NOVA NOTES

二十五载见丹心

BI-MONTHLY JOURNAL OF THE HALIFAX CENTRE

MAR-APR 1983 VOL. 14, No 2

1983 HALIFAX CENTRE EXECUTIVE

Honorary President	- Dr. William Holden, M.D., F.A.C.S.
President	- Kathy Oakley, 3140 Hemlock Avenue, HALIFAX, N.S. B3L 4B6
Vice President	- David Tindall, 3231 Glendale Road, HALIFAX, N.S. B3L 3S4
Secretary	- Wilf Morley, 34 Elizabeth Street, BRIDGEWATER, N.S. B4V 1M2
Treasurer	- Randall Brooks, 71 Woodlawn Road, DARTMOUTH, N.S. B2W 2S2
Editor (NOVA NOTES)	- Peter Steffin, 8 Auburn Drive, DARTMOUTH, N.S. B2W 3S6
National Rep.	- Cathy McLoed, 2-6067 Fraser Street, HALIFAX, N.S. B3H 1R8
Librarian(s)	- L. Burgoyne & J.S. Wells, Saint Mary's University, HALIFAX, N.S. B3H 3C3
Observing Chairman	- Craig MacDonald, 12 Wheatstone Heights, DARTMOUTH, N.S. B2Y 4C6
Mailing Address	- HALIFAX CENTRE, R.A.S.C., c/o 1747 Summer Street, HALIFAX, N.S. B3H 3A6

NOTICE OF MEETING

Date: Friday, 18 March, 8:00 PM

Place: Nova Scotia Museum: Meeting to be held in lower auditorium/theatre. Access from parking lot and side entrance.

Speakers & Topic: Randall Brooks will talk about the history of astronomy in Nova Scotia.

Walter Zukauskas will then present the history of the Halifax Centre of the R.A.S.C.

REFRESHMENTS WILL FOLLOW!

* * * * * * * * * *

NOTICE OF MEETING

Date: Friday, 15 April, 8:00 PM

Place: Nova Scotia Museum: Meeting to be held in lower auditorium/theatre. Access from parking lot and side entrance.

Speaker & Topic The speaker will be Mr. Ken Dunn from the mathematics department at Dalhousie University. His subject will be 'Black Holes and Big Bang Cosmology.

MINUTES OF THE JANUARY MEETING

The first regular meeting of the New Year was held on January 21st. with the new President, Kathy Oakley chairing the session.

Dr. Vincent Audain was the guest speaker. As well as being in private practice he is with the Department of Opthalmology at Dalhousie University. Dr. Audain gave a very informative talk on the structure of the eye and its diseases. He explained that checking the vision of a preschooler was different from that of an adult. The charts are made up differently for non-readers and could also be used in cases where the language barrier might be a problem. He described cataracts and how operations replacing the old lenses are being done. People having histories of glaucoma in their families should have their eyes checked every year, stated Dr. Audain.

Doctors use the eyes to discover other problems. The eye is the only part of the body where the blood vessels can be examined directly. For example, high blood pressure can be detected. Dr. Audain was asked what what distances can be seen in relationship to astronomy. He replied that he could not answer this as he was not an astronomer and did not know of any studies that had been done in this area. He did explain that 20/20 was not the absolute in vision. Many people had vision beyond this.

MINUTES OF THE FEBRUARY MEETING

The February meeting of the centre was held on February 18th. with Dr. Larry Bogan as the speaker. Larry took his sabattical from July'81 to July'82 in New Zealand and this along with slides was his presentation for the evening.

One of the major reasons he went to New Zealand was to see the skies of the southern hemisphere. While there, he made his home in Dunedin on the South Island. (With all the hiking and sight-seeing he and his family did, was there any place he called home?)

Although Larry said he spent much more time exploring New Zealand's plant and animal life he showed us just the same that he also did some astronomy. The Southern Cross along with the Milky Way stands out clearly in the winter. Larry did use the facilities of the Beverly Begg Observatory that overlooks the Dunedin harbour. He said the Magellanic Clouds are not as spectacular as the Andromeda Galaxy but host a number of interesting objects such as the Tarantula and Eta Carinae nebulae. On the otherhand, Omega Centauri was far more dense a globular cluster than M13. Larry Bogan's description of New Zealand was like a travelogue. No wonder he wandered away from the skies to look at the various plant and animal life forms. He showed us that New Zealand is a very mountainous land with a lot less forest land compared to Nova Scotia. It has many sandy beaches along its shorelines and also many steep cliffs. He talked of the flightless birds; the different species of penguins; the glaciers; the thermal areas spouting steam which is used in heating homes and producing electricity; the fiords and the many plants common to New Zealand. Thank you Larry for the interesting slide presentation.

At the close of the meeting Randall Brooks and David Tindall showed a few slides that they had taken of the occultation of Mars during November (19th).

Wilfred Morley
Secretary

TREASURER'S REPORT FOR 1982-HALIFAX CENTRE

The Treasurer's Report for the Halifax Centre for the year 1982 was sent to the National Office in early January 1983 for inclusion in the April Supplement to the Journal. Here, in addition, I have also included the corresponding figures from the 1981 Treasurer's Report and point out a few things I consider noteworthy.

1. This year we had a surplus of $577.84 compared with our(apparent)deficit of $359.25 in 1981. As noted in last year's Report (NN 13,2) 1981 was in fact a break-even year. Continuing the tradition, this year I will argue that our surplus is even higher than the figure shown. (The other members of the Executive call this "creative bookkeeping".)

2. We had another successful year in Handbook sales. Dave Tindall's records show that for the 1982 "Handbook Year" we made $765.50, less a few tens of dollars for postage, on sales of 277 Handbooks. The figures shown in the Report fail to tell the story since (i) early in 1981 we paid National Office for some Handbooks which had already been sold in 1980, and (ii) this year (1982) we have ordered and paid for 200 Handbooks, but had about 100 on hand at year's end. Figures of $500 for net sales in 1981, and of $1,000 for sales in 1982 are reasonable estimates.

3. Interest income was higher this year due to higher rates and since we were able to keep about $1,000 in our savings account all year.

4. The Miscellaneous Income for 1982 is rather high, mainly due to a $170 fund which has been put back into general funds.

Itemized Treasurer's Report:

REVENUE	1981	1982
Membership Fees	1879.50	1268.00
Life Members Grants	0.00	136.00
Donations	0.00	0.00
Educational Activities	0.00	0.00
Interest & Dividents	53.54	124.91
Sales of Handbooks, Net	153.61	567.78
Advertising	150.00	0.00
General Assembly	252.00	350.00
Miscellaneous	76.36	261.64
Total Revenue	2565.01	2708.33
EXPENDITURES		
Fees Remitted to N.O.	1508.60	826.00
Library	86.07	0.00
Meetings & Newsletters	520.40	452.31
Annual Dinner Net	2.65	18.08
General Assembly	477.00	712.00
Equipment & Supplies	20.67	0.00
Office Administration	105.42	60.80
General Expenses & Audit	16.60	11.30
Educational Activities	0.00	0.00
Insurance	0.00	0.00
Awards & Donations	95.46	0.00
Operating Expenses-Observatory	0.00	0.00
Miscellaneous	91.39	50.00
Total Expenditures	2924.26	2130.49
Surplus (or Deficit) on Operations	(359.25)	577.84
Balance from 31 Dec.80	995.41	
31 Dec.81		636.16
Balance to 31 Dec.81	636.16	
31 Dec.81		1214.00

5. The cost of meetings and Nova Notes was down this year - even though postage rates practically doubled!

6. Net costs for the General Assembly were up by $100 this year due to higher air fares, even though Saskatoon is closer than Victoria.

In conclusion, if we assign $400 more for net Handbook sales and subtract the $170 transfer as not really being income, I would claim that our surplus on operations for 1982 was approximately $800 - quite a successful year financially.

Respectfully submitted,

Dale Ellis

January, 1883

P.S. It has been a real pleasure to have been treasurer during the past two years. Thanks to the Executive and to all the members for making it such a worthwile experience. D.E.

REMINDER

- We are trying to set up an exchange of speakers with the Ottawa Centre and are asking for volunteers who might be willing to go basically at the R.A.S.C's expense. If you're interested, call or write the President, and give her a title for the talk you are prepared to give.

OBSERVER'S HANDBOOK 1983

The following table gives an approximate comparison of Handbook sales between this year and last (in each case to February 10th).

How Sold	1982	1983
Nova Scotia Museum	91	78
Mail	44	19
A Pair Of Trindles	25*	25*
N.S. Government Bookstore	0	16*
W. Morley	26	29
R.C. Brooks	8	10
D.A. Tindall	10	10
R. Hawkes	0	3
P. Steffin	2	2
D. Ellis	1	1
Total	207	193

* 1982 actual; 1983 assumes no returns

First of all, I emphasize that the figures are approximate and I humbly apologize to anyone inadvertently left off the list.

Unfortunately, last Autumn, our main publicity agent, Reid Dexter, ceased being weatherman on CBC radio's "Information Morning" and it seems likely that this is responsible for much of the decerase in sales at the Nova Scotia Museum, and by mail. Another factor would be the rise in the price of the Handbook (from $6.00 to $7.00), coupled with the fact that we have now started to charge $1.00 for mailing the Handbook (which actually costs us $1.11).

When you bear in mind that each Handbook sold contributes $3.00 to the revenue of the Centre (less shipping costs), it is clear that Handbook sales are of great importance to the financial health of our Centre. Accordingly I urge you to consider selling a Handbook. Also there have been several instances recently where we have gained new members after selling them a Handbook.

I welcome suggestions for increasing the publicity which the Handbook receives - it really does work: whenever Reid Dexter mentioned it on the radio, the Museum sold three that noon hour; when the article appeared on the Science page of the Chronicle Herald and Mail Star we got a dozen orders by mail and the same number of sales at the Museum. So mention it to others - tell them to buy one at the Museum, by mail or get one for them from me! Pick up one or two at a meeting to take away and sell! (just hand over the money or return the unsold book next time).

David A. Tindall
424-2337 Office
455-7456 Home

NOTICE TO PAID UP MEMBERS

You should have received your 1983 Observer's Handbook by now. If not, please let me know and I'll rectify the situation as soon as possible.

David A. Tindall

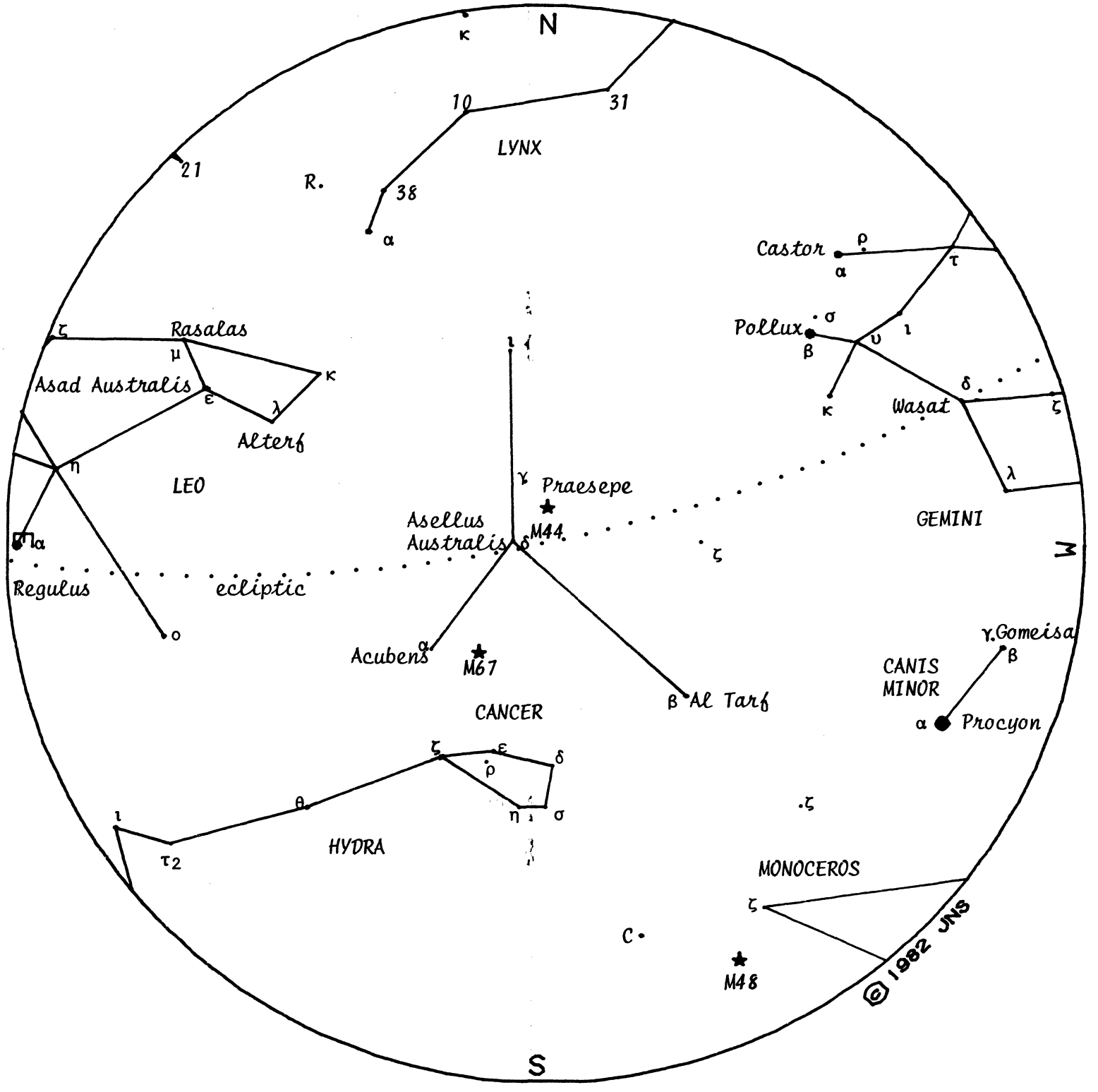
CANCER: The Crab

Cancer is a faint constellation of the zodiac, with no stars brighter than magnitude 3.5. The best known object in Cancer is the open star cluster M44, or Praesepe. M44, also called the "Beehive" is over one degree across in the sky and is some 13 light years in diameter. At a distance of 525 light years away, it can easily be seen as a fuzzy patch by the unaided eye, while individual stars in the cluster can be seen with binoculars. There are 15 stars brighter than magnitude 7.5, and about 80 of the 200 or so cluster stars are brighter than 10th magnitude, which means they can be seen in a telescope of about 2½ inches.

Nine degrees south of M44 is M67, another open cluster. M67 is some 2500 light years away, and therefore the brightest stars are only 10th magnitude. M67 is one of the oldest open clusters known - about twice the age of the sun, or 10 billion years. Open clusters are more typically only tens to hundreds of millions of years old, and among the youngest open clusters are h and chi Persei at less than 5 million years old.

Also found in Cancer is an interesting multiple star system, zeta. In this system of at least four stars, two components, A and B, range in separation from 0.6" to about 1.2", and orbit each other at a mean separation of about 19 AU, and a period of 59.6 years. Component C orbits the pair with a period of about 1150 years, at a distance of 5.8", or about 175 AU. Star C has an unseen companion that causes irregularities in the motion of C with a period of 17.64 years, leading to an estimated separation of about 5 AU. The three visible stars are all about 6th magnitude, and are almost solar like. The system is only about 70 light years from the sun. Trying to separate components A and B would be a challange for a moderate telescope.

Norman Scrimger.


N
κ
10
31
LYNX
21
R.
38
α
Castor
ρ
α
τ
Pollux
σ
β
υ
ι
Rasalas
ζ
μ
Asad Australis
ε
κ
λ
Alterf
η
LEO
γ
Praesepe
M44
Asellus Australis
δ
GEMINI
W
ζ
Wasat
δ
ζ
λ
κ
Regulus
ecliptic
o
Acubens
α
M67
β Al Tarf
CANCER
γ.Gomeisa
β
CANIS MINOR
α Procyon
ζ
ε
δ
ρ
η
σ
θ
ι
τ2
HYDRA
.ζ
MONOCEROS
ζ
C•
M48
© 1982 JNS
S

25 YEARS OF GOOD OBSERVING

The Beijing Observatory complex was established 25 years ago. Owing to the government's priority on the development of the natural sciences, construction of this modern facility was authorized shortly after the birth of modern China with the Observatory opening its doors on 29 September, 1957. Although this was the first observatory of its size in Asia, it ranked 30th. in the world.

Looking back at the process of building this observatory, one realizes every step of its construction reflects the concern for the natural sciences and the future of astronomy in China.

The goals of the observatory are: to familiarize the people with all aspects of the universe; to spread the knowledge of astronomy; to cherish the achievements of earlier Chinese astronomers; to diseminate astronomical knowledge through the publication of periodicals and to organize scientific symposiums. Since its opening, the observatory has had more than 50 exhibitions and received more than 10 million visitors. After his visit to the observatory, the painter-poet Shau Yu-Lai composed the following:

> Observatory, you are full of stars,
> You have broadened our horizon,
> You have given confidence to mankind;
> bold idealism and scientific practice,
> which enable us to open the door
> of the Universe.

The poem shows us the appreciation for the astronomical knowledge gained and spread to all.

The observatory is open to everyone. Every year large numbers of elementary and high school students come to attend and observe the astronomy programs presented there. In addition, students from the astronomy, geography and oceonography departments come to watch the show of "time and chart".

In the past 25 years there were many astronomy exhibitions, among them, "the nine planets", "Comet", "satellite", "sonar and lunar eclipse" and other educational material. These have been designed for children as well as for adult audiences.

Symposiums have often been held in the past 25 years, some of which were co-sponsored by the Beijing Astronomy Society and resident astronomers were also invited to give talks. Most of the audiences consisted of teachers, instructors and enthusiastic astronomers. At the same time, the publicity group of the observatory frequently visited schools and the countryside in an effort to stimulate young people's interest in astronomy.

High school student in Beijing have been using the observatorie's 13cm refractor telescope in their projects for years. Since 1958 the observatory has published the periodical "Astronomy Enthusiasts" which is available in China and in other countries. In 1979, the observatory joined the Tze-Jin-Shan observatory in publishing "Astronomic Almanac" as reference material.

Many astronomy courses have been conducted by the observatory, such as "Telescope Training Sessions", "Orbiting Satellite Observatory Studies" and "Ancient Chinese Astronomy". Observatory educational publications include: "The History of Chinese Astronomy", Chinese/English Planetary Chart", "Satellite" and "The Map of The Universe".

The observatory's original telescope was made in West Germany and it had been in use for 18 years. In 1976 it was replaced with an improved, self-developed telescope, which can focus on a constellation as well as on an individual star. In addition, the observatory staff is engaged in research and development of other related tools of astronomy. Recently, the development of a spectroscope by observatory technicians has proven to be very satisfactory.

In the late seventies there has been an ever increasing number of foreign visitors from astronomy departments at universities in Australia, Japan, England, Argentina and U.S.A. On 29 May, 1981, the King and Queen of Belgium accompanied by 30 other people came to visit Beijing's ancient observatory, which is a branch of the more modern facility.

EDITOR'S NOTE

This article was submitted by Murray Cunningham and translated from the original Chinese by Professor Mak of the Language Dept. at Saint Mary's University.

REMINDER

- Submissions to Burke-Gaffney Award are due by 18 March, 1983.

REMINDER

- 1983 General Assembly is in Quebec City, May 20-22. Anyone wishing to go should set aside these dates and watch the next issue of Nova Notes (to be mailed out by 13 May) for more details.

BOOKS FOR AMATEUR ASTRONOMERS

An avid sky watcher should have three types of books in his library. The first type gives, a daily description of events expected in the sky. Such events range from times of the familiar phases of the moon, to eclipses (both solar and lunar), meteor showers, planetary positions and movements, and timings of such events as the beginning of spring at 4h 39m U.T. on Monday, March 21, 1983. A book presenting this and much more tabular information is the 'Observer's Handbook' edited by Dr. Roy L. Bishop of Acadia University, and published yearly by the Royal Astronomical Society of Canada (R.A.S.C.). This popular handbook is found in professional observatories all over the world. Copies for 1983 are available from the Halifax Centre of the R.A.S.C. or from the Nova Scotia Museum, both located at 1747 Summer Street, Halifax, N.S., B3H 3A6. The 1983 Observer's Handbook costs $7 ($8 if delivered by a uniformed postman) for non-members of the R.A.S.C.

The second type of book that most amateurs use is typified by 'A Field Guide To The Stars And Planets' by Donald H. Menzel which is volume 15 of the Peterson Field Guide Series. The good astronomy field guides contain monthly sky charts including stars down to at least $4\frac{1}{2}$ magnitude in brightness, discussions of the constellations (occasionally including brief stories about mythology), and varying amounts of information on the sun, moon, and other members of the solar system. Some field guides present elementary discussions on telescopes and astrophotography for the amateur. The field guide by Menzel includes all of the above topics, and more. In paper back it sells for about $12 and can be found in stock in most bookstores.

The third type of book used widely by amateur astronomers observing with a telescope or binoculars is the sky atlas. The Menzel field guide has a small atlas section, but more serious observers eventually advance to some of the specialized sky atlases. These can range greatly in size and cost. The more inexpensive 'Norton's Star Atlas' is very popular. It has charts showing 9000 stars, clusters and nebulae, lists of over 700 interesting objects, and also has maps of the Moon and Mars. A good sky atlas plots stars ranging in magnitude down to about 6th or 7th magnitude and indicates variable stars with some unique symbol. Some atlases even show the colours of the stars. Non-stellar objects, such as gaseous and planetary nebulae, supernova remnants, open and globular star clusters, and galaxies, should also be plotted with each category given a special unique symbol. Most atlases can be ordered by your bookstore.

Backyard astronomers will select objects to view from the various tables mentioned in the first two books, and will use the sky atlas to steer his telescope through the stars to locate and view the chosen object.

A very good monthly magazine that keeps amateurs and professionals alike up-to-date with the current activities in astronomy is 'Sky & Telescope'. This magazine is written in non-technical terms and includes articles, charts, and advertisements of commercial and non-commercial nature of interest to the active observer. It can be obtained from the larger news and magazine stands, or by subscription. (EDITORS NOTE; all the afore mentioned books and magazine are available from the Halifax Centre library, on a loan basis, for members only.)

Norman Scrimger

THE DECREE OF 1633

The publication in 1632 of the book 'Dialogue On The Two Chief Systems Of The World' led to the decree of 1633. This widely acclaimed book which brilliantly expounded and defended the Copernican System was written by Galileo Galilei. However well it may have been received by the academic community, especially in northern Europe, it was quickly condemned by the theologians and its sale subsequently forbidden. Although frail of health, Galileo was in 1633 summoned before the Inquisition in Rome and forced to recant his belief that the earth revolved around the sun.

Galileo was born at Pisa on February 15, 1564, the son of a musician. He received his early education at the monastery of Vallombrosa near Florence. In 1581 he entered the University of Pisa to study medecine. His interest soon turned to mathematics which he began to study along with science. But in 1885, before he had received a degree, he was withdrawn from the university because of lack of funds. Returning to Florence, he lectured at the Florentine academy. In 1589 Galileo won the honourable, but not lucrative, post of mathematics lecturer at the University of Pisa. In 1592 pressing financial difficulties forced Galileo to apply for the chair of mathematics at Padua. Being successful, he was to remain for 18 years and perform the bulk of his most outstanding work.

Galileo, as mathematician, astronomer and physicist made several significant contributions to modern scientific thought. As the first man to use the telescope to study the skies, he amassed evidence that proved the Earth revolved around the Sun and is not the centre of the universe as had been believed.

His position represented such a radical departure from accepted thought that he was required to appear before the inquisition, ordered to recant his heretical theories and forced to spend the remaining eight years of his life under house arrest. Most of us living in a comparatively enlightened age would find the proceedings difficult to understand, but this was the 17th century and the church still exercised much influence in the secular life of the population. This was also a time when the Protestant movement gained strength and Galileo only seemed to add fuel to the fire by weakening the church's theological position.

Galileo became easily convinced of the truth of the Copernican theory but did not publish it because of fear of ridicule. When he learned of the invention of the telescope he built one, and quickly improved it to a power of 32. Because of the detail he paid to the curvature of the lenses, his telescopes were the first that could be used for astronomical observation. The first person to apply the telescope to a study of the skies, Galileo in late 1609 and early 1610 announced a series of astronomical discoveries. He found that the surface of the Moon was irregular and not smooth; he observed that the Milky Way system was composed of a collection of stars, and he discovered 4 satellites of Jupiter. He also observed the phases of Venus, the rings of Saturn, and spots on the Sun (which led him to support the Copernican theory).

In 1611 Galileo visited Rome and demonstrated his telescope to the most eminent personages at the pontifical court. Encouraged by the flattering reception accorded to him, he took a more definite position on the Copernican theory. Movement of the spots across the face of the Sun, Galileo maintained, proved Copernicus was right and Ptolemy wrong.

When his book 'Dialogue On The Two Chief Systems Of The World' came out in 1632, with the full imprimatur of the censors, it was greeted with praise from every part of Europe as a masterpiece. It was pointed out to the Pope that despite its noncommittal title, the work was a compelling and unabashed plea for the Copernican system. The Jesuits insisted that it could have worse consequences on the established system of teaching "than Luther and Calvin put together." The Pope, in anger, ordered a prosecution.

The church authorities prosecuted him for "vehement suspicion of heresy." Even though he pleaded illness and old age, Galileo was required to travel to Rome in February, 1633 and stand trial. The commissary general of the Inquisition, obviously sypathizing with him, discreetly outlined for the authorities a way in which he might be let off with a reprimand, but on June 16 the congregation decreed that he must be sentenced. The sentence was read to him on June 21. It read that: he was guilty of having "held and taught" the Copernican doctrine and was ordered to recant. Galileo receited a formula in which he "abjured, cursed and detested" his past errors. The sentence carried imprisonment, but this part of the penalty was immediately commuted by the Pope into house arrest and seclusion on his little estate near Florence, where he returned in December 1633. This sentence remained in effect throughout the remainder of his life.

Although very much belated, Pope John Paul II has recently instructed the Pontifical Academy of Sciences to re-examine Galileo's ecclesiastical condemnation. It has been 350 years since the decree of 1633 and the move to rehabilitate Galileo should go a long way in closing the gap between intellectual freedom and ecclesiastical authority.

Galileo's announcement raised some contradictions between the Copernican theory and the Scriptures. This led some Aristotelian professors, to protect their interests, in seeking the help of ecclesiastical authorities. Together they secretly denounced Galileo to the Inquisition for blasphemous utterances. To forestall a crisis, Galileo appealed to Roman authorities and although he received some sympathetic support, Cardinal Robert Bellamine, the chief theologian of the church, was unable to appreciate the importance of the new theories and clung to the time-honoured belief that mathematical hypothethes have nothing to do with physical reality. He only saw the danger of a scandal, which might undermine the church and its fight with Protestantism. He accordingly deceided that the best thing would be to check the whole issue by having Copernicanism declared "false and erroneous." However, as an act of personal consideration, Cardinal Bellarmine had granted an audience to Galileo and informed him that he must henceforth neither "hold nor defend" the doctrine, although it could still be discussed as a mere "mathematical supposition."

For some years thereafter Galileo lived in retirement, but still carrying on with his studies and writing. In 1624 he again went to Rome, hoping to obtain a revocation of the restrictions placed upon him. This he did not get, but he obtained permission from the pope to write about "the systems of the world," both Ptolomaic and Copernican, as long as he discussed them noncomittally and came to the conclusion dictated to him in advance by the pontiff-that is, that man cannot presume to know how the world is really made because God could have brought about the same effects in ways unimagined by him, and he must not restrict God's omnipotence. This led Galileo to his greatest literary success.

Despite the harsh treatment accorded Galileo by the church he was able to continue his research in the fields of mathematics and physics. We are all familiar with Galileo's astronomical observations, but his works included some extraordinary advances in the application of mathematical analysis to physical problems. Being a product of the times, he also refused to accept certain new mathematical concepts and physical laws because his preconception of a perfect order in the universe would not allow him to accept these ideas. Perhaps his most widely accepted idea is the modern method of the experiment as practiced even by elementary students in their search for the truth in theories. He was totally blind in the last four years of his life, yet he continued his scientific correspondence, dictating to his disciples, to the very end. Galileo was seized with a slow fever and died at Arcetri on January 8, 1642.

Peter Steffin

DONATIONS WANTED FOR HALIFAX CENTRE LIBRARY

The Halifax Centre has a lending library located at the Nova Scotia Museum for the use of its members. The library has developed primarily from contributions by Centre members. We all would like to see the library grow to be able to satisfy even the most discriminating tastes in astronomical reading and to do this is by your future contributions. Any donation of books (or monies) would be greatly appreciated and should go to our librarians or any member of the Executive. Some of our present books are outstanding in their content. Why not drop by after a meeting and take a couple home with you.

NOVA NOTES ARE PUBLISHED BI-MONTHLY BY THE HALIFAX CENTRE R.A.S.C. IN JAN, MAR, MAY, JULY, SEP, AND NOV. ARTICLES FOR THE NEXT ISSUE MUST REACH THE EDITOR BY 15TH. APRIL, 83. ARTICLES ON ANY ASPECT OF ASTRONOMY WILL BE CONSIDERED FOR PUBLICATION. EDITOR: Peter Steffin, 8 Auburn Dr., DARTMOUTH, N.S. B2W 3S6 / 434-4541

NOVA NOTES IS PRINTED BY N.S. MUSEUM