the off-axis aperture stop shines (bad pun). It shows a stable Airy disk surrounded by one or more delicate diffraction rings because it works like an unobstructed long f-ratio refractor which can be used at moderate magnification (100-200 times) to full advantage. I can convert my 200 mm f/6 Newtonian to a 75 mm f/16 telescope, with refractor-like performance just by fastening a circular piece of cardboard with a 75 mm

diameter cut-out to the front of my scope. It is easy to make one and the rule of thumb is:

(primary - central obstruction) / 2 = cut-out

where all of the numbers used refer to the diameter of the particular object. The cardboard should be placed at the front of the telescope tube, oriented such that screws, spider mounts and the central obstruction are masked out by the cardboard.

This also offers a chance to compare unobstructed mirror systems and small refractors side by side by making the aperture stop the same size as the refractor. For example, my 60 mm f/15 refractor (department store variety) was outperformed by the 60 mm f/20 off-axis stop on several double stars. The difference was so great with Epsilon Bootis that the companion was obvious and easy in the reflector while nearly invisible in the refractor. It should be noted that planetary images are more stable and crisp with an off-axis aperture (enjoyed by the public) but the loss of detail resolution and light gathering usually reduces available detail relative to full aperture. I hope that this little trick makes your observing more enjoyable.

Len Larkin

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GAWKER'S REPORT

Time: Sat. Jan. 11 / 86
Place: Mount Uniake
Present: Glenn R., Dave C., Gordon H., Pat K.
M.V.M.(Minimum Visual Magnitude): 5.5
Weather conditions: calm, warm & clear
Equipment: Centre's C8, 20X80 & 10X50 binoc.
Objects observed: M74, M77, M35, NGC 2158
(open cluster seen through M35)

compiled by Doug Pitcairn

LIGHT POLLUTION & WHAT YOU CAN DO ABOUT IT

I am writing this article with the hope that many of you will become anti-light pollution activists. With the recent significant victories and high public interest in astronomy due to Halley's Comet, translating our efforts here on local, regional and national levels may be much easier than many of you think! Recently there has been a spate of coverage on light pollution in both Astronomy and Sky & Telescope magazines. More importantly, this topic has not been limited to astronomical journals but has also received extensive coverage in other publications including newspapers such as the Wall Street Journal. Just as important, many communities have passed light pollution control ordinances, such as San Diego (1984) and the State of New Jersey (1985).

The law in the State of New Jersey represents the toughest and most comprehensive anti-light pollution legislation yet passed. This bill was introduced by Senator Harley, who in turn had become aware of the problem through the efforts of Mr. Fred Schaaf. Mr. Schaff has also seized the opportunities presented by Halley's Comet to educate the public on the need for a saner use of night-time illumination. We should do likewise! It may be possible to reach the highest levels of government, wherever applicable, because of the high public interest. There are two educational kits which may help in this regard. One is a seventy page booklet by Dr. David Crawford entitled "Outdoor Lighting Control". The other would be a copy of the New Jersey state law and the accompanying information package that Senator Harley's office is making available to every city and municipality in his state.

A suggested protocol for accomplishing this goal in our cities, towns would be to have a covering letter detailing some of the means of achieving light pollution control accompanied by the available kits. A proposed list of recommendations to be incorporated into your covering letter follows:

- the use of low pressure sodium (LPS) versus high pressure sodium (HPS) as a lighting source. LPS lights are more efficient than HPS producing more light while using less electricity. The savings to municipalities and ultimately the taxpayer should be emphasized. For us astronomy enthusiasts, LPS lighting holds great promise as it emits all of its light in the D lines of sodium which can be easily eliminated by the use of an appropriate filter. This would be impossible with HPS lights as they emit light over most of the spectrum. Other advantages of LPS lights over HPS are: 1) they produce much less glare. This feature is the reason that the United States Navy's aircraft carriers use only LPS lighting on their runways. 2) LPS has a long history of use in Europe (about 40 years).

- the primary reason for the relatively recent development of HPS lighting was because it gives a better color rendition of the objects it illuminates. However, from a logical point of view, this is unnecessary as the basic idea of night-time lighting is simply to let you see if something is there.

- the use of shades or shielding on <u>all</u> lighting sources. These shields should extend below the bottom of the bulb so that all light is diverted downwards and none to the sides or to the sky. Again, since more light is directed downwards, the amount of light needed can be reduced, again saving money.

- On highways, the use of shielded LPS lights and a reduction in the present density of lights will make highways safer by reducing the glare from lights as well as the number of possible obstructions to hit.

- For pedestrian walkways the use of one metre poles instead of the present 5 metre poles with appropriate shading will deliver more light where it is needed and with a lower cost.

- For shopping malls all lighting should be shielded LPS and all exterior lights should be extinguished after the mall closes. The savings to business should be stressed if they are not already evident.

- Billboards and outdoor advertising displays should have all light directed downwards instead of the current trend to light signs from below and thus casting much of the light into the sky where it is wasted.

- The elimination of unnecessary searchlights and lighting of car lots etc. when no one is there. Statistics available from the FBI show no correlation at all between the the amount of night-time lighting and the crime rate. The majority of crimes occur in the daytime. Here the lighting industry has made its fortune by playing on the emotions of adults who haven't outgrown their childhood fears of the dark. Are we to believe that crime ran rampart at night before the advent of electricity and lighting?

- The effect of light pollution on the environment is also noticeable. On plants a delay in leaf abscission in autumn and premature leaf development in the spring. The effect is also evident in animals, with exposure to night-time light altering hormone levels, and the effect on bird migrations of glare, distraction, etc.)

- Unlike other environmental pollutants, light pollution is not only easy to cure, but saves money to eliminate. With the need for less lighting, we also would not need to build more power plants and would be able to conserve raw materials for more useful purposes.

The addresses for the information aids mentioned above are:

Dr. David Crawford
Outdoor Lighting Control Booklet
Kitt Peak National Observatory
950 North Cherry Avenue
P.O. Box 26732
Tuscon, Arizona 85726
U.S.A.

New Jersey Light Control Kit
Mr. Fred Schaaf
706 E Street
Millville, New Jersey 08332
U.S.A.

Dan Kahraman
RR#3 Wheatley, Ontario
N0P 2P0

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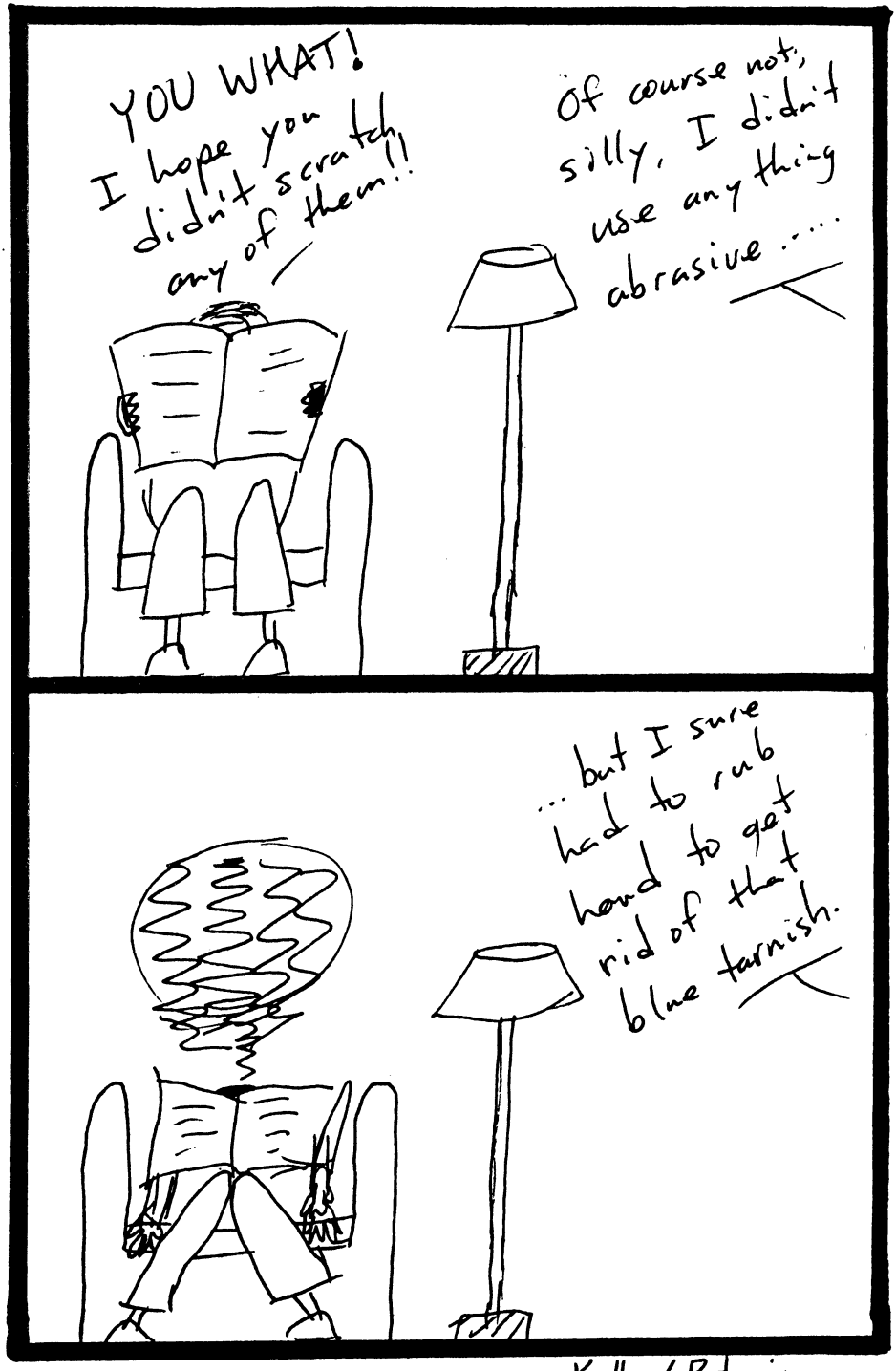
ESOTERICA

Did you know that there is one satellite in our solar system whose orbit, in one way at least, resembles that of a comet more than that of any other satellite? Strange as it may seem, the orbit of Nereid, the outermost of the two known moons of Neptune, is far more eccentric than that of many known comets. In fact, its orbit is in extreme contrast to that of its sister satellite, Triton, which has one of the most circular orbits in our solar system. Nereid's orbit, with an eccentricity of 0.75, takes it from a peri-Neptunian distance of less than 1.4 million km from its planet, to an incredible distance at api-Neptune of over 9.6 million km. Imagine living on Nereid and watching as Neptune changes in size from a scant 0.3 degrees (smaller than our Moon) to a full 2 degrees, half an orbit later. Another amazing fact about this satellite is how close the Nereidian year of its orbit about Neptune comes to that of the Earth; 365.21 Earth days!

GAZER


Hmm! Used cement mixer for sale... That gives me an idea....
Oh, dear.... I've got a surprise for you...
What's that?
While you were in the hospital I cleaned all of your mirrors and eyepieces!



Kelly / Pitcairn

NOVA NOTES INDEX

March - April 1986 Volume 17/Number 2

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R. A. S. C. - HALIFAX CENTRE 1986 CALENDAR OF EVENTS

January 1986

S	M	T	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	**11**
12	13	14	15	16	**17**	***18***
19	20	21	22	23	24	25
26	27	28	29	30	31	

February 1986

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	**8**
9	10	11	12	13	14	***15***
16	17	18	19	20	**21**	22
23	24	25	26	27	28	

March 1986

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	**8**
9	10	11	12	13	14	***15***
16	17	18	19	20	**21**	22
23	24	25	26	27	28	29
30	31					

April 1986

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	**18**	***19***
20	21	22	23	24	25	26
27	28	29	30			

May 1986

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	**10**
11	12	13	14	15	16	***17***
18	19	20	21	22	23	24
25	26	27	28	29	30	31

June 1986

S	M	T	W	Th	F	S
1	2	3	4	5	6	**7**
8	9	10	11	12	13	***14***
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

July 1986

S	M	T	W	Th	F	S
		1	2	3	4	**5**
6	7	8	9	10	11	***12***
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

August 1986

S	M	T	W	Th	F	S
					1	**2**
3	***4***	5	6	7	8	9
10	**11**	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

September 1986

S	M	T	W	Th	F	S
	1	2	3	4	5	**6**
7	8	9	10	11	12	***13***
14	15	16	17	18	**19**	20
21	22	23	24	25	26	27
28	29	30				

October 1986

S	M	T	W	Th	F	S
			1	2	3	**4**
5	6	7	8	9	10	***11***
12	13	14	15	16	**17**	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

November 1986

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	***8***
9	10	11	12	13	14	15
16	17	18	19	20	**21**	22
23	24	25	26	27	28	**29**
30						

December 1986

S	M	T	W	Th	F	S
	1	2	3	4	5	***6***
7	8	9	10	11	**12**	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Key to calendars:

Meetings: **outlined**

Special days: **shadowed**

Observing sessions: **bold and underlined**

Observing session alternates: ***italics and underlined***

Additional Observing sessions:

August 1,2,3,4 camping observing weekend

Meetings:

The 3rd Friday of each month at the N.S. Museum.

Meteor Showers:

August 11 is the Perseids (6-day old moon)
November 16 is the Leonids (full moon)
December 14 is the Geminids (12-day old moon)

Banquet will be on a Friday in May - yet to be announced - watch for it!

October 1 - 1987 Memberships due.

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