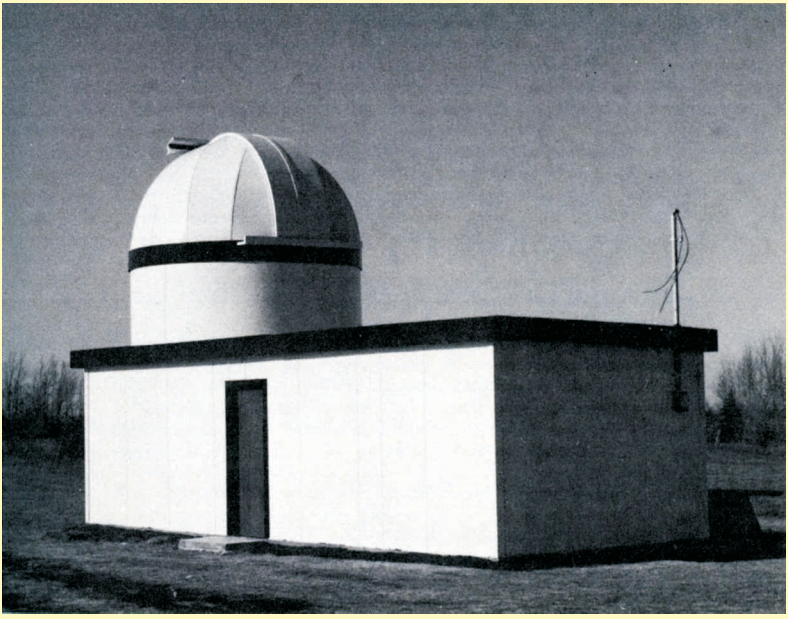
NATIONAL NEWSLETTER

December, 1977



WINNIPEG CENTRE OBSERVATORY

This is the latest addition to the list of observatories operated by the Royal Astronomical Society of Canada. Situated on the banks of the Red River at Glenlea, fifteen miles south of the city, it has been erected by the members of Winnipeg Centre on land made available by the University of Manitoba. In addition to the dome structure, it houses a splendid lounge and discussion area.

Photo by Phyllis Belfield

NATIONAL NEWSLETTER

December, 1977

Editor: HARLAN CREIGHTON
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Centre and local news items, including Centre newsletters, should be sent to:
Winnipeg and West: Paul Deans, 10707 University Ave., Edmonton, Alberta T6E 4P8
East of Winnipeg: Barry Matthews, 2237 Iris Street, Ottawa, Ontario K2C 1B9
Centres français: Damien Lemay, 477, Ouest 15ieme rue, Rimouski, P.Q., G5L 5G1

Except as noted above, please submit all material and communications to:
Mr. B. Franklyn Shinn,
173 Kingston Row,
Winnipeg, Manitoba,
R2M 0T1

Deadline is two months prior to the month of issue.

Ladies and Gentlemen, Meet Franklyn Shinn

It is a pleasure to introduce Mr. B. Franklyn Shinn, who will be assuming the duties of Editor of the *NATIONAL NEWSLETTER* starting with the February, 1978 issue.

Frank has an outstanding record of service in the Winnipeg Centre, where he has served as a Councillor for many years, as well as president and editor of *Winnicentrics*. He is a keen observer and has introduced many members to variable stars and grazing occultations. His expertise as a telescope-maker is known nation-wide. Through his distinguished work, first as Assistant Director, and later as Director of the Planetarium of the Manitoba Museum of Man and Nature, Frank shared his infectious love of astronomy with tens of thousands of Canadians.

It is with pleasure that we welcome Frank Shinn to the editor's chair. Contributions to the *NATIONAL NEWSLETTER*, except those destined to Regional Editors, should now be sent to Mr. Shinn at the address given on the masthead.

Good luck, Frank!

DUE$ DUE

All members are reminded that their 1978 fees were due on October 1, 1977. Members of Centres should remit directly to their Centre's Treasurer; unattached members should send their fees to the National Office, 124 Merton Street, Toronto, Ontario, M4S 2Z2. Please include apartment numbers and your postal code.

Fees are $12.50 for regular members and $7.50 for members *under the age of 18 years as of October 1*, with proof of age required to be eligible for the student rate. As well, some Centres have special fees in addition to the above. Please consult your local treasurer for further details.

Treasurers of Centres are reminded that all membership fees received up to December 31 *must* reach the National Office *by January 15* in order to permit membership lists to be updated in time to mail the February issue of the *JOURNAL*. It will not be possible to retain membership and receive the publications of the Society unless such fees are received by January 15.

Nominations for RASC Officers 1978–1979

The By-Laws of the Society provide for a Nominating Committee composed of the three surviving immediate Past Presidents, whose duty it is to prepare a slate of candidates for the offices of the Society.

Next May, we must elect the following officers: President, 1st Vice-President, 2nd Vice-President, and Secretary. Normally, there is a progression through these offices: the 2nd Vice-President becomes 1st Vice-President; the 1st Vice-President becomes President. However, this progression is not dictated by the Constitution, and alternative nominations may be made for any of these offices.

If any member wishes to make suggestions in this regard, he should contact the Committee Chairman, Dr. J. D. Fernie, c/o the National Office, 124 Merton Street, Toronto, Ontario, M4S 2Z2.

As well, the By-Laws provide that "any five members of the Society, in good standing, may nominate additional candidates for any office, provided that such nomination, accompanied by a letter of acceptance from the nominee shall be received by the Secretary of the Society, not less than sixty days before the date of the annual meeting".

It would be appreciated if any such nominations, (together with a short resume) were submitted no later than *March 1, 1978*, in order to allow for the printing and mailing of ballots.

Full details pertaining to nominations are outlined in By-Law 1, Article 11(a), as published in the June, 1969 *JOURNAL*, pages 155–168.

Nominations Invited for RASC Service Award

The Awards Committee of National Council invites nominations from Centre Councils and the membership at large for the Service Award of the Royal Astronomical Society of Canada.

The Service Award is a major award given to a member in recognition of outstanding service, rendered over an extended period of time, where such service has had a major impact on the work of the Society and/or a Centre of the Society. The Award is given only by resolution of the National Council upon recommendation of the Awards Committee, and is presented at the Annual Meeting of the Society.

The criteria upon which the Award is given are outlined in the October issue of the *NEWSLETTER*, page L47.

Nominations should be sent to the Awards Committee of the Royal Astronomical Society of Canada, 124 Merton Street, Toronto, Ontario, M4S 2Z2. Nominations should reach the committee *no later than December 31*.

The Ken Chilton Prize

The Chilton Prize was established in 1977 by the National Council of the Society in remembrance of K. E. Chilton, an active member of the Hamilton Centre. The Prize is to be awarded annually to an amateur astronomer resident in Canada, in recognition of a significant piece of astronomical work carried out or published during the year.

Nominations should be sent to the Awards Committee of the Royal Astronomical Society of Canada, 124 Merton Street, Toronto, Ontario, M4S 2Z2, and should reach the committee *no later than December 31, 1977*.

Note: The Chilton Prize and the Chant Medal are both awarded to amateur astronomers in recognition of their astronomical work. The Chilton Prize is awarded for a specific piece of work and may be awarded to the same individual more than once. The Chant Medal is awarded for work of a more extensive nature, and is to be regarded as the more senior award. A Chilton Prize winner may, therefore, subsequently be awarded the Chant Medal.

RASC Membership Fees Not Tax Deductible

Enquiries have been received as to whether or not the Society's membership fees are tax deductible. Mr. Peter Broughton, National Treasurer, has received the following advice from Revenue Canada:

> A membership fee paid to a charitable organization is considered a gift for Income Tax purposes if the only advantage accruing to the donor involves the receipt of literature explaining and reporting on the organization's activities or the right to vote at meetings.

Accordingly, membership fees are not tax deductible.

Abolish Duty on Telescopes, Please!

At the September meeting of National Council, National Treasurer Peter Broughton reported that Revenue Canada had advised the Society that telescopes imported by individuals are subject to the following import taxes:

Telescopes imported from preferential commonwealth countries – 2½%
Telescopes imported from other countries (including the U.S. and Germany) – 15%
plus
Federal Sales Tax – 12% (on the value of the telescope + duty as shown above)
plus
Provincial Sales Tax if applicable (on the value of the telescope + duty + F.S.T.)

As a result, your Council unanimously adopted the following motion: "That the Society approach the Minister in charge of Revenue Canada with the proposal to remove the import duty on telescopes imported for astronomical study and research".

It was also suggested that the individual Centres and individual members should be urged to write the Minister and their Member of Parliament asking that the duty be lifted. If a large enough number write the government, it is possible that the present situation may be reviewed and even changed. However, it should be noted that form letters should not be sent.

Telescopes imported by the Society or one of its Centres may already be exempt under certain circumstances, including that the telescope will remain the property of the Society or one of its Centres, and not subsequently become the property of any individual. For further information, contact Revenue Canada and refer to Section 696-05-1 of the Tariff rulings.

Post Office Delays October Publications

The proofs and manuscripts for the *JOURNAL* and *NATIONAL NEWSLETTER* are sent to the University of Toronto Press by special delivery, registered mail. Use of the latter also permits the receiver to trace the progress of a piece of mail through the postal system. The cancellations on the envelope show that the proofs for the October *JOURNAL* arrived at the Downsview Post Office on October 3. In answer to an enquiry from the University of Toronto Press on October 11, the Downsview Post Office said that the material had not arrived. On October 12, the proofs were delivered to the Press.

Castle Frederick, Nova Scotia

At the September meeting of National Council, Dr. Arthur Covington, the hard-working and enthusiastic chairman of the Historical Committee, reported that studies of Dr. Roy Bishop (Halifax Centre) have revealed that Castle Frederick, Nova Scotia was one of the earliest astronomical observatories in North America. National Council passed a motion recommending "that appropriate documentation be forwarded to the Nova Scotia member of the Historical Board of Canada for consideration, and that the site be declared a national monument".

NATIONAL COUNCIL MEETING 30 JUNE, 1977

L to R Front Row – Jack Newton, Rosemary Freeman, Harlan Creighton, A. Batten, Ann Scott, Fred Troyer. *2nd Row* – Boyd Ramsay, Peter Broughton, Dr. Lloyd Higgs, Dr. Ian Halliday, Barry Matthews, Franklin Loehde, Dr. Don Fernie. *3rd Row* – Alf Scott, Ralph Chou, Ron Sawyer, Paul Brown, Gord Patterson, Damien Lemay, George Ball. *4th Row* – Rolland Noel de Tilly, Del Stevens, John Howell, Dr. Roy Bishop, Neil Laffra, Cyril Clark. *5th Row* – Michael Holmes, Hugh Maclean, Henry Lee, Morris Altman, Dr. John Percy. *Absent*: D. J. Fitzgerald, Dr. Helen Hogg, P. Allston.

–Photo: Michael Giovinazzo

Astronomy Downdate

by Dr. Jack Winzer,
Edmonton Centre

Once again it is time for our annual Astronomy Downdate which summarizes the most universe shaking and awe inspiring discoveries of the past year These tidbits are gleaned from exams and class assignments in Astronomy 353 at the University of Alberta.

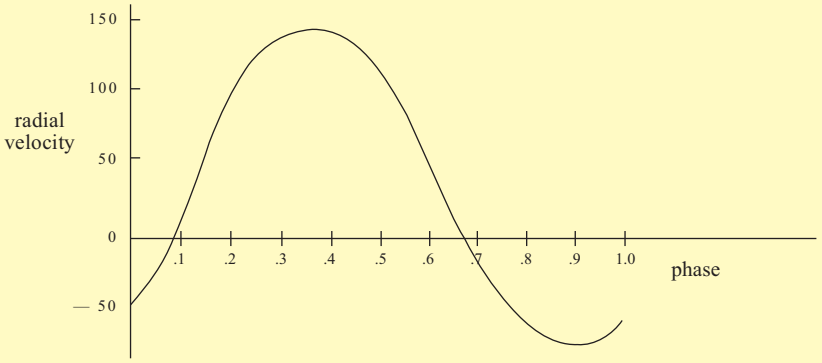
To start, we will consider innovations in astronomical nomenclature. Most readers are aware of the many abbreviations used by astronomers, a typical example being HR diagram for the Hertzsprung – Russell diagram. Some of these are obvious, others are less so, and it is for this latter group that we provide the following definitions:

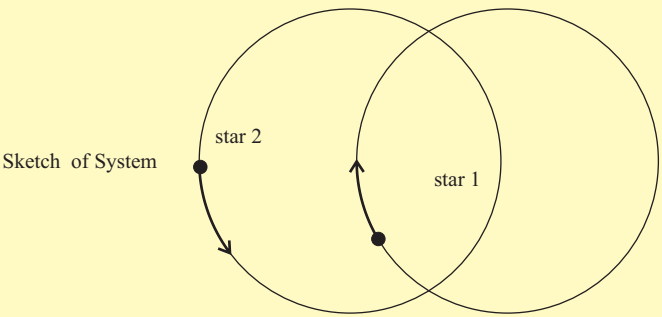
NGC = Norman Gleuber Collection
LMC = Lesser Megalithic Cloud
SMC = Super Megalithic Cloud
ZAMS = Zodiac Annual Mass Sequence

Next, we should remember some of the contributions of the great astronomers of the twentieth century:

Edwin Hubble named the Hubble Diagram.
Henry Draper discovered the Henry Draper Catalogue.
Harlow Shapley invented the magnitude – luminosity relation for Cepheus.

The mechanics of binary star systems have also been revised. The object of the following discussion is to explain the radial velocity variations observed for a single-lined spectroscopic binary. The radial velocity variations are provided below along with the explanation.





Explanation: When star 2 is moving away from star 1, the spectral lines are shifted towards the blue end and you get a blue shift. When star 1 is moving away from star 2, the spectral lines are shifted towards the red end and you get a red shift. When star 1 and star 2 are both moving away from each other, the redshift cancels the blueshift and so there is no radial velocity.

Distance determinations for objects in the universe are of fundamental importance. Here we will consider various methods employed in modern astronomy.

(a) Distances of nearby stars:
  – moving cluster parallax
  – spectroscopic parallax
(b) Distances to globular clusters:
  – moving cluster parallax
  – spectroscopic parallax
(c) Distance to the galactic center:
  – moving cluster parallax
  – spectroscopic parallax
(d) Distance to very distant galaxies:
  – moving cluster parallax
  – spectroscopic parallax

The true power of these two methods is only hinted at above, for we find that not only do they provide distances for every object in the universe, but as well they can also be employed in the determination of masses of stars, and in the determination of the age of the universe!

As we have been talking about the universe, perhaps next we should consider some of the theories of cosmology. The two theories that deal with the formation of the universe are the "Solid State Theory" and the "Big Bag Theory". The former has fallen into suspect among rational people since it violates the laws of hydroglyphic equilibrium and conservation of angular momentum. (No comment was provided with regards to the "Big Bag Theory" so it is uncertain whether the universe is actually found in a Loblaw shopping bag, a plastic garbage bag, or a bag of hot air). We also have a new definition for the perfect cosmological principle: the universe began in the year 4004 BC on November 11 at 11 am when God said "Let there be Light".

And finally a special note to Carl Sagan on how to detect alien civilizations. Two methods are suggested:

(a) by the nuclear radiation from their nuclear reactors
(b) by pollution in the atmosphere of their planet

Reprinted from *Stardust*, Edmonton Centre

(Ed. Note: Dr. Winzer's students clearly have an advanced case of acute examinationitis Albertus)

1978 Observing and Display Competition

As the final touches were being put on this issue, a hefty package arrived from Edmonton containing exciting news about the 1978 Observing and Display Competition to be held in conjunction with the General Assembly scheduled for May 19–22, 1978, in Edmonton. Prizes will be offered for outstanding, original work performed by members during the two years preceding May 1, 1978 in the following categories: Best Centre Diplay; Best Group Observing Project; Best Photometric Project; Best Special-Purpose Instrument or Best Observing or Reducing Technique; Lunar, Planetary, Minor Planets and Comets; Solar; Deep-Sky (nebulae, star clusters, galaxies); Atmospheric Phenomena (aurora, haloes, meteors). The last four categories will be in two parts, with prizes awarded for the best visual observation record and for the best photographic record in *each* category.

Entries must not have been previously entered in the Toronto or Calgary competitions. All entrants must submit an official entry form by mail prior to the start of the Edmonton General Assembly. Entrants whose projects require special or unusual arrangements are asked to advise the organizing committee of their needs as far in advance as possible.

Further details will be published in the next issue or may be obtained from Alan Dyer, c/o Queen Elizabeth Planetarium, Coronation Park, Edmonton, Alberta, T5J 0K1.

Nova S-1, A Black Hole Confirmed

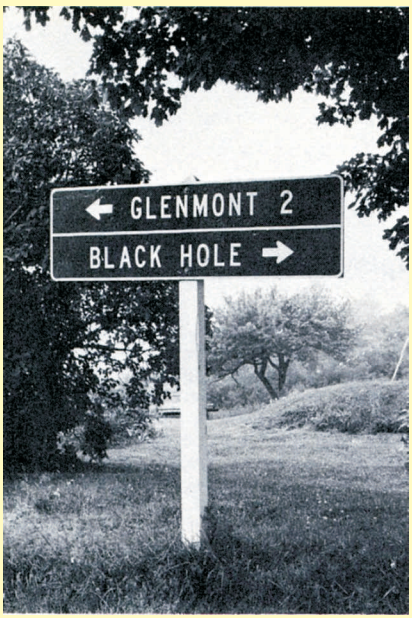
by Roy L. Bishop
Halifax Centre

I wish to report the discovery of a black hole. It has eluded discovery until now for two reasons. Firstly, being located in that remote hinterland, Nova Scotia, it does not enter the field of view of any major radio telescope. Secondly, suggestions based on theory as to where and how to search for a black hole have overlooked evidence of the sort to be presented here. How long this black hole has existed is uncertain, but local evidence likely appeared in the nineteenth century, well before the work of Hawking, Wheeler, or even Oppenheimer and Snyder.

X-ray emission and other radiation from celestial objects such as Cygnus X-1 have not yet provided indisputable proof for the existence of black holes; however, the evidence for Nova S-1 is unequivocal (Figure 1). This structure is located near the sea in western Nova Scotia. The absence of a distance on the sign is consistent with the strongly non-Euclidean nature of spacetime near a black hole. One wonders how many personnel of the Nova Scotia Department of Highways disappeared before attempts to establish a distance were abandoned.

In full awareness of the significance of this discovery, I followed the clue evident in Figure 1. As expected, the road led downward. Soon the undulations and slope increased to such an extent that I deemed it wise to abandon my car and proceed on foot. With my own safety in mind and to ensure communication of this discovery to the outside world, I stopped well short of the Schwarzchild surface and took a photograph (Figure 2). As one would expect, the strongest tidal effects on our planet are found in this region. Near the invisible horizon is the Bay of Fundy.

In recent years much work has been done on the dynamic properties of the Bay of Fundy to evaluate the feasibility of extracting energy from its large tides. All of these studies have dealt only with a resonance involving the Bay of Fundy – Gulf of Maine system. The several uncertainties still outstanding will doubtless disappear when the influence of the black hole, Nova S-1, is taken into account.



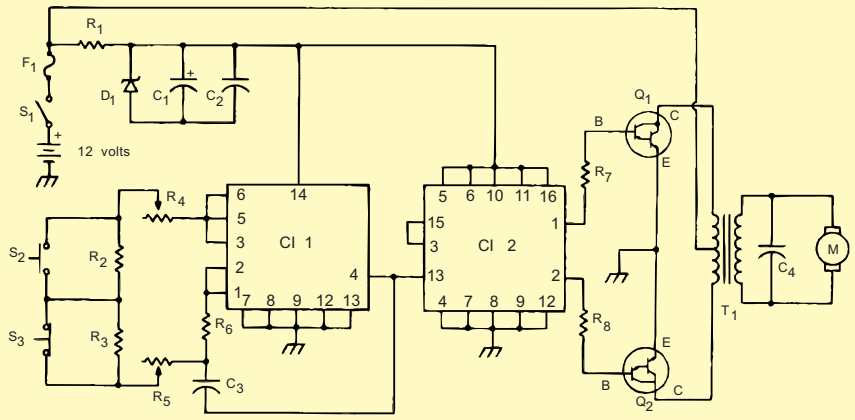
Bloc de guidage à logique COS/MOS

by Alphonse Tardif
Centre de Québec

La plupart des télescopes sont entraînés par un moteur synchrone qui assure la vitesse sidérale approximée de 15 secondes d'arc par seconde quand la fréquence du courant est de 60 Hz. Ce système est tout à fait adéquat pour l'observation visuelle et la photographie des planètes ou des planètes ou des constellations mais il ne suffit pas pour la photographie à longue exposition. Dans ce cas il faut effectuer des corrections de vitesse avec un dispositif mécanique ou mieux, avec un bloc de guidage à fréquence variable.

La revue *Sky and Telescope* a publié récemment deux montages de ce type utilisant des circuits logiques TTL de la série 74. Les deux circuits sont excellents mais leur fonctionnement pourrait causer des ennuis en hiver. En effet, la série 74 est conçue pour fonctionner entre 0° C et 70° C. On peut éliminer ce problème avec la série TTL 54 mais son coût est élevé pour l'amateur. Une autre solution est de choisir une logique plus adaptée au climat canadien comme la logique COS/MOS. Cette famille de circuits intégrés est de plus en plus populaire car elle offre de nombreux avantages. En effet, elle est peu coûteuse, elle consomme très peu de courant et elle fonctionne entre -40° C et +85° C dans la série commerciale avec boitier plastique, qui est la moms coüteuse.

Le circuit est extrêmement simple, comme on peut le constater en regardant le diagramme (Fig 1). Le circuit intégré CI 1 est une quadruple porte NOR COS/MOS. La moitié de ce circuit agit comme oscillateur à 240 Hz. La fréquence d'oscillation est déterminée par le condensateur C_3 et la chaîne de résistances R_2, R_3, R_4 et R_5. La résistance R_5 peut être un simple rhéostat linéaire de 5000 ohms, mais on aurait avantage à utiliser un potentiomètre à 5 ou 10 tours si on desire un réglage plus facile de la fréquence. Les modèles Amphénol 4101 B ou 4201 B 5 kΩ ou tout autre modéle équivalent seraient tout à fait adéquats. La résistance variable R_4



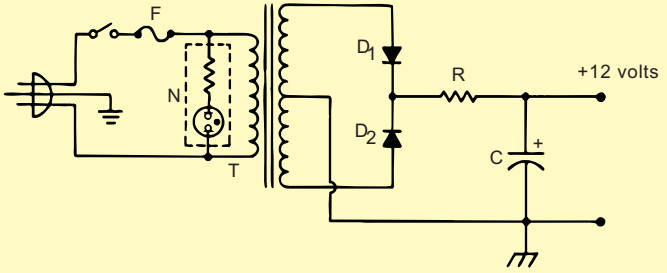
R_1 = 100 ohms $\frac{1}{2}$ watt ± 5%
R_2 = 3900 ohms $\frac{1}{4}$ watt ± 5%
R_3 = 3900 ohms $\frac{1}{4}$ watt ± 5%
R_4 = Rhéostat 10 tours type Bourns "Trimpot" 3006 20 KΩ
R_5 = Potentiomètre 5 KΩ répartition linéaire voir texte
R_6 = 56000 ohms $\frac{1}{4}$ watt ± 5%
R_7 et R_8 = 8200 ohms $\frac{1}{4}$ watt ± 5%
S_1 = Interrupteur 1 pôle 1 position
S_2 = Poussoir momentané normallement ouvert
S_3 = Poussoir momentané normallement ferme

C_1 = 220 µF 15 volts électrol.
C_2 = 0,01 µF céramique
C_3 = 0,1 µF mylar
C_4 = 0,1 µF 600 volts
F_1 = Fusible 1 amp. fusion lente
D_1 = diode zener 11 volts 1 watt (IN 4741)

CI 1 = RCA CD 4001 AE
Radio shack : RS 4001
CI 2 = RCA CD 4027 AE
Radio shack : RS 4027
Q_1 et Q_2 = Texas TIP 140 Darlington
T_1 = Sec. 110 V / Prim. 12,5-0-12,5 V 1 amp. (Hammond 167 J 25 ou équivalent)
M = synchronous motor – 60 Hz, 110 volts

Fig. 1

Bloc d'alimentation



F = Fusible $\frac{1}{4}$ ampére fusion lente

T = Transformateur de filament : primaire 110V ; secondaire 12 ,5 – 0 –12 , 5 volts , 1 amp. (Hammond 167 J25 ou équivalent).

D_1 , D_2 = Diodes silicium 1 amp. ou plus : 50 volts.

C = Condensateur électrolytique 3000 µF. 25 volts.

R = 5,6 ohms 5 watts (Ohmite # 2840 ou équivalent).

N = Lampe témoin néon (Leecraft "Tineon" 36N2311 ou equivalent).

Fig. 2

Circuit de calibrage

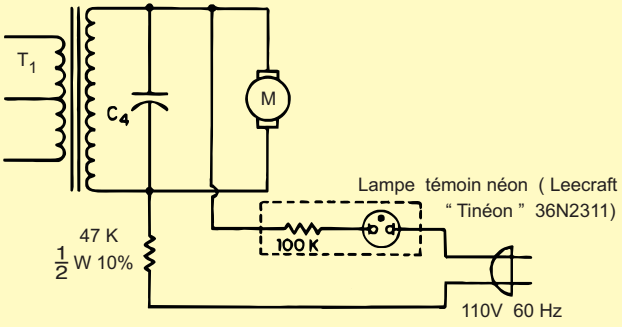


Fig. 3

Renseignements utiles pour le montage

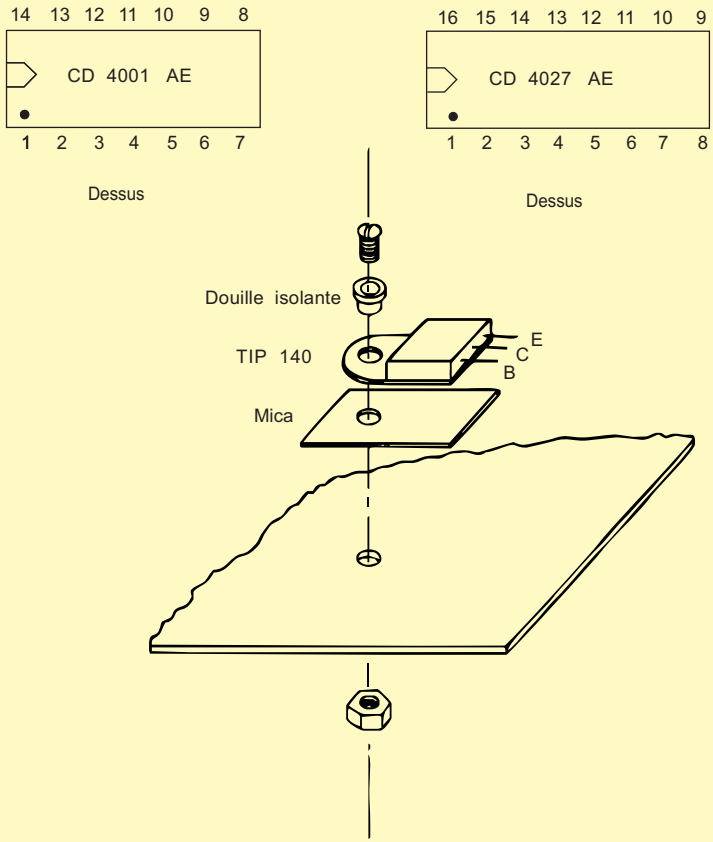


Fig. 4

a pour rôle de compenser les variations dans la valeur des composantes. Il suffit de la régler une fois pour toutes de façon à obtenir une fréquence finale de 60 Hz quand R_5 est au centre de la rotation. La marche rapide s'obtient en appuyant sur S_2 et la marche lente en appuyant sur S_3. Les fréquences correspondantes sont de l'ordre de 70 Hz et 54 Hz respectivement. La résistance R_6 peut avoir n'importe quelle valeur entre 47 000 ohms et 100 000 ohms. Son rôle est de stabiliser l'oscillateur vis-à-vis les changements de température et de tension. Le circuit integré CI 2 est une double bascule J-K. La première partie de ce circuit divise la fréquence par deux et produit une impulsion carrée symétrique. La deuxième bascule divise de nouveau la fréquence par deux, de telle sorte qu'on obtient une fréquence finale de 60 Hz avec une marge de variation de ± 10%. Les sorties Q et $\overline{Q}$ d'une bascule COS/MOS ne laissent passer qu'un courant très faible: environ 1 milliampère. Ce courant est amplifié par deux Darlington de

puissance (TIP 140) dont le gain en courant est de plusieurs milliers. A la sortie des Darlington la tension varie d'environ 12 volts en plus ou en moms et il reste seulement à l'élever à 110 volts au moyen d'un transformateur. Le transformateur utilisé ici est un modèle pour filament, 25 volts avec prise médiane, dont le secondaire est utilisé comme primaire.

L'alimentation des deux circuits intégrés est stabilisée a 11 volts par la diode zéner D_1 . Ceci a pour but de protéger les circuits contre toute surtension transitoire en provenance du transformateur de sortie.

Les circuits COS/MOS sont très sensibles à l'électricité statique. Il faut donc les manipuler avec précaution avant de les installer dans le montage et surtout éviter tout contact avec des objets en plastique. Il serait préférable de les monter sur des bases enfichables. On élimine ainsi le risque de les endommager au moment de la soudure et cela facilite beaucoup le remplacement quand un circuit devient défectueux. Les Darlington de puissance devraient être montés sur un radiateur ou sur le chassis. Dans les deux cas il est indispensable de les isoler avec une feuille de mica car la partie métallique des Darlington est reliée directement au collecteur du transistor de sortie. Le détail du montage est montré à la figure 4.

Dans le diagramme l'alimentation du bloc de guidage est assurée par un accumulateur de 12 volts. On pourrait se servir d'un accumulateur de voiture ou de motocyclette. Une capacité de 5 ampères-heures devrait fournir une nuit d'autonomie car la consommation est de l'ordre de 0,5 ampères. Si une source de 110 volts est disponible sur le site d'observation, on peut remplacer l'accumulateur par le bloc d'alimentation illustré à la figure 2.

Pour ceux qui ne possèdent pas d'oscilloscope, le calibrage peut se faire facilement à l'aide du circuit de la figure 3. On met le bloc de guidage en marche et on relie le circuit de calibrage à une prise de 110 volts 60 Hz. Si la fréquence de l'oscillateur est plus grande ou plus faible que celle de la ligne, on observe un battement dans la lampe néon. La fréquence du battement est égale à la différence entre la fréquence de la ligne et celle de l'oscillateur. Il suffit de régler R_4 pour que la lampe s'arrête de clignoter avec R_5 au centre de sa rotation. La fréquence centrale de l'oscillateur sera alors de 60 Hz. Si l'appareil fonctionne en permanence sur le secteur, on peut incorporer le circuit de calibrage au circuit et l'utiliser comme moniteur de fréquence.

From Telescope to Observatory

by Gregory E. Bailey
Winnipeg Centre

The establishment of an observatory is a common goal of many astronomical associations wanting superior facilities with which to view the heavens. The Winnipeg Centre is no exception. The history of its observatory is scattered intermittently throughout the history of the Centre.

To begin with, it is necessary to open the yellowed leaves of the Accounts and Records books to the year 1923, where an entry dated May 14th noted the payment of $100.00 to Mr. H. B. Allan, for the purchase of a telescope. This telescope, a brass refractor four inches in diameter, appears to be the first such instrument bought by the Centre, and still remains in use today.

A quarter century passed. Then, in November 1948, a Mr. Gardner offered to form a group to investigate the possibility of erecting an observatory for the Centre. In 1949, the Centre received the gift of a telescope from Mrs. Kozer, the widow of a member who had recently died. This was followed by a suggestion that a dome might be built on the roof of the proposed Technical-Vocational School to house our equipment. Negotiations were held, but the plan was rejected by the Winnipeg School Board in April, 1950. Still undaunted, members looked into the possibility of establishing an observatory at United College. Proposed plans for the building included these details: it would be of fireproof construction, with a revolving dome approximately 20 feet in diameter. A fifteen-by-twenty-foot annex to house equipment would complete the plan.

It would seem that no further ideas or inspiration were forthcoming until 1963. Dr. J. Scatliff, a prominent member of the Society, found that the "population explosion" was hampering the effective use of his observatory in the city and generously donated the building for the Centre's use. A location was provided by the owners of CKY Radio at their transmitter site south of St. Norbert. At the same time, Mrs. E. Gardiner donated the entire complement of astronomical equipment owned by her late husband up to the time of his fatal accident, thus providing the Centre with a 12-inch telescope mirror possibly suitable for the observatory.

It would seem, however, that the Scatliff Observatory was destined not to house an instrument of major size. Various smaller telescopes were, at one time or another, in use there, but enthusiasm about the project, while initially high, was short-lived. The observatory fell into disuse, and by 1973, new plans were formulated for raising funds.

When new discussions began about a Centre Observatory, Mr. R. R. Belfield became the driving force behind these plans. He believed that this dream could be brought to fruition if the Centre relied on its own resources. Accordingly, a fund-raising campaign was began, with funds coming from the donations of several private members and a public raffle. The raffle, which offered three colour televisions as prizes, was a success due, in part, to the energy spent in selling tickets. Mr. B. Hanson acquired the assistance of the Winnipeg Police Department to sell the major portion of the tickets, thus ensuring a successful venture. The raffle netted the Society some $1,100.00 after expenses.

An undertaking of this nature cannot be accomplished overnight, and although the fund continued to grow, the administration of the Centre changed hands in October, 1974, before further action was taken. By the end of 1975, the President, Mr. Roy Belfield, pledged to make the fiscal year 1975–76 the "Year of the Observatory". Several locations were proposed, and each had to be considered before being either accepted or rejected. The site at Glenlea was finally chosen for its exceptionally dark sky and its proximity to the main highway.

The Glenlea site is located on University of Manitoba property some twenty miles south of the downtown core of Winnipeg. Discussions were set up between the Centre and the University by Dr. M. Clutton-Brock, who stepped into the breach when Dr. R. Bochonko went on sabbatical. Many long hours of negotiations were held, with Mr. Belfield speaking on behalf of the Society. The terms of the agreement, signed in July 1976, provide the Centre with a fully-serviced observing site for a period of twenty-five years provided the Centre properly and adequately maintains its building. The agreement is most generous, and it is greatly to his credit that Mr. Belfield was able to weld a solid relationship between the University and the Centre.

The design of the building was based on the design of Mr. Belfield's personal observatory, with certain enlargements and modifications. Thus, a twelve-foot dome crowns the upper storey of a twelve-by-thirty-one-foot structure containing the observing chamber, storage space and a small, but cozy meeting room. A twenty-four-inch diameter concrete pier stands fifteen feet below ground level, and nine feet above it to provide rigid mounting for a telescope of substantial size. The building sits on a reinforced concrete pad six inches thick.

The construction of the project was very carefully orchestrated with several events occurring simultaneously. While the site was being surveyed by our engineer, Mr. L. Bunting, and by Mr. Belfield, other members began work pre-fabricating the walls at a warehouse chosen by Mr. P. Moffat in the west end of the city. On July 31st, these were moved by flat-bed trailer to the Glenlea site. Two days later, a half-dozen members excavated the foundation and inserted wooden formers for the concrete pad.

At the same time, construction of the dome began at a warehouse in another part of town. The dome is made from double-thickness ¾-inch plywood struts and cross-beams, and is covered with masonite. All joints were caulked and covered, making it quite water-tight. Construction of the dome was supervised by the late Mr. E. Dyer, who took great pains about the quality of his finished product. The Palomar-type shutters, also constructed from wood, gave Mr. Dyer a particularly trying time, but much good humour, the occasional curse, and many cups of tea produced a set of functional shutters that would be the envy of any professional dome builder.

Meanwhile, back at the site, our dauntless workers dug and poured the pier, with the aid of a hole-borer. A week later, on August 21, 1976, a dozen people turned out for the pouring of the concrete floor. This was a major job, but was accomplished in about three hours. The masterpiece finished, and still very wet ... well, who could resist the urge to write in wet concrete anyway? The ceremonial nail used to inscribe the names of the construction crew has been gilded and added to the Centre's archives.

Construction began on the walls and roof sections, and progressed so rapidly that a substantial part of the building was erected by August 26th. On that date, a convoy formed on Kenaston Boulevard to move the dome by flat-bed truck, which Mr. Belfield had the dubious honour of driving to the site. It moved slowly down Waverly Road to Pembina Highway, past the Fort Garry Campus of the University and out onto the open highway of the prairie south of Winnipeg. The threat of rain hung in the sky as the convoy reached Glenlea and turned onto the half-mile lane to the site, but the sun shone through for a brief instant, almost in exaltation when the work of unloading this precious cargo had been completed.

By Labour Day, the building was virtually complete outside, and the dome had been mounted. However, the task continued, as refinements and finishing touches were added here and there. Electric wiring was installed to provide heat and light in the meeting room. Additional hardware was mounted on the dome to allow better movement. Although work slackened during the winter, it did not stop entirely: insulation was purchased and installed, as were the laminated wood panels to finish the inside walls.

With the passage of time, still more changes may occur. The basic observatory is finished and arrangements have been made for it to house a variety of instruments. With the approach of the summer, and more amenable observing weather, observing programmes can be established and implemented. A system is being formulated to regulate fairly the use of the building to enable the greatest possible number of members to benefit from the Centre's dream.

For there it stands – a tribute to the countless men and women throughout the Centre's history who envisioned the day we would have an observatory of our own; a tribute to the men and women who gave of their time so freely during the summer of 1976 towards the realization of their dream – a stairway to the stars.

QUO DUCIT URANIA

(Reprinted with permission from *A History of the Winnipeg Centre of the Royal Astronomical Society of Canada, 1911–1977*, edited by Phyllis Belfield.)

The Christmas Sky

by Dora Russell,
St. John's Centre

Alas, such smiles are born,
Alone of hearts like yours, or herdsman's souls
Of ancient time, whose eyes, calm as their flocks,
Saw in the stars mere garnishing of heaven.

Browning

☆ ☆ ☆

The stars may well have first been given their names by the shepherds of old, watching their flocks by night. Who, better than they, often spending the entire night out on the hills with their sheep, would learn to know every star in the sky, would weave stories about them to while away the long hours?

☆ ☆ ☆

No marigolds enclosed are:
No shadows great appear;
Nor doth the early Shepherd's Star
Shine like a spangle here.

Herrick

☆ ☆ ☆

Ancient Hebrews saw in the constellation of Auriga, the Charioteer, a representation of the Good Shepherd, who laid down his life for his sheep. It is associated with shepherds and flocks of sheep because of the season when it is visible.

Its lovely lucide, a favourite northern star, is Capella, the Little She-goat. A small triangle of stars nearby represents her three kids. On old charts we see a charioteer drawn, holding the kids in his arms, while the She-goat hangs on his left shoulder.

It has also been known as the Shepherd Star, and poets have called it the "folding star" because it appears at a time of year when the sheep are taken into the fold for the winter season.

Capella is of the nature of the sun, but infinitely larger and a hundredfold brighter. When near the horizon it flashes vivid red and green lights. We see it in its glory on a clear, frosty night of December, when it passes nearly overhead.

☆ ☆ ☆

Orion's beams, Orion's beams;
His star-gemmed belt and shining blade,
His isle of light, his silver streams,
And glowing gulfs of mystic shade.

Manilius

☆ ☆ ☆

Christmas: midnight.

High in the southern sky is the magnificent constellation of Orion, the Hunter.

Orion has been represented in various guises. One scholar of the Biblical school saw in it Saint Joseph, the husband of the Blessed Virgin. Another found somewhere among its stars Christ's Seamless Coat and a Chalice.

"Orion's studded belt" is made up of three stars on a short slanting line. Early Christians looked upon them as the Three Wise Men, ever journeying from the east. This interpretation holds a special significance for us at this season since these stars occupy such a conspicuous place in the Christmas sky.

☆ ☆ ☆

A single misty star
Which is the second in a line of stars
That seem a sword beneath a belt of three.
I never gazed upon them but I dreamt
Of some vast charm concluded in that star
To make fame nothing.

Tennyson

☆ ☆ ☆

The region around Orion is the most exciting spot in the sky. A telescope shows the middle star of Orion's sword to be enveloped in one of the grandest nebulas in the sky. Serviss, who like Tennyson, found that the Great Nebula of Orion held a mysterious charm, said "I can never shake off the impression that the creative power that made the universe lavished its richest gifts upon the location in and around Orion."

Astronomers say that this irregular mass of gas is so stupendous that our entire solar system would be quite lost in this great cavern. Looking at it through a telescope, the nebula looks like a flat surface, but the central region is the mouth of a colossal cave, nothing less than three light years across.

☆ ☆ ☆

A murky manger with both stars
Shining unaltered is a sign of rain.
If while the Northern Ass is dimmed
By vaprous shroud, he of the south gleam radiant,
Expect a south wind; the vaprous shroud and radiance
Exchanging stars harbinger Boreas.

Aratos

☆ ☆ ☆

Rising in the east during the Christmas season is a constellation which may be interpreted as the Manger of the infant Jesus, with the Ass and the Ox presumably standing by.

Near Leo, the Lion, and west of it, are the two obvious stars of Cancer, the Crab. These are named the Asselli, or Ass's colts. The asses are feeding from a silver manger.

On a dark clear night, the eye is attracted by a faint patch of light between the Asselli. This is Praesepe, the Manger, a cluster of stars numbering 300, and a pretty sight in binoculars.

Ancients used the Manger as a weather sign. When it could be seen, fair weather was sure to follow. When it was obscured by a misty atmosphere, a storm was brewing.

☆ ☆ ☆

With vast convolutions Draco holds
Th' ecliptic axis in his scaly folds.
O'er half the skies his neck enormous rears,
And with immense pride meanders past the Bears.

Darwin

☆ ☆ ☆

At various times, from the seventh century to the present day, groups of scholars have sought to alter the sky figures to those taken from sacred history. Bruno, who died for his astronomical beliefs, belonged to this school. During the seventh century the Mosaicists, as they have been called, were most numerous.

According to their interpretation of Draco, the Dragon, the stars represented the Holy Innocents of Bethlehem.

☆ ☆ ☆

And here fantastic fishes duskly float,
Using the calm for waters, while their fires
Throb out quick rhymes along the shallow air.

Mrs. Browning

☆ ☆ ☆

The constellation of the Fishes was represented in ancient times by two fishes, each with a ribbon tied to its tail, and the ribbon knotted together. On a dark December night, the stars marking the ribbon can be traced, forming a V-shaped chasm.

The Biblical school asserts that Pisces, the Fishes, represents those with which Christ fed the 5,000. The fish was always the symbol of the early Christian's faith.

☆ ☆ ☆

Now heaven his further wandering flight confines,
Where, splendid with his numerous stars, he shines.

Ovid

☆ ☆ ☆

The Great Square of Pegasus stands due south and high in the sky, as darkness falls on the Christmas scene below. This group consists of just one enormous square, with scarcely any visible stars to be seen inside it, although one sharp-eyed amateur of by-gone days is said to have counted thirty.

One legend sees in these stars the ass on which Christ made his triumphal entry into Jerusalem.

☆ ☆ ☆

. . . and countless splendours move
Crowned by the blazing Cross high-hung o'er all.
Lowell

☆ ☆ ☆

It is not surprising that Christians saw in the constellation of Cygnus, the Cross of Calvary, a representation of the stars in the Swan that has descended to our day. Indeed, it is better known to beginners as the Northern Cross than by its true title.

The Cross is seen to best advantage in the Christmas sky, as it then assumes an upright position. On Christmas Eve, around nine o'clock, it is outlined against the north-western sky, standing on the horizon like a glittering cross set above earth – a starry symbol of the Christian faith, a sign of promise from the depths beyond.

As it sets in its noble dignity, the stars of the Manger rise in the east.

(I am indebted to *Star Names*, by Richard Allen, Dover, 1963 for much of this information relating to the early Christian faith. – D.R.)

News from Eastern Centres

by Barry Matthews,
Regional Editor

Well – What can I say? This is not only a question but a statement. While I was in Toronto at the General Assembly I made the fatal mistake of asking Harlan Creighton and Ralph Chou if there was anything I could do to help the Society. Naturally I was "volunteered" to act as a Regional Editor of the *NATIONAL NEWSLETTER*, and charged with the task of obtaining notables and news from all the centres east of Winnipeg. In all seriousness I really feel that this was indeed an honour. I am a very strong advocate that the strength and acceptance of the R.A.S.C., nationally and internationally is due to the various centres' activities. Until the various centres submit reports or their own newsletters to the appropriate regional editor, we cannot advise the rest of the R.A.S.C. of what they are doing.

As of now I have heard from two very active centres. Both centres, Halifax and Ottawa are actively engaged in promoting astronomy and personal observing. First from Halifax. Throughout the past year and especially during the summer, Halifax has taken an active role in promoting astronomy through public star nights and museum exhibits. Not only have the members kept the public informed, they have found time to have their own observing weekends. (See article by Randall Brooks, p. L79.) While engaged in all these activities they even found time to prepare astronomy pamphlets for distribution and sale by the Nova Scotia Museum and two winning exhibits by Randall Brooks and Mike Edwards. Well done to a relatively young but very active centre!

On to the Nation's Capital. The Ottawa Centre has also been a very very busy group of dedicated astronomers. At Stellafane in Vermont, Rob Dick and Doug Welch again held up the Canadian honours by walking away with the award for their "Ebert Spectroscope".

During the summer, the Ottawa Centre had the "pleasure?" of having to dismantle and relocate its 40-cm telescope. After a series of events that would have made good material for the "Keystone Cops", the Ottawa Centre completed the move of its North Mountain Observatory. The new observatory is situated near the historic Mill Kintail at Almonte, Ontario and has been re-named the Indian River Observatory. The official opening was presided over by Dr. C. S. Beals, former Dominion Astronomer. The 40-cm telescope previously was located 65 miles south-east of Ottawa, near Osgoode. The new site will have much darker skies and more facilities, including a large radio telescope now under construction. The radio telescope will be a 100-metre baseline interferometer, which, when completed, will probably be the largest such array operated by amateurs in the world. The relocation was organized by the Ottawa Centre's Observatory Committee, consisting of Robert Dick, Art Fraser, Peter McKinnon, Rolf Meir, Barry Matthews, and Brian Stohoe.

The Committee and the Ottawa Centre would like to take this opportunity to thank the National Office and Council of the Society for their assistance in this project.

Finally, please don't forget to send along news items and your newsletters to me.

Centres Français

par Damien Lemay
Regional Editor

La société d'astronomie de Montréal

Au dernier rendez-vous de Stellaphane, certains membres de la SAM se sont distingués, remportant les prix suivants:

– M. Adélard Rousseau; 1er prix catégorie Cassegrain, pour son télescope dont il a lui-méme fabriqué la monture, aidé de M. Henry Coïa pour l'optique.
– M. Claude Picard; 2ième prix pour un Newton, catégorie mécanique.
– M. François Chèvrefils; 3ième prix dans la catégorie spéciale pour son télescope "triplex".

La Fedération Québecoise du Loisir Scientifique (FQLS) a préparé une série de treize (13) emissions télévisees de 30 minutes chacune, en collaboration avec la SAM et Câblevision Nationale. Si vous avez l'équipement audio-visuel adéquat, vous pouvez emprunter gratuitement ces enregistrements. Les intéressés doivent en faire Ia demande à: F.Q.L.S., 1415, Rue Jarry Est, Montréal, P.Q. H2E 2Z7 ou téléphoner à: (514) 374-4700.

Centre du Québec

Lors de la réunion mensuelle du 28 septembre, nous étions honorés de la présence de notre Président national, Monsieur A. H. Batten, accompagné de son épouse. Après un souper en compagnie de l'exécutif de notre Centre, M. Batten présentait une causerie devant les membres réunis dans un pavillon de l'Université Laval. Il nous a entretenu sur la généalogie de la famille Struve qui marqua l'histoire de l'astronomie. C'est alors qu'on apprit que leurs travaux, commencée en Europe, s'était déplacée en Russie puis finalement en Amérique, au gré des grands changements politiques du temps.

À gauche, M. J. P. Bernier, Président du Centre de Québec. À droite, M. A. H. Batten, Président national de la SRAC. Cette photo fut prise lors du souper du 28 septembre, à l'occasion de la visite de M. Batten.

À enjuger par la quantité de pollution lumineuse, Québec serait devenue une grande ville. En effet, le Centre de Québec se sent obligé à son tour d'avoir un site d'observation à plusieurs dizaines de mules à l'extérieur de la ville. À cette fin, une campagne de financement a été lancée en même temps que l'étude de sites potentiels. À date, les résultats sont prometteurs et l'on espère que d'ici le printemps prochain ce sera une réalité. Cet emplacement sera vraisemblablement sous bail, pour parer à la pollution lumineuse éventuelle.

Halifax Centre Holds Camping / Observing Weekend

by Randall Brooks
Halifax Centre

The Halifax Centre held its first Camping/Observing Weekend July 22–24 at Blomidon Provincial Park in the Annapolis Valley of Nova Scotia. About two dozen members and their families set up camp at the park. Through the previous week prospects for good weather appeared favourable and anticipation was high for a spectacular view of the Milky Way.

The site, located 200 m high on Blomidon Bluff, overlooks the 5 counties of Nova Scotia surrounding the Minas Basin. This region proved to be most photogenic, and photographic opportunities included an inversion mirage observed across the Bay of Fundy. As the Friday evening sun began to dip toward the horizon, prospects for a successful observing session looked good, so, out came telescopes, atlases, etc. However, after only a quick glimpse of the first quarter moon, our hopes for a full evening of observing were dampened – literally – by a light shower. All was not lost, as we had arranged to have Roy Bishop point a small laser towards our position from Maktomkus Observatory. To our amazement, the small ¼-watt instrument, which he had piggybacked to a small refractor for pointing purposes, outshone a lighthouse a few meters from his location. The beam, after its 13 km trip, had diverged to a circle 15 m in diameter and produced a beautiful diffraction pattern when observed in a Questar.

Saturday afternoon, the skies were again looking very promising for evening observing. To allow the nature buffs a run, we scheduled a hike to Cape Split, the tip of the fishhook extending into the Bay of Fundy. Most appeared ready for the 5 km to Cape Split, so off we went into the dense forest, guided by Larry Bogan. Midway, rain drops appeared, turning the trail into a muddy, slippery obstacle course. An hour and a half later, we walked out of the forest at the Split to observe the spectacular cliffs falling vertically to the water, and seagulls soaring on the air currents curving over the cliffs. We had timed our arrival to coincide halfway between low and high tides and the water was rushing past the Split to lift the Basin's surface more than 10 m – a most impressive sight! By the time we arrived at Cape Split, our feet were suspect of the 5 km distance and after sliding our way back, they were convinced that the distance was greater. A check of a topographical map confirmed our suspicions – the distance was 8 km each way! Those not used to hiking marvelled at their stamina. Few of us expected to last long at the telescopes if it did clear and another communal meal made it obvious that some of us would not survive to "wish upon a star". Exercise and food in the open air are excellent sedatives. For those who managed to stay awake, a short clear patch produced some respectable views of a number of old stand-bys: 1st quarter Moon, M13, M31 and companions, M51, Dumbell, Ring, etc. With the return of clouds socializing continued, but at 2 it cleared beautifully. Unfortunately, no energy remained and those awake simply lay back contemplating the multitude of stars with a philosophical frame of mind.

Sunday started late, coming alive with a trip to nearby strawberry fields, a visit to Grand Pré National Historical Park and an afternoon visit to Maktomkus Observatory. Maktomkus is a Mic Mac name meaning "Black Rocks", and derives from the layers of black shale laid bare along the cliffs by the eroding action of the famous high tides of the area. These sedimentary rocks were laid down 200–400 million years ago. With the guidance of Sherman Williams and Roy Bishop we clambered down the cliffs to look at fossils and to observe the geological formations. It is almost as awe-inspiring to see a footprint made by an animal 1½ galactic years ago (about 350 million yrs.) as it is to hold a 4 billion-year-old specimen of lunar rock.

All in all, the three dozen who participated in one or more of the events were well pleased with the outcome of our first weekend. More observing time would have enriched it but the deficiency was amply made up for by the other activities and the opportunity to socialize. All who attended are already looking forward to next year's outing which is tentatively scheduled for 27–29 July. The Halifax Centre extends a welcome to anyone interested in participating.

L 'Envoi

And so, another year draws to a close, and with it another volume of the *NATIONAL NEWSLETTER*. This year has not been the easiest for the *NEWSLETTER*, and we have had to overcome a number of formidable obstacles. That we did so successfully, and also made a number of important changes that will result in better service to the membership, is due to the hard work of all those who have contributed to the *NEWSLETTER*.

At the beginning of the year, four new persons joined the staff. Shortly after, your editor moved to Manitoba, suddenly plunging our newcomers into the deep and stormy waters of publishing the *NNL* without the editor close at hand. A great deal of work was needed to establish procedures whereby the *NEWSLETTER* could be published in Toronto, utilizing a staff spread across 3200 km, and with the editor some 2000 km away from the editorial office. I am extremely grateful to Norman Green and his successor, Ian McGregor, for their superb efforts at co-ordinating the Toronto part of our operation; as well as to Nick Fraser and Ralph Chou for their many hours of hard work. As the result, we have laid the foundation needed to permit the editor to reside outside of Toronto, thereby opening up new opportunities for members outside of Toronto to participate in the National Society's activities.

Another important step was the appointment of Dr. Paul Marmet as our French Assistant Editor. Dr. Marmet has proven to be an enthusiastic and diligent member of the team. As the result, we are now able to give better service to our French-speaking members, and it is expected that more French articles will appear in future issues.

Reporting Centre News and other local activities has always been a problem, partly because of the lack of response from the Centres themselves and partly because of a shortage of *NEWSLETTER* personnel to look after this important area. Paul Deans has worked very hard in this field for several years now, and he has been joined by Barry Matthews and Damien Lemay. The results are evident in this issue and all three regional editors are to be congratulated for their efforts.

Another newcomer this year was Dr. Don Fernie, who succeeded the late Dr. John Heard as our scientific advisor. It was Dr. Fernie who persuaded me to take on the editorship of the *NEWSLETTER*, and I am grateful to him for his continuing interest, assistance and contributions.

A great deal of credit is due to Bill Ireland for his many fine illustrations, and to Richard McDonald for his imaginative photographic artistry. Special thanks are also due to our capable Executive Secretary, Miss Rosemary Freeman, for her interest and assistance; to Jan Davidse and Hughes Eng at the University of Toronto Press for assistance, service and support well beyond the call of duty; and to Dr. Lloyd Higgs, Chairman of the Society's Editing Committee for his interest, encouragement, and willingness to help at any time in spite of an already crowded schedule.

Finally, appreciation is extended to all those who have contributed articles, photographs, drawings and ideas.

It has been our hope that the *NATIONAL NEWSLETTER* would be a reasonably accurate expression of the varied interests and activities of our members; that, in sharing common interests, activities and experiences, members everywhere would discover their many common strains of interest, and get to know each other better. In this way, I hope that the *NEWSLETTER* has contributed to a stronger, more unified Society.

This is my last issue of the *NEWSLETTER* as editor, although I hope to continue to serve in some useful capacity at the pleasure of the new editor, Frank Shinn, for whom I have the greatest of respect and the utmost of confidence.

To all members and their families, the staff of the *NEWSLETTER* extends hearty good wishes for a Merry Christmas and a happy and prosperous new year.

And now it is appropriate for me to write:

- 30 -