
NATIONAL NEWSLETTER

Royal Astronomical Society of Canada

Supplement to the *Journal*

Vol. 82, No. 1 February 1988



Comet Bradfield was an attractive object for binocular and telescope observers during the autumn. *Photograph by Marc A. Gelin, Société d'astronomie de Montréal, Nov 23.96, 1987. Two minute exposure on Tri-X with 200 mm f4.5 lens.*

NATIONAL NEWSLETTER

The *National Newsletter* is a publication of the Royal Astronomical Society of Canada and is distributed together with the Society's *Journal*. Inquiries about the Society should be directed to its National Office at 136 Dupont Street, Toronto, Ontario, Canada M5R 1V2.

Editor: IAN G. MCGREGOR

Mailing Address:
McLaughlin Planetarium
100 Queen's Park
Toronto, Ontario M5S 2C6

Editorial Staff:

HARLAN CREIGHTON, DAVID LEVY, DAMIEN LEMAY, BETTY ROBINSON, STEVEN SPINNEY
University of Toronto Press Liaison: AL WEIR

Deadline for June issue is April 1.

Editorial

by Ian G. McGregor

Well, your editor goofed! In my December editorial I commented on the material I like to print in the *Newsletter* and the material which I do not think is suitable. In particular, I was trying to make the point that well-written articles, edited by their authors, and typed have a much better chance of appearing in the *Newsletter* than those that are poorly written, illegible, and incomplete. Unfortunately, I seemed to suggest that I was only looking for articles written in English.

Our society has members across Canada and around the world and certainly I welcome articles written in French. However, during my many years as a staff member of the *Newsletter*, I have seen very few articles or announcements in French submitted for consideration. As a result, there have been numerous issues which have appeared with no French language material at all! I am one of the first to notice their absence (I am partially French-Canadian) but I can only print what I receive whether in the form of newsletters or direct submissions.

The best French language material I have seen is printed in *Le Quebec Astronomique* which is the well-written and attractive bimonthly publication of l'Association des Groupes d'Astronomes Amateurs (A.G.A.A.). This umbrella organization based in Quebec consists of almost two dozen astronomy clubs and both the Centre d'Astronomie (Montreal) and the Quebec Centre of R.A.S.C. are member groups. If I think out loud on this matter I sometimes wonder whether the occasional French language article, or even a regular article in each issue is sufficient when another high quality amateur publication is printing often over two dozen standard size pages of French language material every two months!

My reason for raising this matter in an editorial is to generate some discussion, and I think this must principally come from the French-speaking members of our society. If you feel that it is important for there to be French language articles in the *Newsletter* than I invite your contributions. Damien Lemay of the *Newsletter* staff, and also one of our society's vice-presidents, is our editor for French contributions. I am sure that Damien would welcome receiving submissions. Damien's address is: 6230 Ravine Way, Orleans, Ontario K1C 2V4.

I look forward to hearing from you.

Newton's Lincolnshire Home

by Dianne Brooks
Halifax Centre

Last June, I accompanied my husband Randall and his thesis advisor, Dr. Allan Mills, to the birthplace of Sir Isaac Newton, Woolsthorpe Manor, and located about forty kilometres from Leicester. The day was partly sunny, following a long rain spell and the dark clouds scattered here and there made me wonder if we would be treated to the same rainbow display that was captured so effectively by Roy Bishop also of the Halifax Centre. Parking the car we were greeted by the National Trust custodian who led us up the lawn past a knurled apple tree. "Was that the tree?" I wondered. Its popularly thought to be although the orchard of Sir Isaac's time was further north of the house. Even if this existing tree was not the one under which the falling apple prompted thoughts of gravitation, the tree is still believed to be descended from a 400 year old specimen which blew down and rerooted. The British Geological Survey has recently measured the force of gravity under this tree and by the door.

Led to the house, the window from which Newton observed sunlight was pointed out to us and then we were conducted directly to the study in which his optic experiments were carried out. In a closet-like corner of the large room, a display had been set up demonstrating how Newton studied the spectrum, now recreated by a lamp which projects the colours onto a white surface. While Dr. Mills made some needed repairs to the exhibit equipment, Randall and I were given a personal grand tour of the house.

The 17th century yeoman farmer's manor house was purchased by Newton's grandfather and passed on to his father. there is a lounge and a combined kitchen/dining room downstairs, and the master bedroom, study and an extra bedroom upstairs. The extra bedroom's size was greatly decreased when a new staircase was built facing the main door in the early 19th century. The old staircase was at the back of the house, approached through the kitchen, and nothing can now be seen of it in the section of the house normally open to the public. We were shown a sketch of the very grand staircase and then taken to the attic through the living quarters of the custodian and his wife, to see the existing railing and banister with its elaborate carving. While upstairs we were also shown the surviving "rat-catchers" under the roof, left over from the house's thatched roof period.

Returning to the usual tour area, we stood in the room in which Sir Isaac was believed to have been born – a premature baby small enough to fit in a pint container and not expected to live. The 400 year old floor now slopes down from the outer wall towards the bed and is made of ashlar concrete, a very lightweight construction of ash and lime reinforced by reeds. A large chunk of it on display weighed no more than a kilogram. The spare bedroom is used as an exhibit area for photographs, sketches and printed panels on which information about the series of stamps issued by the British Post Office commemorating the tercentenary of the *Principia* is prominently displayed. Also on the wall is a documented genealogical chart of one side of Newton's family, from before his time to 1981.

Some of the most fascinating features of the house were sketches on the walls, some of which could be attributed to the young Newton, and some of which are speculated to have been deliberately added to the walls by late owners in an attempt to embellish the legend and attract sightseers. Newton was apparently a fan of graffiti and a large sketch in the kitchen, of a chapel's spires, as well as a smaller drawing of a windmill in the hall could be plausibly credited to him. Sketches of advanced geometrical figures are less likely to have originated with him because he would not have known about their content until he went to Cambridge.

In a lounge, a model of a Newtonian telescope stands on a window sill. From a cupboard the custodian showed us one of two existing snuff boxes made from the wood of the apple tree. On sale are first day stamp covers with Roy Bishop's photo of the rainbow over Woolsthorpe. The only ones remaining have the single, apple stamp because the stock containing all four stamps with the photo sold out in the first 24 hours! While I was signing my name in the visitor's book, we were told that previous visitor books are still held by a former owner of the manor and one is particularly sought after by the National Trust. It contains the June 1930 signature of Albert Einstein who commented after his name that, in his opinion, Newton is still the greatest scientist the world has ever known. The custodian, Mr. Stan Cullen, was a well of information on the house and Newton's life, both professional and private, and we felt honoured to have been given such a privileged glimpse into one of Britains' and the world's

most distinguished figures. Reluctant to take up any more of our guide's time, we left Woolsthorpe Manor just before the site was due to officially open for the day.

Next stop was lunch at a pub in Colsterworth across the road from the Church of St. John the Baptist. Thinking over what we had seen, I wondered how many of the local residents appreciate how much history is concentrated in one small area of England. After lunch, we borrowed the church key to see another Newton artifact. When he was nine, the aspiring scientist had carved two sundials with his penknife on the outer south wall of the house. For safe keeping one of these sundials had been mounted on an inner wall of the church. Curiously, it was inverted on the wall, apparently by accident. One must either know where the sundial is situated or look carefully because of its unassuming location. If the church is entered by the back door, which is the only one the very large, old key would fit, one finds oneself in a small room behind the altar. There is a narrow walkway between the back of the organ and the outer wall. On this wall, behind the organ is the sundial, difficult to see clearly because of the dim light from the shaded window above. Some of the Newton family are buried under the organ, commemorated by a plaque high up on the wall, unlit, and partly hidden by the organ. In the nave, beside the left altar, a small display for the *Principia's* tercentenary had been set up on a table. It included a bust of Newton, books of his life and about astronomy, a reaction pendulum, an apple, and a blown-up photocopy of a page from the church records containing an entry for Newton's baptism. Also on the table were several tourist leaflets announcing various Newton theme events planned throughout the district, including a half marathon known as "Newton's Fraction" on June 21 which would pass many relevant landmarks. The leaflets invited readers to "Gravitate to Grantham" where we drove next.

Grantham is where Newton attended King's School while boarding with an apothecary on High Street. The school can be visited only by appointment, so his signature carved on a window sill and other mementoes will have to wait until another time. However, the local museum had an interesting exhibit which included commemorative medals, books, a model of a bronze statue of Newton that stands in the town square, plaster casts of Newton's death mask, one of the sundials, a window sill signature, and a wax figure of Newton conducting his optics experiments. We discovered at the museum information desk that there was a clock in the new mall across the street. Since Dr. Mill's special interest is horology, we went over to investigate the Isaac Newton Shopping Centre. Walking down Newton Lane, one enters the central courtyard under a huge paper mache apple. To the left is a large model of a Newtonian telescope in a glass case. At the far end high on the wall is a very large timepiece consisting of a lion automaton sitting under an apple tree holding the clock face. A plaque hung at eye level explains that the lion is asleep but awakens when the clock chimes on the quarter and half hours and opens its eyes to see if the apple has fallen. On the hour the apple does fall and the lion strikes the chime. I wondered what Sir Isaac would think of the techniques used to popularize astronomy, or to exploit a famous name. Astronomy has been taken to the people in grand style in Grantham.

Woolsthorpe, Colsterworth and Grantham lie within a few kilometres of each other in Lincolnshire. They make a fascinating day out for anyone interested in seeing for themselves the landmarks in Sir Isaac Newton's earlier years. A bit further away but also of relevance is Trinity College Library at Cambridge University, which holds the scientist's private library including his personal copy of the *Principia*.

Reprinted from Halifax Centre's *Nova Notes*

World's Largest Telescope

The Council of the European Southern Observatory gave approval in December to the construction of the ESO Very Large Telescope (VLT). When completed in 1994-95, the VLT will be the world's largest telescope with an array of four telescopes each with a mirror of eight metres diameter giving an equivalent aperture of 16 metres.

With the completion of a four year (1983-87) project study the eight member states, Belgium, Denmark, the Federal Republic of Germany, France, Italy, the Netherlands, Sweden and Switzerland agreed to embark upon this ambitious project which will cost an estimated 382 million DM. A site has not yet been chosen but the excellence of the La Silla site in Chile as well as another site at Cerro Paranal suggest Chile will be the site. A final decision on site will not be made until 1990.

Observer's Cage

by David H. Levy

Our Handbook

Writing about the *Observer's Handbook* allows me to include another of my favourite subjects, Acadia University. Each holds a common tradition and goal of reliability, and each is excellent – something worth celebrating.

Acadia University is the academic home of Roy Bishop, editor of the *Handbook*. It is also my alma mater, and a better place for four years of undergraduate study is not possible on this planet. Located near the shore of the Minas Basin in Nova Scotia, Acadia is a small school that offers an excellent faculty, small student population, and a clear dark sky – all necessary for a healthy academic life. One day in 1969 I had sat down with Roy to discuss the lack of a nearby RASC centre. Frankly, we both felt a bit homesick, and so we were pleased to hear of the revival of the Halifax Centre after a long lapse. From the small town of Wolfville, 90 kilometres to a centre was no distance at all.

More than ten years later, Roy accepted the editorship of the *Handbook*. Our discussion of 1969 had come full circle; the RASC did come to Nova Scotia, but now, in a big way. Acadia was reaching out to the RASC. Since then, the *Observer's Handbook* has come out of Acadia, and the 1988 edition is better than ever.

The excitement begins with the red cover, which announces to the worldwide readership that since the first of Supernova 1987A's three discoverers is a Canadian, this unusual star is a good candidate for Canadian citizenship. (SN 1987A shares that other proud Canadian distinction that we do things differently, somehow.)

The *Handbook* was started eighty editions ago as a service to Canadian observers. Now it is truly a publication of worldwide acclaim, but still Canadian. What other list of tables could possibly get away with the extraordinary statement on page 22: "Time has been said to be Nature's way of keeping everything from happening at once." Then follows a favourite section, the Sky Month By Month. With a daily table on the right-hand page and explanation on the left, these pages are among the most useful, word for word and diagram, in all the astronomical literature. I especially like to see Jupiter's satellites wind their way down the monthly pages, in effect, supervising the year's events.

Founding editor Clarence Augustus Chant and his successor, Ruth Northcott, firmly established the *Handbook* as a reliable reference, and John Percy began its evolution into a more easily read book. In Roy's period of editorship, we have seen the *Handbook* evolve into something different from what it had been. Originally, it did a superb job of telling us what was happening in the sky, but more and more, it now motivates us as well. It is now a book with exciting articles, easily understood directions, and almost unlimited information. A child in grade 6 can benefit from the *Observer's Handbook* and copies are used in most professional observatories. You just can't say that about many books. Roy, you have made Acadia proud.

Events Calendar

April 2	International Astronomy Day
May 29-June 1	Annual Meeting of the Canadian Astronomical Society, Trent University, Peterborough, Ontario.
June 25-26	Workshop on Teaching of Astronomy University of Victoria (in conjunction with joint meeting of ASP, WAA and RASC), Victoria, British Columbia
June 28-July 2	Joint meeting of the Astronomical Society of the Pacific, the Western Amateurs Association and the Royal Astronomical Society of Canada, Victoria, British Columbia.
July 27-30	Colloquium #105, International Astronomical Union on "The Teaching of Astronomy", Williams College, Williamstown, MA.

The Schmidt-Cassegrain Unveiled

by Peter Ceravolo
Edmonton Centre

In 1929, Bernhard Schmidt, a reclusive, eccentric, one-armed optical genius developed a catadioptric (combination minor and lens) telescope that was destined to revolutionize astrophotography and amateur astronomy.

To overcome the restricted field of the reflecting telescope, Schmidt left the primary mirror in a reflector spherical, instead of parabolizing it, and placed a corrector plate at its centre of curvature to compensate for the resultant spherical aberration (the failure of the light rays to come to a common focus). Placing the corrector at the centre of curvature eliminated the coma which restricted the field of view of parabolic mirrors. With the Schmidt camera, a field of view of over 20 degrees is possible, while the simple parabolic mirror is limited to much less than a two degree field. Soon many variations of the Schmidt theme were developed. The one that has had the greatest impact on amateur astronomy is the Schmidt-Cassegrain.

The Cassegrain reflector, consisting of a concave primary mirror, and a convex secondary, is the one telescope configuration that has the most to gain from the catadioptric concept. Allowing the large mirror to remain spherical permits it to have a much shorter focal length than normally possible. The standard reflector is rarely faster than $f/4$ because of the difficulties of figuring as well as the severe coma at the edge of the field. However, the catadioptric primary can easily be made $f/2$ because it can be left spherical. The Schmidt-Cassegrain uses a full aperture, thin corrector plate that has a very weak but complex aspheric profile to correct the poor image that the mirrors alone would produce. The result is an incredibly compact instrument of moderate focal length.

Understanding how the Schmidt corrector works is quite simple if one compares it with a full aperture barlow lens and telecompressor. The spherical aberration in the mirror system causes the light rays close to the centre of the corrector to be focused farther down the optical axis than the light rays close to the edge (see fig. 1a). The Schmidt corrector's complex shape can be divided into two zones, an outer zone which is concave towards the sky, and an inner zone which is convex towards the sky. The point of inflection, where the curve changes from concave to convex, is called the neutral zone (see fig. 1b). The light ray that passes through the neutral zone remains undeviated and defines the focal point of the system. The central convex zone of the corrector acts as a telecompressor and causes the central light rays to focus closer along the optical axis, coinciding with the focal point of the neutral zone ray. The concave zone of the corrector acts as a barlow lens, causing the edge rays to focus farther up the optical axis, again to coincide with the neutral zone focus. The curve on the corrector plate is very slight and not easily visible to the eye without proper test instruments.

You may have already guessed that the correction can be achieved with a corrector that is either wholly convex or concave, with the neutral zone being either at the very edge or the centre respectively. With the convex corrector, the rays would come to the focus closest to the secondary, while the concave corrector would cause all the rays to focus at the farthest point from the secondary, although the last two solutions appear to be simplest they are not the optimum. The corrector is a refracting element and therefore causes chromatic aberration. The chromatic aberration of the wholly concave or convex corrector would be more objectionable than the more complex combination corrector that is widely used today.

Although both mirrors in a Schmidt could be spherical, making the system cheaper to make, better coma correction is achieved if the secondary is slightly aspherized and the corrector designed to eliminate spherical aberration. In actual production, the Schmidt corrector and primary are made first, then the optics are assembled on a test bench and the secondary is touched up until the spherical aberration has been eliminated.

The performance of any Cassegrain telescope, with good optics, is limited by the alignment of the mirrors. The secondary in today's Schmidt-Cassegrains magnifies the primary's focal length five times to achieve the final $f/10$ focal ratio. Since it must do quite a lot of work, the secondary has a great effect on the final image quality, and is thus very sensitive to alignment errors. Quite often a Schmidt-Cassegrain's poor performance can be directly attributed to collimation trouble.

One of the great features the commercial Schmidt-Cassegrain offers is the internal focusing

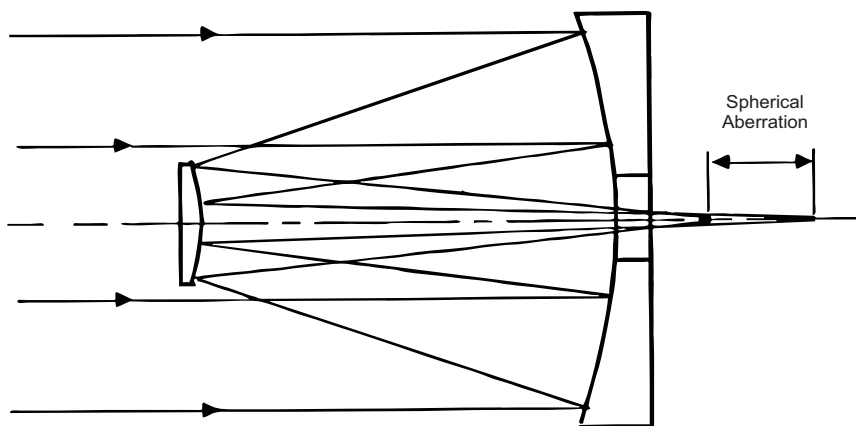


FIG. 1a. Two mirror Cassegrain with spherical aberration.

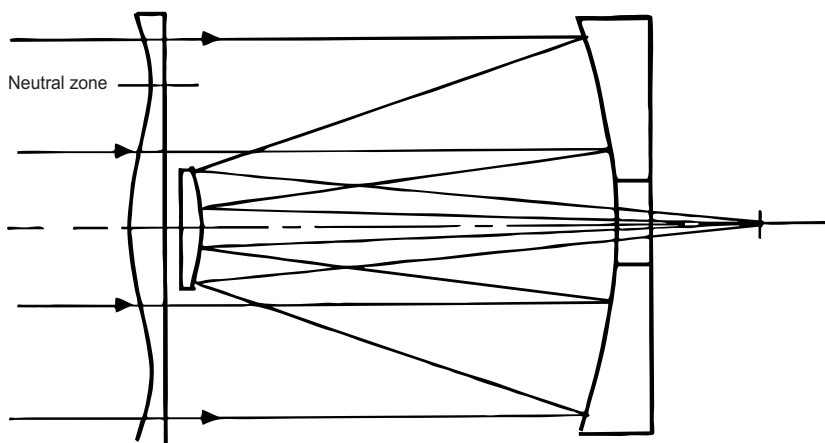


FIG. 1b. Cassegrain with a Schmidt corrector, eliminating spherical aberration.

arrangement. By moving the primary mirror towards and away from the secondary with the knob at the back end of the tube, the telescope can be focused on distant (to infinity) and close objects respectively without having to move the eyepiece or camera. This allows cameras and other accessories to be firmly connected to the back end of the telescope. Although most catadioptrics can be focused down to eight metres or less, the optics are usually optimized for the infinity focus only.

Schmidt's invention caused a revolution in amateur astronomy. No longer was the amateur astronomer limited to a small reflector, or even a small refractor. The attributes of both were combined to create instruments of unparalleled versatility, ease of use and portability while maintaining a relatively large aperture. Evidence of their utility is readily available, just flip through the pages of popular astronomy magazines. The majority of the astronomical photographs and observations made with telescopes were made with the Schmidt system.

Bernhard Schmidt died in Hamburg, Germany, on December 1, 1935. Schmidt did not live to see his invention widely implemented. Despite the obvious advantages, the European astronomical community of the time was conservative and preferred to use the standard, proven equipment. The Schmidt system was not well received until it was introduced to the American astronomers at Mt. Wilson. They immediately realized the instrument's value for astronomical research, and thus the historic 48-inch Schmidt telescope was born. The rest is, as they say, history.

International Youth Camp

The 24th International Astronomical Youth Camp (IAYC) will be held from August 1 to 21, 1988 in Ofterschwang in the Federal Republic of Germany. Local conditions in this mountainous area are favourable for observing.

Since the first IAYC in 1969, the aim of these camps has been to offer people between the ages of 16 and 22 the possibility to cooperate in amateur astronomical projects and to stimulate in this way international understanding and friendship.

For the astronomical program, participants can take part in working sessions on one of the following subjects: Ancient astronomy, Astrometry, Deep Sky, Distances and Stellar Dynamics, Astronomy as an Art, Meteors, the Sun, Micro- and Macrocosmos and Variable Stars. Each group is led by a qualified specialist and a darkroom service is provided for quick development of astrophotographs. The camp language is English, and participants should be able to communicate in it without using a dictionary.

The participation fee will be DM 530. This includes full board accommodation as well as the astronomy program and printed reports.

If you are interested in astronomy and willing to share your hobby with other young people from many other nations, write to: IAYC Workshop Astronomy e.V., Andrea Weyersberg, Ulrich-von-Hutten-Strabe 72, D 7015 Korntal-Munchingen 1, Federal Republic of Germany.

Victoria in '88!

Plans are progressing for the joint meeting of the Astronomical Society of the Pacific, the Royal Astronomical Society of Canada and the Western Amateur Astronomers to be hosted by the Victoria Centre from June 25 to July 2 inclusive.

Highlighting the meeting will be a professional symposium from June 29 to July 1 on the Extragalactic Distance Scale which will feature invited speakers from around the world. Approximately 22 papers will be presented on themes ranging from the local group of galaxies to the calibration of standard candles and the Virgo cluster.

A two-day workshop on the teaching of astronomy to grades 3 to 12 will be held on June 25-26 and promises to be of interest to teachers and astronomy educators.

The Society's General Assembly will be held in parallel with sessions by the Astronomical Society of the Pacific and the Western Amateur Astronomers from June 29 to July 2.

The Victoria meeting represents the 100th Meeting of the Astronomical Society of the Pacific and commemorates the 70th anniversary of the founding of the Dominion Astrophysical Observatory.

General registration will start on Tuesday, June 28 for the symposium and continue on through July 1. For general information on registration, accommodation and fees write to the Victoria Centre Secretary: Alice Newton, R.R. 1, 801 Stanehill Pl, Victoria, British Columbia V8X 3W9.

Across the R.A.S.C.

WINNIPEG: *Winnicentric*s editor Myra Bannerman reports the centre's observatory was very active this past autumn. Some of the projects involved spectroscopy and photometry. The centre's meeting room and library has moved to St. Paul's College of the University of Manitoba. In lieu of paying a rental fee a proposal has been made for the centre to establish a scholarship fund with the college.

OTTAWA: A 40 page December issue of *Astronotes*, the largest ever printed, celebrated the newsletter's 25th anniversary. The issue featured articles by almost all of the sixteen individuals who have edited the newsletter as well as many photographs and interesting tidbits of information. Best wishes for the next 25 years!

SASKATOON: Plans are progressing for a new 16-inch Centre telescope. Well-known member Gordon Patterson has his *Handbook of Astrophotography for Amateur Astronomers* now printed in a second edition. Copies are available for \$16.95 plus \$1.00 postage and handling from Herrem Publishing Company, P.O. Box 8967, Saskatoon, Saskatchewan S7K 6S7. A local television station is doing a monthly promotion for the centre.

CALGARY: Jim Himer has been nominated to be the new centre president for the January elections. The annual centre party was scheduled for January 16 at the Wainwright Hotel.

MONTREAL: The centre's Christmas part was scheduled to be held at the observatory on December 12. Outgoing centre president Ron Pow highlighted the year's activities in his year-end report. These included the naming of the observatory, the Isabel K. Williamson Observatory at an impressive dedication ceremony. Congratulations to Bob Venor for receiving the centre's Charles Good Award for his over 50 years of service to the centre. William Cadloff is the new president.

NIAGARA: The past year was a very exciting one for this active centre. A 17.5 inch telescope was purchased and has found a home on a 15 acre farm site owned by one of the members. In the summer a fundraising drive was a huge success and the club has its own crest and jackets. As well, the format of *Niagara Whirlpool* has changed with the purchase of a photocopier. In the autumn the centre hosted the meeting of the Niagara Frontier Council of Amateur Astronomical Societies (NFCAAA). Production of a booklet describing the history of the centre for this year's 30th anniversary celebrations is progressing well. The centre will be meeting with local authorities to discuss a site for a new public observatory.

EDMONTON: George Moores will be organizing the 1988 Alberta Star Party to be held next August and which is being hosted by the centre. Bob Drew has been organizing the reconstruction of the centre's 17.5-inch telescope. The rebuilt semi-portable three piece telescope was to be unveiled last December.

TORONTO: The annual awards banquet was held at the end of November. Chris Trump, vice-president of Spar Aerospace, was the guest speaker. At last count about two dozen people are travelling with the centre's solar eclipse expedition to the Phillipines to see the March total eclipse of the sun. Experienced eclipse observers Randy Attwood and Ralph Chou are acting as organizers.

WINDSOR: Secretary Joady Ulrich reports that at the November meeting of the centre, the president, Lorison Durocher, received the Windsor Centre Plaque. Lorison has been a very dedicated member of the centre serving both as its secretary (nine years) and currently as its president as well as for many "extra mile" efforts to enhance its progress. Congratulations Lorison!

Across the R.A.S.C. is a regular feature of the *Newsletter*. Centre editors or secretaries should send newsletters and reports of their activities to the *Newsletter* editor. Deadline for the June issue is April 1.

Finland Prepares for Solar Eclipse 1990

The sunrise in Helsinki on July 22, 1990 will be highly exceptional. When the upper part of the sun rises over the northeastern horizon at 4:52 am Finnish Summer Time (GMT + 3 hours), it will be a narrow crescent which rapidly diminishes. A couple of minutes after the whole sun has risen, the crescent disappears and darkness falls on the city. The total eclipse will last for nearly two minutes, and then the morning will start anew.

The zone of totality crosses southeastern Finland as a lane with a width of about 170 kilometres. It continues into the northern parts of the Soviet Union and runs along the coast of the Arctic Sea, till it ends near the Aleutian Islands south of Alaska.

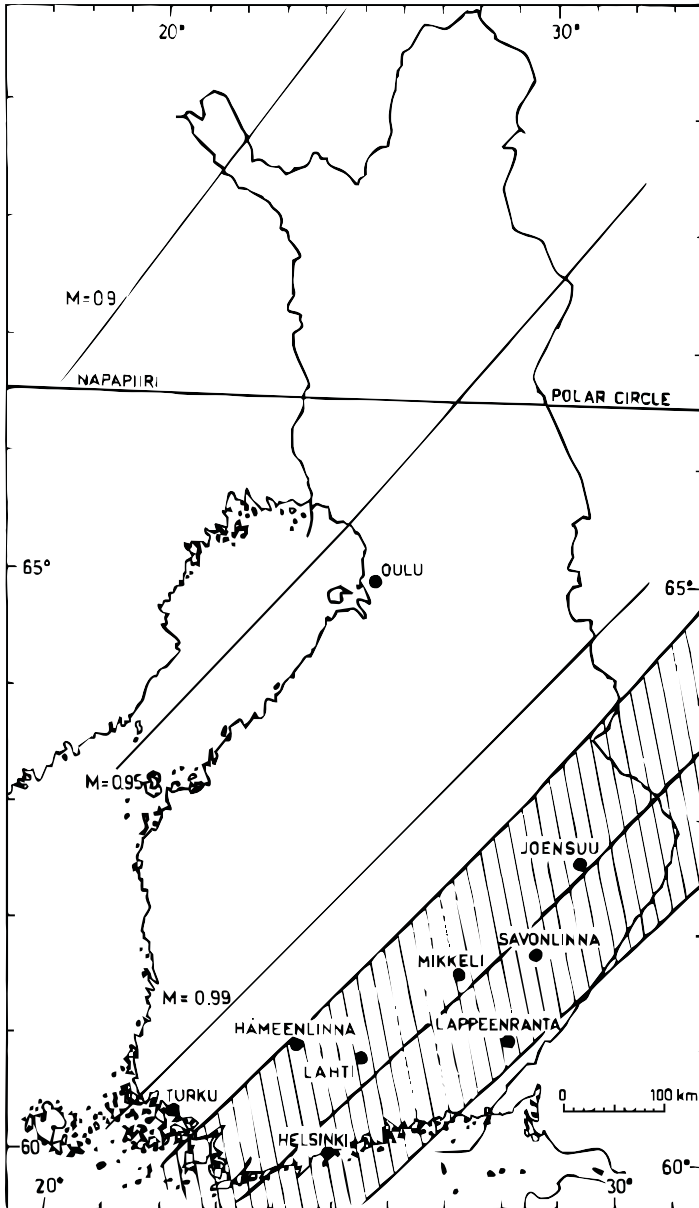
In Finland there are several towns and tourist centres in the totality zone. The best conditions for observing the eclipse may be near Joensuu, where the height of the sun during the total eclipse will be about four degrees (eight moon diameters) over the horizon.

“It is still very low, and thus there will certainly be difficulties with any planned experiments”, says the staff of the Helsinki University Observatory which is coordinating the arrangements. “But it is the first total solar eclipse in Finland for over 40 years-and the first in Helsinki since 1715-and will certainly attract great attention. And for photographers the event will offer fine possibilities.”

Preliminary Data for the 1990 Eclipse

Helsinki (Latitude 60°09'43", longitude 24°57' 16", height – 33-m) Joensuu (Latitude 62°37", longitude 29°49", height – 100-m)

	<i>Helsinki</i>	<i>Joensuu</i>
1st Contact		
Time (UT)	1:02.58	1:02.30
Apparent height of centre of the sun (h)	–3.10°	0.38°
Azimuth (A)	216.3°	220.5°
Position angle of the point of contact (P)	282.4°	282.5°
2nd Contact		
time	1:52.26	1:53.00
h	1.04°	4.24°
A	227.2°	231.6°
P	112.1°	100.7°
Mid Eclipse		
time	1:53.08	1:53.45
h	1.09°	4.30°
A	227.3°	231.7°
P	192.2°	192.5°
3rd Contact		
time	1:53.50	1:54.30
h	1.15°	4.37°
A	227.5°	231.9°
P	272.3°	284.3°
4th Contact		
time	2:45.08	2:46.57
h	5.99°	9.36°
A	238.4°	243.2°
P	102.0°	102.6°



The zone of totality crosses the southern Finland in the early morning of July 22nd, 1990.

Several groups from central Europe and other parts of the world have also shown interest in the eclipse. The travel organizations in Finland are prepared to handle a large flow of international visitors.

One of the experiments the Finns are planning, dubbed Solrad 90, will try to determine the diameter of the sun with simple measurements. A long row of school children, perhaps extending all the way across the zone of totality, will observe the eclipse through hand-held screens and measure the length of totality with handwatches. Several video cameras will be used along the row to register the disappearance and reappearance of the sun.

The total eclipse of 1990 will also coincide with the celebrations of the 350th anniversary of the University of Helsinki. The University was founded in Turku in 1640 and moved to Helsinki in 1827.

The next total solar eclipse of the sun in Europe will be in 1999 when the shadow of the sun will cross central Europe from England to Italy.

Useful Addresses

Helsinki University Observatory, Tahtitorninmaki, SF-00130 Helsinki, Finland, tel. 358-0-1911.

Ursa Astronomical Association, L'alvanarustajankatu 3, SF-00140 Helsinki, Finland, tel. 358-0-174048 or 657728.

Geodetic Institute, Ilmalank. 1, SF-00240 Helsinki, Finland, tel 358-0-410433.

Meteorological Institute, Vuorikatu 24, SF-00100 Helsinki, Finland, tel. 358-0-19291.

Finnish Tourist Board, Asemapaallikonk. 12 B, SF-00520 Helsinki, Finland, tel. 358-0-1445 11, and offices in several countries.

For more information, please contact Reino Anttila, Tapio Markkanen, or Heikki Oja do Helsinki Observatory.

Dressing for Winter Observing

**by Frank Dempsey
Toronto Centre**

Winter skies have many beautiful and fascinating objects for the amateur astronomer to enjoy, if the observer is properly prepared to withstand the harsh cold of a Canadian winter. Fortunately, in this space age, there are many lightweight materials available that allow one to be comfortable without being cumbersome. Here are my suggestions for protecting different parts of the body:

Underwear: Polypropylene underwear is very light and warms and keeps moisture away from the skin. Modern Kroy wool underwear achieves the same warmth without the irritating itchiness of traditional wool. Upper body underwear with a turtleneck is also highly recommended.

Middle Layer: Shirts and pants should have ample pockets for holding food snacks and spare batteries for flashlights, etc. Sweaters come in a wide range of materials and heat retaining properties. Heavy wool sweaters are generally warmer than synthetics. Skirts and kilts are not recommended.

Outer Garments: A top quality parka with hood is well worth the investment. The warmest are filled with down. In windy conditions, a pair of nylon wind pants may also be necessary. Under the parka hood, a toque will keep your ears warm but a balaclava is the best protection for the face. For the feet, there are excellent winter boots available with separate inside liners. Inside these liners wear wool socks over polypropylene sock liners worn next to the skin. Heavy woollen gloves or mittens worn over thin versions of the same will provide lots of protection for the hands while still allowing plenty of movement. Extra protection can be provided with thin glove liners and even nylon outer mitts in the worst conditions.

Of great importance in staying warm is occasional exercise with occasional snacks of high calorie food. Take little walks, swing your arms and twiddle your fingers and toes. Keep handy thermos filled with a hot drink and stuff your pockets with candy bars, granola bars, etc. And have a good hot meal before you start your observing session.

Reprinted from Toronto Centre's *Scope*

Electronic Mail Anyone?

Editor: The following announcement has been sent to all Centre Secretaries.

At the meeting of National Council on September 26, 1987, the Computer Use Committee sponsored a resolution that called for the National Office to join the computer electronic mail network known as NetNorth. As a result of the passage of this resolution, the National Office obtained a computer account at the University of Toronto, so that it is now possible to communicate with National Office using computer mail. This has important implications for the accessibility of National Office to the Centres: another means of communication has been made available to you. This letter will provide some background to the NetNorth network, and offer some suggestions on how your centre can link into the network.

The use of electronic mail is an important and effective way for widely dispersed individuals and groups to communicate with one another. The RASC is an organization with centres in most major Canadian cities, and is administered by councilors and representatives spread across the country. With the increased use of personal computers, electronic mail has come to rival and exceed the services provided by Canada Post. It is clear that the RASC National Office will benefit from access to an electronic mail network.

Following an investigation of the available computer networks, the Computer Use Committee selected NetNorth.

“The NetNorth Network is a national private network connecting computer systems that are administered and operated by Canadian academic institutions and by supporting Canadian institutions with which these academic institutions pursue their objectives.”¹

NetNorth has its origins in BITNET, the American network established between Yale and City College of New York in 1981. NetNorth continues to be affiliated with BITNET and EARN (European Academic Research Network). These links provide any user with access to over 1,700 institutions in North America, Europe, Africa and Asia. And the number of subscribing institutions is rapidly increasing.

“NetNorth is a non-profit consortium, established and operated by Canadian academic institutions with initial support and continuing encouragement from IBM.”²

NetNorth is the network that is used most frequently in the scientific community. At the last annual meeting of the Canadian Astronomical Society, the Computing Resources Subcommittee recommended that CASCA members (or their institution) join NetNorth. There are at least seven members of National Council who already have access to the NetNorth network. It is with this core of users that National Council is expected to communicate the most in the initial years.

But as time goes on, it is the wish of the Computer Use Committee that centres investigate the possibility of establishing a link with the National Office using NetNorth. In doing so, your centre would have a direct “line” to the Society’s Executive Secretary, Rosemary Freeman, to send annual reports, to request information and to receive notices from the National Office. Telephone communication is expensive and Canada Post is often too slow or unreliable. We believe that it would be advantageous for a centre to obtain access to NetNorth.

For this means of communication to work, it is of course necessary that your centre have access to a modem-equipped microcomputer or terminal. The next step is to obtain a NetNorth “username”. There are two potential ways for a centre to link into the NetNorth network:

a) investigate whether or not there is already a member of the centre with access to NetNorth. It is probable that many centres have such members. Because a high volume of communication between a centre and National Office is not anticipated in the early stages of electronic mail use, that member may be willing to act on the centre’s behalf. b) It is possible for centres to join the NetNorth network by acquiring a computer account at your local university. The Computer Use Committee encourages centres to make inquiries at your local university’s computing centre.

Option (a) would be the easiest (and with the possibility of zero net cost, the cheapest) for centres, but you may find your local university receptive to giving you an account at a very reasonable annual rate, especially as the RASC is a non-profit organization involved in education. As a guideline to the possible financial commitment to NetNorth for your centre, note that National Council has budgeted \$200 for the first year of our computer account at the University of Toronto. This added item in the national budget is expected to be offset by the decreased expenditures on telephone calls and regular mail as a result of the use of NetNorth. The actual expense could well be 50% of the budgeted \$200 (actual costs will depend on usage). The cost of computer accounts at other universities will vary, but please inquire.

Should you locate a member in your centre with access to NetNorth, please inform him/her that the National Office is assigned the username RASC at NetNorth node UTORPHYS. Below is a short directory of NetNorth usernames. (Although there may be minor differences in the syntax fo different machines, the correct username must always be a part of the NetNorth address string.) If you have any questions or need assistance, contact the Computer Use Committee. We will be pleased to help in any way we can.

NetNorth Username	User and Position
RASC@UTORPHYS	Rosemary Freeman Executive Secretary
TINDALL@DAL	David Tindall Secretary
LAH@NRCBRA	Lloyd Higgs 1st Vice President
BISHOP@ACADIA	Roy Bishop Past President and Editor, <i>Observer's Handbook</i>
BEATTIE@UTORPHYS	Brian Beattie Librarian
PULS@UALTAMTS	Franklin Loehde Chairman, Computer Use Committee
PERCY@UTORPHYS	John Percy Member, Endowment Fund Committee
NSCRIMG@TUNS	Norman Scrimger Halifax Centre Rep

Please note that NetNorth is an option for your centre to consider. Nothing will change in the operation of the Society that will put centres without NetNorth at a disadvantage. But clearly it would be to the benefit of your centre to have an additional means of contacting National Office. It is the wish of the Computer Use Committee that the day will come when all centres can be linked electronically. It is up to you and the council of your centre to investigate NetNorth and help make this wish a reality.

Yours sincerely
Franklin C. Loehde
Chairman
Computer Use Committee

Résumé des activités de l'A.G.A.A. en 1987

par Damien Lemay

Le 12ième Congrès de l'A.G.A.A., les 19, 20 et 21 juin à Drummondville fût un succès avec 109 inscriptions. Le savoir faire de Réal Manseau et de ses amis du club de Drummondville y est sûrement pour quelque chose. L'observatoire de George Hamel avec un newtonien de 40 cm dans un dôme de 6 m de diamètre, plus un maksutov de 25 cm et une paire de jumelles géantes avec des objectifs de 15 cm, fût le lieu de rendez-vous par excellence pour les soirées d'observation. Merci à la météo qui a aussi collaboré. Le clou du congrès a été la conférence du Dr. Raymond Fredette, philosophe, qui avait pour titre «Galilee, un astronome amateur qui a réussi». Aux groupes qui désireraient entendre parler de Galilee, je leur recommande monsieur Fredette. Le prix Méritas est allé à François Bourbeau de Drummondville qui a aussi été remarqué par son rôle d'animateur durant le congrès. A noter que François est un membre associé (unattached) de la S.R.A.C. Le Trophée Méritas a maintenant un petit frère, "Les Pléiades," en mémoire de Rolland Noel de Tilly. Ce trophée consiste en une plaque d'émail sur cuivre représentant un ciel étoilé et signée par sa fille Pauline Noel-de-Tilly. A compter de 1988 il sera remis à un astronome amateur de moins de 18 ans, qui se sera distingué par ses travaux astronomiques.

L'Expo Science Internationale, du 8 au 13 juillet, comptait 39 kiosques sur l'astronomie, dont une dizaine tenus par des membres de l'A.G.A.A. Le Centre de Québec de la S.R.A.C. et la S.A.M. y étaient dument représentés. Cette exposition rassembla des participants de nombreux pays dont quelques uns venant d'aussi loin que la Chine.

Le Festival d'Astronomie Populaire du Mont Mégantic, les 17, 18 et 20 juillet; il s'agissait de la cinquième édition de cette manifestation dont le succès dépend de la collaboration des astronomes professionnels du Mont Mégantic et des amateurs. Trois conférences principales furent données par les Drs Claude Carignan, René Racine et Gilles Fontaine. Plusieurs amateurs étaient là avec leurs kiosques illustrant leurs travaux ainsi qu'avec leurs télescopes pour assister l'Observatoire du Mont Mégantic pendant les soirées d'observation. Evidemment tout le monde veut voir à travers le télescope de 1.6 m, mais à cause de l'achalandage les télescopes d'amateur sont aussi très appréciés.

Le Camp de Port-au-Saumon, du 3 au 16 août a été favorisé par une météo plus favorable que la moyenne des années antérieures. Plusieurs projets sérieux purent être réalisés. L'équipe d'animation a profité de la présence de trois Français, Igor Beauvoir, Olivier Bésida et Oliver Saint-Pé. En plus de leur expérience ils avaient apporté du matériel spécial capable de causer l'envie de la plupart des amateurs. Par exemple, des réseaux de diffraction de 140, 528 et 600 traits par mm pour photographier des spectres d'étoiles. Ils avaient même un CCD, malheureusement la non disponibilité d'ordinateur adéquat n'a pas permis d'en tirer tout le potentiel. Néanmoins, cela a stimulé l'enthousiasme de tous les participants.

Projet de Camera Schmidt L'A.G.A.A. a acquis deux ensembles complets de caméra Schmidt avec monture équatoriale et télescope guide qu'elle met à la disposition de ses membres. Ainsi tous les clubs, qu'ils soient riches ou non, ont maintenant accès à une puissante technique pour la photographie des objets lointains ou "deep sky." Des stages furent organisés pour enseigner la manipulation de ces instruments.

Poste Electronique Tout comme la S.R.A.C. qui encourage ses membres possédant un ordinateur muni d'un modem à communiquer via le NetNorth Network, l'A.G.A.A. a négocié une entente avec Infoqoq, un système de distribution de données de l'Université du Québec.

CAFTA, le Concours Annuel des Fabricants de Telescope Amateur a eu lieu les 21, 22 et 23 août à Lanaoia à quelque 60 km à l'est de Montréal. Dans la catégorie mécanique le prix a été décerné à Yvon Prigent (S.A.M.) pour la monture équatoriale d'une paire de télescopes consistant en un newtonien de 25 cm et un 15 cm en piggy-back. Le prix pour la meilleure optique est allé à André Guibard pour le miroir de 15 cm de son newtonien. Enfin, le prix d'originalité à Jean-Guy Taillon (Verdun) pour une

monture équatoriale mue par des moteurs à impulsions (stepping motor) contrôlées par ordinateur. Le vendredi et le samedi soir furent propices à l'observation, les deux plus gros instruments disponibles consistent en un dobsonien de 33 cm et un C-14.

Société d'Astronomie de Montréal (S.A.M.) Lors de la dernière assemblée générale le conseil d'administration a été réélu en bloc à l'exception du représentant national qui est maintenant Jean-Pierre Urbain.

Centre de Québec, le protocole d'entente pour utiliser l'observatoire du Collège de Lévis a été renouvelé. *L'Almanach Graphique 1988* a aussi été publié. Ceux qui en désirent une copie gratuite n'ont qu'à écrire au secrétaire M. Yvon Labadie, 101 rue Saint-Paul #2, Québec, G1K 3V8. Avec votre demande, prière de fournir une enveloppe pré-adressée et munie d'un timbre pour le retour.

Uranometria 2000 0

by Paul Comision
Ottawa Centre

There have been many atlases available to amateur astronomers in the past few years, including:

Anton Becvar's *Atlas Coeli*
Wil Tirion's *Sky Atlas 2000.0*
Charles Scovill's *A.A.V.S.O. Variable Star Atlas*
Smithsonian Astrophysical Observatory *Star Atlas*

Even so the arrival of *Uranometria 2000.0* written by Wil Tirion, Barry Rappaport, and George Lovi has caused a stir in the observing community. The above noted atlases, although thorough and colourful (such as Becvars' and Tirions') are very good at a desk but rather difficult to use at the telescope because of the large loose sheet size.

I will begin my short critique with the positive points about this celestial atlas. (Note: Only Volume I covering the northern hemisphere down to -6 degrees declination with 259 charts has been released so far. Volume II is expected in mid 1988.)

Uranometria 2000.0 is printed and bound on 23 x 31 cm sheets in two hard cover books. As I shall explain later, this has both advantages and disadvantages for the user. In general, it is a much superior atlas to Wil Tirion's *Sky Atlas 2000.0* which covers the heavens on 26 charts showing some 43,000 stars down to magnitude 8.0 as well as 2,500 deep sky objects. *Uranometria* has 473 charts in total showing 332,556 stars to magnitude 9.5 and 10,300 non-stellar objects including x-ray and radio sources. The scale is large giving 18.5 mm per degree of declination.

Now for the negative points:

With 259 charts in the first volume, quick access becomes difficult with no tabs or dividers in the book. Instead of an index, the authors printed a useless two-page diagram attempting to show the location of the charts. How do you get easy access in the dark? Easy! Photocopy the charts, place them in protector sheets, and divide these into three binders by declination. An index at the front of each binder and a set of dividers solves the problem.

In summary, from a mapping or cartographic point of view, the atlas is excellent. From a logistic point of view much is desired. I feel that the good points outweigh the bad and recommend this atlas which sells for about \$60 Canadian to everyone.