

NOVA

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1977 Halifax Centre Executive

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UP COMING EVENTSWEDNESDAY, 23 NOV:

Note the change of meeting day! Our special speaker for this meeting will be Dr. John R. Percy and his topic will be Pulsating Stars. Dr. Percy is Canada's leading expert on pulsating stars and is well known to RASC members as the Editor of the Observer's Handbook. You will also have read articles by him in the Journal and he is presently Editing a column in the Journal on Education IN Canada. He was the recipient of the Society's Service Award this year and he is undoubtedly one of the most active professional astronomers in the RASC.

Friday, 17 Dec.

David MacDonald, a Halifax Centre member, will bring us up to date on the Space Shuttle project presently getting into full swing by NASA. He has a large number of slides and is well up on the project and its objectives, and we think you will find it highly interesting.

Saturday 19 Nov.

Observing meeting meeting at B-GO at 7:

Sept. & Oct. Meeting Minutes

The Sept. 16 and Oct. 21 meetings were both held at the Museum. Both were opened by Dr. DuPuy with the usual list of announcements concerning the activities of the Centre. Dr. Bishop made reports at both meetings on items arising from the National Council Meetings held through the summer. The Sept. meeting was organized by Dr. DuPuy and consisted of a slide quiz, and three cross-word puzzles on various astronomical areas. The slides were to be identified by each person while the puzzles were deciphered by groups of 8 or 10 people. He had devised a point scheme and the winning team was rewarded by the praise and adulation of the other three teams. This type of activity has once again been well accepted with many finding out that there is still a lot to discover in astronomy. Following the quiz, Steve Morris, a graduate student at SMU, told of a project he has going. He is measuring the light variations of stars in Orion, especially those near the Great Nebula. If anyone is interested in observing these stars, we have charts showing the stars and the comparison stars and these may be obtained from the Ed.

The October meeting was presented by Sherman Williams of Avonport. Sherman is a teacher who has gained some considerable success in being able to give his students some real understanding of astronomical phenomena. Teaching at the grade 6-9 level, he can take little for granted and must devise techniques for demonstrating and advancing an understanding of phenomena such as shadows, sunspots, motion of the Earth and Sun. He brought along some of his demonstration equipment, which although simple, demonstrated some not so simple and all too often ignored relationships. He related some examples of how one can use your surroundings to aid the teaching process--sometimes to the disgust of over zealous janitors. My favorite was the occasion when he used small holes in window blackouts (some holes made quite deliberately) to show the movement of a naked eye sunspot group across the solar surface. Over a period of a week the students could watch the daily progress and actually deduce that the Sun rotated in roughly 4 weeks. Most of us know 'all' about such simple matters but I think it is important to have a teacher such as Sherman, remind us of the mental process a student must use to make abstract associations. And as usual Sherman ended with some of his spectacular slides.

HOMO-ASTRONOMERUS

"...astronomers are divided into two species. The first is purely nocturnal and spends its working hours taking photos of objects so far away that they probably don't exist anymore. They're not interested in the solar system which they consider very odd and almost an inexcusable accident. During the daytime they may be found sleeping under large stones and in warm, dry places.

Members of the second species work more normal hours and inhabit offices full of calculating machines and lady computers. This hinders them a lot; nevertheless they manage to produce reams of mathematics about the --probably non-existent--objects photographed by their colleagues, with whom they communicate through little notes left with the nightwatchman.

Both species have one thing in common. They are never known, except in moments of extreme mental aberration, actually to look through their telescopes. Still, they do get some very pretty photographs."

from Prelude To Space
by Arthur C. Clarke

Of all the comets in the sky
 There's none like Comet Halley.
 We see it with the naked eye
 And periodi-cally.

The first to see it was not he
 But yet we call it Halley.
 The notion that it would return
 Was his origi-nally

Sir Harold Spencer Jones

Nova S-1, A Black Hole Confirmed

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 Schwarzschild 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.

Roy L. Bishop
Maktomkus Observatory

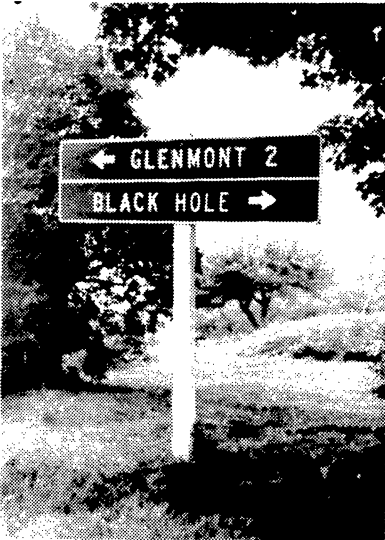


Figure 1



Figure 2

Light Curves of Variable Stars

The term variable star is applied to any star that is varying in brightness. Very little was known about variable stars until after the invention of the telescope; the variability of Mira Ceti was recognized in 1596. Only eighteen variable stars had been discovered up to 1844, when Argelander published the first catalogue of variable stars. This publication marks the beginning of systematic studies of variable stars, which are now an important branch of astronomical research.

When a variable star is discovered, the character of the variation is determined by repeatedly comparing the brightness with that of near-by stars whose light is constant. It is usual to plot the observed magnitudes against the dates of observations. This gives the light curve, and the best curve through the points shows how the magnitude varies with time. The period is the interval between the times of greatest or least brightness.

Variable stars may be classified into the following groups:

- 1) Cepheid variables
 - a) classical Cepheids Period = 1 week
 - b) Type II Cepheids Period = 2 weeks
- 2) RR Lyrae or cluster var. Period = 12 hours
- 3) Long period variables Period = 300 days
- 4) Irregular variables
- 5) Eclipsing binary stars (not dealt with here)

Below you will find data for four stars which you may plot on graph paper. Convention requires the time (date) to be plotted across (the abscissa) and the magnitude to be plotted vertically (the ordinate) with the brightest magnitude always at the top. The scale to be chosen depends on the nature of the light curve, so play around with the numbers before starting the plot in order to choose a suitable scale, ie one which will demonstrate the light variations to best effect.

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T CEPHEI

The time is expressed in Julian Days, the first four numbers of which are 2428 and later 2429.

JD	Mag	JD	Mag	JD	Mag	JD	Mag	JD	Mag
806	9.0	971	9.5	121	5.9	273	10.3	429	7.9
822	9.7	978	9.3	130	5.8	281	10.4	440	7.1
830	9.9	989	9.0	141	6.1	291	10.5	449	6.6
839	10.1	003	8.7	152	6.3	300	10.3	460	6.3
852	10.4	010	8.8	162	6.8	309	10.3	468	6.2
860	10.7	031	8.6	173	7.0	319	10.0	479	6.0
870	10.8	041	8.7	183	8.0	327	10.0	490	5.7
882	11.0	050	8.2	190	7.6	343	9.6	499	5.5
901	10.8	061	8.1	200	8.3	351	9.8	511	5.4
914	11.0	070	7.2	212	8.4	364	9.4	520	5.5
922	11.0	080	6.6	219	8.5	382	9.0	541	6.1
931	10.4	090	6.3	231	8.7	392	8.7		
942	10.2	100	6.0	241	9.0	402	8.4		
950	10.0	112	6.0	250	9.7	410	8.3		
959	9.9	115	5.7	260	9.8	420	8.2		

ST VIRGINIS

The phase is in days. Put largest negative value at left.

Phase	Mag.	Phase	Mag.	Phase	Mag.
-0.100	11.38	0.150	11.21	0.400	10.35
-0.075	11.38	0.175	11.29	0.425	10.40
-0.050	11.29	0.200	11.38	0.450	10.65
-0.025	10.88	0.225	11.38	0.475	10.82
0.000	10.25	0.250	11.38	0.500	10.95
0.025	10.50	0.275	11.38	0.525	11.07
0.050	10.74	0.300	11.38	0.550	11.17
0.075	10.87	0.325	11.38		
0.100	11.00	0.350	11.38		
0.125	11.11	0.375	11.10		

[AQUILAE

The phase is in days. The difference in magnitude between the variable and a comparison star is given. The negative sign means the variable is brighter than the comparison star.

Phase	Mag Diff.	Phase	Mag Diff.	Phase	Mag Diff.
-2.50	0.56	1.25	-0.17	5.00	0.61
-2.25	0.60	1.50	-0.11	5.25	0.60
-2.00	0.61	1.75	-0.06	5.50	0.54
-1.75	0.57	2.00	-0.05	5.75	0.43
-1.50	0.49	2.25	-0.05	6.00	0.27
-1.25	0.33	2.50	-0.03		
-1.00	0.16	2.75	0.03		
-0.75	0.00	3.00	0.21		
-0.50	-0.20	3.25	0.27		
-0.25	-0.41	3.50	0.31		
0.00	-0.50	3.75	0.36		
0.25	-0.47	4.00	0.40		
0.50	-0.40	4.25	0.45		
0.75	-0.33	4.50	0.52		
1.00	-0.24	4.75	0.57		

YZ CASS

Phase	Mag.	Phase	Mag.	Phase	Mag.
2.32	8.350	2.41	8.307	3.25	8.320
-0.87	8.477	0.12	8.300	4.30	8.480
0.91	8.307	0.20	8.320	4.29	8.315
3.00	8.323	2.20	8.379	4.42	8.640
-0.10	8.309	2.25	8.379	4.49	8.700
-0.05	8.661	0.56	8.310	4.55	8.558
0.00	8.720	1.35	8.306	6.53	8.309
0.07	8.562	2.70	8.313	6.09	8.311
2.06	8.314	2.35	8.320	6.68	8.382
3.87	8.320	2.00	8.309	6.70	8.375
2.12	8.329	1.61	8.311	6.82	8.331
4.04	8.309	0.13	8.361		

Save the graphs so you can use them with next issue's article which will describe the differences between variables, how to use the variations to determine the distance to them, etc. In the mean time it is suggested that you should look up the sections on variable stars in one of the text books in the Centre's library. Look for the books by Abell, Pasachoff, Baker or Jastrow & Thompson.

ASTRO-PROBE

Darlene English

S P O T A R I M O R T S G N A
 M L B L R P O C E T U S H M S
 U A S A P A L L A S I N N E T
 R N E D E U R A N U S K M T R
 T E R I S R P O N A T I T E O
 C T V T A U O P N C L T E O N
 E A E V E N E D I K K T O R O
 P R R A D I A L Y S S I H P M
 S Y M A R G L I A R I T U N Y
 O I N D E X U M L H U A G O R
 M R R L L E B B M U D N A O A
 S U I W S P E S E B J L M G N
 O F L O W A N O L B O Z M A I
 C R A B N R A T S L K C A L B
 C E N O I S L U M E E L G N A

The above is the solution to the puzzle which appeared in the Sept/Oct issue. There are one or two corrections which a few people have picked up already. From the letters left over you will find the hidden word or should that be words--Hertzprung-Russell. How'd ya' do?

DEFINITELY CANADA'S OLDEST OBSERVATORY

Bruce Torquemada

(who is this guy anyway??)

The first word relating to this remarkable find was brought to the writer by Prof. Oberon Hermes, mythologist at Asgard University in Bifrost, North Dakota. Prof Hermes had been studying totem myths of West Coast Amerindian tribes and had found mentions of astronomy; particularly hints at predicting astronomical events. The myths and legends spoke of a medicine man of some sort from the far north who could actually make these predictions. Intrigued, Hermes began studying Inuit folklore.

Then came a lucky break in the form of an Exxon far north survey. A plane somewhat off course over Melville Island in the Beaufort Sea was being flown by a Mr. Corrigan who noticed a series of holes in the permafrost below. He took several photos before returning home, where he crashed. The film, luckily, survived and pictures of the holes were eventually sent to Hermes who was able to match them up with what he had learned. The writer was contacted and became sufficiently interested as to accompany Hermes to the site, along with an archeologist, a few government officials and a report from UFO magazine.

The holes themselves were found to be arranged in three concentric circles with the holes in each circle evenly spaced. The inner circle was about 10.6 m in diameter and had nine holes of about 60 by 80 cm which were about 120 cm deep; and the third circle was 28.2 m in diameter and had 27 holes of the same size as those in the inner ring. The writer was immediately reminded of Stonehenge except, of course, that at Stonehenge the marking holes are not holes.

The legend which probably concerns the site is as follows: long, long ago an Inuit named Nekstif Frumlukup (which roughly translates--Dummy-who-Wastes-Time-looking-at-the-Sky) managed to get into his tribe's good graces by erecting a mystic device which enabled him to predict the positions of the SUN, MOON and planets and to predict eclipses and other astronomical phenomena of the sort.

(it must be remembered that from Melville Island, Latitude 75.5° N, the disappearance and reappearance of the Sun held great importance.)

This legend seemed fairly likely but, the problem was that the legend mentioned an erected device, not holes, and although a legend becomes garbled in centuries of transmissions it would seem that the holes were places where objects were set. But the holes were in pristine condition, the only damage being due to their apparent great age, and so there was a question of what were the indicators made that their removal, probably natural, would leave no trace or do no damage. After much rumination it was realized that ice blocks or stacks of snow blocks would cause the observed phenomena. It also suggested a name for this old but by no means primitive observatory--Snowhenge.

Ice construction for Snowhenge also explains the final chapter in the tale of Nekstif Frumlukup: the spring following a particularly warm summer Nekstif predicted the reappearance of the Sun some two days ('two sleeps' is the actual phrase) before it actually did, an occurrence, or lack thereof, which considerably upset the tribe. Nekstif also had the misfortune a week or two later to completely miss what is interpreted as a total solar eclipse. It was then that the tribe, in the manner of the times, "cut off his grant"; he was bound, put in a kiyak and pushed to where killer whales were mating. (it is hoped that this great pioneering astronomer met his demise with the same courage with which van Biesbrook faced a frozen mustache, Tycho a severed nose and A.H. Batten the coffee at Saint Mary's U.)

However, while the observatory was in action it produced extremely good results. Carvings on bone and antlers found in the immediate neighbourhood were inscribed in a manner similar to South Amerindian astronomical talleys which kept track of lunar phases and positions of a transit of Venus and the lunar occultation of Gem (this carving is reproduced in Fig. 1). Snowhenge was so successful that word of it went southward and reached the West coast Amerinds who raised totem poles in a vain attempt (vain since they lacked the required knowledge) to duplicate its successes.

The story of Northern astronomy does not, however, end with Nekstif's unfortunate demise. Other legends took us some

eighteen kilometers south where similar markings on a much smaller scale brought up stories concerning Nekstif's great-grandson, who was named in the family tradition, Heebedder Watchistep (rough translation 'Cool it Buddy'). According to the tales, Heebedder studied the dilapidated remains of his ancestor's triumph and downfall and realized both the cause of his severe censure and the fact that precision construction and not size was the critical factor in Nekstif's success. So, at the second site Heebedder built a miniscale Snowhenge with a total diameter of 1.4 m of small bones. However, he was aware of his ancestor's fate and so built a rude concealing edifice of snow about his construction. Unfortunately he was observed using his device and so went the way of his famous relative. There is one final note which would cheer Heebedder's soul: the basic design of his mini-Snowhenge's cover (see Fig. 2) was adopted by his tribe and eventually all Inuit.

Finally, concerning the age of Snowhenge; precessing Arctic skies to best fit Snowhenge gives a date of about 2800 BC and radio dating of bones at the site and ice fossils in the holes give similar results, making Snowhenge the oldest observatory not only in Canada but perhaps even in the Americas.

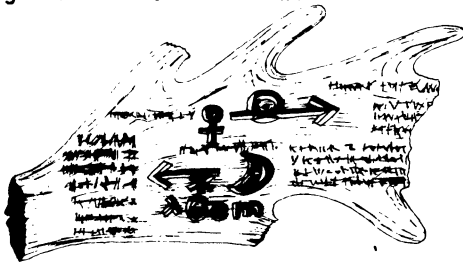


Figure 1

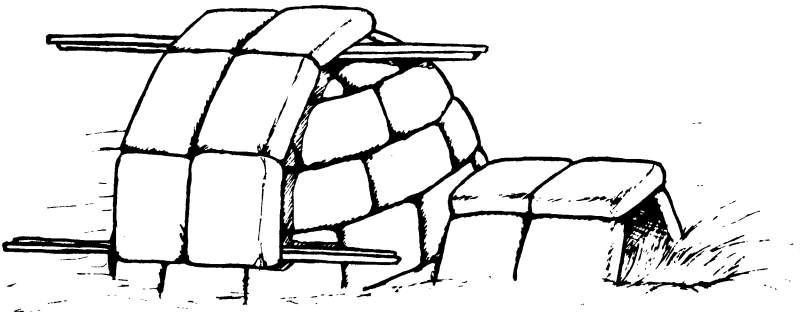


Figure 2

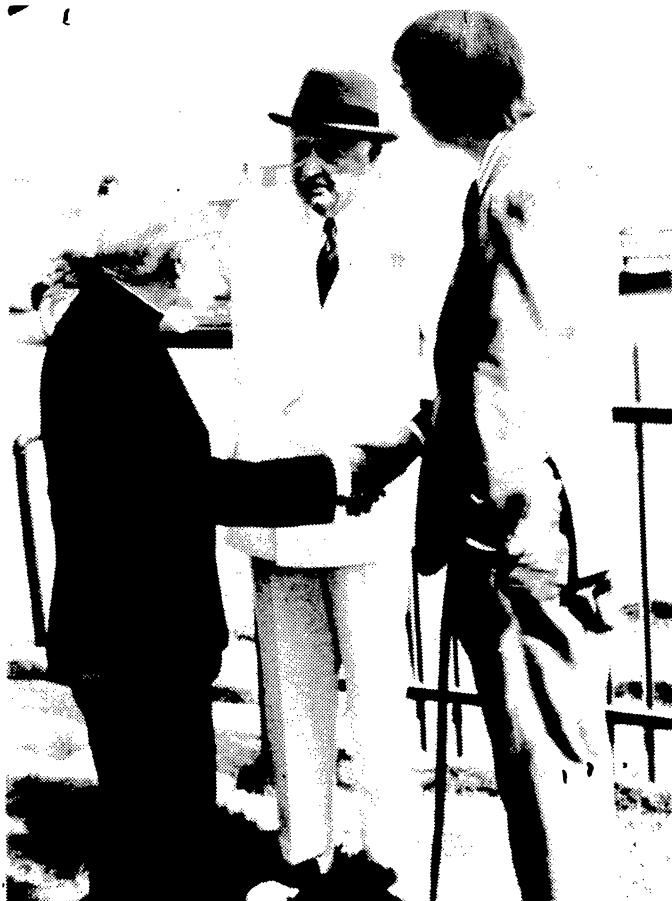


COMET WEST OVER AVONPORT

05 20 AST March 6, 1976
50 mm, f/1.4, 20s, Tri-X

by

Sherman Williams



AN HISTORIC OCCASION

Our honorary president, Rev. M.W. Burke-Gaffney, Cyrus Eaton and Carl Sagan meet at Wallace Bridge, Nova Scotia, the birthplace of Simon Newcomb, on July 9 1972, one day prior to the last total eclipse in this province for 107 years.

(photo by R.L. Bishop)

ITEMS FOR SALE

1. Eyepiece: Edmund orthoscopic \$ 25.
6 mm, 1 $\frac{1}{4}$ " tube.
2. Eyepiece: Brandon, parfocalized \$ 40.
24 mm, 1 $\frac{1}{4}$ " tube, case.
3. Anglotar 35 auxiliary wide angle \$25.
camera lens attachment with
leather case.
4. 10 inch f/8 aluminized University \$175.
Optics paraboloidal mirror (new).
(Diagonal mirror included)

Items 1, 2, & 3 are available from
Roy Bishop, Avonport, N.S. BOP 1B0

Item 4 is available from
Dr. Robert Abell, 195 Main St., Middleton
N.S.

1978 MEMBERSHIPS

As you are aware the time to pay up has passed by but you are not too late--lucky you! We know you don't want to miss any exciting episodes of the new science fiction thriller coming up in Nova Notes, or any other of those electrifying articles on the advancement of the frontiers of astronomy. To avoid any disappointments send us that money right now before you forget!! \$7.50 for students under 18, \$10. students over 18, \$12.50 regular and \$150 for lifers (but be warned you don't get a gold membership card--cheap what?). Oh yea and you also get those uppity canada publications--the Journal and Observer's Handbook. The Handbooks are in, so if you havn't picked yours up yet, come and get it at the November meeting. Fees should be paid to the Treasurer or Editor at addresses on first page.

ASTRONOMICAL CALENDAR

Diane Brooks

NOVEMBER/DECEMBER

- 1 Nov. 1536--Cardinal von Schonberg, Archbishop of Capua, wrote to Copernicus urging him to publish his theory of the solar system.
 1889--Eclipse of Iapetus by shadow of Saturn's ring observed by Barnard.
 1917--Hale reflector first used.
 Maximum concentration of S. and N. Taurids.
- 2 Nov. 1850--Asteroid, Egeria, discovered by Hind.
 1885--Birth of Harlow Shapley.
 1962--Dedication of 60", 300' long McMath telescope at Kitt Peak, the largest solar telescope.
- 3 Nov. 1679--Appearance of a comet which enabled Newton to demonstrate that comets are subject to gravitation and probably move in elliptical orbits.
 1957--Sputnik II launched with Laika.
 1958--Kozyrev in USSR observed and obtained a spectrogram of gas exuded from the central peak of the crater, Alphonsus.
 1960--Death of Sir Harold Spencer Jones, 10th Astronomer Royal.
 1973--Launch of Mariner to Mercury,(first).
- 4 Nov. 1934--Death of Arthur N. Brown, English amateur observer of variable stars.
 1962--Tass reported that Pulkovo Observatory had picked up radio signals from Venus at 3 cm. Maximum positive discrepancy between apparent and mean solar time.
5. Nov. 1868--Transit of Mercury.
 1965--Comet Ikeya-Seki broke into two.
- 6 Nov. 1892--Discovery of a periodic comet by Edwin Holmes; rediscovered in 1964 after being missed seven successive times.
 1993--Transit of Mercury.

- 7 Nov. 1631--Transit of Mercury first observed, by Gassendi.
 1906--Transit of Mercury.
 1960--Transit of Mercury.
- 8 Nov. 1711--Birth of Mikhail Lomonosov who saw a luminous ring around Venus during the first 18th century transit.
 1853--Asteroid, Euterpe, discovered by Hind.
 1956--Comet Arend-Roland discovered at Uccle Obs., Belgium.
 1969--Death of Vesto Slipher who supervised the probe that resulted in Pluto's discovery.
- 9 Nov. 1967--Saturn V first launched.
- 10 Nov. 1894--Transit of Mercury was well observed by Barnard at Lick Obs.
- 11 Nov. 1572--Tycho Brahe saw supernova in Cassiopeia; this event turned him from chemistry to astronomy.
 1980--Voyager 1 will investigate Titan.
- 12 Nov. 1621--The name "aurora borealis" was coined by Gassendi on the occasion of a conspicuous display.
 1782--John Goodricke observed Algol fade to one-third its normal brightness; he suggested that it was due to a companion.
 1916--Death of Percival Lowell.
 1974--Comet 1974g (17th mag.) discovered by Sidney van den Bergh--the first found by a Canadian astronomer and the most distant yet found.
- 13 Nov. 1577--Understanding of comets began with Tycho's discovery of a comet.
 1851--Hind wrote to the editor of the Astronomical Journal declaring that the reference star, K, on Ferguson's report must be a planet beyond Neptune.
 1833--Sir John Herschel sailed to S. Africa to study the southern sky.
 1971--Mariner 9 arrived on Mars.
 1986--Transit of Mercury.
- 14 Nov. 1574--Last occurrence of aurora in England for 142 years.
 1896--Discovery of Procyon's white dwarf companion by J.M. Schaeberle at Lick.
 Maximum concentration of Andromedids.

- 15 Nov. 1630--Death of Kepler.
1738--Birth of Frederick William Herschel.
1852--Asteroid, Lutetia, discovered by Goldschmidt.
1850--The Bonds (father and son) discovered Saturn's crepe ring.
1999--Grazing transit of Mercury.
- 16 Nov. 1492--A 280 lb. stone fell at Ensisheim in Alsace and is still displayed in a church there.
1852--Asteroid, Kalliope, discovered by Hind.
- 17 Nov. 1954--Death of Thaddeus Banachiewicz.
1966--Greatest meteor shower on record.
Maximum concentration of Leonids.
- 20 Nov. 1750--LaCaille left Lorient for Cape of Good Hope where he observed co-ordinates for 9,766 stars down to 7th magnitude over 127 nights. He named the southern constellations.
1889--Birth of Edwin Hubble.
1952--Occultation of Sigma Arietis by Jupiter. Baum and Code proved that Jupiter's atmosphere consists of hydrogen and helium with Mt. Wilson's spectroscope.
- 21 Nov. 1951--Harvard Announcement Card No. 1160-1161 gave the orbital elements and a first ephemeris for Jupiter's 12th moon, (J-XII).
1970--Directors of 5 observatories in Arizona asked that an ordinance be passed to turn city lights groundward.
- 22 Nov. 1608--A brochure in France pointed out that the telescope could be used for seeing small stars, not only "ships", "troops" or "ladies".
1644--Johannes Hevelius observed phases of Mercury.
1675--Roemer presented his view that the speed of light is not infinite to the Academie.
1968--Report that Icarus had been measured by radar.
- 23 Nov. 1725--Pierre Bouqueor made first determination of atmospheric extinction.
1864--Death of Wilhelm Struve, founder of modern double star astronomy.
1877--A fireball over the British Isles caused a noise 100 times greater than a thunder clap.

- 24 Nov. 1601--Death of Tycho Brahe.
1639--First transit of Venus observed with optical aid, by Jeremiah Horrox.
- 25 Nov. 1943--Leedey meteor fall.
- 26 Nov. 1818--Comet Encke discovered by Pons at Marseilles; named after the man who predicted its return.
- 27 Nov. 1872--Meteor shower occurred when Earth crossed orbit of vanished Biela's Comet.
1885--First photo of a meteor trail, at Prague.
1963--New observations of eruptions on moon, at Lowell Obs.
1964--Death of V.V. Shanonov, planetary and lunar expert.
- 28 Nov. 1659--Christian Huygens did first detailed drawing of Mars showing Syrtis Major.
1964--Mariner 4 launched.
1965--Canada launched Alouette II.
- 30 Nov. 1825--Captain Kater, V.P. and treasurer of R.A.S., noted the various brightnesses and colours of Saturn's rings.
1962--Death of J.L. Pawsey, Australian radio astronomer.
1964--Ion rockets first used in flight by USSR's Mars Probe, Zond II.
1971--First photo of Phobos showing features; taken by Mariner 9.
- Nov. 1962--Existence of quasars established.
- 1 Dec. 1659--Huygens recorded the observation that Mars' rotation seems to take 24 terrestrial hours.
1935--Death of Bernhard Schmidt, inventor of the Schmidt telescope.
- 2 Dec. 1894--Death of C.A.F. Peters of Konigsberg Obs.
1924--Death of Hugo von Seeliger, pioneer in statistical studies of stars.
1934--Second 200" disk for the Hale telescope was poured, successfully.
1976--Launch tower at Cape Kennedy was blown up.
- 3 Dec. 1850--Lassell confirmed the discovery of Saturn's crepe ring and coined the name in a letter to the

Astronomer Royal.

1973--Pioneer F encountered Jupiter.

- 4 Dec. 1546--Tycho Brahe born.
- 5 Dec. 1879--William Abney's infrared solar spectrum was presented to Royal Society. His emulsions were sensitive to 12,000 Å; this wasn't repeated for many years.
- 6 Dec. 1631--Transit of Venus predicted by Kepler wasn't observed.
1882--Transit of Venus.
1957--First American satellite, Vanguard I, launched.
- 7 Dec. 1876--A bright equatorial spot developed on Saturn; Asaph Hall followed it for 61 rotations.
1905--G.P. Kuiper born.
1968--OAO launched.
- 8 Dec. 1845--Fifth asteroid, Astraea, discovered by Hencke.
1874--Transit of Venus.
1889--Schiaparelli, the first to think of observing Mercury during the day, reported his idea.
1919--Beginning of six sudden outbursts on Jupiter till 1952, all in S. Equatorial Current.
1965--Death of McLaughlin, authority on Mars & novae.
- 9 Dec. 1874--Transit of Venus.
- 10 Dec. 1684--Halley told Royal Society that Newton had showed him a treatise called De Motu (On Motion).
- 11 Dec. 1610--Letter from Galileo to de Medici announcing his discovery of phases of Venus.
- 12 Dec. 1871--Jules Janssen discovered dark lines in corona spectrum during total eclipse.
1895--New star in Centaurus discovered by Mrs. Fleming.
1970--X-ray satellite, "Uhuru", launched from San Marco, off Kenya.
- 13 Dec. 1871--Birth of Russel W. Porter, founder of Stellafane.
1920--First determination of Betelgeux's diameter.
- 14 Dec. 1725--Bradley began observations on proper motion.
1881--Death of William Burt, British selenographer.

- 1976--Death of Donald Menzel, leading authority on sun.
Maximum concentration of Geminids.
- 15 Dec. 1612--Simon Marius drew attention to Andromeda Galaxy by studying it through a telescope.
1859--Kirchhoff described chemical composition of sun from spectroscopic observations.
1966--Discovery of Saturn's 10th moon by Dollfus.
1970--Earliest planetary touchdown--Venus VII.
- 16 Dec. 1962--Explorer XVI, the micrometeoroid satellite, was launched.
1963--Beginning of symposium which included discussion of theory that radio stars were created by gravitational collapse.
- 17 Dec. 1896--Birth of Father Burke-Gaffney.
1970--Venera 7 recorded a temperature of 474°C on Venus.
- 18 Dec. 1604--Kepler told Fabricius that Mars' path is a perfect ellipse.
- 19 Dec. 1972--Apollo program ended.
- 20 Dec. 1891--323rd. asteroid found by Wolf by photography.
- 21 Dec. 1614--Father Caccini preached that Galileo, Copernicus, mathematics and mathematicians were anti-religious.
- 22 Dec. 1968--First manned journey around moon, by Apollo 8.
1870--C.A. Young discovered flash spectrum during eclipse.
Maximum concentration of Ursids.
- 23 Dec. 1672--Cassini found Rhea, Saturn's third moon.
1895--Death of John Russell Hind.
1906--Death of M. Janssen, French astronomer.
1963--Death of Rudolph Kuhn, publicizer of astronomy on German TV.
1973--Death of Gerard Kuiper.
- 24 Dec. 1629--Galileo's Dialogo finished.
1957--Zurich daily sunspot number reached 355--an all-time record.
1965--Heaviest meteorite fell on British Isles since 1795 (102 lbs.)

- 25 Dec. 1642--Isaac Newton born.
Mean solar time agrees with apparent solar time.
- 26 Dec. 1908--Comet Moorehouse passed perihelion.
- 27 Dec. 1560--First good description of northern aurora,
by Konrad Gesner.
- 28 Dec. 1571--Johannes Kepler born.
- 1725--Bradley noticed proper motion of γ Draconis.
1882--Sir Arthur Eddington born.
1969--Comet Bennett discovered.
1973--Comet Kohoutek reached perihelion.
- 29 Dec. 1845--Separation of Biela's Comet into 2 parts
first noted by Herrick and Bradley at Yale.
1966--Tass Agency reported that A.I. Oparin,
USSR's greatest lunar authority, thinks that
organic substances, alive or dead, are possible
on the moon.
- 30 Dec. 1610--Letter from Galileo to Castelli describing
his search for the gibbous phase of Mars; he
could not see it.
1963--Total eclipsed moon became very dim be-
cause of volcanic dust in the atmosphere.
- 31 Dec. 1719--Death of John Flamsteed.
1802--Olbers rediscovered Ceres, 1 year after the
original discovery by Piazzi.
1838--Experiment conducted by Sir John Herschel
in S. Africa enabling him to calculate the
solar constant.
1864--Birth of Robert Aitken, discoverer of more
than 3100 visual binaries.
1909--Percival Lowell stated that 2 new canals
had been discovered on Mars.
1958--End of International Geophysical Year.
1965--End of International Year of the Quiet Sun.
- Dec. 7B.C.--Conjunction of Jupiter and Saturn may
have been the Star of Bethlehem. This conjunc-
tion also occurred in May and September.

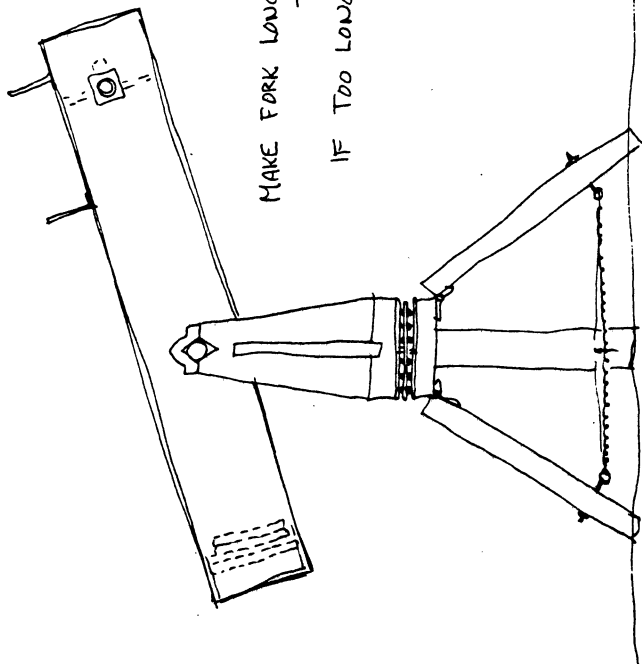
CENTRE TELESCOPE PROJECT

HEIGHT OF EYEPIECE SHOULD BE
CONVENIENT FOR
AVERAGE HEIGHT PERSON
~ 5FT ABOVE GROUND
MAX (?)

MAKE FORK LONG ENOUGH TO ALLOW SCOPE
TO REACH ZEUTH

IF TOO LONG - ADD WEIGHT TO REAR OF TUBE
SO BALANCE POINT CAN BE
MOVED BACK.

TRY TO MAKE AS
LIGHT - BUT AS
STURDY AS POSSIBLE!

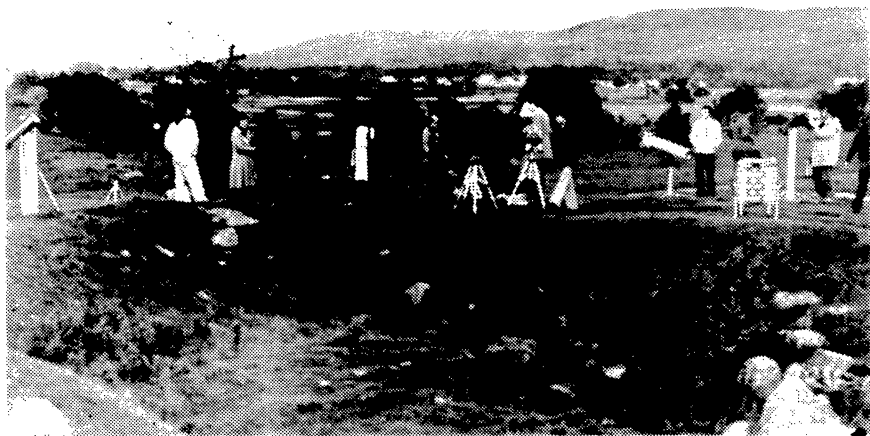


The above drawing shows an overall view of the design adopted for the telescope being constructed by Centre members on clouded out observing sessions. As you can see Larry Bogan's design is not complicated, is light and very manageable. Next month's issue will contain his complete set of design drawings from which you may want to build a similar instrument.

OBSERVING MEETINGS

The second last observing meeting at the Fr. Burke Gaffney Observatory, met with more success than has become normal. The skies were clear but... the moon was too bright for good viewing. The observing session (of the two centuries) was held at Castle Fredick in Falmouth on October 8, '77. Attempts were made to reach everyone who signed the list at the September meeting to announce the session at Falmouth. Two photographs by Dr. Roy Bishop, discoverer of the significance of the site appear with this article. Below is pictured some of the group of 25 members which arrived for the session. I don't think anyone would dare to step in front of a telescope being operated by any member of this rugged looking group. As you can see, we were ready for the cold and frosty weather of the night. One member was ready to take his snow mobile out ! But he was the most comfortable, by far.





The above photograph shows the location of the Observing Session. Telescopes were set up on what was at one time the east patio of the home of J.F.W. DesBarres (we can think that, since it may add to value of the outing). The depression in the foreground is thought to be the remains of the basement of DesBarres' home, following a fire a few generations down the line from DesBarres himself. There were about 12 telescopes set up, including a Dollonds of London dating back to the late 1700's (a recent acquisition of Roy Bishop's). Coffee and a warm kitchen were provided by Mr. and Mrs. Bruce Saunders (present owners of the property) for which all were grateful. In short, a success-observing session was held.

Michael P. Edwards
Observing Chairman

FUMBLING THROUGH THE FALL SKIES

Mike Edwards (OC)

But the cold weather is usually the clearest, so don't put the dust covers on those telescopes. To quote from Star Maps for Beginners, a book of the Halifax Centre library: In November "the Northern Cross stands upright in the western sky, and bright Vega and Altair are below it. Between the latter star and Albireo, the star at the foot of the cross, lies the small constellation of Sagitta, the Arrow. If the Arrow has come from the bow of Sagittarius, the Archer, it has gone far astray. Above Altair is Delphinus, thought of by most "old farmers or sailors" as "Job's Coffin". Fomalhaut of Piscis Austrinus (Southern Fish) fame rides in solitary splendor, while higher and farther to the east we find Cetus, being now well displayed." November's tales of mythology are usually followed by those of December. This book is "in grain" as mythological tales follow the skies "cielng plan", of each month. For December; "the Northern Cross stands erect in the west, now almost on the horizon. A little way to the north, Vega is setting. In the south, the large comparatively vacant area between Eridanus and the bright star Fomalhaut (pronounced fo-mal-hawt) preceeds the brilliant Orion region in the south east. The triangle formed by Betelgeuse in Orion, Procyon in Canis Minor and Sirius in Canis Major now stands on its base, in the east, while Capella in Auriga is approaching the Zenith. Above the Little Dipper, looking like an M is Cassiopeia, a queen of Ethiopia who was beautiful and was too vain about it." When you hear "My, but it's cold outside...", think My, but it's clear outside..., then take your telescopes or binoculars and mythological digests, and-ge-viewing, go fumbling through the fall skies.

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NAVA NOTES are printed bi-monthly in Jan., March, etc., through the courtesy of the Nova Scotia Museum. Articles pertaining to any aspect of astronomy will be considered for publication. To be included in the Jan. issue, articles should reach the Editor not later than Dec 18 and those with photos not later than Dec 16.

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