

*The Royal Astronomical Society of Canada*



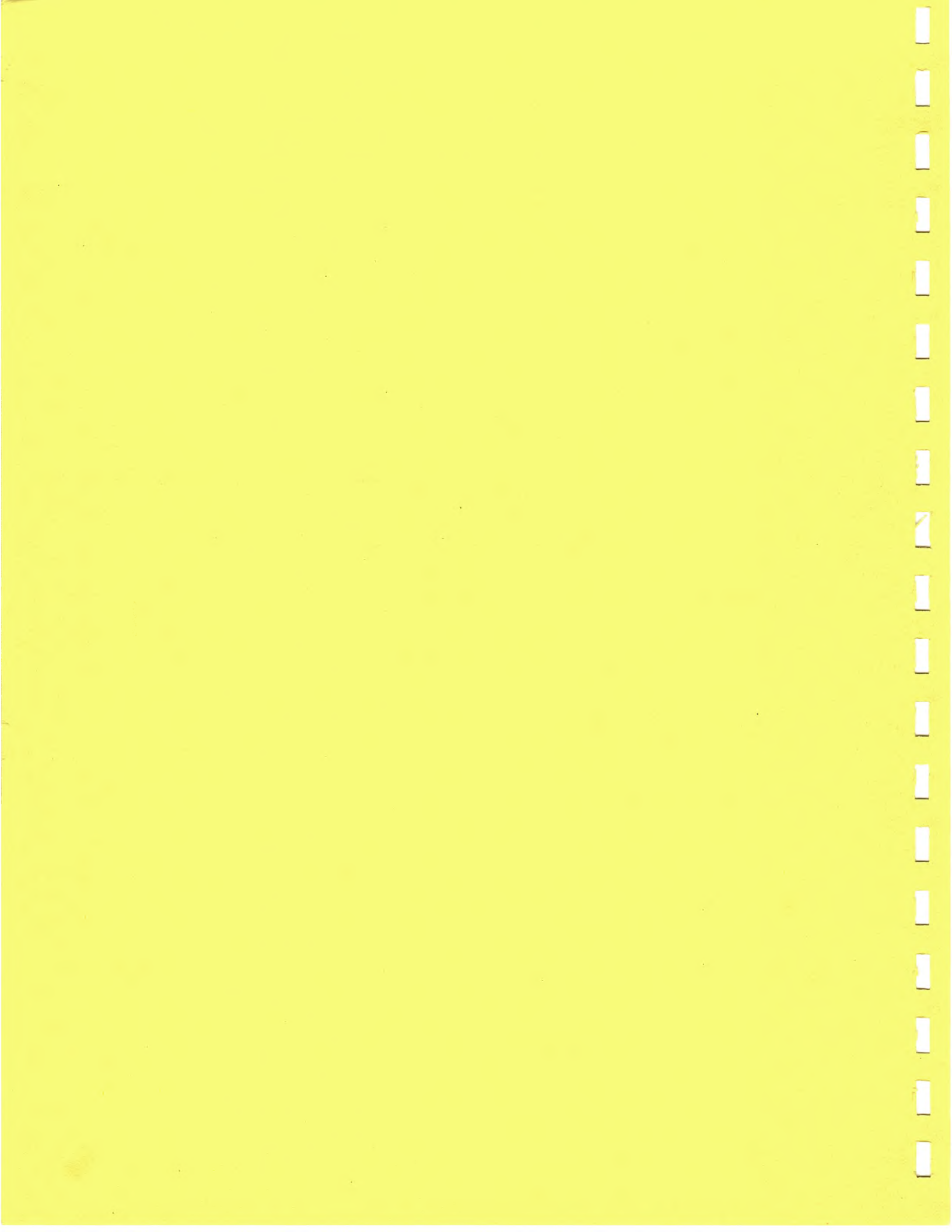
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*Windsor Centre*

*Golden Anniversary*

*June 29th to July 2nd*



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# R.A.S.C. National Presidential Message

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA  
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA



136 Dupont Street Toronto, Ontario M5R 1V2

## Welcome Delegates and Friends to GA'95;

On behalf of the *National Council* and *The Society at-large*, it is my pleasure to welcome you to Windsor and GA'95!. You are guaranteed a good time, and a productive and informative time. Frank Shepley and his local organizing committee have been working diligently for several years to ensure that the RASC's annual get-together in 1995 will meet, if not exceed, the standards set by those GAs which have come before.

There is a special reason for meeting here this year: the Windsor Centre of the RASC is celebrating its 50th Anniversary. After so many years of active participation in our Society, the Windsor Centre retains stability through its large coterie of long-serving members, yet enjoys the vital enthusiasm of new members. It is a fine example of the best our Society offers to its members and the general public.

I hope that you will enjoy your visit to Windsor and the surrounding areas, that you will have many opportunities to share your astronomical experiences with your fellow RASCals, and that you will help to guide The Society into its second century by participating in the discussions and debates at the General Assembly.

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Doug Hube, President

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# Windsor Centre Presidential Message

The Royal Astronomical Society of Canada



Windsor Centre

Dear General Assembly Delegates;

On behalf of both the executive and the membership of the Windsor Centre, I would like to extend a warm welcome to all delegates to this year's General Assembly. This is the first time the Windsor Centre has hosted a G.A. The G.A. Committee has put a lot of time and effort into the preparation and I am sure that you will be pleased by the results. My thanks to the committee and its chairman, Frank Shepley for all their hard work.

The Windsor Centre is celebrating its 50th year as a member of the Royal Astronomical Society of Canada. The first meeting were held at the Willistead Manor, which was the home of Mr. Edward Chandler Walker, founder of the world- renowned distillery. To help commemorate this occasion, we have created a lapel pin that you obtain as memorabilia.

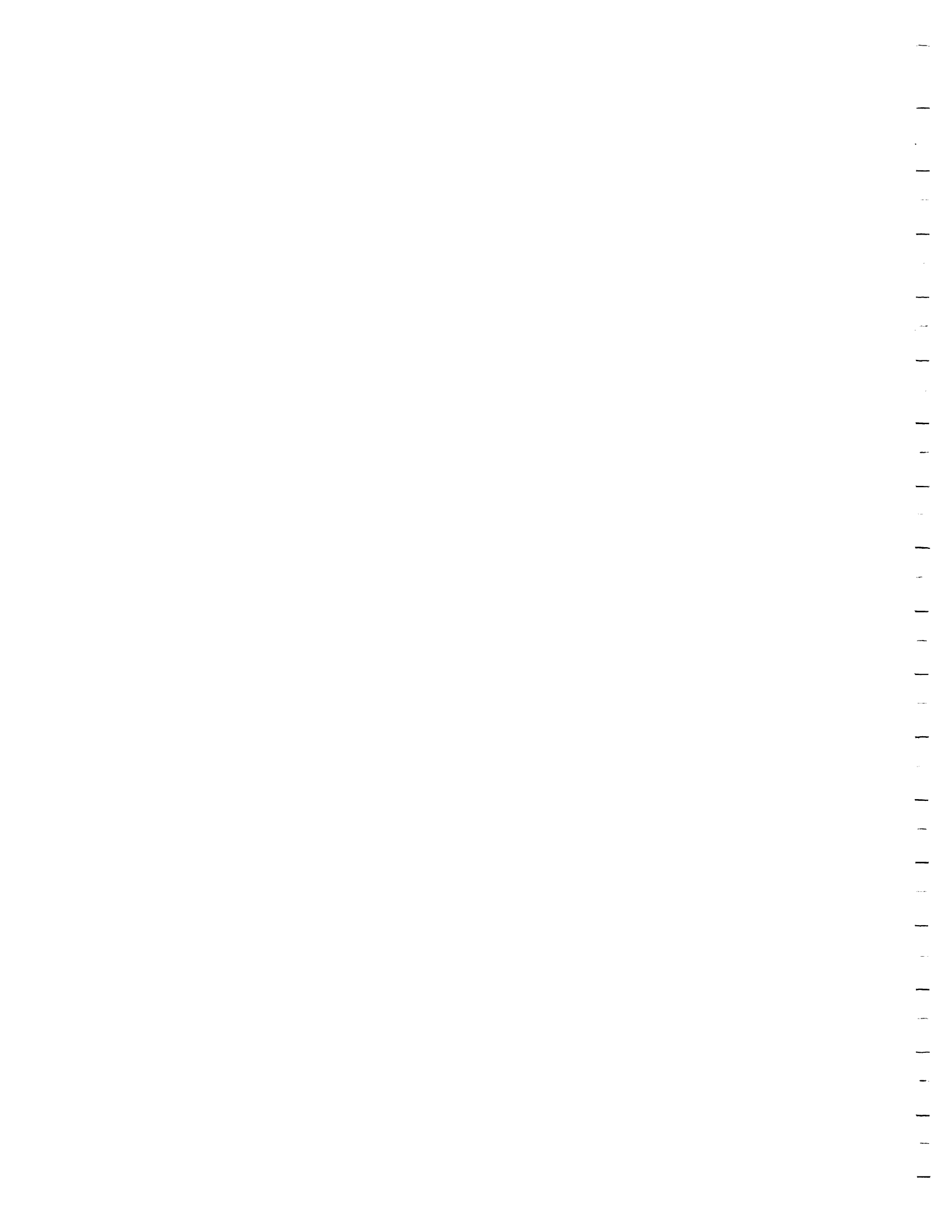
The University of Windsor is minutes from the river, with its parks and trails that lead downtown where one can find the International Freedom Festival, shopping, night life and the Windsor Casino if you feel lucky.

I am sure you will find it an excellent place to renew old friendships and make new ones. I hope you can take advantage of the tours that take in some of the history and nature of Windsor and surrounding County.

Clear, Dark Skies

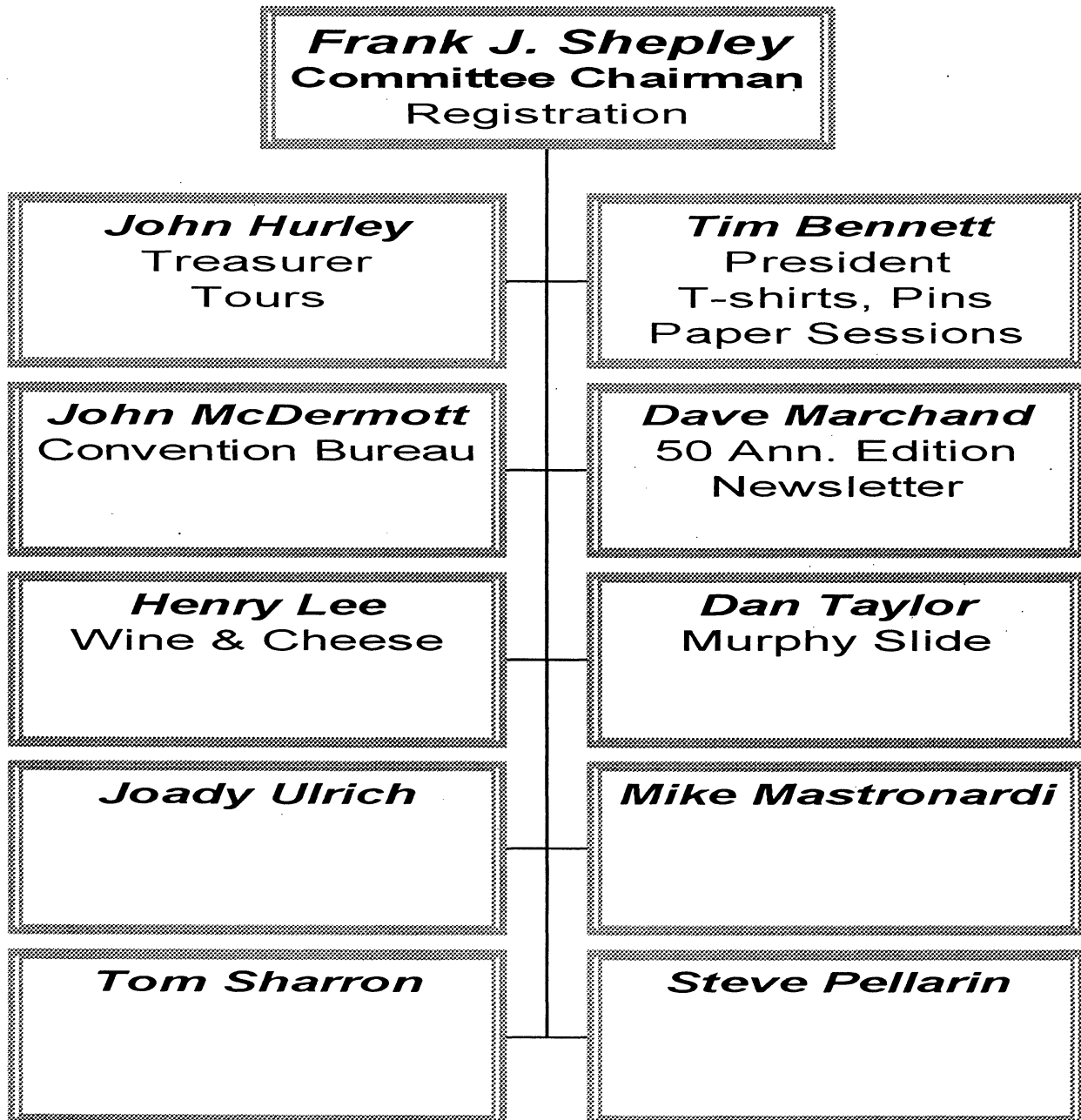
A handwritten signature in black ink, appearing to read "Tim Bennett".

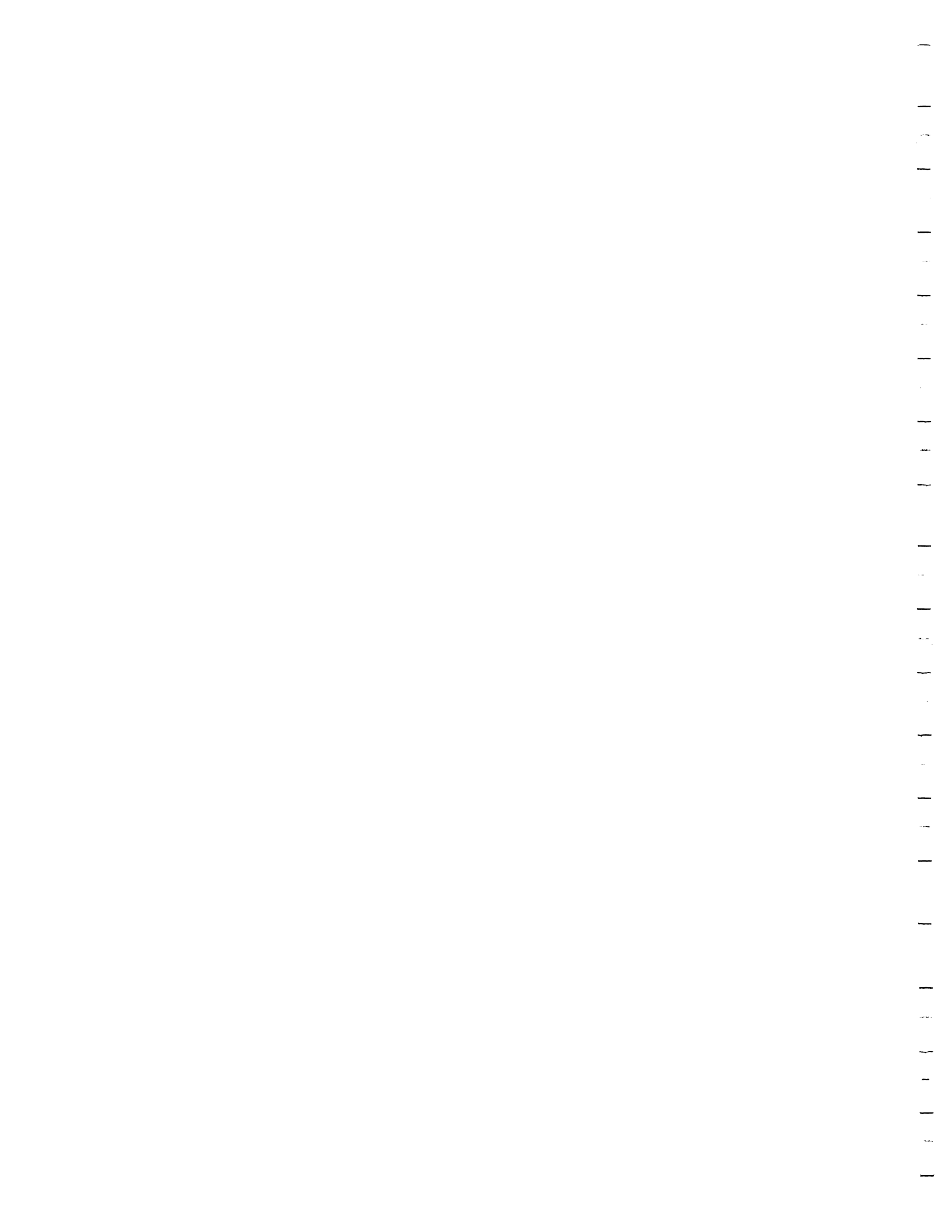
Tim Bennett, President  
Windsor Centre





# G.A. '95 Committee





## Schedule

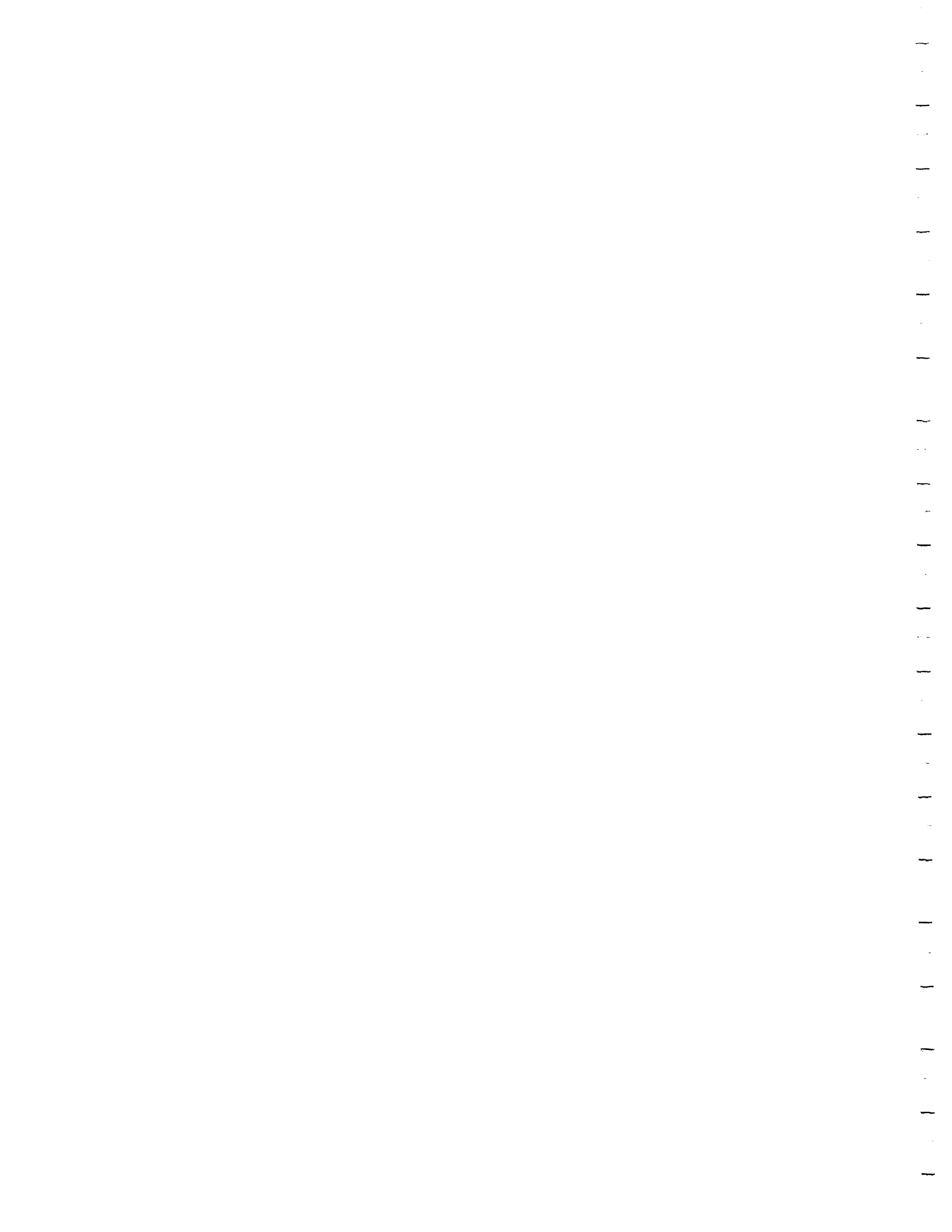
<b>Wed. June 28</b>	<b>12:00 - 20:00</b>	Registration starts at in the Vanier Lobby
	<b>17:30 - 19:00</b>	Dinner - Win Clare Hall- upstairs
	<b>9:45</b>	Fireworks at the River
<b>Thurs. June 29</b>	<b>7:00 - 8:30</b>	Breakfast
	<b>8:30 - 18:00</b>	Fort Malden \Pelee Island Winery Day Tour
	<b>9:00 - 20:00</b>	Registration in the Vanier Lobby
	<b>12:00 - 13:00</b>	Lunch
	<b>17:30 - 19:00</b>	Dinner
<b>Fri. June 30</b>	<b>7:00 - 8:30</b>	Breakfast
	<b>8:30 - 12:00</b>	Windsor Historical Tour
	<b>9:00 - 20:00</b>	Registration in the Vanier Lobby
	<b>9:00 - 16:30</b>	National Committee & Council Meetings Board Room- Student Centre
	<b>12:00 - 13:00</b>	Lunch
	<b>12:45 - 18:00</b>	Point Pelee Tour -
	<b>17:30 - 19:00</b>	Dinner
	<b>20:00 - 0:00</b>	Wine & Cheese - Ambassador Room in the Student Centre
<b>Sat. July 1</b>	<b>7:00 - 8:30</b>	Breakfast
	<b>8:40 - 9:00</b>	Group Photos
	<b>9:30 - 12:00</b>	Paper Sessions - Odette Building Rm. 104
	<b>12:00 - 13:15</b>	Lunch
	<b>13:15 - 17:00</b>	Paper Sessions - Odette Building Rm. 104
	<b>17:30 - 19:00</b>	Dinner
	<b>20:30 - 0:00</b>	Murphy Slide Show\ Song Contest Oak Room - Vanier Hall
<b>Sun. July 2</b>	<b>7:00 - 8:30</b>	Breakfast
	<b>10:00 - ?</b>	1995 General Assembly Meeting - Odette Building Rm. 104
	<b>After GAM</b>	National Council Meeting
	<b>12:00 - 13:15</b>	Lunch
	<b>13:30 - 17:00</b>	Paper Session ( if Needed)
	<b>17:30 - 19:45</b>	Banquet/Awards - Ambassador Room in the Student Centre
	<b>20:00</b>	Ruth Northcott Lecture - Erie Hall Rm. 1120

**Note:** All Meals (except Banquet) are in the Win Clare Hall upstairs of the Vanier Lobby  
**Tour Pickups are in front of Vanier Hall**  
**Free Time on Sunday afternoon if there is no Papers**



## Paper Session Schedule

9:45	Robert Dick	The Southern Sky: Activities After the November 3 Solar Eclipse
10:05	Rajiv Gupta	Digital Imaging
10:40	John E. Kennedy	Astronomy over Three Centuries
11:05	Richard W. Schmude	Wideband Photometry of Mars During the 1994-95 Opposition
11:30	Robert Dick	Light Pollution Abatement: Successes in Ottawa: What Cities Want to Hear!
12:00	Lunch	
13:20	Paul Gray	Observing the Quadrantids Meteor Shower An Update
13:40	Paul Boltwood	Photometric Work
14:20	Raymond Auclair	Ai-je bien vu Pluton? Have I seen Pluto?
14:40	Al DesRoiser	Roll Off Roof Observatory
14:55	Peter Broughton	James Craig Watson (1838-1880)
15:20	Break	
15:50	Dave Lane & Paul Gray	Supernova Scotia 1995F
16:55	Alan Dyer & Glenn Hawley	Eclipse Over the Andes



# Paper Sessions

**Robert Dick**

## **The Southern Sky: Activities After the November 3 Solar Eclipse**

Over two dozen RASC members journeyed to the southern hemisphere to witness the solar eclipse of November 3, 1994. Most of them continued to enjoy Peru and Chile during extended tours of archaeological and astronomical sites. One trip was to the Las Campanas Observatory where a 16 mm time-lapse film was shot of the celestial sphere as it rotated for 5 hours. This brief film will be shown.

**Rajiv Gupta**

## **Digital Imaging**

Computers have long been used in CCD astro-imaging, but have seen limited use in traditional astrophotography. We will describe how digital techniques can be applied to film astrophotography, with examples. System requirements, and benefits and limitations of the process, will be discussed.

**John E. Kennedy**

## **Astronomy over Three Centuries**

The 50th Anniversary of the founding of the Windsor Centre is an appropriate occasion for a brief examination of the progress of astronomy during the 18th, 19th and 20th centuries. Throughout this period advances in technology, coupled with an unprecedented explosion of information, have affected greatly the science of astronomy. In each successive century the interest of the public in astronomy has new levels.





**Richard W. Schmude, Jr.**

**Wideband Photometry of Mars During the 1994-95 Opposition**

An intensive photometric study of Mars was carried out during the 1994-95 opposition. The normalized V-filter magnitude corrected to a solar phase angle of  $0^\circ$  is  $V(1,0) = -1.54 \pm 0.02$ . This value is 5% (or 0.05 magnitudes) brighter than the 1992-93 measurement. This increase in brightness may be due to the more northward tilt of Mars or due to the increase in cloud over Mars. The solar phase coefficient measured in the V-filter is  $0.0118 \pm 0.0005$  magnitudes per degree; this is almost identical to the value measured in 1992-93.

The north polar cap retreated at about the same rate as in 1992-93; it was about  $1^\circ$  larger in diameter this year than 2 years ago.

**Robert Dick**

**Light Pollution Abatement: Successes in Ottawa: What Cities Want to Hear!**

The Light Pollution Abatement Committee in Ottawa has scored a number of successes in changing lighting policy in the National Capital Region. This paper outlines how this was done. The paper will explain how Ottawa has convinced technical authorities, who are concerned with cost, safety and security, to adopt sharp cut-off luminaries. There will also be advice for other Centres on how to change lighting policy in their municipalities.

**Paul Gray**

**Observing the Quadrantids Meteor Shower -An Update**

In 1993 at the GA in Halifax a paper was presented about the observations of the Quadrantids in 1992 and 1993. Now after a few more years of observations by the same group as well as others more results have been attained. In this paper I hope to show that the shower is very strong for those who wish to observe it correctly at the right time.

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## **Paul Boltwood**

### **The Boltwood Observatory and His Photometric Work**

Paul Boltwood will speak about his observatory and homemade CCD camera. He will show a few astrophotos and then describe his photometric work. His observatory has provided a substantial portion of the data base for the professional OJ-94 project. The OJ-94 project is testing theoretical models of the blazar OJ287.

## **Raymond Auclair**

### **Ai-je bien vu Pluton?**

Je ent de capturer Pluton. La 14e magnitude serait un bon test pour mon systeme (mes yeux, mon telescope et mon emplacement). Pendant une nuit, un ciel d'une clarte exceptionnelle me permet de dessiner avec soin ce que je vois dans un champ centre sur la position probable de Pluton. Je pense avoir vu l'objet mais la fumee des feux de foret de l'ouest canadien m'empechera de confirmer l'observation. Je me tourne vers les cartes du ciel mais voila qu'on me propose trois positions differentes pour Pluton. Laquelle est la bonne? (et pourquoi les deux autres serait erronees?)

### **Have I seen Pluto?**

I've decided to nab Pluto. Well, that's pretty close to the practical limits of my system (my eyes + my scope + my sky). For one clear night, I carefully drew the field of view and my drawing shows a probable candidate. Except that the smoke of Western Canada forest fires has since kept me from confirming the sighting... and charts propose three possible locations for Pluto at the time of my sighting (if one is right, then two must be wrong).

## **Al DesRoiser**

### **Roll Off Roof Observatory**

I will show slides and explain the construction and selection of materials used in building my log cabin style roll off roof observatory.

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## **Peter Broughton**

### **James Craig Watson (1838-1880)**

Watson was born in southwestern Ontario but moved to Michigan with his family for his high school and university education. Like his contemporary, Simon Newcomb, who also moved to the States as a youngster, Watson went on to become one of the most renowned astronomers of his time.

## **Dave Lane & Paul Gray**

### **Supernova Scotia 1995F**

This talk will present the steps leading up to and the process used to find supernova 1995F by members of the RASC at Saint Mary's University on February 10th, 1995. We will also very briefly describe (we are not astrophysicists!) what supernovae are, what are their properties, and why they are important to discover and study throughout their life cycle.

## **Alan Dyer & Glenn Hawley**

### **Eclipse Over the Andes**

In November 1994, the Calgary Centre, in conjunction with the Alberta Science Centre, led a tour group of 40 people to Chile to view the total eclipse of the Sun. The viewing site was incredible - a 4,000 metre high plain surrounded by snow-capped volcanoes of the Andes. The tour also included a visit to the Las Campanas Observatory and an unforgettable night of viewing the southern skies with the University of Toronto's Helen Sawyer-Hogg Telescope, Canada's only observatory in the southern hemisphere. Alan and Glenn will recount the RASC's eclipse trip, show some of the best eclipse slides and video clips taken by tour members, and take the audience members on an armchair tour of the southern skies using astrophotos and CCD images Alan shot at Las Campanas on this and previous visits.

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# AWARDS

## The Chant Medal

The Chant Medal of the Society was established in 1940 in appreciation of the great work of the late Professor C. A. Chant in furthering the interests of astronomy in Canada. It is awarded not more than once a year to an amateur astronomer resident in Canada for extensive and original work of value of astronomy.

This winner for 1994, *Paul Boltwood*, has committed himself to the production of professional - quality astronomical data at his home observatory in Stittsville, near Ottawa, Ontario. He started with the design of a first - rate backyard observatory with a 7 inch apochromatic refractor. He then designed and constructed a CCD camera with impressive capabilities. The camera system includes a vacuum chamber in which the CCD chip is thermoelectrically cooled to -72 degrees C, a filter set, custom - designed to closely match standard colorimetry systems, complex support electronics, and many thousands of lines of computer software.

Paul did not stop with the development of the hardware, however. After proving the system out by producing a stunning series of images of faint astronomical objects, Paul investigated possible professional collaborations. He was accepted as a member of the OJ - 94 project and started observing the prime target - the 16th magnitude quasar OJ287 - as well as a secondary target, 3C66A. After several months of nightly observations, Paul realized that OJ287 varied substantially over the course of a single night. Realizing that "aliasing" effects would degrade the accuracy of his data, Paul began observing the object continuously every clear night, all night. To produce and reduce the many gigabytes of data, Paul developed over 10,000 lines of computer software to automate the process.

Paul's dedication to the project has already resulted in an interesting discovery: the quasar's light is more variable when the object is brighter. In conjunction with the other observers, the group has produced the most detailed light curves ever for quasars. Paul's contributions of data have far exceeded the output of the professional observers. At over 12,000 individual observations to date, he has supplied more than half of the total data. His professional collaborators have referred to the "Boltwood Effect", where the plots of spectral bands covered by Paul stand out because of the dense data points. Paul recently traveled to Finland to present his data at the OJ - 94 conference, where he received the Merit Award for presenting the best paper. His paper has also been published in the conference proceedings.





## The Chilton Prize

The Chilton Prize was established in 1977 in remembrance of Kenneth E. Chilton, an active member of the Hamilton Centre. A plaque is awarded in recognition of a significant piece of astronomical work carried out or published during the year.

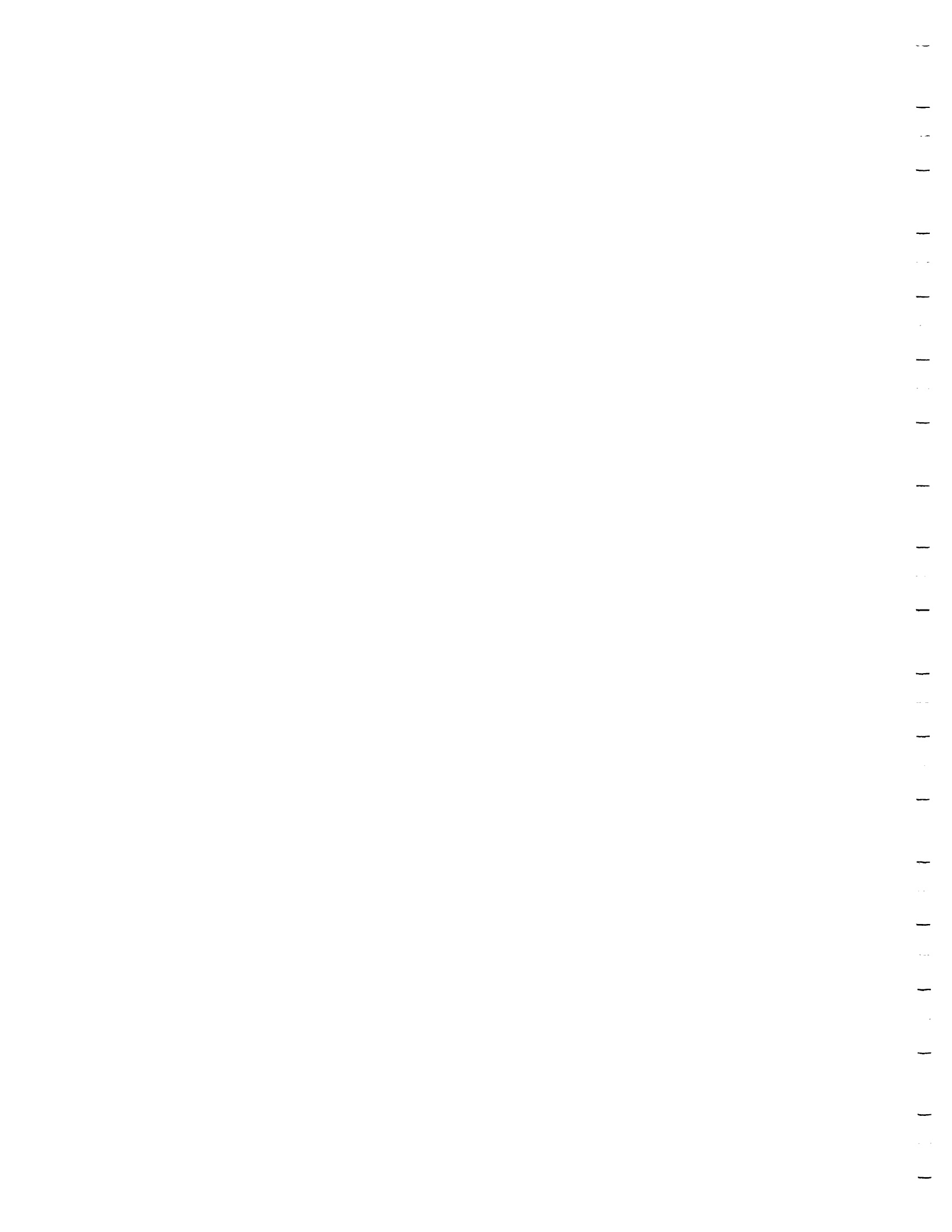
This year, for the first time, there are co - winners: *Paul Gray* and *David Lane* of the Halifax Centre. Paul and Dave's careful and meticulous work in devising and carrying out their supernova search program more than qualifies for such recognition. Their search program was very carefully planned and executed with great dedication and skill. The fact that they have been successful in their endeavors is a remarkable achievement and certainly worthy of substantial recognition by the Society. There can be no denying the significance of the discovery of SN1995F that came as a direct result of their efforts.

These two amateurs are a shining example of what can be achieved with dedication and determination. Although the discovery was made at a university observatory, using the university observatory, telescope and accessories, the program was carried out entirely as an amateur project and was not part of any official university research activity. The search program was carried out on Paul and Dave's spare time and would never have happened without the special talents of both of them. While Paul worked out the details of the search program and selected appropriate target galaxies, Dave used his expertise to upgrade the telescope and ancillary equipment so that they could proceed with the program. In particular, the use of Earth Centered Universe, the sky simulation software written and developed by Dave Lane, to drive the telescope and to aid in targeting candidate galaxies, was a major determining factor in their eventual success.

The Burke - Gaffney Observatory at Saint Mary's University stands to benefit directly from the inclusion of this software into the observatory's operations because it is now a much more capable facility than it would otherwise have been.

While the supernova search is the focus for this Chilton Prize citation, it seems appropriate to mention Paul Gray's other contributions to astronomy in the form of his organized meteor observing sessions that have been running for several years now, and that contribute data regularly to the International Meteor Organization. These endeavors mark Paul as one of Canada's most outstanding amateur astronomers.

The achievements of amateur astronomers like Paul Gray and Dave Lane are of great benefit to the RASC for they raise public awareness of the Society, its members and their work. Discoveries such as this bring recognition, credibility and respect to the RASC. The world at large is made aware that amateur astronomers are much more than just stargazers - they are knowledgeable, hard working, dedicated people who strive to improve our understanding of the Universe we live in - and they do it all out of love of the stars. Paul Gray and Dave Lane, because of their discovery, are now ambassadors of astronomy and of the RASC and very deserving of proper and public recognition by the Society in the form of the 1995 Chilton Prize.



## The Service Award

The Service Award, in the form of a bronze medal, recognizes outstanding service to a Centre or to the national Society over a period of at least ten years. There are two winners this year: *Patrick Kelly* of the Halifax Centre and *Ron Gasbarini* of the Niagara Centre.

Since joining the Halifax Centre in 1981 *Pat Kelly* has been a very active member of the RASC, first at the Centre level and then nationally.

Pat has occupied the following Centre Executive positions: NOVA NOTES Editor for seven years (1985 - 1992), President for two years (1992 -1993), Vice - President and Secretary for one year (1994), and a key member of the 1993 General Assembly organizing Committee from 1990 to 1993. Nationally he has been Editor of the Bulletin for three years (1992 - 1994) and serves on the Publications Committee.

Pat has faithfully kept the Centre membership records and handled the annual business of membership accounting for the last ten years. Whenever there is a job to be done he is always at the front of the line to help out. Always cheerful, always smiling and pleasant, Pat refuses to argue with anybody about anything. He just smiles and keeps working. He has, over the years, participated actively in virtually every Centre event, working long and enthusiastically to promote public awareness of science in general and astronomy in particular through Astronomy Day, Nova East, other public star parties and meteor watch events held by the Halifax Centre and most especially through his many years of volunteering in the small Halifax Planetarium. He has been the catalyst that started several other Centre members as planetarium speakers and so is responsible, at least in part, for the much expanded public program now offered in the Halifax Planetarium.

Related to this field is his active involvement as a member of the Board of Directors of the Nova Scotia Planetarium Advisory Committee, where he works to promote the establishment of a new planetarium for the province. An experienced and engaging speaker, Pat also devotes a considerable amount of time to bringing astronomy to children through school and public library presentations.

The RASC owes much of its special character to its blend of amateur and professional expertise, to its ability to present accurate and exciting science to the public. Patrick Kelly has made a major contribution in this regard, both in the Halifax Centre, and to the Society nationally.

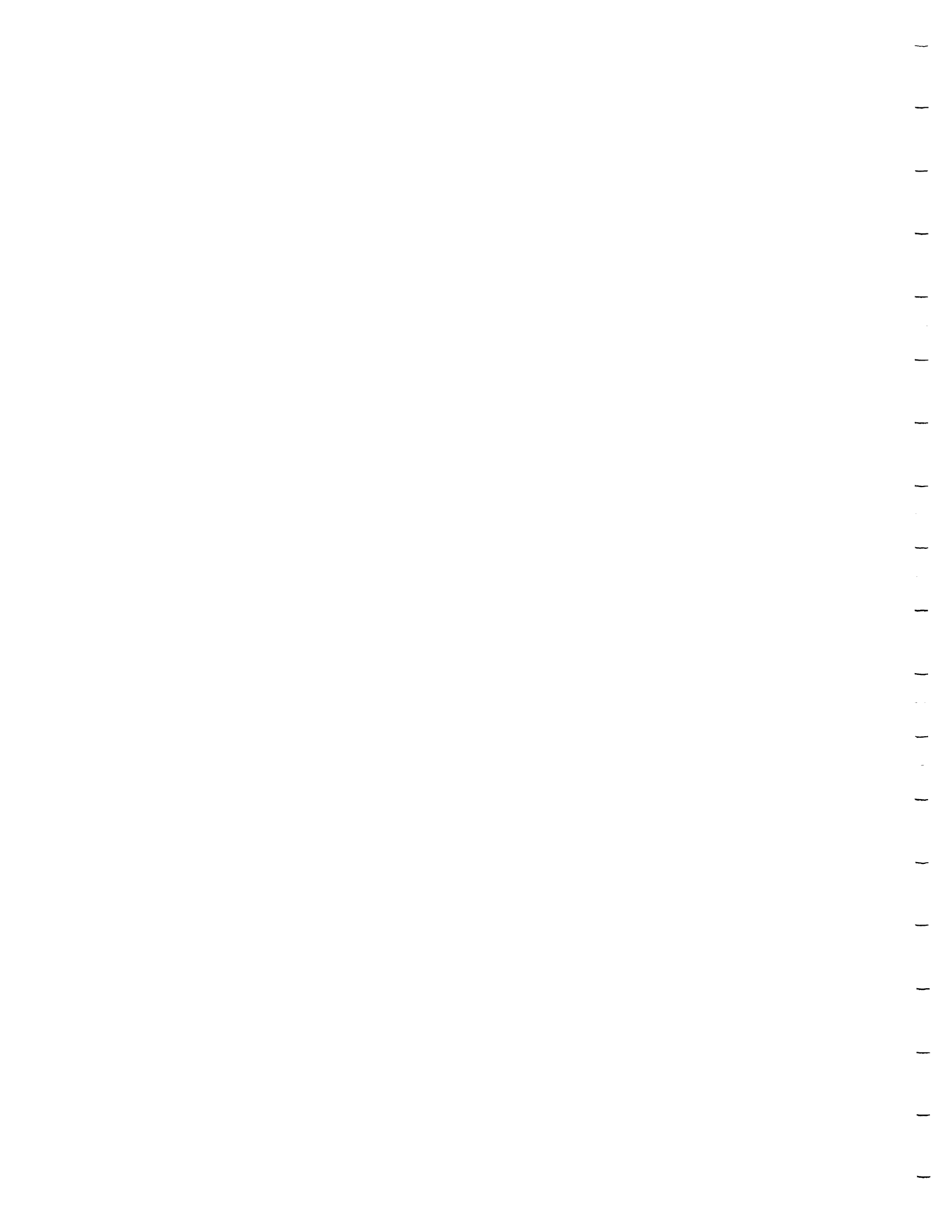


## **The Service Award....cont.**

*Ron Gasbarini* joined the Niagara Centre at the age of twelve. In the twenty-three years since, he has selflessly provided outstanding service to the club. He founded the Observers' Group in 1977 and served as its first Chairman and went on to hold every office in the Centre except Treasurer, often serving multiple positions. When no one else would accept responsibility for a necessary post, the Niagara members could always count on Mr. Gasbarini.

He has made innumerable presentations to school classes, to Cub and Guide groups and to other public organizations. On many occasions, Mr. Gasbarini was the Public Relations Director and actively advertised Centre activities. Both in his capacity as Secretary and as a regular Board member, he was instrumental in the preparation of the new Centre By - Law. He played an essential part in the construction of the Centre observatory and he continues to provide much assistance in its operation and maintenance. He routinely provides the refreshments at the monthly meetings, all too many times at his own expense, and frequently lends a hand at star nights, mall displays, field trips, fund - raising activities and banquets.

On the recommendation of the Directors and members of the Niagara Centre, and of the national Awards Committee, National Council enthusiastically approved the presentation of the Service Award to Mr. Ron Gasbarini at the 1995 General Assembly in Windsor.



## The Simon Newcomb Award

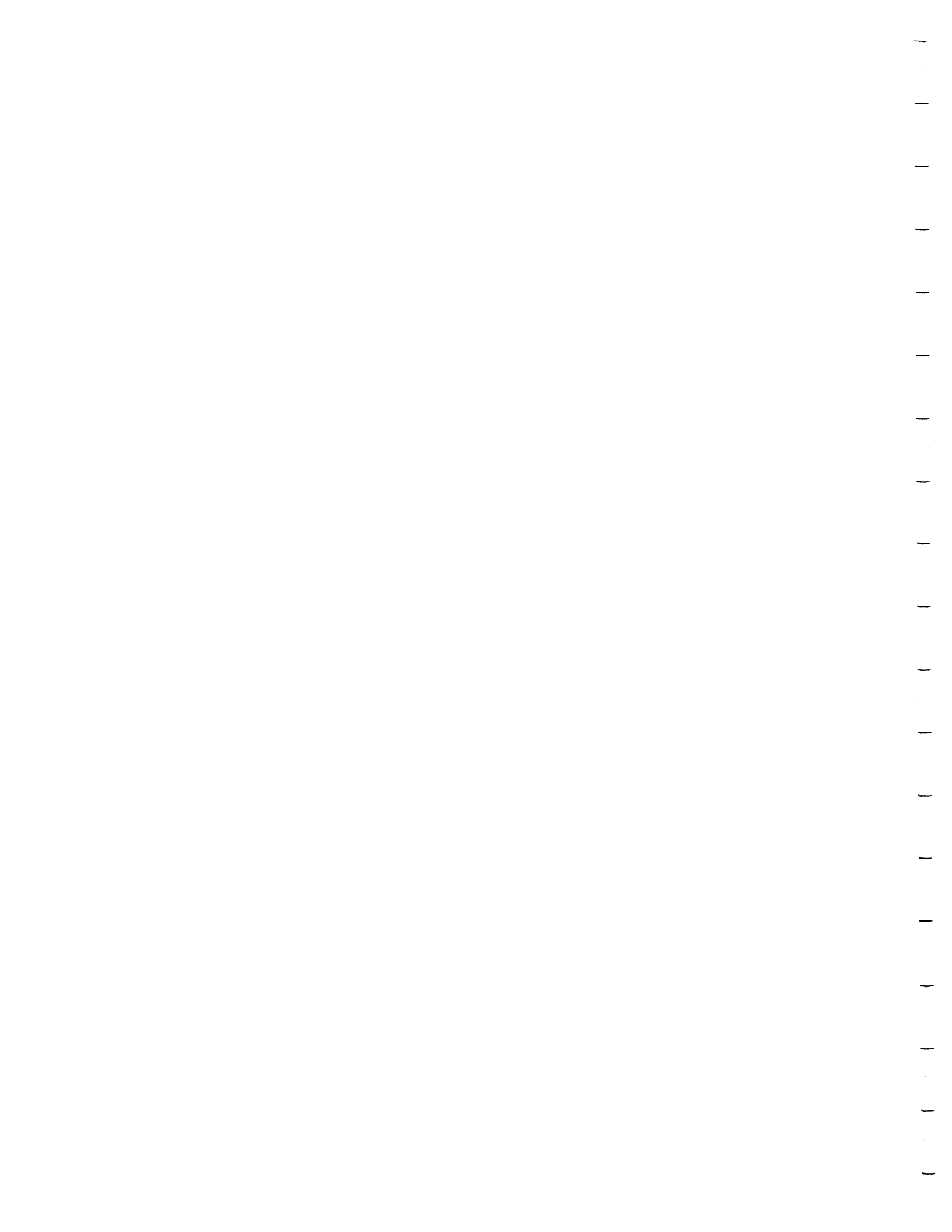
The Simon Newcomb Award is named in honour of the famous astronomer, Simon Newcomb (1835-1909), who was born in Nova Scotia and later served for twenty years as Superintendent of the American Ephemeris and Nautical Almanac Office at the United States Naval Observatory in Washington. The award was created in 1978 by the RASC National Council on the initiative of the Halifax Centre, though the terms were broadened in October, 1994, and a cash prize as well as a trophy and books are now offered.

The intention is to encourage members of the Society to submit well-written articles of general interest and to recognize the best of these through the award. Details can be found in the December, 1994, Bulletin or in the Minutes of the National Council for October, 1994.

The Simon Newcomb Award for 1994 was won by *Michael S.F. Watson*, an unattached Life Member of the RASC, for his outstanding article, "*Simultaneous Lunar Occultations of Two Planets*". As a result of rule change, the decision to grant the award was made too late for the presentation to take place at last year's General Assembly. However, those members who were in St. John's will remember Michael's excellent talk at the paper sessions, and everyone will have enjoyed reading Michael's paper in the August, 1994, issue of the Journal. The note "*About the Authors*" in that issue tells that Michael has been a life member of the Society since 1970 and has held various positions at the national level in the RASC and was a recipient of the Service Award in 1992. He is an experienced solar eclipse observer and a long-time astrophotographer.

## The Plaskett Medal

The Plaskett Medal winner was *Michael Richer*. He received his Ph.D. from York University, and his thesis topic was "*Planetary Nebulae - Their use as a Tool to Probe the Evolution of Galaxies.*" Michael is now at the Paris Observatory.





# THE RUTH NORTHCOTT LECTURE

**DR. CAROLYN S. SHOEMAKER**

## *"Comet Impact - Lessons Learned"*

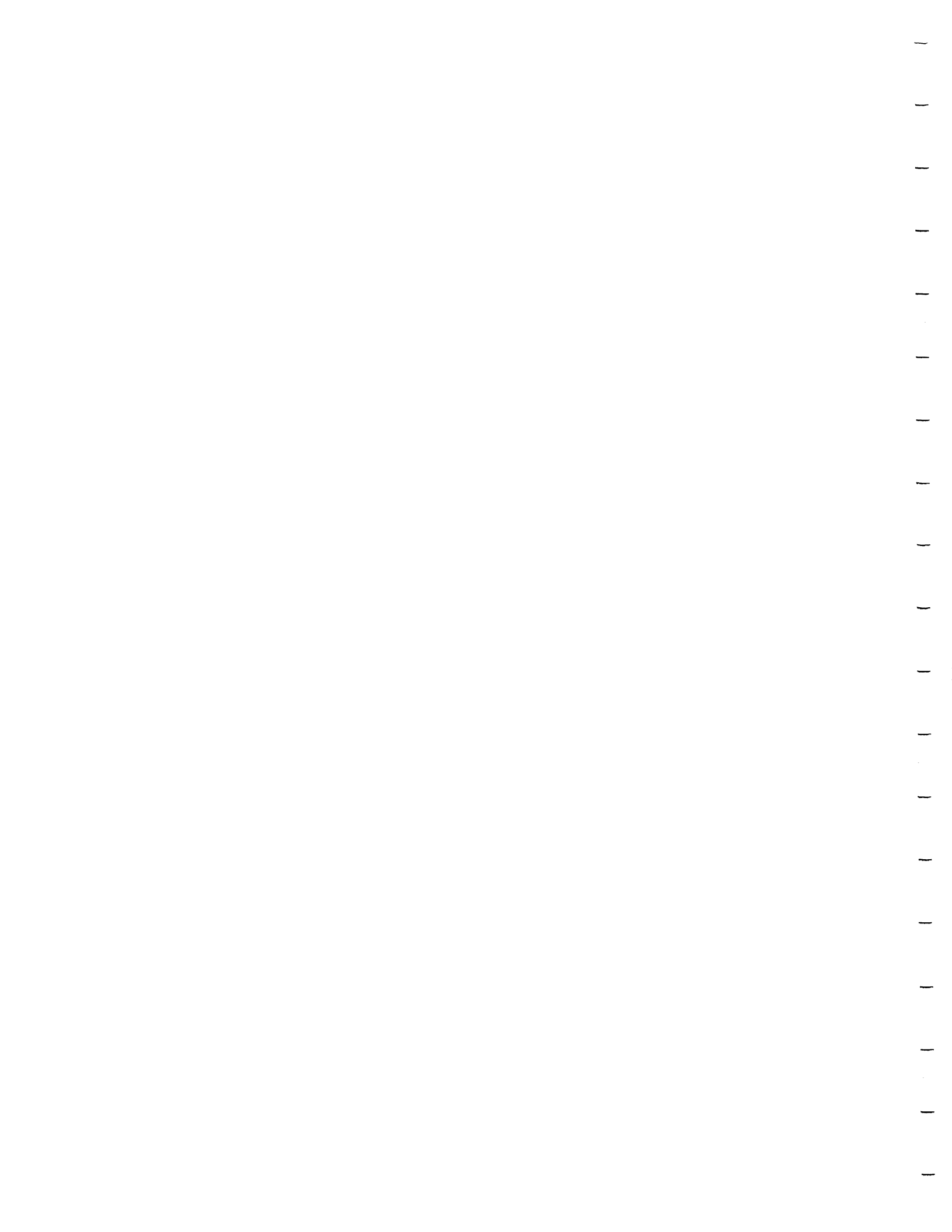
Born in Gallup, New Mexico, in 1929; Carolyn Shoemaker received her Bachelor's and Master's Degrees from Chico State College, California, in 1949 and 1950, respectively. Along with husband, Eugene, she was awarded the Rittenhouse Medal from the Rittenhouse Astronomical Society in 1988. After receiving an Honorary Doctorate of Science degree from Northern Arizona University in 1990, she and husband Eugene became Cloos Scholars at John Hopkins University, also in 1990.

Dr. Shoemaker's career has been both fascinating and eventful. Since 1980, she has served as a visiting scientist in the Astrogeology Branch of the U.S. Geological Survey. In 1989, she became a Research Professor of Astronomy at Northern Arizona University. Then, in 1993, Dr. Shoemaker joined the staff of the Lowell Observatory. From 1981 - 1985, she also served as a research assistant at the California Institute of Technology.

Dr. Shoemaker has discovered 32 comets, including 15 short - period comets of the Jupiter family and 17 long - period comets, two of which are giant bodies that came no closer to the Sun than Jupiter's orbit. Working with her husband, Dr. Eugene Shoemaker, and David Levy, Dr. Shoemaker discovered Periodic Comet Shoemaker - Levy 9 in orbit around Jupiter in March, 1993.

Dr. Shoemaker is credited with the discovery of more than 800 asteroids, of which 162 bear numbers. Among the newly - discovered asteroids are 42 Earth - crossing asteroids. She also developed an efficient stereoscopic technique for scanning films taken with Palomar Observatory's 1.2 metre Schmidt camera, making it twice as fast to image the sky. This was also the instrument used to discover Comet Shoemaker - Levy 9.

Turning her talents to investigations of our own planet, Dr. Shoemaker has worked in collaboration with her husband to investigate meteorite craters and ancient impact structures in Australia. She discovered the meteorites at Veevers Craters, and also the impact sites at Wolfe Creek Crater.



# A Thank You From the G.A. '95 Chairman

To All Friends at the G.A.;

I would like to this opportunity to thank everyone who has lent a hand, an ear, or advice to me over the last two years. Since I had never done anything the resembles this kind of responsibility, I needed some help and advice, and I was not afraid to ask for it.

I started out by attending the last three G.A's, and they were great to learn from. The chairpersons of each of the GA's were also great in giving me the "*dos and don'ts.*"

Our National President(s), Peter Broughton and Doug Hube have both been very helpful in providing information in their areas of expertise.

In regards to the Ruth Northcott Lecturer, I would to like to thank Peter Jedicke and David H. Levy for their help.

I could go on for pages thanking people, so I will finish here with a final thank you to the rest of the G.A. '95 committee, with very special thanks to John Hurley and Tim Bennett and his wife Sheila.

I hope you enjoy yourself in Windsor as much as I have enjoyed the job I've had for the last two years.

Next year it's off to Edmonton.

Yours truly



Frank J. Shepley



Thank You to.....



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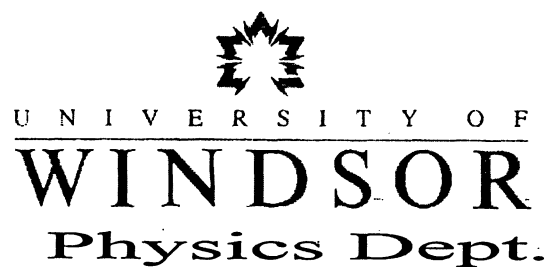
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*Jack Brisbin - D.A.S. Past President  
Neighbourhood Naturalist*

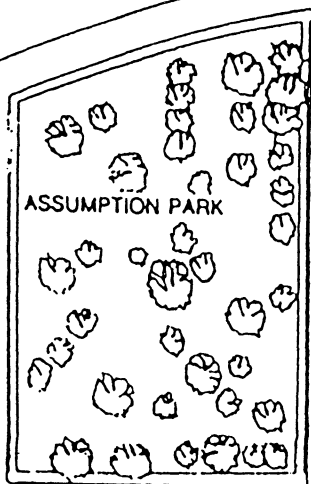
*Jim's Moble Inc.  
Preceptor*



DETROIT RIVER

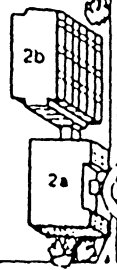
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ASSUMPTION PARK

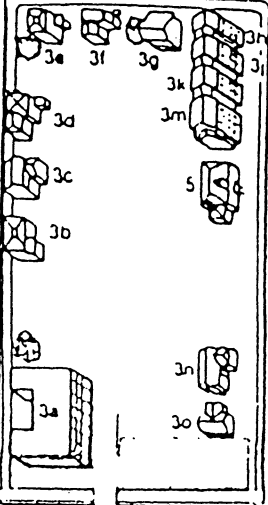
VISTA PLACE



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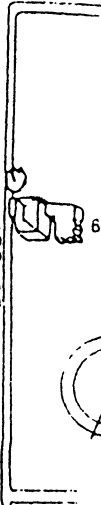
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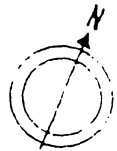
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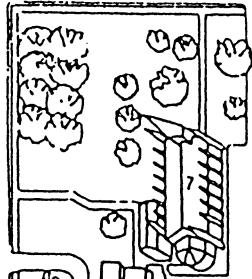


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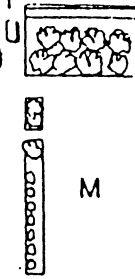
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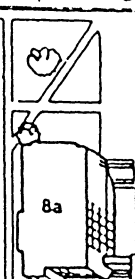
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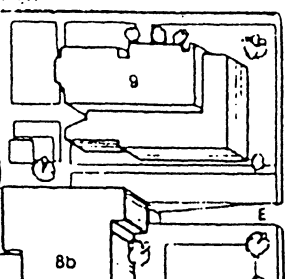
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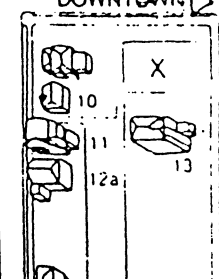
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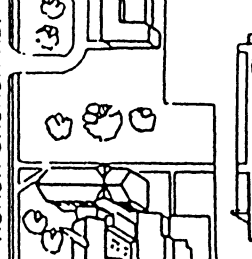
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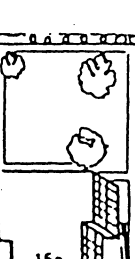
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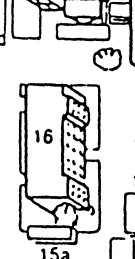
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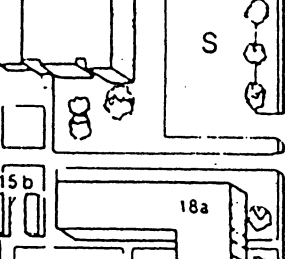
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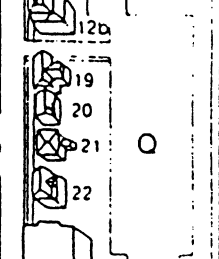
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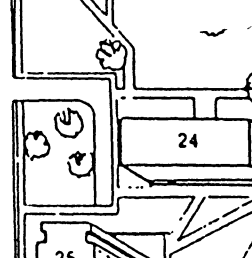
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Student Centre  
Board Room  
Ambassador Room

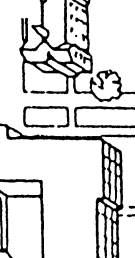
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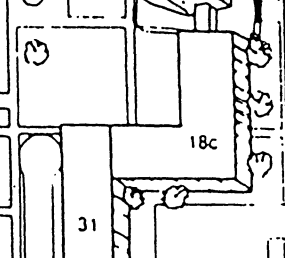
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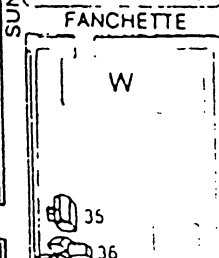
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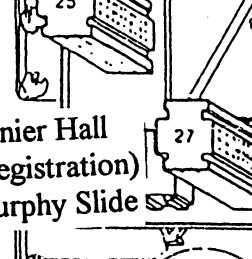
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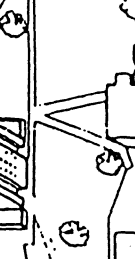
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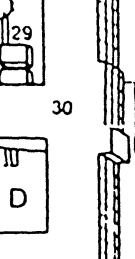
Vanier Hall  
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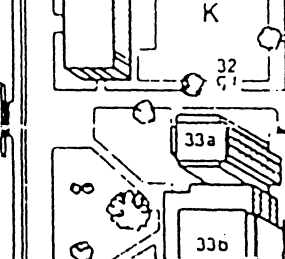
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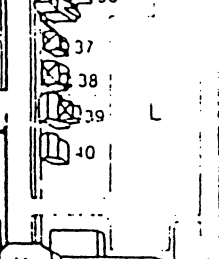
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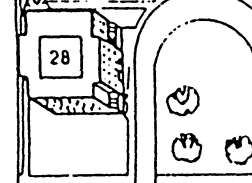
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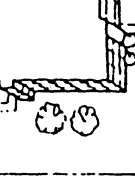


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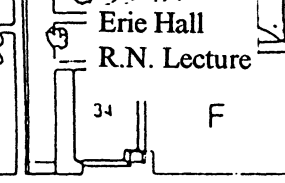


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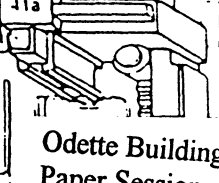
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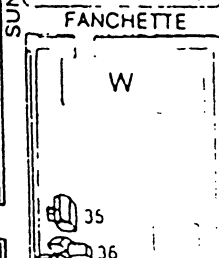
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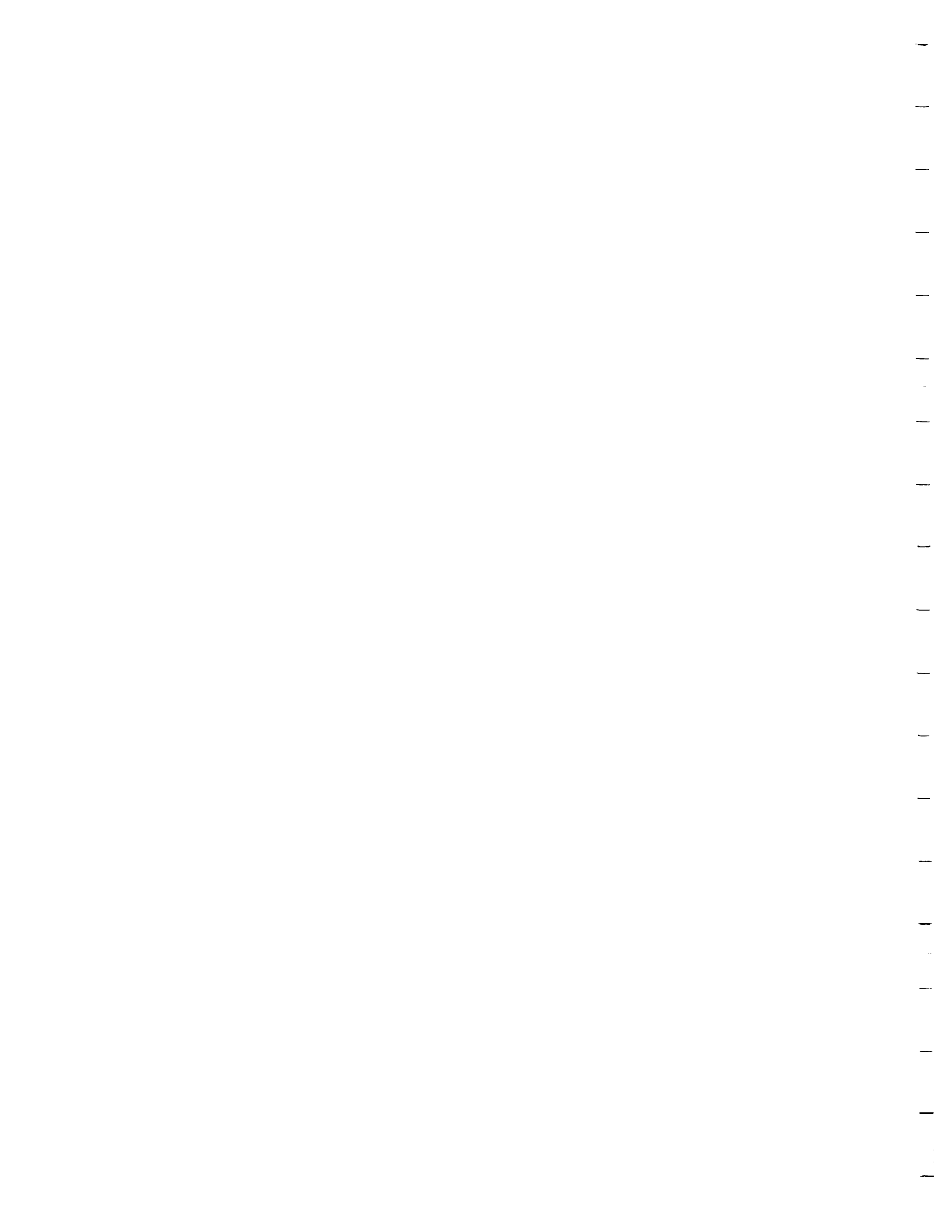
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