NOVA NOTES

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THE NEWSLETTER OF THE HALIFAX CENTRE OF THE RASC
C/O 1747 SUMMER STREET, HALIFAX, N.S., CANADA B3H 3A6

INSIDE THIS ISSUE...

EDITOR/PRESIDENT'S REPORT

The only major item of news since the last issue of *Nova Notes* is the nearly unanimous passage of the motion (by the membership) to acquire land for a Centre's observing site and future observatory. The motion was amended to include all of Hants County, rather than just the Gore hill.

Since that time, several of us had have had the opportunity to observe from the Gore hill — our first impressions were not good — we got practially blown off the hill and there were problems with distant car lights.

Roy Bishop has found a potential site at St. Croix (see the map in this issue) which looks very favourable. We have observed there on at least three occasions with favourable vibes — the only "negative" is that the horizons are not as good, but then again there is no wind! This site, would be leased from Minas Basin Pulp and Power Company, allowing us to use most our funds for the contruction of an observatory rather than to purchase land — but there are negative aspects to leasing, too.

Roy has obtained permission to use this site from this period onwards as the Centre's regular observing site, replacing the Beaverbank Site for all but meteor and public observing. Thanks very much, Roy, for your leg-work on this site.

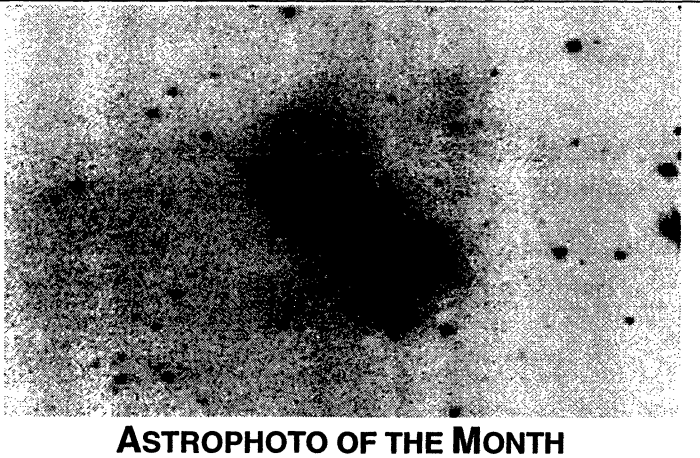
I apologize to those who wrote to GAZER in the last two months. GAZER has been a bit slow in responding and there is no space available anyways — look for his Q&A's and gossip next issue. By the way, GAZER can now be reached in the "Info Super Highway (not!)" at GAZER@hercules.stmarys.ca. Ω

LETTER TO THE EDITOR:

Dear Editor,

I see from the October issue of *Nova Notes* that Constellation Joe finally made it to Taurus and, in so doing, managed to misquote a few items of interest regarding open clusters. Where does he get his information?

The closest open cluster to us is the Ursa Major cluster, or Collinder 285 (June JRASC), which is roughly 24 pc distant (78 ly's if this obsolete unit must be used). The Hyades cluster is probably the second closest, lying at a distance of about 44 pc (or 143 ly's) from the Sun, not 130 ly's as quoted in Joe's article. This value is, in fact, still relatively uncertain (October JRASC). Since the cluster extends over as much as 20° to 26° of sky, its equivalent spatial extent is 16-



ASTROPHOTO OF THE MONTH

Last issue's "Object of This Month and Next" was M76, "The Little Dumbbell", a planetary Nebula in Perseus. Several observers from the Halifax Centre and the Nova Central Astronomy Club (in Truro) observed the object visually. The image shown above is a ST6 CCD Image taken by Paul Gray and David Lane at Saint Mary's University's Burke-Gaffney Observatory. The exposure time was 5 minutes. Paul Gray, David Lane, and others are involved in a Supernova Search program — this image was taken during a "pretty-picture" taking break in our regular program. If you would like to help out (or just tag along) in our program, please give one of us a call.

RASC
HALIFAX CENTRE

NOVA NOTES, the newsletter of the ***Halifax Centre of the Royal Astronomical Society of Canada***, is published bi-monthly in February, April, June, August, October, and December. The opinions expressed herein are not necessarily those of the *Halifax Centre*. Material for the next issue should reach the editor by **January 20, 1995**. Articles on any aspect of astronomy will be considered for publication. "Letters to the Editor" or to our resident expert: *GAZER* are also most welcome. Contact the editor at:

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20 pc (52-65 ly's), rather than the 8 ly's cited by Joe. In fact, the value cited by Joe does not even encompass the central region of the cluster marked by the V-shaped group at the head of Taurus!

The reference in the article to "moving groups" is unfortunate, since it opens the article into the realm of the controversial. While there are moving groups associated with both the Ursa Major and Hyades clusters, much of the work on these has been done by Olin Eggen based mainly on over interpreted proper motion and photometric data. Stellar atmosphere studies of "members" of Eggen's moving groups typically find that anywhere from 50% to 75% of the listed members are likely to be field stars rather than escaped members of their respective open clusters. Thus, the delineation of moving groups as the evaporated stars from dynamically dissolving open clusters is not yet on as firm a foundation as one would like. Such moving groups should exist, it is simply that Eggen's lists of potential members contain a lot (an awful lot) of "ringers."

Sincerely yours,
David Turner
JRASC Editor and Open Cluster Aficionado

1993/94 Treasurer's Report:
by Ian Anderson, Treasurer

Activities at the *Halifax Centre* of the RASC returned to normal in 1994. Compared to 1993, in which we hosted the GA, it was a much quieter year. Financially, the *Halifax Centre* had a good year for overall growth.

Our success in merchandising campaigns, combined with the merging of the '93 GA account in January, put our cash balance at an all time high of nearly $10,000 in March. The average balance was $7,730, doubling that of 1993.

We felt flush in 1994. We loosened the reins on expenses and general spending. We also had help from the Provincial Government in the form of a $1,000 grant connected to our GA in '93.

Our sales campaigns were good, but not as successful as we had envisioned. We tended to err by over stocking on merchandise. The last of the 1994 calendars took ages to disappear. Pins did not sell well, and T-shirts were left in stock. Handbooks sales were off considerably from an unusual 1993, while other publications were stable. The big event in May — the annular solar eclipse through Halifax — brought an enormous public turn-out. We had no difficulty in selling and giving away eclipse glasses at that event.

Three days before our fiscal year-end, we stocked up heavily on T-shirts for Nova East and the coming year. Unless we accurately assess our market for some of these products in the future, our tendency to overstock will be detrimental. The Centre had unusual expenses of replacing the C8 mount and tri-pod this year. Office administration costs were up considerably over 1993, the biggest single change in that category was the mail-out of handbooks. (If you can, please collect your own handbook during any of the monthly meetings). The newsletter publication costs were also up 14% due to a change in printers. This was at a time when membership was down by 10%! The Centre also contributed $500 to defray costs of Mary Lou Whitehorne's trip to the IAU conference in Europe.

Our attitude was relaxed in 1994. I believe that will change in 1995 regardless of the decision we make regarding land purchase or leasing.

As I write this, enthusiasm for the Gore site in Hants County has waned. Questions as to its desirability of location, viewing and its proposed cost have arisen. It is unclear that we will commit $10,000 to the acquisition of land. If the Centre does purchase land in 1995, and if it plans to develop it in the future, this will be the last of the easy years. As treasurer, my job would become more difficult in planning cash flow, in overseeing and controlling expenses and in preparing monthly budgets — for the first time in years. Expense claims will sometimes be challenged, and purchasing decisions may be questioned. This is the nasty side of the finance man's role, especially if he finds he has little money to work with. Have a Happy 1995! Ω

Meeting Report: September 94 by Doug Pitcairn

The first meeting of the fall started off with Dave giving us his presidents report. He reminded us of the upcoming NovaEast star party at Fundy National Park, welcomed the new faces that were visible in the audience, and told us about the latest telescope which was donated to the centre.

ROYAL ASTRONOMICAL SOCIETY of CANADA, *Halifax Centre*

COMPARATIVE INCOME STATEMENT YEARS ENDING Sept 30, 1994 and Sept 30, 1993

ADJUSTED TO REFLECT END OF MEMBERSHIP YEAR	Years Ended September 30 1994	1993	Amount of Increase or (Decrease) during 1994
REVENUE	(Based on revised 1993 report)		
Membership Fees	$3,187.50	$3,062.00	$125.50
Life Members Grant	446.40	396.80	49.60
Donations	72.00	40.74	31.26
Interest & Dividends	365.75	492.80	(127.05)
Handbook Sales (Net Cost)	253.59	454.46	(200.87)
Sales of Merchandise	1,630.15	2,227.55	(597.40)
General Assembly	20.73	1,296.52	(1,275.79)
Other Grants	1,000.00	853.00	147.00
Miscellaneous	98.77	128.12	(29.35)
Total Revenue	$7,074.89	$8,951.99	($1,877.10)
EXPENDITURES			
Fees to National Office	$1,903.50	$1,819.20	$84.30
Meetings & Newsletter	1,174.57	1,093.25	81.32
Equipment & Supplies	786.57	0.00	786.57
Cost of Goods Sold	925.65	1,084.47	(158.82)
Office Administration	427.02	121.99	305.03
Educational Activities	124.71	0.00	124.71
Awards & Donations	500.00	142.39	357.61
Miscellaneous	72.58	123.78	(51.20)
Total Expenditures	$5,914.60	$4,385.08	$1,529.52
Surplus or (Deficit) on Operations	**$1,160.29**	**$4,566.91**	($3,406.62)

COMPARATIVE BALANCE SHEET YEARS ENDING Sept 30, 1994 and Sept 30, 1993

ADJUSTED TO REFLECT END OF MEMBERSHIP YEAR	Years Ended September 30 1994	1993	Amount of Increase or (Decrease) during 1994
ASSETS	(Based on revised 1993 report)		
Cash	$1,573.29	$6,374.47	($4,801.18)
Accounts Receivable	918.30	627.26	291.04
Handbook Inventory	722.00	218.50	503.50
Merchandise Inventory	1,494.69	567.44	927.25
Investments	8,209.39	3,209.39	5,000.00
Accrued Interest	279.91	175.46	104.45
1993 GA Account	0.00	1,296.52	(1,296.52)
Est'd Library	2,329.12	2,052.96	276.16
Observatory Equipment	1,939.75	1,918.57	21.18
Est'd Miscellaneous	452.54	250.00	202.54
Total Assets	$17,918.99	$16,690.57	$1,228.42
LIABILITIES			
Accounts Payable	$408.00	$403.92	$4.08
Est'd Handbook Payable	$1,292.00	$1,168.50	$123.50
Other (GST for Handbooks to N.O.)	27.66	87.11	($59.45)
Total Liabilities	$1,727.66	$1,659.53	$68.13
CAPITAL			
Equity	$16,191.33	$15,031.04	$1,160.29
Total Liabilities & Capital	**$17,918.99**	**$16,690.57**	$1,228.42

Dr. Murray Cunningham, our honorary president, has donated his 4" f/12 Maksutov spotting scope. This is a high quality instrument with excellent optics, and David eloquently expressed our thanks to Dr. Cunningham.

The main speaker for the meeting was our own Pat Kelly. Pat's topic was the current state of interstellar travel. He started out with a few cartoons, then got serious with a fast paced look at the various types of spacecraft which have been considered or designed with long distance space travel in mind. We learned all about specific impulses, ion engines, and even the fact that antimatter is currently worth about 10 million dollars a milligram! (Must be what they use to make Panoptic eyepieces!)

The handbook talk of the night was given by the "Meteor Man", Paul Gray. His topic was of course the meteor section of the handbook. Paul explained the meanings of the various data, and offered some tips on the how, when, and where of meteor observation.

Next, we were treated to some of the latest images of the comet impacts on Jupiter. Dave Lane showed images he had downloaded from the Internet, and Roy Bishop showed us a few he had obtained from David Levy himself.

The meeting finished up with some discussions about the East Gore hill observing site. The Centre's executive is considering a land purchase in this area, as it appears to be a reasonable location to construct an observatory. No doubt we will all hear much more about this in the months ahead.

Afterwards, of course there were some refreshments, and some of the members ended the evening with a late night repast at a nearby establishment. Ω

MEETING REPORT: OCTOBER 94 by David Turner

The October 21st meeting of the Halifax Centre took place on a rainy Nova Scotia evening that brought out approximately 50 people to hear Mary Lou Whitehorne speak about "ESTEC: The European Space Research and Technology Centre." The meeting began with the usual introduction of the ruling junta members, as well as an introduction of members of the junta-to-be. Notices followed regarding a forthcoming talk by PFL (President-For-Life) Dave Lane at the Discovery Centre on "How to Buy a Telescope for Christmas" and about the SNAFU affecting the mailing of the August issues of the Journal and Bulletin. At this point there was a bit of a break in the proceedings during which Murray Cunningham made a formal donation to the Centre of an oil painting by former (and now deceased) RASC President Ruth Northcott. The painting depicted a pleasant scene of spruce woods and flowers on a small piece of canvas.

At this point PFL Lane introduced Ms. Whitehorne for her talk, which could have been subtitled "Mary Lou in Nether-Netherland." For those who missed the evening, Mary Lou was an invited participant at the General Assembly of the International Astronomical Union held last August in the Hague, and was reporting on the meeting in response to the Centre's partial support of her travel expenses. She showed off a number of slides of the Hague and the meeting location, and made a few comments about getting around in the city, about seeing such oddities as two-dimensional trees and the Hague's Omniversarium, and about astronomers falling asleep during the talks. Actually, I am not certain about the last comment since I was nodding off myself at the time. There was also some discussion about the country itself, about windmills, and her lodging arrangements, but these were scattered around her main talk.

The main presentation was a discussion of her visit to ESTEC in Noordwijk. What followed was a grand tour of the testing facilities of ESA, the European Space Agency — the good folks who brought you GIOTTO — including shots of their various research satellites and launch facilities. The photographs included views of all of the various satellites launched or planned by ESA: ULYSSES, CLUSTER, METEOSAT, ENVISAT, etc., etc. I actually made notes of all of them, if you want the full treatment. After a few minutes of this, however, I had trouble hearing what was said. Somehow the following comments kept coming to mind: "Captain, our sensors have detected a small metallic object of primitive design on a collision course with the Enterprise. Recommend evasive action." Fortunately, I did pay attention to the shot of the bathroom on the space shuttle, which is something that most of us were probably wondering about. My overall impression of the talk was that it was a very interesting travelogue on Holland sandwiched around a tour-de-force on space junk.

Paul Gray followed this with his latest "What's Up?" segment. This included the usual listing of events taking place in the sky, namely a partial lunar eclipse on our November meeting night, the Leonid shower that same evening, where to find Saturn and Mars, Mercury at Greatest Elongation West, the latest on comets visible through your 60-inch scope, etc., etc. The elusive Doug Pitcairn gave the Handbook Study this night, and talked about how to estimate limiting magnitude for visual observations using the stars near Polaris. (Yes, I did remember to bring my nitro tablets with me this time!)

What followed was a lengthy discussion of a new potential observing site for the Centre located near Gore, illustrated copiously with slides of the area. This was the prelude to a motion previously recorded in Nova Notes, which was passed by the members present following a vote on an amendment to the original motion. Without a copy of Robert's Rules of Order handy, this part of the meeting was a bit confused at times, but I suspect that most people were quite happy by then to see the meeting being wrapped up. This was a rather lengthy evening for newcomers. Ω

MEETING REPORT: NOVEMBER 94 by Pat Kelly

Our venerable president-for-life kicked off the November meeting with a follow-up on the search for a permanent observing site. He mentioned some of the potential problems with the Gore site and showed a map of a possible alternative in St. Croix. As the centre now has permission to try out the St. Croix site, a map to the location is included in this issue.

El Presidente also announced that two centre members had been awarded the national Messier Certificate. The first went to our observing chairman, Paul Gray. It was explained that a result of several delays in the normal chain of events that leads to the certificate, it took almost two years to get to this day!. The other certificate went to John Reppa, from Sydney. Although he rarely makes it to Halifax for meetings, John is an avid observer.

The next item on Dave's little list, was the annual meeting. He explained that traditionally the president's and secretary's annual reports appear in the *NOVA NOTES* and the national annual report, respectively. Ian Anderson then presented the treasurer's report, which is reproduced elsewhere in this issue of *NOVA NOTES*. Ian followed up the usual tables of figures with some stunning colour slides showing membership figures, where the centre's income came from and where its expenditures went. The idea of scaling the income and expenditure pie charts to the same relative scale and overlapping them to show the difference was particular well-received — it is not often that a treasurer's annual report is an "annular" report! Trust, me, you had to be there!

The auditor's report, written by our auditor, Dr. Larry Bogan, was then read. It was moved by Ian Anderson/Bill Thurlow that the auditor's report be accepted. The motion was carried. As there were no executive positions that were coveted by more than one person, the executive for 1995 was elected by acclamation.

It is note-worthy that we have a few new faces this time, which is always a good thing as new people bring new ideas and much enthusiasm with them.

Larry Bogan was up next with the regular handbook talk. Larry had chosen the topic of time and generated a lot of chuckles as he explained that he was going to skip the first four pages in the handbook article, and start on the last page where there was something that he could understand! Larry went over the procedure for correcting time from local time to Universal Time and the method to calculate the current sidereal time.

Larry was followed by Roy Bishop who displayed the newly framed painting that had been recently donated to the centre by Dr. Murray Cunningham.

Roy had one other item, which I note upon looking back at the agenda for the meeting was listed as "Roy's item" began with Roy explaining that as a result of the last national council meeting the *Halifax Centre* had just added another name to the short list of members who had received the national **Service Award Medal**. I had not been able to make it to that meeting, and recalled nothing going through the centre executive in the way of a nomination. However, when Roy said that he was making the announcement because that person had been able to be at the meeting, I got a bit more excited. I was going to get to do a meeting report and describe in detail how some poor, unsuspecting person was going to get publicly embarrassed by being brought to the front of the room and made to stay there while a citation extolling their virtues was read to everyone else. Roy went on to state that one of the traits that this member is well-known for is their **imperviousness to cold**. It was at this point that I realized that I was the poor unsuspecting slob! In retrospect, I still cannot really believe it, especially when I look at the names of the other people from the centre who have received this award. I would like to thank everyone who had a hand in this "conspiracy of silence".

Our observing chairman Paul "Meteor Man" Gray was up next for the usual "What's Up" talk. Paul started out by noting that Venus was now visible. He also started a new feature called "Object of This Month and Next". He hopes to keep member's reports of these objects on file so that beginners will have something to consult. This month's "object" was the Auriga clusters, M36, M37 and M38.

Dave Lane took the floor once again to show some slides. These included pictures he had taken of a very bright rainbow; NOVA EAST (including one of Greg "Pierless/Peerless" Palman doing a centerfold spread (for an upcoming astrophysics swimsuit issue?) and another showing Mary Lou and Greg poring over a chart of Lacerta and "discussing" the visibility (or non-visibility) of various objects.

Also shown were slides taken at Eugene Shoemaker's talk that was recently given at UNB. There were also some interesting slides of the oldest (1851) still-standing observatory in Canada. There is even a space science research centre at UNB and they were shown a 16" X-ray telescope that was made there which will soon be launched on a rocket.

David then switched from slides to show an observing chair that his father had made for him based on one which Clint Shannon purchased at Starfest. His father has made a small production run of three and one is still unspoken for (*Editor's Note: Its gone now!*).

It was back to slides by Paul Gray for a quick overview of Starfest and also some impressive pictures of the David Dunlap Observatory in Toronto.

Mel Blake, a part-time astronomy, graduate student at Saint Mary's gave an interesting talk on some observations that he had made of the results of the collision between Comet Shoemaker-Levy 9 and Jupiter.

He was at the University of Regina at the time and was using a 10" telescope.

The meeting ended with a short presentation by David Chapman. While in Newfoundland he had discovered that the community museum in Port-aux-Basques contains an astrolabe. It was discovered by a diver in 1981, who had been exploring a well-known wreck off of the south shore of Newfoundland. the astrolabe has been dated to 1628. Ω

THE FIRST CHRISTMAS:
by David Turner

The scene is the astronomy library at Sippar, a city in Mesopotamia on the Euphrates River 50 km southwest of modern Baghdad and 60 km north of ancient Babylon. It is the evening of a day near the end of Kishlimu in year 306 of the Seleucid Era (mid-December of 7 BC by modern reckoning). Astronomers have gathered to assess the significance of their planetary observations over the last 7 months and to consult ancient records of planet positions stored on clay tablets. It has been a most curious period. The great planet Jupiter, named in honour of the king of the gods, has passed the fainter planet Saturn three times this year: at the beginning of Simanu (May 29), the beginning of Tashritu (September 30), and most recently in the middle of Kishlimu (December 5). Saturn, considered to be the Protector of the Children of Israel, is honoured by them with the day marking their Sabbath - Saturday. An event of momentous importance to the Jews must be in the offing for the gods Jupiter and Saturn to be in close proximity to one another for so long.

There is something more, however. A check of the records on the clay tablets reveals that such triple conjunctions of Jupiter and Saturn are fairly rare. The constellation of Taurus was the site of one in year 185 of the Nabonasser Era (563/562 BC), Virgo was the site of another in year 225 of the Nabonasser Era (523/522 BC), and the most recent such event occurred in Cancer in year 167 of the Seleucid Era (146/145 BC). One of their colleagues has been busy for the last three months projecting planetary movements into the future using a geometrical representation of their motions in order to predict triple conjunctions of these two important planets over the next few millenia. According to his calculations, fifteen more are predicted over the next three thousand years. But none will occur in Pisces, the site of this year's Triple Conjunction.

The last result strikes them as being very important astrologically. Their recent observations of stars visible on the eastern horizon at sunrise indicate that a new astrological era has begun. What was once the Age of Aries, marked by sunrises in the constellation of Aries on the first day of Spring, has become, as a consequence of the slow march of precession, the Piscean Age marked by sunrises in Pisces on the first day of Spring. The meaning of the planetary conjunctions is now clear! The recent "rebirth" of the heavens in Pisces is preceding an Earthly rebirth of particular importance to the Jews. In accordance with Jewish tradition, the birth of the new Jewish messiah is being signaled in the stars. The Triple Conjunction in Pisces that they have witnessed, being the first and only such conjunction in Pisces during the entire Piscean Age, is the long-awaited signal!

Evening twilight has just ended for the citizens of Jerusalem. Out on the Mount of Olives east of the Vale of Kidron on the edge of the city, a group of Magi (the local term for astronomers) has completed a short journey from Jericho, where they had an audience with King Herod at his winter palace. It is now the end of Shabatu (February 15, 6 BC), and the Magi have been directed by the Jewish scholars to the small town of Bethlehem, just south of Jerusalem. Their arrival in Jericho and the news of their two-month journey from the Kingdom of Parthia in search of the newborn messiah had created considerable consternation among the Jewish citizens. Could the reign of the despised King Herod finally be near an end? Certainly, Herod himself was most anxious to interview them to learn when the "star" had appeared. He had shown great interest in all that they had to tell him.

Here on the edge of Jerusalem they survey the rapidly-darkening sky above the western horizon. Although they know that Jupiter and Saturn have still been in reasonably close proximity to one another in recent weeks, cloudy weather had obscured their view of the planets on most nights. Tonight is different. Off to the southwest the clearing sky reveals Jupiter and Saturn standing above the horizon in the glow of the zodiacal light (see diagram), like a signpost marking the road to Bethlehem. Tonight, as well, they have been joined by the swiftly-moving Mars, the god of war, which now lies between them. Together the three planets point like a heavenly finger towards their ultimate goal - Bethlehem and the newborn messiah. Their quest is almost over.....

While the story presented here is fictional, the events they depict are quite real. There was a Triple Conjunction of Jupiter and Saturn in Pisces during 7 BC, followed by a planetary massing of these planets with Mars in February of 6 BC. The elapsed time from the first conjunction in May of 7 BC to the final massing in February of 6 BC was 9 months, identical to the normal period between a child's conception and his birth. There have been no comparable celestial events since that time with connotations quite like those described here. But was this the Star of Bethlehem? No-one can be sure. The story of the Star is one that has inspired scholars through the ages. Numerous explanations have been advanced to explain the events described in the Book of Matthew as a natural, or even supernatural, phenomenon. The one given here is my own personal favourite. Very few historical documents from that era have survived to the present. The

oldest events described in the biblical records of the Old Testament can be traced to a period no more than two thousand years prior to the Star of Bethlehem. By way of contrast, the earliest zodiacal constellations date to a period five thousand years before that, and it has been argued by some that our collective human memory preserves recollections from 100,000 years ago - a time when the bright stars of the Big Dipper (Ursa Major) actually did form a configuration strikingly similar to the profile of a Great Bear. The Bear is no longer easy to recognize because the long-term space motions of the nearby stars comprising this asterism have altered its appearance completely. The study of astronomy clearly has very ancient roots! Ω

RUTH NORTHCOTT PAINTING INSCRIPTION: by Roy Bishop

Editor's Note: *Following is the inscription attached to the back of the painting by Ruth Northcott which was donated to the Centre by Dr. Murray Cunningham. The centre deeply appreciates Murray for his donation. He can be assured that his painting will be well looked after.*

Ruth Josephine Northcott (1913-1969) was an astronomer associated with the David Dunlap Observatory at the University of Toronto from its opening in 1935 until her death. Her research interests were stellar radial velocities and spectroscopic binaries. For many years she supervised all the undergraduate astronomy laboratory courses at the University and taught an extension course in astronomy for teachers. She was president of The Royal Astronomical Society of Canada in 1962 and 1963, and was Assistant Editor of both the Society's **Journal** and the **Observer's Handbook** from 1951 to 1956. and Editor from 1957 until 1969. In 1943/44 she was president of the Toronto Centre of the Society.

Ruth Northcott had many interests in addition to astronomy. She served on the governing body of the Royal Canadian Institute, was a member of the Field Naturalists Society, and the Toronto Camera Club. She studied at the Ontario College of Art and produced many water-colour and oil sketches.

This painting was given to Dr. Murray Cunningham by Dr. Helen Sawyer Hogg, a close friend of Ruth Northcott, at the time of a joint meeting of the RASC and the Canadian Astronomical Society at Saint Mary's University, Halifax, NS, in June 1980. Dr. Cunningham, the honorary president of the Halifax Centre of the RASC, presented the painting to the Halifax Centre at its meeting of October 21, 1994.

The Centre's intent is that this painting should be loaned out to interested members of the Centre for a few months at a time.

Prepared by Roy Bishop
November 1994

POST NOVA EAST 94 REPORT: by Doug Pitcairn

So you're going to plan a star party. Let's consider the choices. As the weather works out around these parts, star parties are far more likely to encounter favourable conditions after the middle of August. Then, there's the requirement for a weekend near the New Moon, and to be a weekend before the Labour Day weekend. The net result of these collective conditions is that about every fourth year, one does not get any weekend in August filling the bill, so to speak.

Now, it turns out that on these years, the Thanksgiving Weekend is near the New Moon. Isn't astronomy wonderful? So, we trade bugs for cold, and go for it.

This year's Nova East was held on the October 8th weekend. The faithful met in a beautiful Fundy Park all decked out in its autumn finery. The weather looked indeterminent, and Friday night a 50% clear sky with some alto stratus and some low cumulus hung overhead as I entered the meeting hall for our scheduled public talks.

The first speaker was our Mary Lou Whitehorne. She wooed the crowd with a talk about "Stories in the Stars". Then yours truly babbled on for a bit about "Man's Place in the Cosmos". Afterwards, we went outside for a look up, and lo and behold the clouds had moved in. So we all retired back to the site with the usual apologies to the public. Then half an hour later, it cleared off and we had a wonderful night with average seeing and transparency. (MVM=6.0)

Saturday dawned clear, but broken clouds came and went until the evening. Attendees gathered on the hill site, set up scopes, looked at equipment, talked about the previous years events, took a group photo, and in general did all the things that are so pleasurable about Nova East.

After supper, some gathered at the Assembly Hall again, along with about 50 or 60 public for three more talks. Pat Kelly gave a talk "Bump & Grind in the Solar System" about collisions in the solar system. Then Dave Driscoll of Saint John gave a talk, "Supermarket Science" about all those strange headlines that we've seen in the supermarket tabloids. Dave's unique sense of humour and the totally bizarre headlines kept the audience chuckling. Then Dr. Roy Bishop closed the talks with a short but interesting talk "UFO's are Real and Dangerous!" where he suggested that the real danger is in wasting ones time dealing with falsehoods and mis-interpreted astronomical information.

Saturday night was not as good as Friday, but there was several hours of useable observing as well as some excellent camaraderie around a late night campfire.

Sunday was a relaxed day of hiking, with the exception of the Kelly Clan who were camped across the road at the other campground. They returned from a morning hike to discover that their tent and some of their equipment had been stolen! The suspects were two young fellows who were camped at the same site. Police are still investigating without much hope of success.

Monday morning found us saying good-byes for another year. All people who are regulars at Nova East know the special feeling one gets at

this annual get together. It is a chance to make new friends with a similar interest, and to get together with old friends met years before.

As a final note, this year's Nova East was the first one which was not advertised at all. Yet attendance was just slightly under the norm, and this could have been attributed to the later date this year. Nevertheless, the event now has a life of it's own. Perhaps it is time for the Halifax centre to consider a low key camping observing weekend somewhere else at another time? Or are two observing events in a single year too many. Are there any members out there who do not attend Nova East but who would like to attend a low key, nearby get together, say at dollar lake park in July? Please contact one of the executive members and let us know. Something else to think about. Ω

CONSTELLATION OF THE MONTH: ANDROMEDA
by Joseph Yurchesyn

During late autumn and early winter, Andromeda, the Princess of Ethiopia, approaches the meridian in the early evening. The three brightest stars in Cassiopeia can be used as an arrow head to point the way. In fact it points almost exactly at the Andromeda Galaxy. The constellation consists of two chains of stars (the brighter star chain being south of the fainter) running away from an apex star that is also one of the stars in the *Great Square* of Pegasus.

Andromeda is located just south of the Milky Way and is devoid of bright galactic objects except for the open cluster NGC-752, the planetary nebula NGC-7662, the double star Gamma and the variable star R Andromedae. However, numerous extra-galactic deep sky objects are present. These include the galaxies M-31 and its two attendant galaxies M-32 & M-110, NGC-891 and NGC-404.

The double star γ Andromedae was discovered in 1788 and is a yellowish-orange — greenish-blue pairing of 2.1, 5.1, 10", 130°. The separation distance and angle has remained unchanged for 130 years. The companion star is itself a 5.5, 6.3 double of 61 year period. The orbit is highly inclined as seen from the Earth and a maximum separation of 0.55", last attained in 1982.

The variable star R Andromedae, located about 7° SW of M-31, is a Mira type long period red giant type variable star. It varies between magnitudes 5.3 and 15.1, over a 409 day period.

The magnitude 8.5 planetary nebula NGC-7662 is located ½° SW of 13 Andromedae. The unique feature of this planetary nebula is its double ringed appearance that is visible through photography or large telescopes.

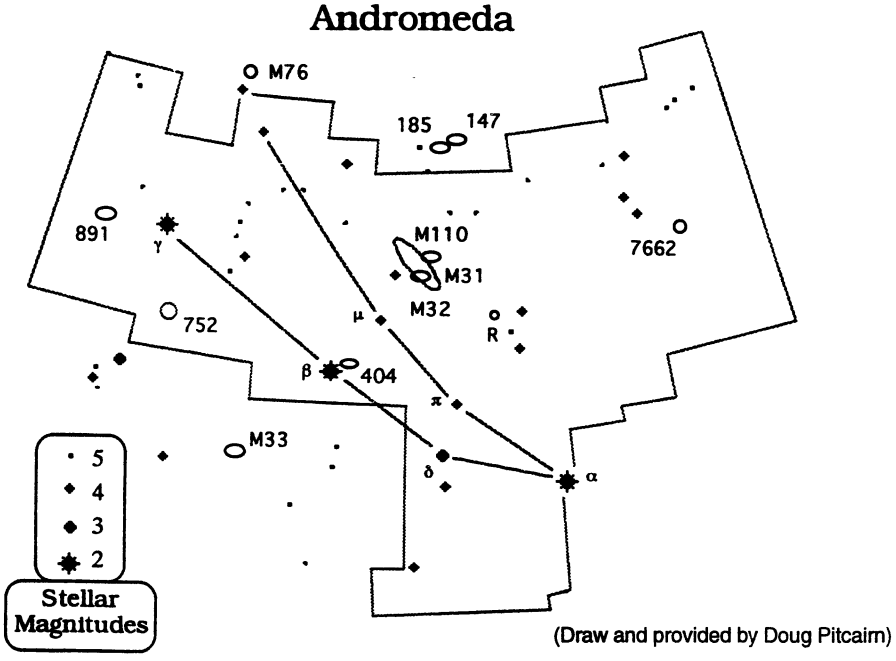
The open cluster NGC-752 is a large scattered cluster ¾° in diameter. It is located about 40% of the way from γ Andromedae to M-33 and the brightest members shine at 9th magnitude. The cluster is estimated to lie 1,300 ly's distant and to be about 1.5 billion years old.

Numerous galaxies are also present in Andromeda, the most spectacular being the Andromeda nebula, M-31. However, NGC-404 is almost as easy to find, as it lies 6' north of β Andromedae. At magnitude 11.9 and 1.3'x1.3', its surface brightness is high, but the proximity of Beta can make it difficult to locate on less than dark nights.

Another galaxy, NGC-891 is a striking edge-on spiral, similar to NGC-4565 in Coma Berenices. Located about 5° west of γ Andromedae, the galaxy is not an easy object to locate, due to its low surface brightness. It is 12'x1', shines at magnitude 10 and is detectable in a 5" or 6" telescope. It lies about 43 million ly's distant.

The Andromeda nebula, M-31, steals the show in this constellation. At a distance of 2.2 million ly's (or 12 M-31 diameters), it is the most distant object easily visible to the naked eye. Our sun, at such a distance, would shine at magnitude 29! A low power telescope also reveals two attendant galaxies, M-32 and M-110 (NGC-205). M-31 also has two other probable satellite galaxies: NGC-147 and NGC-185, located some 7° north in Cassiopeia.

M-31 may have been known as far back as 905 AD. It was called the "Little Cloud" and appeared on pre-telescope star charts. The first telescopic observations are believed to have occurred in 1611 or 1612. Long exposure photographs began to reveal the true nature of M-31, when they recorded individual stars. With the use of the 100" telescope in 1923, several cepheid variables were



(Draw and provided by Doug Pitcairn)

identified and established the object as an extra-galactic object, with a tentative distance of 900,000 ly's. Further studies of M-31 in 1953 using the 200", revealed the existence of two distinct populations of stars (Pop. I and Pop. II) and hence, two types of cepheids. The actual brightness of these two types of cepheids varied by a factor of 2 to 3. That discovery more than doubled the size of the universe and increased the distance to M-31 to the present day accepted value of 2.2 million ly's.

The Andromeda galaxy is known to be surrounded by some 140 globular clusters. From their apparent size, distribution and absolute magnitudes, they appear to be comparable with those in our own galaxy. In its content of stars, dust and gas, the Andromeda system is very similar to the Milky Way.

Just a little something to ponder, when you next gaze in the direction of Andromeda. Now, I wonder if modern technology can image a magnitude 29.1 star?... Ω

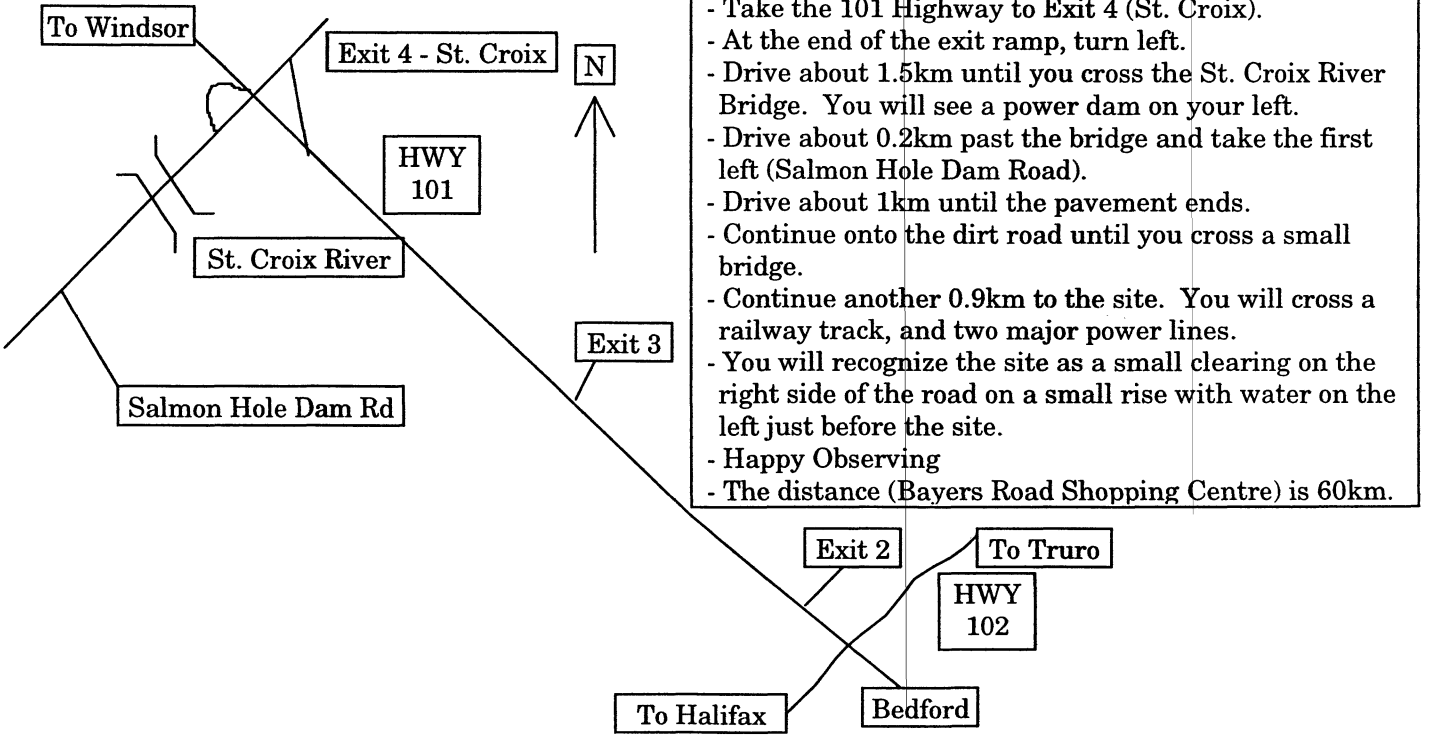
METEORS NOTES:
by Paul Gray

Beautiful arctic air brings the clear, cold skies of winter. With the coldest months ahead, now is a good time to get out and enjoy the winter constellations before its too cold to go out. A good way to say hello to these constellations or even learn them is to go out and watch a meteor shower as well.

December brings a couple of well known meteor showers with the Geminids being one of the best of the year. This year the shower peaks at 7am local time on the morning of the 14th, however it is normally good to watch the night before and the night after. The Moon is close to full this year, but sets at 4am which means that for those who like to see the shower at its best will get a chance. During the couple of hours before dawn, the Moon will be gone and the radiant will be high in the sky at the time of peak.

The second shower of December is the Ursids on the 22nd. They peak at 10pm locally but the Moon is up and close to full. They are weaker, but have had large outbursts in the past. Keep an eye up if your out this night. You never know when a outburst will occur.

The last shower of note is actually on January 3rd at 7pm local time. The Quadrantids' peak is nicely placed in the evening but the radiant is low. The Moon will set early so it will not hinder observations. This shower has been studied by a local group from Halifax, as well as groups in France and Hungary. The results from the past three years have improved our understanding of this shower but more data is needed. I will be out with my group if the weather is good and if you are interested in joining us or would like to collect data to add to ours, please contact me before January 3rd. The more people the better. Clear skies! Ω



Travelling from Halifax (Bayers Road Shopping Centre):

- Take the 102 Highway to Exit 4 (Sackville).
- Take the 101 Highway to Exit 4 (St. Croix).
- At the end of the exit ramp, turn left.
- Drive about 1.5km until you cross the St. Croix River Bridge. You will see a power dam on your left.
- Drive about 0.2km past the bridge and take the first left (Salmon Hole Dam Road).
- Drive about 1km until the pavement ends.
- Continue onto the dirt road until you cross a small bridge.
- Continue another 0.9km to the site. You will cross a railway track, and two major power lines.
- You will recognize the site as a small clearing on the right side of the road on a small rise with water on the left just before the site.
- Happy Observing
- The distance (Bayers Road Shopping Centre) is 60km.

MAP TO ST. CROIX OBSERVING SITE

Notice of Meetings and Events

Date: **Regular Meeting - Friday, January 20th at 8pm**; 7pm for the council meeting (all are welcome)
Place: Lower Theatre, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access from the parking lot.
Topic: **The ASTRID Feature — A Probable Meteor Impact Feature in Nova Scotia on South Mountain** by **Dr. George R. Stephens** of Acadia University. We will also be doing the regular Handbook Talk.

Date: **Regular Meeting - Friday, February 17th at 8pm**; 7pm for the council meeting (all are welcome)
Place: Lower Theatre, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access from the parking lot.
Topic: Main Topic: TBA. We will also be doing the regular Handbook Talk.

Telescopes for Loan

The Halifax Center has several telescopes for loan to members. These include a Celestron C8 equipped for photography, a Questar 3.5", a 4" rich-field telescope, a 4" Maksutov-Cassegrain, and a 10" Dobsonian. Contact the Observing Chairman, Paul Gray, for further information.

Public Halifax Planetarium Shows

The Halifax Planetarium, located in the Dunn Building at Dalhousie University, provides shows each week on Thursday evenings at 7pm. Contact the *Nova Scotia Museum of Natural History* at 424-7353 for show information.

The Objects of This Month and Next

The objects we suggest you observe this month and next are the 3 Messier Clusters: M36, M37, and M38 in Auriga. All of these clusters can be observed in binoculars. Send your observing reports to Paul Gray and they will be printed in a future Nova Notes.

Astro-Ads

Celestron C8 Telescope. 8" Schmidt-Cassegrain telescope with wedge, tripod (Meade make), 2x Barlow, and 25mm eyepiece. Asking $600 or will trade for a pair of 10x50 or 10x60 TENTO binoculars and also a old-type Soviet-made camera, Zenit or Zenit-B, etc.

Contact
(contact the editor to be put in touch with the owner: Mike Boschat)

Meade 8" SCT Telescope. 8" Schmidt-Cassegrain telescope Multi-Coated Optics, equatorial mount, pedestal base, 8x50 finder, a variety of good quality eyepieces, a 2x barlow, Thousand Oaks Solar Filter, star diagonal, an assortment of filters, a Dew Zapper, and dew shield. The scope is in mint condition but is not equiped with an electric drive. Willing to sell for a very reasonable price.

Contact
David W. Griffith, Bridgewater — Phone 527-1301

T-Shirts

We have a large supply of new Centre T-Shirts. These T-Shirts are a 3 colour design which incorporates our new centre logo along with a smaller national logo printed onto high-quality 100% cotton shirts.

These will be available at meetings. For information about mail-orders call Shawn Mitchell.

1994 Halifax Centre Executive

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